Final report on the results of the Asset Quality Review of second-tier banks in the Republic of Kazakhstan

February 2020

НАЦИОНАЛЬНЫЙ БАНК КАЗАХСТАНА

CONTENTS

1. Executive summary

In 2019 National Bank of Kazakhstan (NBK) conducted an Asset Quality Review (AQR) of the top 14 banks, which were chosen based on their economic significance for the banking system of Kazakhstan. The banks were ranked based on their total assets size and loan portfolios relative to those of the banking sector as a whole, ensuring that a representative share of the sector would have been reviewed – the selected banks accounted for 87% of the total banking assets in the country and 90% of the total loan portfolio of the banks.

Asset Quality Review (AQR) is an approach based on international financial reporting and prudential standards which is reflecting financial regulator's prudential outlook on the current financial accounting and risk assessment practices. The review aimed at and managed to provide an objective and fair view on the value of banks' assets as well as a true and fair view on the capital adequacy of the banks in scope.

On 30 December 2019 NBK published AQR system-wide report[1] which describes:

- The context and objectives of AQR exercise and general approach;
- The methodology of AQR exercise per work block;
- Preliminary outcome of the AQR exercise at system level as well as next steps towards closure of the exercise – since then the transparency phase was finished with additional detailing of the AQR results and communication with the participating banks on it completed.

In accordance with the AQR results provided in the AQR system-wide report published on 30 December 2019, no capital shortfall is observed at the banking system level (aggregating results of the participating banks) as of 1 April 2019, prudential k1 and k2 minimum capital requirements are met at the system level taking into account the AQR results:

- At consolidated level the k1 capital surplus versus prudential minimum requirement is ~70% after taking into account all AQR adjustments of expected credit loss (ECL) and assets revaluation (compared to ~105% capital surplus pre-AQR);
- Similarly, AQR shows that k2 capital surplus on a system level is sufficient for risk coverage from the prudential standpoint (e.g., in terms of assessment of collective provisioning models, on-balance sheet real estate revaluations and application of prudential impairment triggers).

AQR results should not necessarily impact capital or banks' financial statements. Firstly, AQR methodology has some conservatism implemented in the prudential approach to the regulator's interpretation of accounting standards application. Secondly, AQR program estimates the result as of 1 April 2019, after which there have been changes to the banks' portfolios. Many banks had already considered the observed results during AQR and took measures to improve portfolio quality and started to improve polices and processes, data and systems to ensure compliance with AQR methodology requirements. However direct violations of accounting standards by the banks should be reflected in their financial statements for the corresponding period.

The report at hand complements the one released in December 2019 and provides greater details on the third point – AQR outcome and next steps, in particular:

- It sheds more light on the system-level findings and bank-by-bank outcomes;
- Explains the main drivers of these findings;
- Elaborates on the next steps and remediation plans, reflecting interactions and discussions held between supervisory bodies and banks.

[1] AQR system-wide report published on 30 December 2019, available at https://www.nationalbank.kz/?docid=3610&switch=russian and http://finreg.kz/cont/20191226_Final%20system%20report_consolidated_v265389_на%20публикацию1рус.pdf.

AQR outcome, assessment of measures to improve quality of assets and support capitalization after 1 April 2019, as well as the Program for Increasing the Financial Resilience of the Banking Sector that is being implemented in Kazakhstan since 2017 — they all confirm than the country's banking sector has no capital shortfall both on system level and on bank level.

During the period from 1 April 2019 up to now banks took measures to improve quality of their portfolios, request and secure additional collateral items, recover defaulted facilities and support capitalization.

Measures undertaken by the Agency for Regulation and Development of the Financial Market of the Republic of Kazakhstan (the Agency) to improve policies and procedures as a part of remediation plan based on AQR results will ensure completion of bank rehabilitation process and avoid emergence of new systemic risks.

In the coming months, the Agency and NBK will closely monitor the implementation of these remediation plans in all participating banks to ensure appropriate and effective measures are being put in place to support the development of identified priority risk management aspects. This includes but is not limited to improvements of risk management frameworks, underlying models, business processes, policies and procedures, systems and data.

This will be supported by dedicated supervisory measures that aim at facilitating and enforcing the implementation of systemic changes to further develop banking and financial supervisory processes – establishment of new or enhanced elements of risk based supervision, enhancements to regulatory reporting and analytics, etc. which are elaborated in Section 6 of this report.

NBK and the agency will provide detailed information on corresponding priorities, as well as progress by banks observed regarding the implementation of the required corrective measures and any additional supervisory actions undertaken to ensure effectiveness and appropriateness of mitigations.

This report is divided into five main sections as follows:

- *2. AQR exercise overview* – organizational setup of the review and the brief recap of the methodology are provided;
- *3. System-level findings* – results of the interlinking work blocks that led to the final result are presented on the system level to provide the public with more transparency on the asset quality of the Kazakh banking system;
- *4. Bank-by-bank view on the outcomes* – results of the interlinking work blocks that led to the final result are presented on the bank level;
- *5. Remediation plans* – remediation plans for banks are outlined to shed the light on how AQR results will be accounted for further;
- *6. Next steps* – roadmap of actions aimed at strengthening and development of the banking system of Kazakhstan and its ability to withstand crisis events is outlined.

2. AQR exercise overview

2.1. Organizational setup

The AQR program performed by NBK and the Agency was following the same principles as the reviews conducted by the European Central Bank (ECB) in 2014 and subsequent cycles. While local specifics of regulation and the Kazakh financial system have been accounted for in the methodology and execution of NBK and the Agency exercise, the fundamental building blocks and the overall philosophy of the ECB version have been retained. This in particular applies to the objectivity, comparability and level-playing field principles as well as to the level of conservatism imposed. Similarly, the exercise was performed using a proven "three lines of defense" model involving professional and independent accounting firms, inspectors and supervisory experts and decision-making bodies of NBK and the Agency. This structure is described in detail in the AQR system-wide report published on 30 December 2019.

In general, the key bodies involved in the exercise were:

- 14 participating banks, including senior management representatives responsible for signing-off on correctness of data and information provided to the NBK and the Agency;
- AQR execution team (explained in greater details below);
- Steering Committee, led by the Governors of NBK and the Agency;
- Management of NBK / the Agency.

AQR execution team was divided into three lines of defense to ensure adherence to the proven methodology and the corresponding governance setup and enabled a stringent and targeted execution of the required quality controls:

- The 1st line of defense consisted of two groups:
  - Bank teams: 500+ employees from independent auditing companies were responsible for the in-depth analysis of the data submitted by banks;
  - Independent appraisal companies: about 70 companies revalued banks' collaterals and on-balance sheet real estate assets prior to their submission to bank teams for validation;
- The 2nd line of defense consisted of 35+ NBK / Agency inspectors, who managed the process onsite and performed independent quality assurance of the outcomes of the analysis by the bank teams;
- The 3rd line of defense was represented by Central Project Management Office (CPMO), consisting of NBK / Agency specialists and independent AQR experts, who developed the AQR methodology as well as quality assured all results to ensure they are consistent across banks / bank teams and in line with AQR methodology.

2.2. Methodology overview

AQR was composed of two phases. Phase 1 involved the process of portfolio selection for their detailed analysis within Phase 2 – some portfolios were excluded from the scope of AQR due to extremely high provision rate, insignificant asset size, etc. Thus, each participating bank had a unique set of portfolios in the AQR scope. Phase 2 comprised the execution of 9 interlinked work blocks and as well 10th work block being overarching quality assurance and monitoring[2]. 9 interlinked work blocks assessed banks' balance sheets and key risk management and accounting aspects – ranging from application of accounting and prudential standards to detailed credit file review and re-calculation of expected credit loss at individual debtor level as well as portfolio level. Both phases are explained in greater details further in this section.

The AQR snapshot date was set to 1 April 2019 – all analysis was performed based on the data as of this date. Post 1 April 2019 data has been considered in such cases as full repayments in the credit file review scope which were excluded in case of no hidden refinancing was identified, substantial change of collateral's state (e.g., damage or loss), existence of recent valuations which could be indexed to 1 April 2019, etc.

As already stated, NBK chose 14 banks to undergo the exercise based on their economic significance for the banking system of Kazakhstan. Figure 1 represents the list of the banks included in the AQR scope which is sorted by decreasing significance.

Figure 1: Banks included in the AQR scope

№	Bank
1	Halyk Bank
2	Sberbank
3	Kaspi Bank
4	ForteBank
5	CenterCredit Bank
6	ATF Bank
7	Eurasian Bank
8	First Heartland Jysan Bank
9	Bank RBK
10	Alfa-Bank
11	Altyn Bank
12	Nurbank
13	Home Credit Bank
14	VTB Bank

[2] Explained in greater details in Sections 1-10 of the AQR Manual.

PHASE 1[3]

0. **Portfolio selection:** Phase 1, implemented since May till June 2019, was used to group all assets into comparable portfolios in accordance with the AQR methodology. As a result of portfolio selection process, the following portfolios were identified:

Table 1: List of portfolios valued at amortized cost included in the AQR scope

AQR portfolio	Abbreviation	Description
Government entities exposures	GOVGOV	Loans and other exposures[4] with local and international government entities
Financial institutions exposures	FINFIN	Loans and other exposures with financial institutions, banks, insurance companies, securities industry participants
Government corporates exposures	CORGOV	Loans and other exposures to Sovereign Wealth Fund "Samruk-Kazyna", National Management Holdings "Baiterek" and "Kazagro" and their subsidiaries and sub-subsidiaries with government participation > 50%
Corporate exposures secured by real estate	COREST	In accordance with internal AQR definition
Investment loans	CORINV	Investment loans or other exposure issued to a corporate debtor in accordance with its business plan aimed at creation, development and modernization of material production unit, production and transport infrastructure. This portfolio does not include corporate exposures secured by real estate (previous row).
Large corporate exposures	CORLAR	Loans and other exposures with large corporate clients in accordance with internal AQR definition
Medium corporate exposures	CORMED	Loans and other exposures with mid-size corporate clients in accordance with internal AQR definition
Large retail exposures	RETLAR	Loans and other exposures with retail clients in accordance with internal AQR definition
Loans to individuals secured by real estate	RETEST	In accordance with internal AQR definition
Car loans & other collateralized retail exposures	RETCAR	In accordance with internal AQR definition
Consumer loans, credit cards & other retail exposures	RETCON	In accordance with internal AQR definition
Small business exposures	RETSML	Loans and other exposures with individual entrepreneurs or legal entities — small corporate clients in accordance with internal AQR definition
Distressed assets	DISASS	Loans and other exposures with distressed assets management entities (OUSA)[5]
Other assets	OTHASS	Other assets valued at amortized cost under IFRS 9 excluding securitized ones[6]
Related party	RELATE	Loans and other exposures to all related parties[7]

[3] AQR system-wide report published on 30 December 2019, available at https://www.nationalbank.kz/?docid=3610&switch=russian and http://finreg.kz/cont/20191226_Final%20system%20report_consolidated_v265389_на%20публикацию1рус.pdf.

[4] Both on-balance and off-balance exposures are considered everywhere in the table with credit conversion factor applied.

[5] Distressed assets should not have been in the final exercise due to consolidation nature of AQR and loans to OUSA being intra-group loans – thus loans on balance sheets of OUSAs were reviewed instead. Some assets remained in such portfolios due to errors in classification by the banks.

[6] That includes receivables, accrued but outstanding payments, etc.

AQR portfolio	Abbrevia-tion	Description
exposures		irrespective of debtor type (large corporate, medium corporate, individual, etc.)

Note: these portfolios were explicitly constructed for AQR purposes and thus do not directly coincide with publicly disclosed figures. Any comparison of figures on these portfolios with publicly available information would be inappropriate as segmentation was done specifically for AQR purposes.

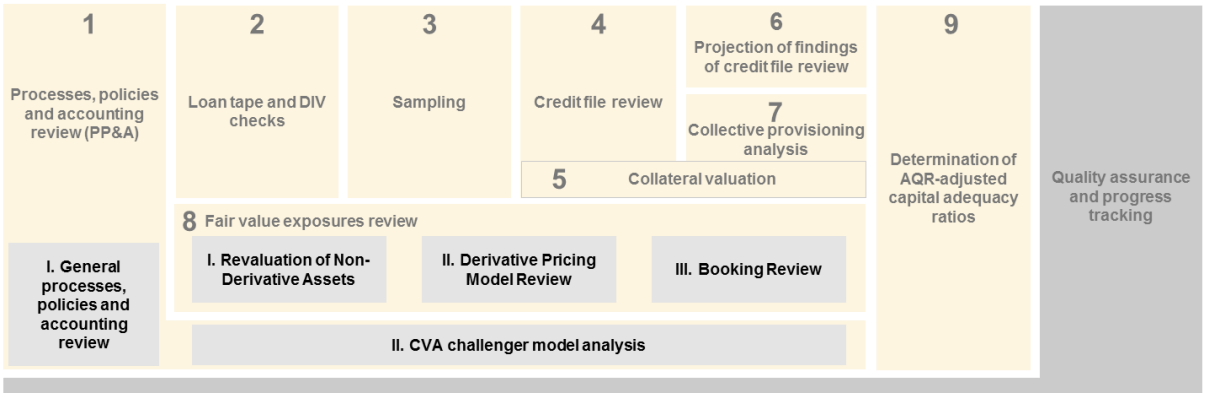
Following the portfolio definition, portfolios were selected for a more detailed analysis in Phase 2. Depending on asset type, two selection approaches were used (please refer to Section 3.2.1 of the AQR system-wide report published on 30 December 2019 for further detail):

- Risk-based portfolio selection approach for assets valued at amortized cost;
- Materiality- and fair value hierarchy[8]-based portfolio selection approach for fair value exposures.

PHASE 2[9]

Phase 2, implemented since August till December 2019, consisted of 9 interlinked work blocks, each of them is described in detail in the following subsections.

Figure 2: Structure of Phase 2



For work blocks with quantitative assessment, two types of adjustment have been estimated.

The first type of adjustments – "IFRS adjustments", – potential adjustments which reflect conservative regulator's view on accounting standards application by banks, which were then compared with CET1 capital: adjustment from credit file review, adjustment from fair value exposures review, tax offsetting effect and direct capital correction required due to misstatements found in prudential reporting.

Additionally, the prudential implications observed within the analysis performed in AQR were estimated from the following drivers:

- Misstatements in regulatory reporting;
- Reclassifications of debtors to stage 2 or stage 3 according to prudential impairment triggers;

[7] Related parties are defined in correspondence with IAS 24 (9) and the local regulation.
[8] Level of fair value hierarchy under clauses 72-90 of IFRS 13.
[9] For more detailed description please refer to Section 3.2.2. of the AQR system-wide report published on 30 December 2019, available at https://www.nationalbank.kz/?docid=3610&switch=russian and http://finreg.kz/cont/20191226_Final%20system%20report_consolidated_v265389_на%20публикацию1рус.pdf.

- Projection of credit file review results to non-sampled portfolio;
- Findings of collective provisioning analysis based on prudential challenger models;
- Revaluation of the real estate held on banks' balance sheets.

Adjustments have been estimated from the analysis performed as a part of each of the 9 AQR work blocks.

1. **Processes, policies and accounting review (PP&A):** bank processes, policies and accounting practices have a key impact on the carrying values of assets in banks' balance sheets and, hence, were reviewed. Key topics covered: application of fair value hierarchy accounting classifications, ECL approach and application of staging impairment triggers. Full details around the methodology could be found in Section 1 of the AQR Manual.
2. **Loan tape creation and data integrity validation (DIV):** the further review was based on a "loan tape" provided by the bank. This loan tape included basic account information such as segment classification, missed payments status and identifiers of the loan/debtor. The data was required to be of sufficient quality to perform the required analysis of the AQR templates, which necessitated automated checks of the data set and a review of consistency across internal IT systems. Full details around the methodology could be found in Section 2 of the AQR Manual.
3. **Sampling:** in order to ensure an efficient execution of the exercise and following proven standards, not all exposures have been reviewed individually, but the assessment was based on a representative sample of debtors that was defined following a risk-based stratified sampling approach, see Section 3 of the AQR manual. Full details around the methodology could be found in Section 3 of the AQR Manual.
4. **Credit File Review (CFR):** the CFR was based on a detailed analysis of individual debtors and all their exposures, which included an impairment stage classification analysis and a review of expected credit loss (ECL) calculation. As a result, bank teams recalculated all ECLs for all exposures within the scope. For stage 1 and stage 2 exposures for fully sampled corporate portfolios an additional calculation was performed using a simplified adjustment to the level of probability of default and recovery rate to arrive at adjustments for expected credit loss. Full details around the methodology could be found in Section 4 of the AQR Manual.
5. **Collateral valuation:** a key input required for expected credit loss (ECL) estimation for some debtors (e.g. those who were classified as stage 3 and for which cash flows are not enough to cover exposure in certain scenarios) was a value of their collateral – to estimate its value correctly across all participating banks and in adherence with the AQR methodology, collaterals were revalued and only then used as an input for the CFR. Full details around the methodology could be found in Section 5 of the AQR Manual.
6. **Projection of findings of credit file review:** as the CFR was conducted on a stratified sample of debtors, see work block 3 above, all CFR's findings were projected to assess the consequences of identified findings at overall portfolio levels. The key projected metrics included the share of impairment stage reclassifications and share of increase in expected credit loss (ECL). Full details around the methodology could be found in Section 6 of the AQR Manual.
7. **Collective provisioning analysis:** for retail portfolios and stage 1 and 2 debtors in corporate portfolios, collective provisioning approach was applied – based on loan tapes, bank teams calculated the expected credit loss (ECL) and then estimated the provisions for the entire portfolio based on the methodology provided by CPMO in terms of a challenger model and strict guidance and corresponding quality assurance measures. For portfolios partially covered by the CFR, the CFR findings were taken into account through adjustments to probabilities of default, losses given default and shares of portfolio by impairment stage based on the outcomes (reclassification and

recalculation of ECL) in CFR. Full details around the methodology could be found in Section 7 of the AQR Manual.

8. **Fair value exposure review:** for fair value exposures, a thorough revaluation was carried out and included bonds, fair value loans, derivatives and on-balance real estate. Additionally, CVA models were checked (for banks, which had a CVA model as of 1 April 2019). Full details around the methodology could be found in Section 8 of the AQR Manual.
9. **Determination of AQR-adjusted capital adequacy ratios:** in order to correctly account for AQR adjustments, the results of the AQR program were aggregated to estimate impact on capital. Adjustments were split into 2 categories: potential IFRS adjustments and prudential adjustments. IFRS adjustments were estimated considering:
    - Reclassification of debtors to an upper impairment stage on the basis of prudential interpretation of IFRS 9 and Regulation 269 triggers;
    - Re-calculation of expected credit loss (ECL) for the borrowers in the scope of credit file review who had been classified by banks into stage 3 before the AQR exercise;
    - Revaluation of assets held on balance sheet (apart from the real estate) at fair value.

    On the other hand, prudential adjustments were estimated considering:
    - Reclassification of debtors to an upper impairment stage on the basis of Regulation 170 triggers;
    - Projection of credit file review results;
    - Findings of collective provisioning analysis;
    - Revaluation of the real estate held on banks' balance sheets.

    The starting point was calculating pre-AQR capital based on prudential and financial reports. The bank teams performed verification of capital numbers in prudential reports against capital numbers calculated independently by the bank teams as of 1 April 2019; all material differences had to be further analyzed and explained by the banks. Misstatements in prudential reports were applied as a direct correction to banks' capital figures, as shown below. Following the initial capital estimation, bank teams calculated the AQR adjustments from the previous work blocks, and applied it to the capital adequacy ratios:
    - Regulatory view on IFRS adjustments was accounted for through impact on k1 capital (CET1 adequacy);
    - These adjustments could be partially off-set by direct tax impact and changes in deferred tax assets;
    - Prudential implications in terms of risk coverage (e.g. assessment of collective provisioning models, real estate valuations and application of prudential credit impairment triggers) were considered within the analysis of k2 adequacy.

    As the AQR was performed on a consolidated basis, the AQR effect is most comparable with consolidated capital values (as per Regulation 170, capital is not calculated on a consolidated basis). According to calculations performed during the AQR, applying the AQR adjustments to consolidated capital values would not lead to significantly different outcomes as opposed to applying the adjustments to non-consolidated capital values.

    Additional details on determination of AQR-adjusted capital ratios are provided in Section 4 of the AQR system-wide report published on 30 December 2019. Full details around the methodology could be found in Section 9 of the AQR Manual.

3. System-level findings

The AQR system-wide report was published on 30 December 2019 and disclosed the following:

- Assessment of k1 capital ratio adequacy at the system level;
- Assessment of k2 capital ratio adequacy at the system level.

This report provides a more detailed view on the AQR outcomes, in particular:

- System-level outcomes split by AQR work blocks (to give a more comprehensive understanding of the specifics of asset quality across multiple areas and segments);
- Bank-by-bank outcomes split by AQR work blocks (to provide a view on banks' asset quality compared to the market and peers).

The section consists of 6 subsections covering key findings for each of the work blocks[10]:

- Portfolio sampling (work block 3);
- Collateral valuation (work block 5);
- Credit file review (CFR) and projection of findings on the portfolios not included in the sample (work blocks 4 and 6);
- Collective provisioning analysis (work block 7);
- Fair value exposures review (work block 8);
- Determination of AQR-adjusted capital adequacy ratios (work block 9).

The findings in this report fully coincide with the outcomes and messages as disclosed in the AQR system-wide report published on 30 December 2019 and provide additional detail to those.

For detailed description of each work block and its methodology, please refer to the AQR system-wide report published on 30 December 2019[11].

3.1. Portfolio sampling

The scope of the program covered 163 thousand debtors in corporate portfolios and "loans to individuals secured by real estate" portfolio. Representative samples for further credit file review (CFR) analysis have been drawn from these debtors.

Samples were defined based on splitting the debtors to "strata" by risk level and exposure, (for detailed description of portfolio sampling methodology see Section 3 of the AQR Manual[12]). This approach allowed NBK to create samples that were representative of the population for each portfolio.

The following table shows proportion of exposure sampled for credit file review (CFR) analysis for all portfolios of assets valued at amortized cost. The first column contains the share of on-balance and off-balance sheet exposures selected for CFR (as a share of total exposure of the portfolio within the AQR scope). For example, if for "corporate exposures secured by real estate" (COREST) portfolio KZT 100 were included in the AQR scope, of

[10] Processes, policies and accounting review (work block 1) and loan tape creation and data integrity validation (work block 2) are not covered in the sections due to absence of the quantitative findings from these work blocks: work block 1 was aimed at review of bank processes, policies and accounting practices, work block 2 was a data collection process and its quality analysis for further work blocks (all findings and issues were noted and included in the acts of inspection provided to the banks and taken into account in further work blocks where applicable).

[11] AQR system-wide report published on 30 December 2019, available at https://www.nationalbank.kz/?docid=3610&switch=russian and http://finreg.kz/cont/20191226_Final%20system%20report_consolidated_v265389_на%20публикацию1рус.pdf.

[12] AQR Manual dated 26 July 2019, available at https://www.nationalbank.kz/?docid=3610&switch=russian

which KZT 90 has been selected for CFR review, the value in the first column would be equal to 90%. The second column shows distribution of resulting sample between portfolios (share of a portfolio's exposure sampled for CFR in the overall CFR sample). For example, if total sample for CFR is equal to KZT 1000 and COREST sample is equal to 90, then the value in the second column will be equal to 9%.

Table 2: Sampling rates weighted by exposure, across banks (%)

Portfolio	Sampling rate for CFR	Weight of portfolio in overall sample for CFR
COREST	89%	8%
CORGOV	100%	4%
CORINV	100%	1%
CORLAR	90%	45%
CORMED	86%	23%
DISASS	100%	0%
FINFIN	100%	12%
GOVGOV	100%	1%
OTHASS	100%	1%
RELATE	100%	3%
RETEST	10%	1%
RETLAR	100%	1%

Loans to central government ministries (if present) and exposures with NBK from the "government entities exposures" portfolio were excluded from CFR and analyzed using a simplified approach.

It is important to note that due to a high concentration of corporate portfolios in Kazakhstan (listed portfolios often consist of several large debtors that represent the majority of the portfolio) sampling rates of these portfolios are much higher than those that could be observed in similar AQR exercises in other countries. Therefore, none or minimal projections were required to apply CFR results to the whole portfolio. Exception is the "loans to individuals secured by real estate" portfolio which consists of a large number of retail loans and therefore features comparatively lower sampling rates.

No calculation of expected credit loss (ECL) based on the collective provisioning approach has been performed for any of fully sampled portfolios to avoid double-counting.

Nine banks have corporate portfolios valued at amortized costs fully sampled:

- Kaspi Bank;
- ForteBank;
- Eurasian Bank;
- First Heartland Jysan Bank;
- Bank RBK;
- Alfa-Bank;
- Altyn Bank;
- Nurbank;
- VTB Bank.

Due to their specific nature some of the exposures from fully sampled portfolios (e.g. "government entities exposures" and "financial institutions exposures") were not reviewed within CFR. Also, some borrowers from "small business exposures" portfolios were included

in the scope of CFR (as an exception, due to large loans or credit lines of those borrowers) – this fact is not reflected in the table above due to the anomalous nature of such debtors.

With large number of portfolios in scope for CFR, the described approach has proven its efficiency and provided the required level of precision with limited effort. Given high sampling rates of corporate portfolios, projection of stage 3 ECL estimates on the remaining parts of the portfolio did not significantly increase overall ECL.

3.2. Collateral valuation

For all stage 3 debtors, all mortgage debtors and related party debtors, their collaterals had to be revalued. As described in detail in the AQR system-wide report published on 30 December 2019, revaluations were conducted as of 1 April 2019 in accordance with the international standards (EVS-2016 and principles of the Royal Institute of Certified Surveyors, see Section 5 of the AQR Manual[13] for more details). The valuations were prepared by independent appraisers with the bank teams providing the validation of appraisal reports.

The sample for collateral revaluation consisted of top 90% collaterals of each debtor as per collateral value used by bank for provisions estimation as of 1 April 2019 and all collaterals valued over KZT 1 BN. Collaterals which were out of this sample were considered at collateral value used by bank for provisions estimation as of 1 April 2019 in the work blocks further.

Table 3 represents the results of collateral revaluation by collateral type:

- Pre-AQR aggregated (aggregated across all collateral objects in the sample for collateral revaluation for this type of collateral) value post haircuts used by the bank for expected credit loss (ECL) calculation is the collateral value based on an internal (by the bank itself) or independent appraisal done before AQR after application of all relevant haircuts (sales cost discount, time to sale discount, collateral discount, etc.) used by the bank for provisions calculation as of 1 April 2019;
- Post-AQR aggregated (aggregated across all collateral objects in the sample for revaluation for this type of collateral) value post haircuts is the collateral value based on the appraisals done within AQR (by the independent appraisal companies) and validated by the auditors (bank teams[14]) after application of all relevant haircuts as of 1 April 2019;
- There are also weighted average, arithmetic average and median values of relative (to pre-AQR) revaluations across all collaterals within each collateral type.

These collateral revaluation results were used as inputs into the credit file review. In other words, they are fully accounted for in the credit file review (CFR) results and thus they do not represent standalone impact in any form[15]. Within CFR, the impact of collateral revaluation is taken into account as a change in potential recoveries, but one also has to take into account that collateral revaluation does not have a direct impact on ECL calculation. In other words, 1 KZT downward revaluation is not equal to 1 KZT ECL upward recalculation:

- Many facilities have quite high coverage by collaterals thus a decrease in collateral value may have no impact on actual recoveries on such exposures;
- Many facilities can be covered by debtors' cash flows without the need to foreclose collaterals;

[13] AQR Manual dated 26 July 2019, available at https://www.nationalbank.kz/?docid=3610&switch=russian
[14] Organizational setup, including bank teams (the first line of defence), is described in Section 2.1.
[15] While revaluations in work block 8 "Fair value exposures review" reflect standalone impact and are not connected to the results of credit file review.

- Resulting ECL value is weighted for the probability of specific scenarios, and probabilities of recoveries from collaterals are different across borrowers.

As can be seen from Table 3, the overall system-wide revaluation is 23,8% of collateral values used by banks for provision calculation with ~80% of this effect coming from "commercial & industrial real estate" and "other collateral" revaluations.

Table 3: Collateral revaluations (KZT BN, % of pre-AQR valuation)

Collateral type	Pre-AQR aggregated value post haircuts (KZT BN)	Post-AQR aggregated value post haircuts (KZT BN)	Weighted average revaluation (%)	Arithmetic average revaluation (%)	Median revaluation (%)
Residential real estate	234,2	205,4	-12,3%	12,9%	7,0%
Commercial & industrial real estate	1 331,4	1 113,8	-16,3%	-1,7%	-3,5%
Agricultural land	27,0	12,9	-52,3%	-25,1%	-31,2%
Other land	206,6	142,7	-30,9%	-6,6%	-17,1%
Other collateral[16]	425,7	221,4	-48,0%	-21,9%	-28,8%

Weighted average, arithmetic average and median revaluation can be distanced relative to each other due to either existence of outliers in terms of relative revaluation or in terms of collateral value (both relatively big and relatively small sizes). Weighted average takes into account collateral value giving bigger weights to bigger collaterals while arithmetic average and median values perceive all revaluations if they were revaluations of collaterals of the same size.

Overall, the main drivers of collateral value change compared to pre-AQR appraisals are:

- Unreasonable judgment of an appraiser (i.e., not based on any reliable statistics and research, but rather only on expert opinion) as a valuation basis with the most common case being the usage of a comparative approach (when the valuation is based on comparable market transactions for that collateral) based on non-comparable analogs (for example, deals with much smaller objects or objects located in better locations);
- Usage of cost approach which can lead both to over- and undervaluation and does not represent the real market value of the object (the value for which the object can be sold is not equal to the value of rebuilding the object from scratch);
- Usage of outdated appraisals based on non-actual information.

Changes in collateral valuation used by the banks for pre-AQR appraisals are, among other things, caused by deficiencies in the existing standards of appraisal activities in Kazakhstan that need to be aligned with international appraisal standards going forward.

Based on these findings, the banks will be expected to implement corrective actions, including but not limited to:

- Improvement of collateral valuation process and requirements:
  - Application of more detailed and stringent requirements for appraisal reports used for collateral valuation (requirements for appropriate valuation approaches, detailed and justified assumptions used, obligatory collateral documentation to be included, etc.)
  - Implementation of more thorough appraisal quality assurance processes;

[16] "Other collateral" type includes cars and other transport, production and other equipment, inventory, etc.

  - Ensuring having regular collateral revaluation going forward;
- Collection and storage of statistics on collateral foreclosures for a more accurate estimation of collateral value haircuts;
- Collection and storage of all relevant valuation data in internal systems which would also enable more granular regulatory reporting and introduce the opportunity for the regulator to validate the valuations centrally, etc.;
- Regular and timely revaluation of all collaterals in accordance with improvements described above;
- Taking updated collateral values into account in all relevant business processes (e.g., risk-based pricing, risk-adjusted return estimation, business planning and budgeting, credit decision-making and credit monitoring).

3.3. Credit file review and projection of findings

Following the sampling exercise which was conducted for 163 thousand debtors across all participating banks, 5,875 of them were sampled for a detailed credit file review. The process included classifying each debtor to one of three impairment stages based on staging triggers (in accordance with the Table 53, Section 4 of the AQR Manual). Expected credit loss (ECL) was then calculated on individual level for all debtors in stage 3 (except for debtors in "loans to individuals secured by real estate" portfolio). ECL for debtors in stages 1 and 2 was calculated only for those portfolios which were fully sampled for credit file review (in this case ECL was calculated using simplified approach via estimation of probabilities of default and recovery rates).

The results of credit file review were later used for projection of findings. The process included the projection of exposures reclassified to stage 3 and related ECL on the wider portfolio unless the whole portfolio was sampled for credit file review. Exposures reclassified to stage 3 were projected only for corporate portfolios, retail mortgages portfolios, while related ECL was projected only for corporate portfolios. ECL calculation and staging classification for the rest of portfolios were done based on collective provisioning analysis.

Table 4 represents the results of debtors' reclassification in each assets' portfolio, valued at amortized cost:

- Pre-AQR total share of stage 3 debtors across all banks' assets equals the exposure of debtors assigned to stage 3 by the banks themselves divided by the total exposure of all debtors in the respective portfolio. Portfolios that were not included in credit file review are also included;
- Post-AQR total share of debtors in stage 3 across all banks' assets due to IFRS effect is equal to:
  - For exposures in the AQR scope: sum of exposures of debtors classified by banks as stage 3 and the exposures of debtors reclassified to stage 3 based on all IFRS triggers used for the AQR divided by the total exposure of all debtors in the respective portfolio. Portfolios that were not in the AQR scope are also included;
  - For exposures not in the AQR scope: sum of exposure of debtors classified by banks as stage 3 divided by the total exposure of all debtors in the respective portfolio. Portfolios that were not in the AQR scope are also included.

As shown in Table 4, portfolios with the biggest share of reclassifications as a result of credit file review are "medium corporate exposures" and "corporate exposures secured by real estate".

Table 4: Share of debtors in stage 3 across all banks' assets (including assets which are not in the AQR scope) (%)

Portfolio	Pre-AQR total share of debtors in stage 3 across all banks' assets (%)	Post-AQR total share of debtors in stage 3 across all bank's assets due to IFRS effect (%)
COREST	37%	49%
CORINV	24%	25%
CORLAR	27%	28%
CORMED	36%	38%
FINFIN	1%	1%
RELATE	37%	38%
RETCAR	26%	26%
RETCON	11%	11%
RETEST	26%	26%
RETSML	38%	38%

The table does not show portfolios with insignificant number of debtors due to reclassification results for those not being representative. Post-AQR share of debtors in stage 3 for "consumer loans, credit cards & other retail exposures" (RETCON) and "car loans & other collateralized retail exposures" (RETCAR) portfolios has been calculated based on collective provisioning analysis.

Post-AQR weighted average share of stage 3 debtors in all portfolios of all participating banks due to IFRS effect equals 21,1%[17]. Share of post-AQR stage 3 debtors didn't increase significantly due to IFRS effect. The banks' CET1 capital (with capital adequacy support measures in place) allows banks to hold fully adequate provisions for credit impaired debtors.

Key reclassification triggers:

- The impairment and significant increase in credit risk (SICR) triggers used by banks for determination of impairment stage do not fully correspond to the best practices and existing regulation (Regulation 269 and Regulation 170) / are applied inconsistently / are applied manually;
- Definition of restructuring / distressed restructuring of the loans does not fully correspond to the rules specified by existing regulations (Regulation 269) / is applied inconsistently;
- "Cure" criteria for impairment stage improvement (recovery from the default stage and improving the impairment stage) are not defined / are applied inconsistently.

Based on these findings, the banks are to implement a set of corrective actions which have been communicated within the acts of inspection, including:

- Implementation of a more comprehensive list of impairment triggers and restructuring / distressed restructuring definitions into banks' internal policies, processes and systems;
- Implementation of "cure" and recovery from default criteria including exact conditions under which the impairment stage of a financial asset could be improved (term, amount to be repaid, improvement in financial conditions etc.);

[17] Significant share of financial assets belongs to "financial institutions exposures" portfolio with low share of stage 3 debtors. That said, weighted average share of stage 3 debtors is significantly lower than the simple average of all share values listed in the table.

- Review of all financial assets' classification in accordance with the implemented list of triggers and restructuring / distressed restructuring definitions;
- Automation of staging classification processes;
- Introduction of an updated set of metrics for credit monitoring processes including full list of impairment triggers and parameters which are required for calculation of the value of each trigger to ensure that all impairment triggers are monitored on a regular basis;
- Taking updated classification of financial assets into account in all relevant business processes (e.g., ECL calculation processes, risk-based pricing, risk-adjusted return estimation, business planning and budgeting, credit decision-making and monitoring);
- Collection and storage of all relevant data for debtors' classification including the historical data on stages assigned, triggers hit and monitoring results as well as all data required for stages assignment.

After staging classification review, bank teams estimated the ECL for debtors in a given portfolio. ECL assessment on a debtor level included:

- Calculation of debtors' cash flows available for debt repayment under different macroeconomic scenarios;
- Adjustment of the cash flows from collateral foreclosure considering full results from collateral revaluation work block under different macroeconomic scenarios;
  Assessment of probability of "going-concern" outcome (i.e. entity continues to generate operating cash flows) and "gone-concern" outcome (i.e. assets of the company will need to be foreclosed / sold).

ECL values were then estimated based on the probability-weighted average as a difference between the present value of cash flows and the exposure amount under the different scenarios.

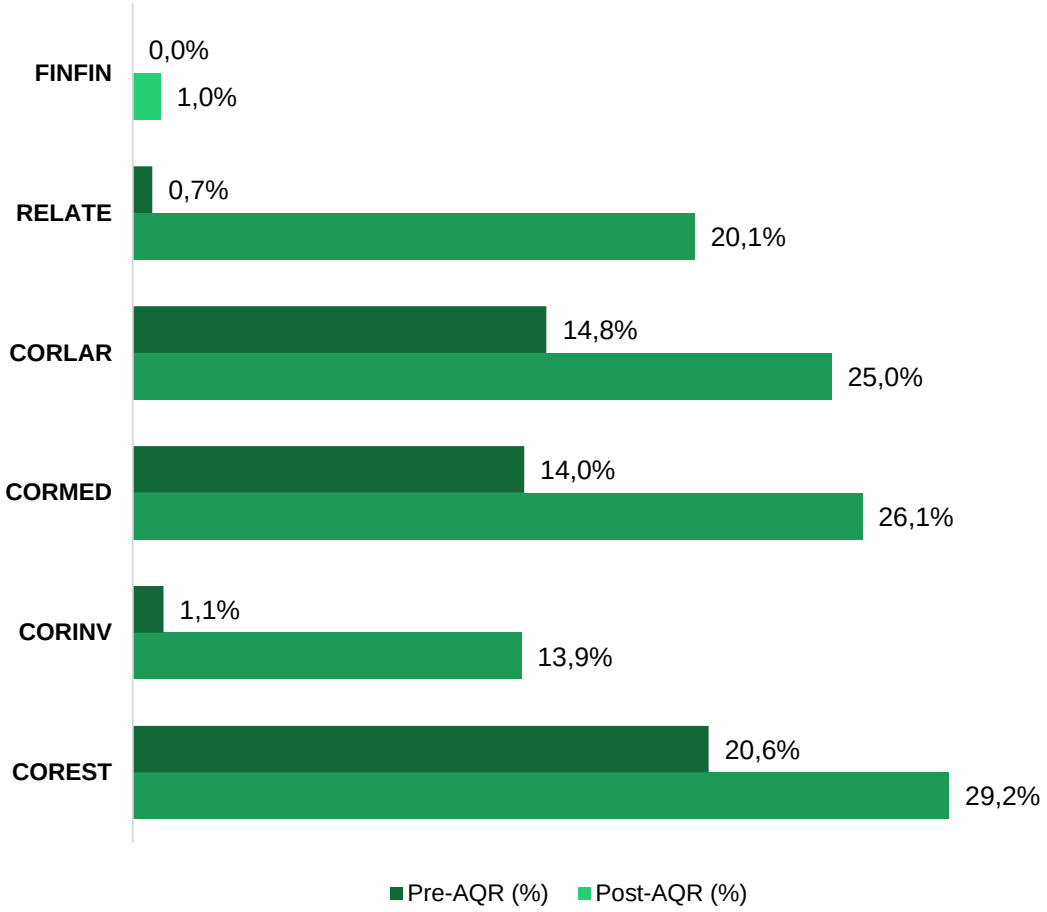
Figure 3 represents the change of ECL value in each portfolio due to IFRS effect:

- Pre-AQR ECL is equal to the sum of ECL of exposures in stages 1, 2 and 3 for sampled debtors in the respective portfolio calculated by banks themselves (pre-AQR) divided by the exposure of debtors in the respective portfolio[18];
- Post-AQR ECL is equal to the sum of ECL of exposures in stages 1, 2 and 3 for sampled debtors in the respective portfolio calculated by bank teams for debtors under credit file review process, projection of findings and results based on collective provisioning divided by the exposure of debtors in the respective portfolio.

As depicted in Figure 3, the most significant change of ECL was observed in "related party exposures" and "investment loans" portfolios.

[18] According to information provided by banks during AQR.

Figure 3: Pre-AQR and post-AQR ECL level (%):



- *The table does not show portfolios with insignificant number of debtors due to ECL calculation results not being representative;*
- *Portfolios "loans to individuals secured by real estate" (RETEST), "car loans & other collateralized retail exposures" (RETCAR) and "consumer loans, credit cards & other retail exposures" (RETCON) are not presented in the figure as ECL for those portfolios has been fully calculated based on collective provisioning analysis – these portfolios are presented in the next section.*

Overall, the main drivers for post-AQR ECL increase are:

- Inconsistencies in debtors' total exposure (leading also to inconsistent level of ECL):
  - Credit conversion factors by asset types are incorrectly assigned (understated values used) due to lack of banks' statistics or not full compliance with regulatory standards (Annex 6 of Regulation 170);
  - Discounts on the loans issued with non-market conditions (below typical product market terms) are not calculated / not applied to the value of loans;
- Incorrect assessment of debtors' cash flows under "going-concern" approach:
  - Debtors' financial data is not collected in a systematic way or the data is of poor quality / outdated / uses management reporting without any objective proof of adequacy of such financials;
  - Banks overestimate debtors' cash flows by using consolidated (sometimes consolidated data used is not provided by the debtor, but calculated by the bank) cash flows of group of companies / related clients instead of using

standalone debtors' financial statements or financial statements of only those related parties which are contractually liable to repay the debts of the borrower in case of default;
    - Application of positive probability of "going-concern" scenario when there are no proven operating activities or cash flows from the debtors' operations;
- Overestimation of expected cash flows from collateral sales (see Section 3.2. in this report).

Based on these findings, the banks are to implement corrective measures which have been communicated within the acts of inspection, including:

- Implementation and validation of the approach for credit conversion factor calculation. Bank should either apply credit conversion factors listed in Annex 6 of Regulation 170 for respective asset types or calculate them using bank's statistics on usage of credit limits by debtors before and after credit impairment event; appropriate rules for credit decision-making should be in place to justify low credit conversion factor values;
- Implementation and validation of the approach for calculation of discounts for loans issued with non-market conditions. Bank should have a set of criteria for identification of loans issued with non-market conditions and the methodology for calculation of the discount (based on the difference of market average interest rate and effective interest rate of the loan as well as other terms like maturity / payment structure etc.);
- Implementation of requirements for set of data to be collected from the debtors (should at least include audited financial statements and full tax declarations of the debtor and guarantors / co-debtors if applicable) with defined frequency. Bank can also implement an internal documentation with exceptions to these requirements (cases when no official reporting is requested);
- Update of the approach for debtors' cash flow calculation. Bank should have formalized guidelines on estimation of debtor's cash flows which are later used for ECL calculation and defined criteria on how to determine the list of connected clients whose cash flows might be taken into account (incl. list of requirements for the existence of contractual obligations to repay the debtor's liabilities);
- Automation of impairment trigger calculation, determining an impairment stage and ECL in accordance with updated processes as per the points mentioned above;
- Taking updated ECL numbers into account in all relevant business processes (e.g., financial, regulatory and management reporting, risk-based pricing, risk-adjusted return estimation, business planning and budgeting, credit decision-making and monitoring);

Collection and storage of all relevant data for ECL calculation (at least including debtors' total exposure, impairment stage, collateral values, historical data on debtors' cash flow).

3.4. Collective provisioning analysis

47 out of 134 portfolios analyzed in the AQR were in-scope for the collective provisioning analysis (most of retail portfolios and stage 1 & 2 debtors in corporate portfolios). Loans to government and financial institutions as well as to related parties were out of scope for collective provisioning due to being fully captured through credit file review (CFR) and due to their non-homogeneous nature and limited sizes of portfolios.

For portfolios in scope of CFR (corporate exposures and "loans to individuals secured by real estate" portfolios) results of the CFR have been projected to unsampled part of portfolio and relevant adjustments have been made during the collective provisioning analysis. For additional details on the applied methodology please see Section 6.6 of the AQR Manual[19].

[19] AQR Manual dated 26 July 2019, available at https://www.nationalbank.kz/?docid=3610&switch=russian.

For every portfolio in scope bank teams used the loan tape information to calculate risk metrics within specifically designed “challenger models”. These models allowed to calculate key risk metrics: probability of default (PD), loss given default (LGD), exposure at default (EAD), effective interest rate (EIR) and distribution across impairment stages. These metrics were used to estimate expected credit loss (ECL) and subsequently required level of provisions. Calculations performed by bank teams have been verified by the inspector teams. This included verification of all major assumptions, input parameters and data. Obtained results have then been independently cross-checked by CPMO’s central challenger model to verify all key figures as well as drivers of ECL underestimation, which allowed to independently challenge the level of provisioning given banks’ data. Final results were obtained by the bank teams after being validated by the CPMO central challenger model. Description of some of the quality assurance measures undertaken in this process was presented in the AQR system-wide report published on 30 December 2019 at NBK website[20].

The table below shows distribution of the number of portfolios in which challenger model calculations (overall and by portfolio type) resulted in ECL estimates exceeding, equal to or below banks' calculations. For 23% of the in-scope portfolios, challenger model calculations resulted in ECL equal to or below banks' ECL, whereas for 77% of portfolios, the challenger model outcomes exceeded banks' ECL estimates.

Table 5: Scope of the analysis and overview of outcomes

Portfolio type[21]	# of portfolios	Challenger model indicated insufficient ECL	Challenger model did not indicate insufficient ECL
Total	**47**	**77%**	**23%**
COREST	2	100%	-
CORLAR	3	100%	-
CORMED	4	100%	-
RETCAR	4	25%	75%
RETCON	14	57%	43%
RETEST	9	100%	-
RETSML	11	82%	18%

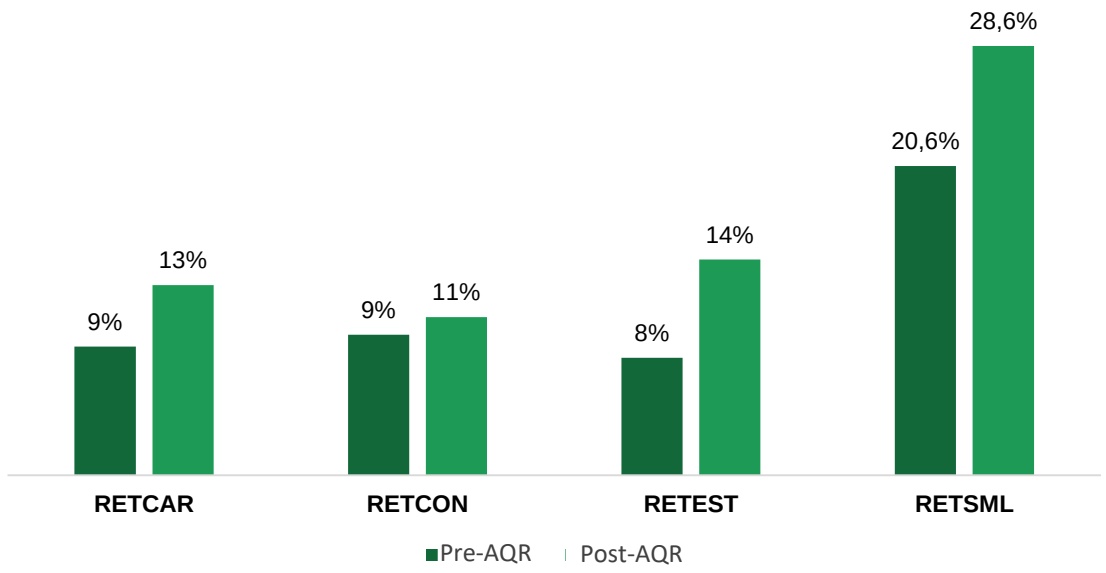
As a result of the analysis, provision coverage ratio for each portfolio type was calculated. Calculation was based on ECL estimates obtained by bank teams’ challenger models and it was then compared to bank's ECL estimates divided by total portfolio exposure as of 1 April 2019. It is important to note that “consumer loans, credit cards & other retail exposures” portfolio was the only portfolio in scope of collective provisioning analysis for each of the 14 participating banks. Other portfolio types were not in scope of such analysis for every bank.

For fully sampled portfolios all calculations were performed within credit file review process and no collective provisioning analysis was undertaken. For other non-retail portfolios ECL for stage 3 debtors was assessed during CFR, and ECL for stage 1 and 2 debtors was assessed during collective provisioning analysis using challenger model with projections of CFR outcomes. For non-fully sampled retail portfolios (e.g. “loans to individuals secured by real estate”) ECL for all loans has been assessed via collective provisioning analysis with projections of CFR outcomes.

[20] AQR system-wide report published on 30 December 2019 (Section 3.2.2), available at https://www.nationalbank.kz/?docid=3610&switch=russian and http://finreg.kz/cont/20191226_Final%20system%20report_consolidated_v265389_на%20публикацию1рус.pdf.
[21] Portfolio descriptions corresponding to portfolio codes are presented in Table 1.

In addition, some portfolios were excluded from the scope of AQR completely for some banks (more details in the Section 2.2. of this document).

Figure 4: Expected credit loss share by portfolio (% of the exposure)[22]

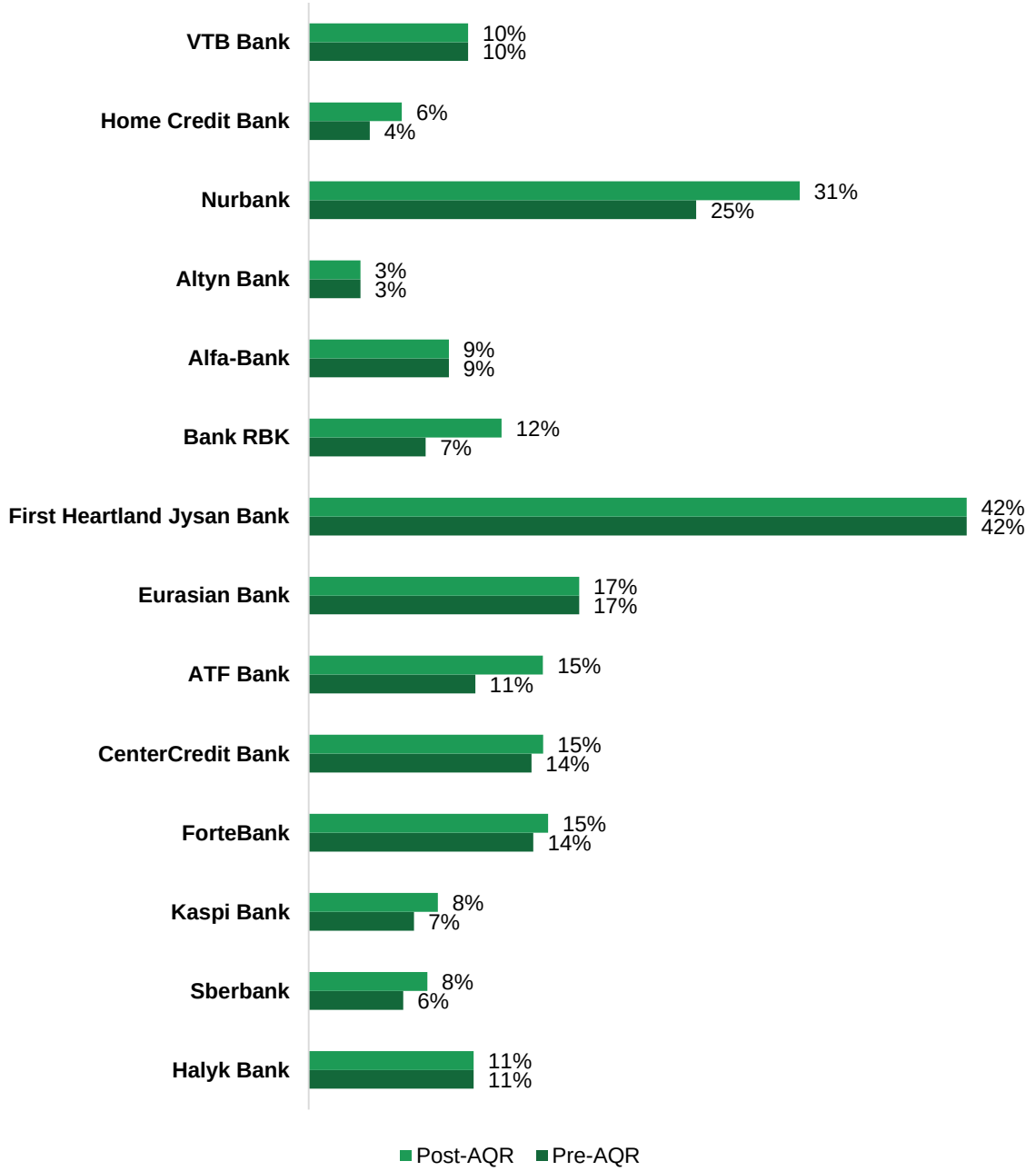


Calculated as average of ECL shares for individual banks. ECL share shown for "small business exposures" portfolio features CFR results for the largest borrowers in this portfolio.

For corporate portfolios not fully sampled for CFR analysis, ECL for stage 1 and stage 2 borrowers was estimated based on collective provisioning analysis. The impact on those portfolios is provided in the previous section.

[22] Portfolio descriptions corresponding to portfolio codes are presented in Table 1.

Figure 5: ECL share for “consumer loans, credit cards & other retail exposures” portfolio, % of exposure



Observed increase in average ECL share was not a result of just a prudential approach: for each bank risk metrics were assessed independently and where no issues were identified no increase in ECL was proposed. Details for each bank are provided in bank-by-bank sections below.

Figure 6: ECL share for “small business exposures” portfolio, % of exposure

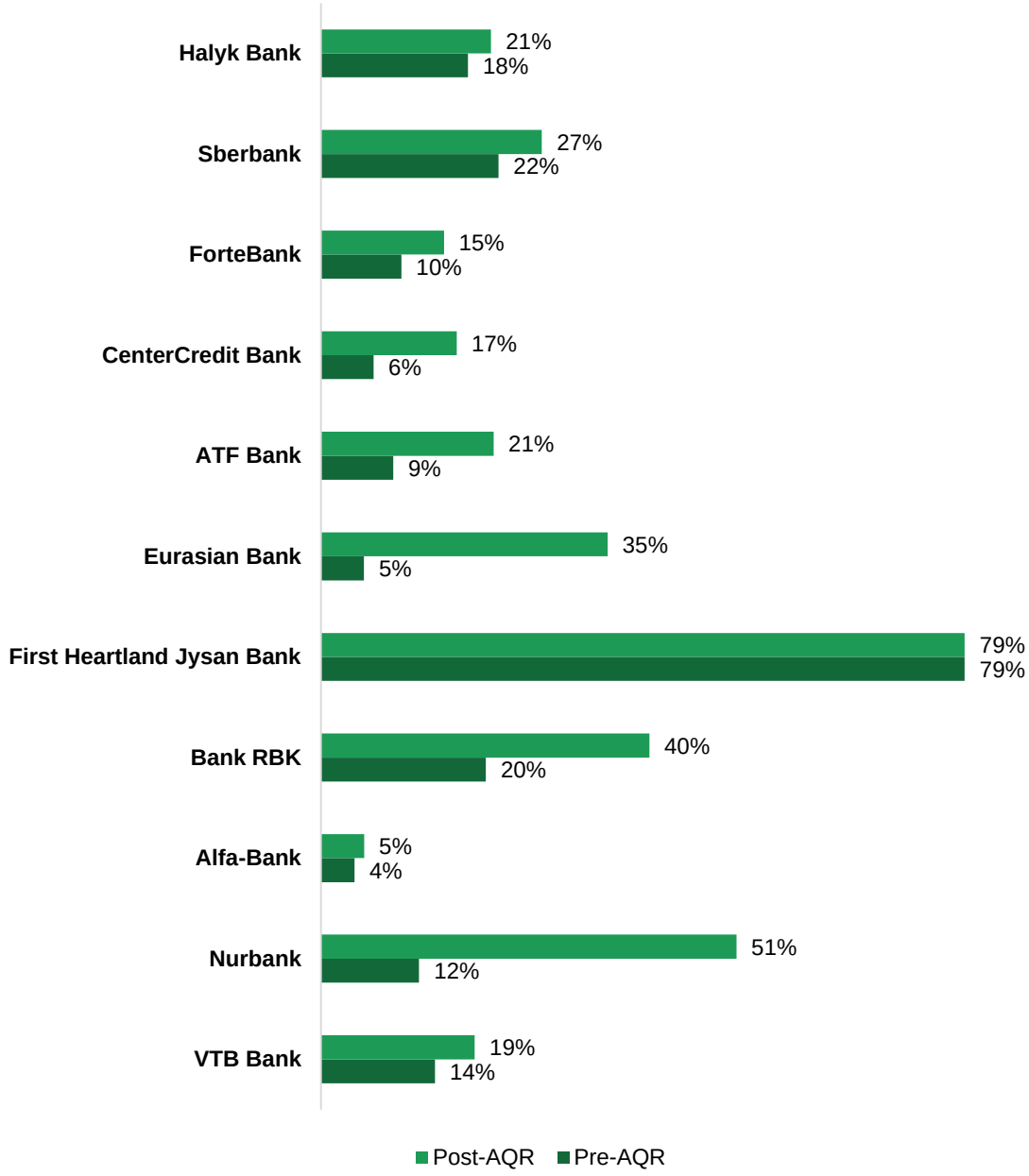


Table below shows approximated driver analysis of ECL underestimation by banks for each portfolio type. The impact is estimated based on challenger model sensitivity analysis and review of banks’ models.

Table 6: Drivers behind ECL underestimation by banks, % of total ECL underestimation

Portfolio type[22]	Understated PD	Understated LGD	CFR outcomes projections
Total	**18%**	**55%**	**26%**
COREST	11%	12%	77%
CORLAR	19%	1%	80%
CORMED	24%	14%	62%
RETCAR	-	100%	-
RETCON	50%	50%	-
RETEST	0,4%	45%	54%
RETSML	14%	86%	0%

ECL underestimation drivers were calculated via challenger model sensitivity analysis. PD – probability of default; LGD – loss given default; CFR – credit file review.

The table shows a relative contribution of each factor into the ECL underestimation based on bank teams' calculation for each of the portfolios. "Understated PD" and "Understated LGD" indicate what share of ECL revaluation was driven exclusively by PD and LGD reassessment during the collective provisioning analysis, and "CFR projections" factor indicates what share of ECL revaluation was driven by the change of parameters based on projections from credit file review. Based on CFR results it was calculated what share of sampled debtors should be reclassified from stage 1 to stage 2 and 3, and from stage 2 to stage 3. Resulting values were projected to the non-sampled part of the portfolio and provisioning analysis was performed based on the new impairment staging. Detailed description of CFR adjustment application to collective provisioning analysis is provided in Section 7.5.9. of the AQR Manual.

Overall, the main drivers behind adjustments for ECL estimates calculated by the banks are:

1. Application of unjustified assumptions and simplifications for probability of default models (PD), for example:
   - Lack of proper accounting for the cases of restructuring (incl. refinancing), write-offs, loan sales and transfers to third parties in default rate statistics and calibration of the probability of default models / lack of mechanisms to identify cases of restructuring and improper accounting for cases of hidden restructuring;
   - Limited usage of impairment triggers and not sufficiently conservative definition of timeframe required for a loan to be considered cured from default in default rate statistics and calibration of the probability of default models.

2. Application of unjustified assumptions and simplifications for loss given default models (LGD), for example:
   - Lack of proper recognition of cases where collaterals cannot be foreclosed and / or sold (e.g., collateral ownership has already been transferred to a third party, collateral being under arrest);
   - Loss given default models use limited statistics of recoveries (e.g. only a subset of available data, improperly treat cures, fines and penalties, accumulated interest, collection agencies fees, etc.).

3. Projections from credit file review. During the process of credit file review a sample of all corporate portfolios and "loans to individuals secured by real estate" portfolio have been reviewed. As a result, some exposures have been reclassified to a different impairment stage. Reclassifications are projected to the non-sampled exposures, driving increase in

ECL estimates based on collective provisioning analysis. The following drivers were key for the increase of ECL estimates:

- Incorrect classification of debtors into impairment stages as per IFRS 9;
- Underestimation of debtor-level ECL (driven by underestimation of exposure at default, overestimation of expected cash recoveries in case of default or overestimation of collateral value).

4. Other factors potentially leading to an inaccurate calculation of ECL:
   - Limited usage of appropriate forecasting techniques (e.g., change of risk metrics according to macro scenarios) in estimating ECL across portfolios;
   - Lack of regular model validation, back-testing, proper monitoring of model performance using a comprehensive set of model performance metrics;
   - Lack of documents that outline model development, provisions calculation approach, data quality assessment, model calibration and validation procedures, approaches taken and outcomes of such validation;
   - Insufficient granularity of client segmentation, use of a limited number of segments.

Based on these findings, banks are to implement a number of corrective measures. Typical measures, applicable to the most of participating banks, include:

- Refinement of risk metrics calculation models (PD, LGD, etc.) used for provisions estimation:
  - Adjustment of probability of default models to properly account for all restructuring cases, written-off (in full and partially), sold and transferred exposures;
  - Adjustment of loss given default models for collateralized exposures to properly account for probability of foreclosure and collateral realization statistics;
  - Adjustment of models to reflect particular features of different client segments: more thorough selection of data and segmentation criteria as well as statistical testing for each potential segmentation criterion and various segmentation techniques;
  - Adjustment of risk metrics estimation and ECL calculation approach for any asset types with exposure to credit risk (e.g. receivables, guarantees). PD and LGD values should not be zero for such exposures unless a strong justification is present with appropriate statistical evidence;
  - Introduction of improved forecasting mechanisms, including implementation of analysis for at least three macroeconomic scenarios across risk metrics and calibration of risk metrics to current macroeconomic conditions (PD, LGD);
  - In case of insufficient statistics on risk metrics, continue to gather and store data to extend analysis horizon and improve model reliability.
- Modernization of internal data systems to account for enhanced model logic, including automated storage and quality assurance for data used to calibrate and run the models as well as models' outcomes, linking bank systems in an automated way from risk metrics calculation to ECL and capital calculation modules;
- Maintaining high model quality by creation of proper model documentation describing full calculation logic, used assumptions, statistical testing conducted, etc.;
- Make sure that there is regular independent validation of models used for collective provisioning, and of data inputs used in models.

3.5. Fair value exposures review

Fair value exposures include: bonds, fair value loan portfolios, on-balance sheet real estate, derivatives. All such exposures were separately revalued with the assessment of the effect of such revaluation, with derivatives being revalued through derivative pricing models review. In addition, all bonds on banks' balance sheets were reviewed for:

- Correct classification under IFRS 9: amortized cost vs fair value. The results of SPPI (solely payment of principal and interest) and business model tests were challenged by the bank teams;
- Correct classification under IFRS 13 fair value hierarchy: all bonds classified by banks as Level 1 were challenged and the bank teams analyzed if for such bonds an active market[23] was present as of 1 April 2019.

No cases of incorrect classification of bonds under IFRS 9 were found by the bank teams, but reclassifications of bonds across fair value hierarchy levels under IFRS 13 were found for 7 banks.

Bank	Cases of reclassification across fair value hierarchy levels
Halyk Bank	✓
Sberbank	✓
Kaspi Bank	
ForteBank	✓
CenterCredit Bank	✓
ATF Bank	
Eurasian Bank	
First Heartland Jysan Bank	✓
Bank RBK	✓
Alfa-Bank	
Altyn Bank	✓
Nurbank	
Home Credit Bank	
VTB Bank	

Table 7 provides an overview of which asset types were selected for review for each bank. The following thresholds were applied for selection by asset types:

- 5% of total assets threshold for bonds: only Level 2 and Level 3 fair value bonds as per articles 72-90 of IFRS 13 were considered, as, by definition, Level 1 assets have an active market which provides publicly available pricing data in a consistent way;
- All fair value loan portfolios regardless of their share in total asset structure;
- 5% of total assets threshold for securitizations;
- 1% of total assets threshold for capital participation and individual direct investments;
- 1% of total assets threshold for on-balance real estate;
- All derivative trades active as of 1 April 2019.

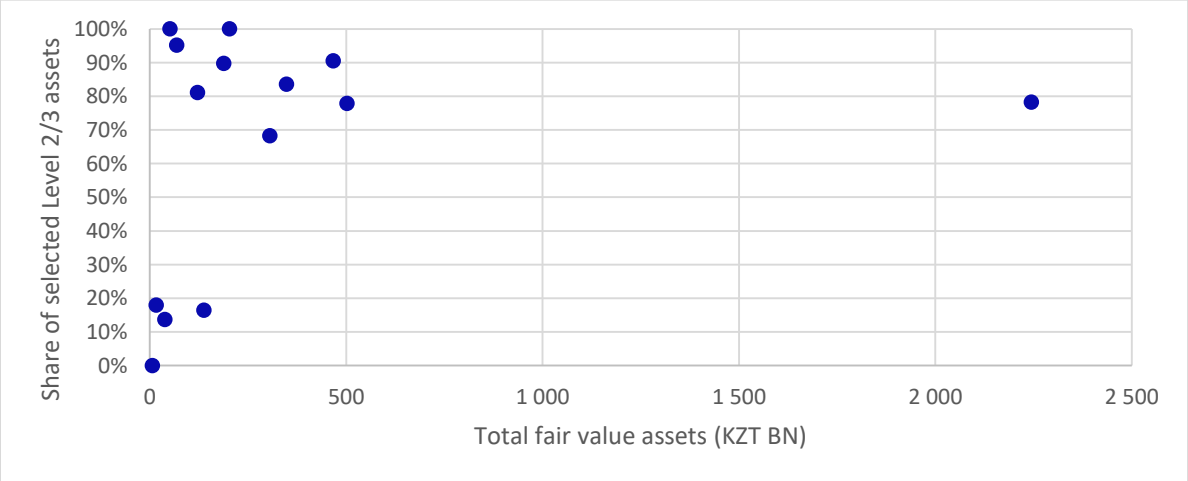
[23] Under IFRS 13, a fair value asset is attributed to Level 1 if an active market exists for identical assets, i.e. a market in which transactions for the asset or liability take place with sufficient frequency and volume to provide pricing information on an ongoing basis.

Table 7: Selected fair value asset types for review per participating bank

Bank	Bonds	Fair value loan portfolios	On-balance real estate	Derivatives
Halyk Bank	✓		✓	✓
Sberbank			✓	✓
Kaspi Bank	✓			✓
ForteBank	✓		✓	✓
CenterCredit Bank	✓		✓	✓
ATF Bank			✓	✓
Eurasian Bank	✓	✓	✓	✓
First Heartland Jysan Bank	✓	✓	✓	✓
Bank RBK	✓		✓	✓
Alfa-Bank			✓	✓
Altyn Bank	✓		✓	✓
Nurbank	✓		✓	✓
Home Credit Bank				✓
VTB Bank				✓

No participating banks had sufficient share of securitizations or participations and individual private equity investments for these asset types to be reviewed. Figure 7 shows the share of selected Level 2/3 assets relative to the total fair value assets.

Figure 7: Selected fair value assets portfolios



Sampling was performed in line with the AQR Manual:

- Up to top-20 unique bonds were selected for each bank identified by ISIN, and ranked by mark-to-market x duration;
- All fair value loan portfolios were selected for revaluation;
- For every bank, top-10 on-balance real estate assets by book value as of 1 April 2019 in each of the categories (own use, investment property, foreclosed collaterals), and 100 randomly selected assets from the remaining pool were selected for revaluation if available.

The adjustments were driven by revaluation of bonds, fair value loan portfolios and derivatives. For bonds and fair value loan portfolios, the revaluation was done directly (in addition to revaluation, bonds were also reviewed for correct accounting for embedded derivatives); for derivatives, pricing models used by banks were reviewed, and wherever a significant issue was identified, bank teams were required to describe the issue, quantify the associated risk of incorrect pricing, and propose improvement measures to the bank.

As depicted in Table 8, the largest adjustments were driven by revaluation of fair value loan portfolios.

Table 8: Fair value exposures revaluation – adjustments

Asset type	**Adjustments prior to tax offsetting**[24]			
	KZT BN	*Weighted average revaluation*	*Arithmetic average revaluation*	*Median revaluation*
Bonds[25]	-6,1	-1,1%	-3,9%	-0,9%
Fair value loan portfolios	-16,2	-16,4%	-29%	-16,4%
Derivatives[26]	-1,7	N/A[27]	N/A	N/A
Total	**-24,0**	**N/A**	**N/A**	**N/A**

Table 9 and further bank-by-bank specific fair value exposure review parts have the following specifics:

- Weighted average revaluation is equal to total revaluation divided by the total initial book value of revalued assets for that asset type / bank;
- Arithmetic average revaluation is equal to arithmetic average of percentage revaluations of all revalued assets for that asset type / bank;
- Median revaluation equals to the median of percentage revaluations of all revalued assets for that asset type / bank.

Table 9: Fair Value assets revaluations – prudential adjustments

Asset type	**Revaluation per asset**		
	Weighted average revaluation	*Arithmetic average revaluation*	*Median revaluation*
On-balance real estate	-22,9%	-23,5%	-17,2%

3.6. Determination of AQR-adjusted capital adequacy ratios

The results of all mentioned work blocks combined allowed to estimate the total impact of the AQR on the capital requirements and to project it on the banks' capital adequacy.

[24] Determination of tax impact was performed within work block 9 based on estimated reduction in taxable income for 2019 and expected increase of deferred tax assets.

[25] Here and further on in bank specific fair value exposure review parts, the effect of review of accounting is combined with effect of bond revaluation, as (1) bonds were the only analysed securities to have embedded non-standard derivatives, and (2) the effect of review of accounting proved to be immaterial on its own.

[26] Here and further on in bank specific fair value exposure review parts, the effect of applying CVA challenger model is combined with the effect of derivative pricing model review, as (1) both only apply to derivatives, and (2) (2) the effect of applying CVA challenger model proved to be immaterial on its own.

[27] Adjustment relative to initial derivative book value is not given, as derivative values tend to be close to zero and may even be negative, therefore, such a metric is meaningless.

Table 10 shows the AQR impact on k1 capital. The starting point is the k1 capital as of 1 April 2019, to which the following adjustments are applied: Adjustment from credit file review, adjustment from fair value exposures review, tax offsetting adjustment (expected AQR capital adjustments were analyzed against Tax Code of the Republic of Kazakhstan and expected tax impact was evaluated in a hypothetic scenario where these adjustments were applied as of 1 April 2019), as well as capital adjustment required due to data discrepancies found in regulatory reporting. The overall system-wide adjustment was KZT ~429 BN.

Final AQR-adjusted k1 capital is compared against required capital as of 1 April 2019, according to Regulation 170[28].

Table 10: System-level k1 capital adjustments

Value		Explanation
1. Post-AQR k1 capital ratio of the banks (final result) as of 1 April 2019	**12,7%**	**Banks' AQR-adjusted k1 ratio (final result)**
2. Pre-AQR CET 1 capital adequacy as of 1 April 2019	**15,5%**	**CET1 capital as reported by the banks as of 1 April 2019 as percentage of the bank's total risk-weighted assets (RWAs)**
3. AQR adjustments, KZT BN as of 1 April 2019	-429	Adjustments for exposure in scope for credit file review, fair value assets revaluation: revaluation of bonds and derivatives, decrease of capital impact from the decrease of taxable profits in 2019 and increase in deferred tax assets, adjustments in regulatory reporting.

Additionally, total capital adequacy was estimated taking the following into account:

- Reclassification of debtors into stage 2 or stage 3 based on prudential credit impairment triggers;
- Projection of credit file review (CFR) outcomes to non-sampled parts of the portfolio;
- Collective provisioning analysis results based on prudential challenger models;
- Revaluation of the on-balance real estate;
- Adjustments to total capital due to observed discrepancies in regulatory reporting (which was immaterial at system-level).

Prudential impact is fully reflected in the set of measures communicated to banks in the acts of inspection. The Agency will regularly monitor implementation of these measures through SREP process and targeted on-site inspections.

According to the analysis performed within the AQR, even if the prudential adjustments would be implemented immediately, the remaining capital buffer would have covered this effect over 2 times without any support measures from the state or the shareholders.

[28] Regulation 170 by the board of NBK dated 13 September 2017 with the changes dated 12 November 2019 (Regulation 191), available at: https://www.nationalbank.kz/?docid=969&switch=russian&showall

4. Bank-by-bank view on the outcomes

4.1. Halyk Bank

4.1.1. Portfolio sampling

The following table shows proportion of exposure sampled for credit file review (CFR) analysis for all portfolios of assets valued at amortized cost. The first column contains the share of on-balance and off-balance sheet exposures selected for CFR (as a share of total exposure of the portfolio within the AQR scope). For example, if for "corporate exposures secured by real estate" (COREST) portfolio KZT 100 were included in the AQR scope, of which KZT 90 have been selected for CFR review, the value in the first column would be equal to 90%. The second column shows distribution of resulting sample between portfolios (share of a portfolio's exposure sampled for CFR in the overall CFR sample). For example, if total sample for CFR was equal to KZT 1000 and COREST sample was equal to 90, then the value in the second column would be equal to 9%.

Table 11: Sampling rates by portfolio type (%)

Portfolio[29]	Sampling rates	Weight of portfolio in overall sample for CFR
COREST	92%	10%
CORLAR	93%	38%
CORMED	86%	22%
RETEST	6%	1%
CORGOV	100%	6%
FINFIN	100%	20%
GOVGOV	100%	0%
RELATE	100%	3%
RETLAR	100%	0%

Loans to central government ministries (if present) and exposures with NBK from the "government entities exposures" portfolio were excluded from CFR and analyzed using a simplified approach.

Due to their specific nature some of the exposures from fully sampled portfolios (e.g. "government entities exposures" and "financial institutions exposures") were not reviewed within CFR. Also, some borrowers from "small business exposures" portfolios were included in the scope of CFR (as an exception, due to large loans or credit lines of those borrowers) – this fact is not reflected in the table above due to the anomalous nature of such debtors.

4.1.2. Collateral valuation

As can be seen from Table 12, overall collateral revaluation for the bank is about 36% with 70% of this effect coming from "commercial & industrial real estate" and "other collateral" revaluations.

Collateral revaluation results were used as inputs into the credit file review. In other words, they are fully accounted for in the results there, thus they do not represent standalone impact in any form[30]. Within credit file review, the impact of collateral revaluation is taken into account as a change in potential recoveries, but one also has to take into account that collateral revaluation does not have direct impact on expected credit loss (ECL) calculation.

[29] Portfolio descriptions corresponding to portfolio codes are presented in Table 1.
[30] While revaluations in work block 8 "Fair value exposures review" reflect standalone impact and are not connected to the results of credit file review.

In other words, 1 KZT downward revaluation is not equal to 1 KZT ECL upward recalculation due to the following reasons:

- Many facilities have quite high coverage by collaterals thus even a decrease in collateral value may have no impact on actual recoveries of such exposures;
- Many facilities can be covered by debtors' cash flows without the need to foreclose collaterals;
- In ECL calculation the final value is weighted based on probability of scenarios, and the probability of collateral foreclosure scenario may vary for different borrowers.

Table 12: Collateral revaluations (KZT BN, % of pre-AQR valuation)

Collateral type	Pre-AQR aggregated value post haircuts (KZT BN)	Post-AQR aggregated value post haircuts (KZT BN)	Weighted average revaluation (%)	Arithmetic average revaluation (%)	Median revaluation (%)
Residential real estate	90,7	64,6	-28,8%	-22,3%	-27,1%
Commercial & industrial real estate	314,2	224,3	-28,6%	-20,6%	-29,5%
Agricultural land	1,4	0,6	-56,5%	-44,8%	-40,6%
Other land	81,9	46,4	-43,4%	-30,8%	-34,4%
Other collateral[31]	151,5	74,5	-50,8%	-36,5%	-37,2%

Weighted average, arithmetic average and median revaluation can be distanced relative to each other due to either existence of outliers in terms of relative revaluation or in terms of collateral value (both relatively big and relatively small sizes). Weighted average takes into account collateral value giving bigger weights to bigger collaterals while arithmetic average and median values perceive all revaluations if they were revaluations of collaterals of the same size.

Overall, the main drivers of collateral value change compared to pre-AQR appraisals are unreasonable judgement of an appraiser, including:

- Usage of a comparative approach based on not comparable analogs or application of not valid adjustments to these analogs;
- Usage of cost approach which can lead both to over- and undervaluation;
- Inappropriate application of income approach (e.g., cash flow assumptions are not aligned with the market context).

Changes of collateral value used in provisions calculation by the bank as of 1 April 2019 were also driven by imperfections of the current valuation standards in the Republic of Kazakhstan that should be in line with international valuation standards: insufficient granularity of requirements to approach eligibility, sufficient justification of expert judgments and assumptions used, reliability and confirmability of used statistics, etc.

4.1.3. Credit file review and projection of findings

Table 13 represents the results of debtors' reclassification in all portfolios of assets valued at amortized cost:

- Pre-AQR total share of stage 3 debtors in all bank's assets equals the exposure of debtors assigned to stage 3 by the bank itself divided by the total exposure of all

[31] "Other collateral" type includes cars and other transport, production and other equipment, inventory, etc.

debtors in the respective portfolio. Portfolios that were not in the AQR scope are also included;

- Post-AQR total share of debtors in stage 3 in all bank's assets due to IFRS effect is equal to:
  - For exposures in the AQR scope: sum of exposure of debtors classified by the bank as stage 3 and the exposure of debtors reclassified to stage 3 based on all IFRS triggers used for AQR divided by the total exposure of all debtors in the respective portfolio. Portfolios that were not in the AQR scope are also included;
  - For exposures not in the AQR scope: sum of exposure of debtors classified by the bank as stage 3 divided by the total exposure of all debtors in the respective portfolio. Portfolios that were not in the AQR scope are also included.

Table 13: Share of debtors in stage 3 in all bank's assets (including assets which are not in the AQR scope) (%)

Pre-AQR total share of debtors in stage 3 in all bank's assets (%)	Post-AQR total share of debtors in stage 3 in all bank's assets due to IFRS effect (%)
15,5%	16,0%

Post-AQR weighted average share of stage 3 debtors in all portfolios of the bank equals 16,0%. Hence, the share of post-AQR stage 3 debtors has not increased significantly if additional IFRS reclassifications are accounted for. The bank's CET1 capital allows the bank to hold fully adequate provisions for credit impaired debtors.

Key reclassification triggers:

- >90 DPD (days past due) for at least one of the debtor's exposures;
- Restructuring due to deterioration of the debtor's financial conditions.

Post-classification, the bank team estimated the level of expected credit loss (ECL).

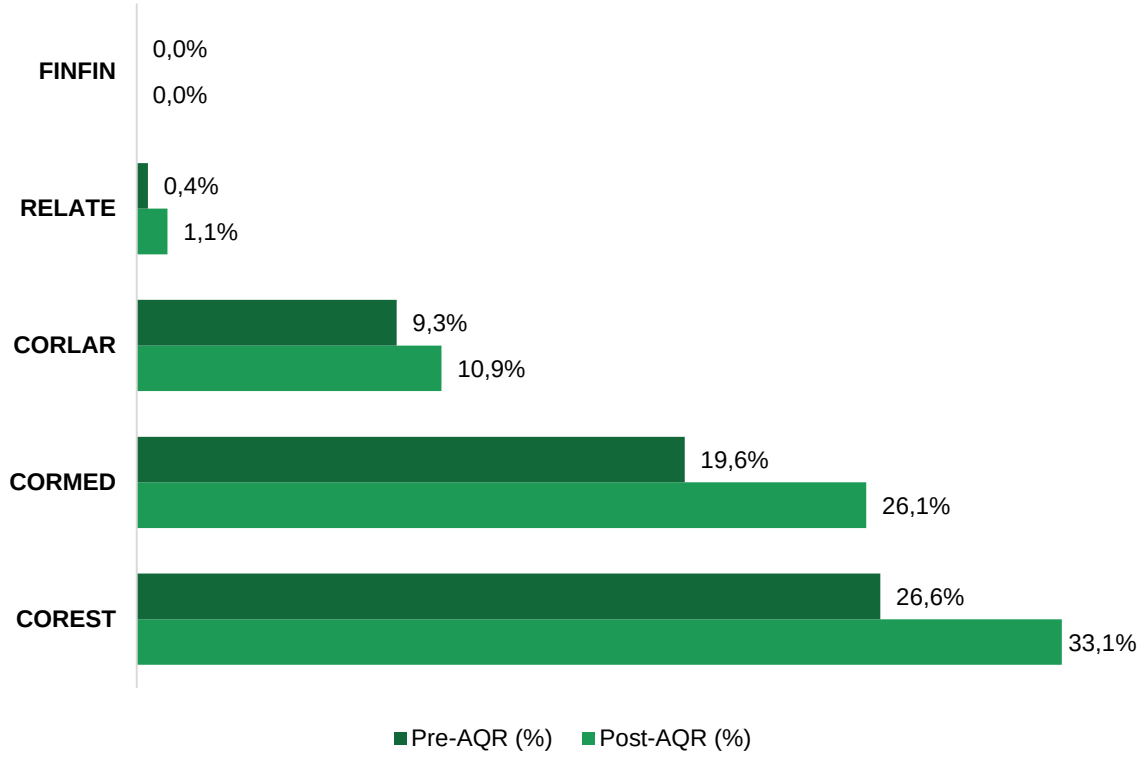
Figure 8 represents the change in ECL ratio in each portfolio of assets valued at amortized cost:

- Pre-AQR ECL is equal to the sum of ECL of exposures in stages 1, 2 and 3 for sampled debtors in the respective portfolio calculated by the bank divided by the exposure of sampled debtors in respective portfolio[32];
- Post-AQR ECL is equal to the sum of ECL of exposures in stages 1, 2 and 3 calculated by the bank team for sampled debtors in the respective portfolio as a result of credit file review, projection of findings and collective provisioning analysis, divided by the exposure of sampled debtors in the respective portfolio.

As depicted in Figure 8, the most significant change in ECL was observed in "medium corporate exposures" and "corporate exposures secured by real estate" portfolios.

[32] According to information provided by banks during AQR.

Figure 8: Pre- and Post-AQR Expected Credit Loss (%)



- *The table does not show portfolios with insignificant number of debtors due to ECL calculation results not being representative;*
- *Portfolios "loans to individuals secured by real estate" (RETEST) and "consumer loans, credit cards and other retail exposures" (RETCON) are not presented on the chart as ECL for these portfolios is calculated fully as a result of collective provisioning analysis – corresponding results are presented in the following section.*

4.1.4. Collective provisioning analysis

The following table shows shares of portfolios selected for the collective provisioning analysis for which the challenger model calculations performed by the bank team resulted in expected credit loss (ECL) estimates exceeding, equal to or below bank's calculations.

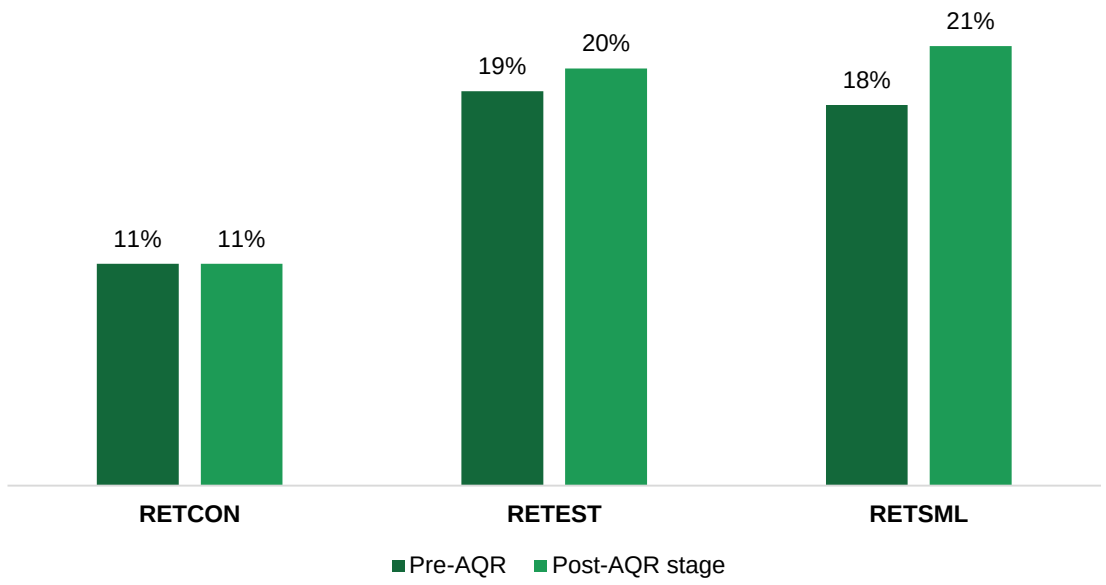
6 portfolios (retail portfolios and stage 1 & 2 debtors in corporate portfolios) were in-scope for the collective provisioning analysis.

For 17% of the in-scope portfolios, the challenger model resulted in ECL estimate below bank's calculation.

Table 14: Scope of the collective provisioning analysis (%)

# of portfolios	Challenger model resulted in lower ECL	Challenger model didn't result in lower ECL
6	83%	17%

Figure 9: ECL per portfolio type (%)[33]



ECL in "small business exposures" portfolio includes credit file review outcomes for the largest debtors of this portfolio.

For corporate portfolios not fully sampled for credit file review ECL for debtors in stages 1 and 2 is calculated within the collective provisioning analysis. Increases in ECL rates are presented together with the credit file review (CFR) outcomes.

Table below shows approximated driver analysis of ECL increase for each portfolio type. The impact is assessed by sensitivity analysis of the challenger model and a review of the bank's models.

Table 15: Drivers behind ECL increase, % of total ECL increase

Portfolio type[33]	Understated PD	Understated LGD	CFR projections
Total	**35%**	**31%**	**34%**
COREST	0%	0%	100%
CORLAR	0%	0%	100%
CORMED	25%	0%	75%
RETCON	-	-	-
RETEST	0%	100%	0%
RETSML	56%	44%	0%

ECL increase drivers were approximated by sensitivity analysis of the challenger model. PD – probability of default; LGD – loss given default; CFR – credit file review.

[33] Portfolio descriptions corresponding to portfolio codes are presented in Table 1.

The table shows relative contribution of each of the drivers to the ECL revaluation based on the bank team's calculation for each portfolio. Thus, "Understated PD" and "Understated LGD" factors demonstrate the share of ECL revaluation driven solely by PD and LGD adjustments used for collective provisioning analysis, and "CFR projections" factor demonstrates the share of ECL revaluation driven solely by the changes in risk parameters for debtors not sampled for CFR. The share of sampled debtors to be reclassified from stage 1 to stages 2 & 3 and from stage 2 to stage 3 was calculated based on the CFR outcomes. The resulting findings were projected to the non-sampled part of the portfolio and collective provisioning analysis was then based on the adjusted impairment staging distribution. Section 7.5.9 of the AQR Manual contains a detailed description of the process of implementation of CFR adjustments in the collective provisioning analysis.

The main drivers of adjustments to the ECL calculations by the bank were:

- **PD:** Insufficiently granular risk differentiation. As a result, same probability of default values are assigned to loans with different risk profiles;
- **PD:** Occasionally excessive simplification of probability of default models, e.g. no assessment of PD for specific product types (e.g., receivables), not sufficiently granular client segmentation;
- **LGD:** Calibration of / historical data used for loss given default models does not fully account for the probability of sale of collaterals (e.g. cases when collateral ownership has already been transferred), all collaterals are assumed to be sold with a 100% probability.

4.1.5. Fair value exposures review

As depicted in Table 16 and Table 17, adjustments were driven by revaluation of bonds, while prudential adjustments were mainly due to revaluation of on-balance real estate.

Table 16: Fair value assets revaluations – adjustments

Asset type	Adjustments prior to tax offsetting			
	KZT BN	*Weighted average revaluation*	*Arithmetic average revaluation*	*Median revaluation*
Bonds	-3,7	-2,3%	-2,5%	-1,8%
Derivatives	0,0	N/A	N/A	N/A
Total	**-3,7**	**N/A**	**N/A**	**N/A**

No material impact on derivative valuation is explained by no significant issues discovered during derivative pricing models review and CVA impact being non-material.

Table 17: Fair value assets revaluations – prudential adjustments

Asset type	Revaluation per asset		
	Weighted average revaluation	*Arithmetic average revaluation*	*Median revaluation*
On-balance real estate	-22%	-25%	-17%

Key drivers of valuation change:

- Usage of incomparable analogs and incorrect assumptions (e.g. overly optimistic cash flow expectations or valuing incomplete construction as complete) in appraisal reports used for calculating book value;

- Usage of KASE quotes for bond pricing in the absence of active market (under IFRS 13, quotes can only be used directly when there is an active market available, i.e. markets where transactions take place with sufficient frequency and volume for pricing information to be provided).

4.1.6. Determination of AQR-adjusted capital adequacy ratios

Post AQR, Halyk Bank had a surplus of k1 capital of 12,5% of risk-weighted assets (Table 18).

Table 18: k1 capital adjustments

Value		Explanation
1. Pre-AQR CET1 capital adequacy as of 1 April 2019	**20,4%**	**CET1 capital as reported by the bank as of 1 April 2019 as a percentage of total risk-weighted assets (RWAs)**
2. AQR adjustments, KZT BN, as of 1 April 2019	-18,9	Adjustments for exposure in scope for credit file review, fair value assets revaluation: revaluation of bonds and derivatives, decrease of capital impact from the decrease of taxable profits in 2019 and increase in deferred tax assets, adjustments in regulatory reporting
3. Bank's post-AQR k1 ratio (final result) as of 1 April 2019	**20,0%**	**Bank's AQR-adjusted k1 ratio (final result)**

Prudential impact is fully reflected in the set of measures communicated to banks in the acts of inspection. The Agency will regularly monitor implementation of these measures through SREP process and targeted on-site inspections.

4.2. Sberbank

4.2.1. Portfolio sampling

The following table shows proportion of exposure sampled for credit file review (CFR) analysis for all portfolios of assets valued at amortized cost. The first column contains the share of on-balance and off-balance sheet exposures selected for CFR (as a share of total exposure of the portfolio within the AQR scope). For example, if for "corporate exposures secured by real estate" (COREST) portfolio KZT 100 were included in the AQR scope, of which KZT 90 have been selected for CFR review, the value in the first column would be equal to 90%. The second column shows distribution of resulting sample between portfolios (share of a portfolio's exposure sampled for CFR in the overall CFR sample). For example, if total sample for CFR was equal to KZT 1000 and COREST sample was equal to 90, then the value in the second column would be equal to 9%.

Table 19: Sampling rates by portfolio type (%)

Portfolio[34]	Sampling rates	Weight of portfolio in overall sample for CFR
CORLAR	79%	57%
CORMED	66%	30%
RETEST	8%	2%
COREST	100%	5%
CORGOV	100%	2%
FINFIN	100%	5%
RELATE	100%	0%
RETLAR	100%	0%

Loans to central government ministries (if present) and exposures with NBK from the "government entities exposures" portfolio were excluded from CFR and analyzed using a simplified approach.

Due to their specific nature some of the exposures from fully sampled portfolios (e.g. "government entities exposures" and "financial institutions exposures") were not reviewed within CFR. Also, some borrowers from "small business exposures" portfolios were included in the scope of CFR (as an exception, due to large loans or credit lines of those borrowers) – this fact is not reflected in the table above due to the anomalous nature of such debtors.

4.2.2. Collateral valuation

As can be seen from Table 20, overall upward collateral revaluation for the bank is about 10% with 95% of this effect coming from "commercial & industrial real estate" and "other collateral" revaluations.

Collateral revaluation results were used as inputs into the credit file review. In other words, they are fully accounted for in the results there, thus they do not represent standalone impact in any form[35]. Within credit file review, the impact of collateral revaluation is taken into account as a change in potential recoveries, but one also has to take into account that collateral revaluation does not have direct impact on expected credit loss (ECL) calculation. In other words, 1 KZT downward revaluation is not equal to 1 KZT ECL upward recalculation due to the following reasons:

[34] Portfolio descriptions corresponding to portfolio codes are presented in Table 1.
[35] While revaluations in work block 8 "Fair value exposures review" reflect standalone impact and are not connected to the results of credit file review.

- Many facilities have quite high coverage by collaterals thus even a decrease in collateral value may have no impact on actual recoveries of such exposures;
- Many facilities can be covered by debtors' cash flows without the need to foreclose collaterals;
- In ECL calculation the final value is weighted based on probability of scenarios, and the probability of collateral foreclosure scenario may vary for different borrowers.

Table 20: Collateral revaluations (KZT BN, % of pre-AQR valuation)

Collateral type	Pre-AQR aggregated value post haircuts (KZT BN)	Post-AQR aggregated value post haircuts (KZT BN)	Weighted average revaluation (%)	Arithmetic average revaluation (%)	Median revaluation (%)
Residential real estate	0,7	0,7	0,5%	3,8%	-3,4%
Commercial & industrial real estate	50,8	52,8	3,8%	39,8%	-2,5%
Agricultural land	1,2	1,3	9,2%	17,7%	12,4%
Other land	1,2	1,3	12,7%	10,3%	5,2%
Other collateral[36]	15,9	20,7	30,3%	36,8%	24,2%

Weighted average, arithmetic average and median revaluation can be distanced relative to each other due to either existence of outliers in terms of relative revaluation or in terms of collateral value (both relatively big and relatively small sizes). Weighted average takes into account collateral value giving bigger weights to bigger collaterals while arithmetic average and median values perceive all revaluations if they were revaluations of collaterals of the same size.

Overall, the main drivers of collateral value change compared to pre-AQR appraisals are:

- Usage of a comparative approach based on not comparable analogs or application of not valid adjustments to these analogs;
- Usage of cost approach which can lead both to over- and undervaluation;
- Lag between collateral data update (collateral value and status, etc.) and its integration into internal data systems which can lead to use of non-actual information in provisions estimation modules.

Changes of collateral value used in provisions calculation by the bank as of 1 April 2019 were also driven by imperfections of the current valuation standards in the Republic of Kazakhstan that should be in line with international valuation standards: insufficient granularity of requirements to approach eligibility, sufficient justification of expert judgments and assumptions used, reliability and confirmability of used statistics, etc.

4.2.3. Credit file review and projection of findings

Table 21 represents the results of debtors' reclassification in all portfolios of assets valued at amortized cost:

- Pre-AQR total share of stage 3 debtors in all bank's assets equals the exposure of debtors assigned to stage 3 by the bank itself divided by the total exposure of all debtors in the respective portfolio. Portfolios that were not in the AQR scope are also included;
- Post-AQR total share of debtors in stage 3 in all bank's assets due to IFRS effect is equal to:

[36] "Other collateral" type includes cars and other transport, production and other equipment, inventory, etc.

- For exposures in the AQR scope: sum of exposure of debtors classified by the bank as stage 3 and the exposure of debtors reclassified to stage 3 based on all IFRS triggers used for AQR divided by the total exposure of all debtors in the respective portfolio. Portfolios that were not in the AQR scope are also included;
- For exposures not in the AQR scope: sum of exposure of debtors classified by the bank as stage 3; divided by the total exposure of all debtors in the respective portfolio. Portfolios that were not in the AQR scope are also included.

Table 21: Share of debtors in stage 3 in all bank's assets (including assets which are not in the AQR scope) (%)

Pre-AQR total share of debtors in stage 3 in all banks' assets (%)	Post-AQR total share of debtors in stage 3 in all bank's assets due to IFRS effect (%)
9,1%	9,1%

Post-AQR weighted average share of stage 3 debtors in all portfolios of the bank equals 9,1%. Hence, the share of post-AQR stage 3 debtors has not increased significantly if additional IFRS reclassifications are accounted for. The bank's CET1 capital allows the bank to hold fully adequate provisions for credit impaired debtors.

Key reclassification triggers:

- Restructuring due to deterioration of the debtor's financial conditions.

Post-classification, the bank team estimated the level of expected credit loss (ECL).

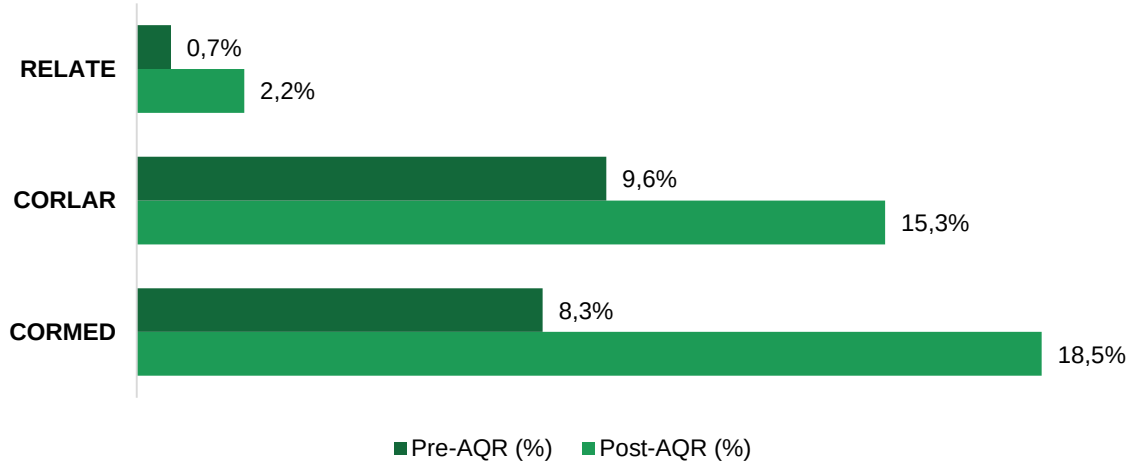
Figure 10 represents the change in ECL ratio in each portfolio of assets valued at amortized cost:

- Pre-AQR ECL is equal to the sum of ECL of exposures in stages 1, 2 and 3 for sampled debtors in the respective portfolio calculated by the bank divided by the exposure of sampled debtors in respective portfolio[37];
- Post-AQR ECL is equal to the sum of ECL of exposures in stages 1, 2 and 3 calculated by the bank team for sampled debtors in the respective portfolio as a result of credit file review, projection of findings and collective provisioning analysis, divided by the exposure of sampled debtors in the respective portfolio.

As depicted in Figure 10, the most significant change in ECL was observed in "medium corporate exposures" and "large corporate exposures" portfolios.

[37] According to information provided by banks during AQR.

Figure 10: Pre- and Post-AQR Expected Credit Loss (%)



- *The table does not show portfolios with insignificant number of debtors due to ECL calculation results not being representative;*
- *Portfolios "loans to individuals secured by real estate" (RETEST) and "consumer loans, credit cards & other retail exposures" (RETCON) are not presented on the chart as ECL for these portfolios is calculated fully as a result of collective provisioning analysis – corresponding results are presented in the following section.*

4.2.4. Collective provisioning analysis

The following table shows shares of portfolios selected for the collective provisioning analysis for which the challenger model calculations performed by the bank team resulted in expected credit loss (ECL) estimates exceeding, equal to or below bank's calculations.

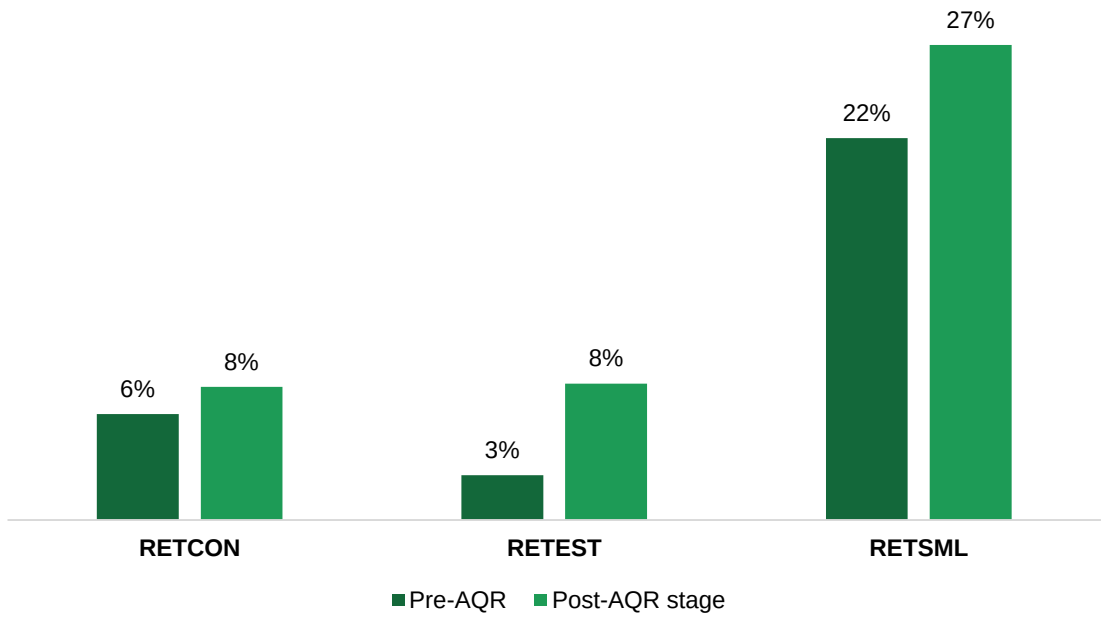
5 portfolios (retail portfolios and stage 1 & 2 debtors in corporate portfolios) were in-scope for the collective provisioning analysis.

For all of the in-scope portfolios, the challenger model resulted in ECL estimate above bank's calculation.

Table 22: Scope of the collective provisioning analysis (%)

# of portfolios	Challenger model resulted in lower ECL	Challenger model didn't result in lower ECL
5	100%	0%

Figure 11: ECL per portfolio type (%)[38]



ECL in "small business exposures" portfolio includes credit file review outcomes for the largest debtors of this portfolio.

For corporate portfolios not fully sampled for credit file review ECL for debtors in stages 1 and 2 is calculated within the collective provisioning analysis process. Increases in ECL rates are presented together with the credit file review (CFR) outcomes.

Table below shows approximated driver analysis of ECL increase for each portfolio type. The impact is assessed by sensitivity analysis of the challenger model and a review of the bank's models.

Table 23: Drivers behind ECL increase, % of total ECL increase

Portfolio type[38]	Understated PD	Understated LGD	CFR projections
Total	**27%**	**29%**	**44%**
CORLAR	32%	0%	68%
CORMED	67%	0%	33%
RETCON	0%	100%	0%
RETEST	0%	0%	100%
RETSML	16%	84%	0%

ECL increase drivers were approximated by sensitivity analysis of the challenger model. PD – probability of default; LGD – loss given default; CFR – credit file review.

The table shows relative contribution of each of the drivers to the ECL revaluation based on the bank team's calculation for each portfolio. Thus, "Understated PD" and "Understated LGD" factors demonstrate the share of ECL revaluation driven solely by PD and LGD adjustments used for collective provisioning analysis, and "CFR projections" factor

[38] Portfolio descriptions corresponding to portfolio codes are presented in Table 1.

demonstrates the share of ECL revaluation driven solely by the changes in risk parameters for debtors not sampled for CFR. The share of sampled debtors to be reclassified from stage 1 to stages 2 & 3 and from stage 2 to stage 3 was calculated based on the CFR outcomes. The resulting findings were projected to the non-sampled part of the portfolio and collective provisioning analysis was then based on the adjusted impairment staging distribution. Section 7.5.9 of the AQR Manual contains a detailed description of the process of implementation of CFR adjustments in the collective provisioning analysis.

The main drivers of adjustments to the ECL calculations by the bank were:

- **PD:** Lack of a formal methodology to account for restructuring cases which may lead to misrepresentation of the probabilities of default. Bank systems don't store all required data in a way that it could be fully utilized for further estimations of risk metrics and in risk models;
- **LGD:** Calibration of / historical data used for loss given default models does not fully account for the probability of sale of collaterals (e.g. cases when collateral ownership has already been transferred).

4.2.5. Fair value exposures review

As depicted in Table 24 and Table 25, adjustments were non-material, while prudential adjustments were mainly due to revaluation of on-balance real estate. While direct revaluation of bonds was out of scope for Sberbank, the securities were still analyzed for embedded non-standard derivatives, such as floored coupon or callability by the issuer, and correct accounting, i.e. ensuring that any such embedded derivatives are properly reflected on bank's books and considered during valuation.

Table 24: Fair value assets revaluations – adjustments

Asset type	Adjustments prior to tax offsetting			
	KZT BN	*Weighted average revaluation*	*Arithmetic average revaluation*	*Median revaluation*
Bonds	0,0	0%	0%	0%
Derivatives	0,0	N/A	N/A	N/A
Total	**0,0**	**N/A**	**N/A**	**N/A**

No material impact on derivative valuation is explained by no significant issues discovered during derivative pricing models review and CVA impact being non-material.

Table 25: Fair value assets revaluations – prudential adjustments

Asset type	Revaluation per asset		
	Weighted average revaluation	*Arithmetic average revaluation*	*Median revaluation*
On-balance real estate	-22%	-22%	-17%

Key drivers of valuation change:

- Overestimated prices of comparable objects in valuation reports used to calculate book value due to using listed prices as opposed to transaction prices.

4.2.6. Determination of AQR-adjusted capital adequacy ratios

Post AQR, Sberbank had a surplus of k1 capital of 5% of risk-weighted assets (Table 26).

Table 26: k1 capital adjustments

Value		Explanation
1. Pre-AQR CET1 capital adequacy as of 1 April 2019	**12,7%**	**CET1 capital as reported by the bank as of 1 April 2019 as a percentage of total risk-weighted assets (RWAs)**
2. AQR adjustments, KZT BN, as of 1 April 2019	-2	Adjustments for exposure in scope for credit file review, fair value assets revaluation: revaluation of bonds and derivatives, decrease of capital impact from the decrease of taxable profits in 2019 and increase in deferred tax assets, adjustments in regulatory reporting
3. Bank's post-AQR k1 ratio (final result) as of 1 April 2019	**12,5%**	**Bank's AQR-adjusted k1 ratio (final result)**

Prudential impact is fully reflected in the set of measures communicated to banks in the acts of inspection. The Agency will regularly monitor implementation of these measures through SREP process and targeted on-site inspections.

4.3. Kaspi Bank

4.3.1. Portfolio sampling

The following table shows proportion of exposure sampled for credit file review (CFR) analysis for all portfolios of assets valued at amortized cost. The first column contains the share of on-balance and off-balance sheet exposures selected for CFR (as a share of total exposure of the portfolio within the AQR scope). For example, if for "corporate exposures secured by real estate" (COREST) portfolio KZT 100 were included in the AQR scope, of which KZT 90 have been selected for CFR review, the value in the first column would be equal to 90%. The second column shows distribution of resulting sample between portfolios (share of a portfolio's exposure sampled for CFR in the overall CFR sample). For example, if total sample for CFR was equal to KZT 1000 and COREST sample was equal to 90, then the value in the second column would be equal to 9%.

Table 27: Sampling rates by portfolio type (%)

Portfolio[39]	Sampling rates	Weight of portfolio in overall sample for CFR
COREST	100%	2%
CORLAR	100%	23%
CORMED	100%	24%
FINFIN	100%	49%
RELATE	100%	1%
RETLAR	100%	1%

Due to their specific nature some of the exposures from fully sampled portfolios (e.g. "financial institutions exposures") were not reviewed within CFR.

4.3.2. Collateral valuation

As can be seen from Table 28, overall collateral revaluation for the bank is about 38% with 90% of this effect coming from "residential real estate" and "commercial & industrial real estate" revaluations.

Collateral revaluation results were used as inputs into the credit file review. In other words, they are fully accounted for in the results there, thus they do not represent standalone impact in any form[40]. Within credit file review, the impact of collateral revaluation is taken into account as a change in potential recoveries, but one also has to take into account that collateral revaluation does not have direct impact on expected credit loss (ECL) calculation. In other words, 1 KZT downward revaluation is not equal to 1 KZT ECL upward recalculation due to the following reasons:

- Many facilities have quite high coverage by collaterals thus even a decrease in collateral value may have no impact on actual recoveries of such exposures;
- Many facilities can be covered by debtors' cash flows without the need to foreclose collaterals;
- In ECL calculation the final value is weighted based on probability of scenarios, and the probability of collateral foreclosure scenario may vary for different borrowers.

[39] Portfolio descriptions corresponding to portfolio codes are presented in Table 1.
[40] While revaluations in work block 8 "Fair value exposures review" reflect standalone impact and are not connected to the results of credit file review.

Table 28: Collateral revaluations (KZT BN, % of pre-AQR valuation)

Collateral type	Pre-AQR aggregated value post haircuts (KZT BN)	Post-AQR aggregated value post haircuts (KZT BN)	Weighted average revaluation (%)	Arithmetic average revaluation (%)	Median revaluation (%)
Residential real estate	12,8	7,7	-39,3%	-35,6%	-30,9%
Commercial & industrial real estate	60,8	37,8	-37,8%	-22,5%	-28,1%
Agricultural land	n/a	n/a			
Other land	2,7	2,3	-16,1%	-18,3%	-15,5%
Other collateral[41]	8,3	5,2	-36,8%	-38,9%	-53,5%

Weighted average, arithmetic average and median revaluation can be distanced relative to each other due to either existence of outliers in terms of relative revaluation or in terms of collateral value (both relatively big and relatively small sizes). Weighted average takes into account collateral value giving bigger weights to bigger collaterals while arithmetic average and median values perceive all revaluations if they were revaluations of collaterals of the same size.

Overall, the main drivers of collateral value change compared to pre-AQR appraisals are:

- Usage of a comparative approach based on not comparable analogs or application of not valid adjustments to these analogs;
- Usage of cost approach which can lead both to over- and undervaluation;
- Appraisal report adjustments are often based only on the expert judgement of an appraiser and do not have any objective justification.

Changes of collateral value used in provisions calculation by the bank as of 1 April 2019 were also driven by imperfections of the current valuation standards in the Republic of Kazakhstan that should be in line with international valuation standards: insufficient granularity of requirements to approach eligibility, sufficient justification of expert judgments and assumptions used, reliability and confirmability of used statistics, etc.

4.3.3. Credit file review

Table 29 represents the results of debtors' reclassification in all portfolios of assets valued at amortized cost:

- Pre-AQR total share of stage 3 debtors in all bank's assets equals the exposure of debtors assigned to stage 3 by the bank itself divided by the total exposure of all debtors in the respective portfolio. Portfolios that were not in the AQR scope are also included;
- Post-AQR total share of debtors in stage 3 in all bank's assets due to IFRS effect is equal to:
  - For exposures in the AQR scope: sum of exposure of debtors classified by the bank as stage 3 and the exposure of debtors reclassified to stage 3 based on all IFRS triggers used for AQR divided by the total exposure of all debtors in the respective portfolio. Portfolios that were not in the AQR scope are also included;
  - For exposures not in the AQR scope: sum of exposure of debtors classified by the bank as stage 3 divided by the total exposure of all debtors in the

[41] "Other collateral" type includes cars and other transport, production and other equipment, inventory, etc.

respective portfolio. Portfolios that were not in the AQR scope are also included.

Table 29: Share of debtors in stage 3 in all bank's assets (including assets which are not in the AQR scope) (%)

Pre-AQR total share of debtors in stage 3 in all banks' assets (%)	Post-AQR total share of debtors in stage 3 in all bank's assets due to IFRS effect (%)
16,6%	16,6%

Post-AQR weighted average share of stage 3 debtors in all portfolios of the bank equals 16,6%. Hence, the share of post-AQR stage 3 debtors has not increased significantly if additional IFRS reclassifications are accounted for. The bank's CET1 capital allows the bank to hold fully adequate provisions for credit impaired debtors.

Post-classification, the bank team estimated the level of expected credit loss (ECL).

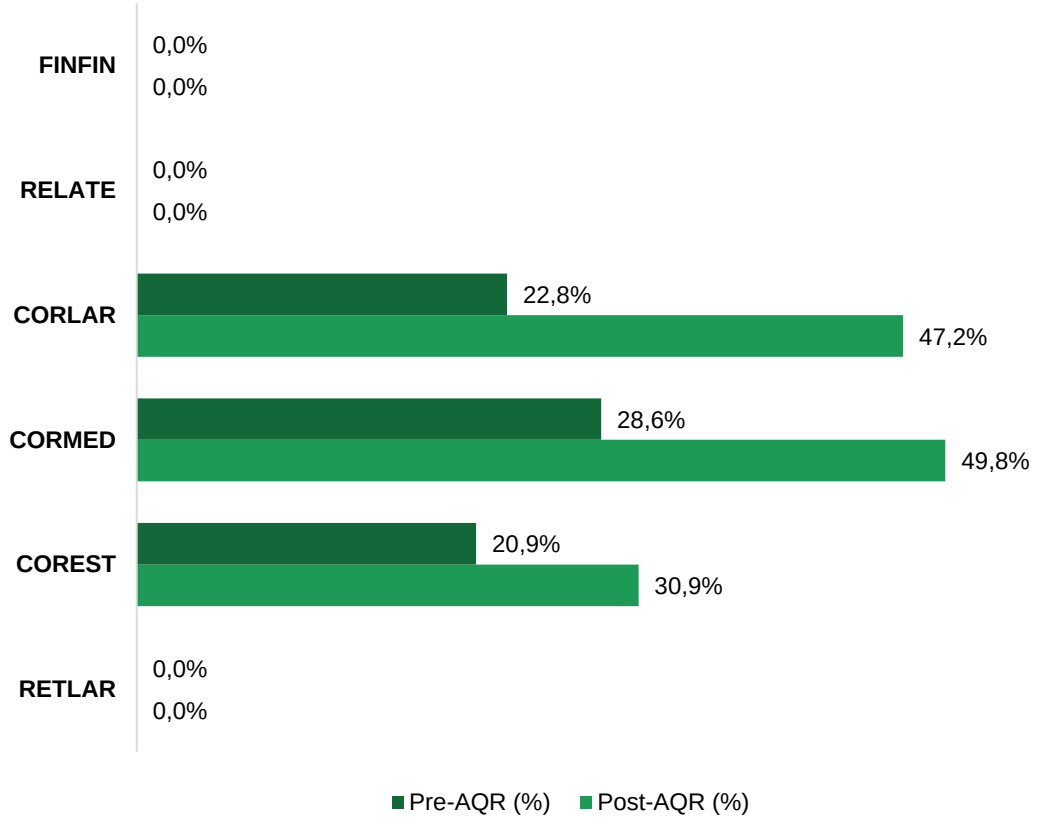
Figure 12 represents the change in ECL ratio in each portfolio of assets valued at amortized cost:

- Pre-AQR ECL is equal to the sum of ECL of exposures in stages 1, 2 and 3 for sampled debtors in the respective portfolio calculated by the bank divided by the exposure of sampled debtors in respective portfolio[42];
- Post-AQR ECL is equal to the sum of ECL of exposures in stages 1, 2 and 3 calculated by the bank team for sampled debtors in the respective portfolio as a result of credit file review, projection of findings and collective provisioning analysis, divided by the exposure of sampled debtors in the respective portfolio.

As depicted in Figure 12, the most significant change in ECL was observed in "large corporate exposures" and "medium corporate exposures" portfolios.

[42] According to information provided by banks during AQR.

Figure 12: Pre- and Post-AQR Expected Credit Loss (%)



- *Portfolios "car loans & other collateralized retail exposures" (RETCAR) and "consumer loans, credit cards and other retail exposures" (RETCON) are not presented on the chart as ECL for these portfolios is calculated fully as a result of collective provisioning analysis – corresponding results are presented in the following section.*

4.3.4. Collective provisioning analysis

The following table shows shares of portfolios selected for the collective provisioning analysis for which the challenger model calculations performed by the bank team resulted in expected credit loss (ECL) estimates exceeding, equal to or below bank's calculations.

2 retail portfolios were in-scope for the collective provisioning analysis.

For one of the portfolios the challenger model resulted in ECL estimate below bank's calculation.

Table 30: Scope of the collective provisioning analysis (%)

# of portfolios	Challenger model resulted in lower ECL	Challenger model didn't result in lower ECL
2	50%	50%

Loans from "loans to individuals secured by real estate" portfolio were excluded from the AQR scope for this bank.

Figure 13: ECL per portfolio type (%)[43]

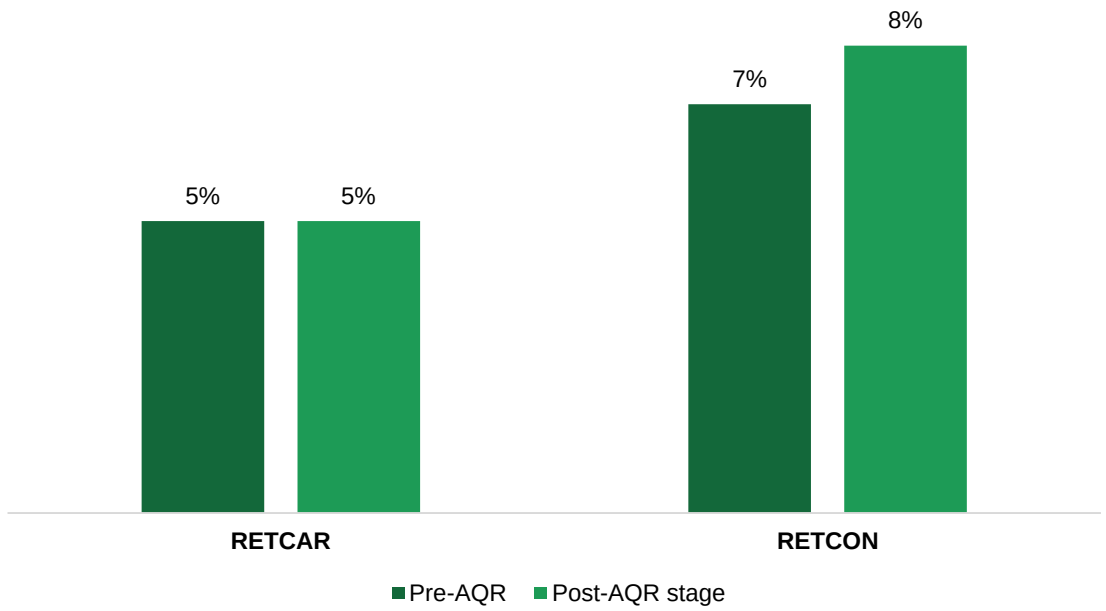


Table below shows approximated driver analysis of ECL increase for each portfolio type. The impact is assessed by sensitivity analysis of the challenger model and a review of the bank's models.

Table 31: Drivers behind ECL increase, % of total ECL increase

Portfolio type[43]	Understated PD	Understated LGD	CFR projections
Total	**58%**	**42%**	**0%**
RETCAR	-	-	-
RETCON	58%	42%	0%

ECL increase drivers were approximated by sensitivity analysis of the challenger model. PD – probability of default; LGD – loss given default; CFR – credit file review.

The table shows relative contribution of each of the drivers to the ECL revaluation based on the bank team's calculation for each portfolio. Thus, "Understated PD" and "Understated LGD" factors demonstrate the share of ECL revaluation driven solely by PD and LGD adjustments used for collective provisioning analysis, and "CFR projections" factor demonstrates the share of ECL revaluation driven solely by the changes in risk parameters for debtors not sampled for CFR. The share of sampled debtors to be reclassified from stage 1 to stages 2 & 3 and from stage 2 to stage 3 was calculated based on the CFR outcomes. The resulting findings were projected to the non-sampled part of the portfolio and collective provisioning analysis was then based on the adjusted impairment staging distribution. Section 7.5.9 of the AQR Manual contains a detailed description of the process of implementation of CFR adjustments in the collective provisioning analysis.

[43] Portfolio descriptions corresponding to portfolio codes are presented in Table 1.

The main drivers of adjustments to the ECL calculations by the bank were:

- **PD:** Lack of proper accounting for the cases of restructurings (incl. refinancing), insufficiently conservative choice of time horizon for cures in default rate statistics, impairment staging and calibration of the probability of default models;
  LGD: Occasionally excessive simplification of probability of default and loss given default calculation, e.g. loss given default is calculated on limited statistics.

4.3.5. Fair value exposures review

As depicted in Table 32, adjustments were non-material. Revaluation of on-balance real estate was out of scope for Kaspi Bank.

Table 32: Fair value assets revaluations – adjustments

Asset type	Adjustments prior to tax offsetting			
	KZT BN	*Weighted average revaluation*	*Arithmetic average revaluation*	*Median revaluation*
Bonds	-0,1	-0,1%	-0,3%	-0,3%
Derivatives	0,0	N/A	N/A	N/A
Total	**-0,1**	**N/A**	**N/A**	**N/A**

Most bonds selected for revaluation were found to be valued correctly or below fair value. No material impact on derivative valuation is explained by no significant issues discovered during derivative pricing models review and CVA impact being non-material.

4.3.6. Determination of AQR-adjusted capital adequacy ratios

Post AQR, Kaspi Bank had a surplus of k1 capital of 3,5% of risk-weighted assets (Table 33).

Table 33: k1 capital adjustments

Value		Explanation
1. Pre-AQR CET1 capital adequacy as of 1 April 2019	**11,6%**	**CET1 capital as reported by the bank as of 1 April 2019 as a percentage of total risk-weighted assets (RWAs)**
2. AQR adjustments, KZT BN, as of 1 April 2019	-10,5	Adjustments for exposure in scope for credit file review, fair value assets revaluation: revaluation of bonds and derivatives, decrease of capital impact from the decrease of taxable profits in 2019 and increase in deferred tax assets, adjustments in regulatory reporting
3. Bank's post-AQR k1 ratio (final result) as of 1 April 2019	**11,0%**	**Bank's AQR-adjusted k1 ratio (final result)**

Prudential impact is fully reflected in the set of measures communicated to banks in the acts of inspection. The Agency will regularly monitor implementation of these measures through SREP process and targeted on-site inspections.

4.4. ForteBank

4.4.1. Portfolio sampling

The following table shows proportion of exposure sampled for credit file review (CFR) analysis for all portfolios of assets valued at amortized cost. The first column contains the share of on-balance and off-balance sheet exposures selected for CFR (as a share of total exposure of the portfolio within the AQR scope). For example, if for "corporate exposures secured by real estate" (COREST) portfolio KZT 100 were included in the AQR scope, of which KZT 90 have been selected for CFR review, the value in the first column would be equal to 90%. The second column shows distribution of resulting sample between portfolios (share of a portfolio's exposure sampled for CFR in the overall CFR sample). For example, if total sample for CFR was equal to KZT 1000 and COREST sample was equal to 90, then the value in the second column would be equal to 9%.

Table 34: Sampling rates by portfolio type (%)

Portfolio[44]	Sampling rates	Weight of portfolio in overall sample for CFR
RETEST	13%	2%
COREST	100%	1%
CORGOV	100%	23%
CORLAR	100%	31%
CORMED	100%	15%
FINFIN	100%	4%
GOVGOV	100%	21%
RELATE	100%	0%
RETLAR	100%	1%

Loans to central government ministries (if present) and exposures with NBK from the "government entities exposures" portfolio were excluded from CFR and analyzed using a simplified approach.

Due to their specific nature some of the exposures from fully sampled portfolios (e.g. "government entities exposures" and "financial institutions exposures") were not reviewed within CFR. Also, some borrowers from "small business exposures" portfolios were included in the scope of CFR (as an exception, due to large loans or credit lines of those borrowers) – this fact is not reflected in the table above due to the anomalous nature of such debtors.

4.4.2. Collateral valuation

As can be seen from Table 35, overall collateral revaluation for the bank is about 4% with this effect mostly coming from "commercial & industrial real estate" and "other collateral" revaluations, what is partially balanced by upward revaluation in "residential real estate" and "other land".

Collateral revaluation results were used as inputs into the credit file review. In other words, they are fully accounted for in the results there, thus they do not represent standalone impact in any form[45]. Within credit file review, the impact of collateral revaluation is taken into account as a change in potential recoveries, but one also has to take into account that collateral revaluation does not have direct impact on expected credit loss (ECL) calculation.

[44] Portfolio descriptions corresponding to portfolio codes are presented in Table 1.
[45] While revaluations in work block 8 "Fair value exposures review" reflect standalone impact and are not connected to the results of credit file review.

In other words, 1 KZT downward revaluation is not equal to 1 KZT ECL upward recalculation due to the following reasons:

- Many facilities have quite high coverage by collaterals thus even a decrease in collateral value may have no impact on actual recoveries of such exposures;
- Many facilities can be covered by debtors' cash flows without the need to foreclose collaterals;
- In ECL calculation the final value is weighted based on probability of scenarios, and the probability of collateral foreclosure scenario may vary for different borrowers.

Table 35: Collateral revaluations (KZT BN, % of pre-AQR valuation)

Collateral type	Pre-AQR aggregated value post haircuts (KZT BN)	Post-AQR aggregated value post haircuts (KZT BN)	Weighted average revaluation (%)	Arithmetic average revaluation (%)	Median revaluation (%)
Residential real estate	15,0	17,2	15,0%	17,5%	7,6%
Commercial & industrial real estate	102,8	101,0	-1,8%	16,4%	3,6%
Agricultural land	1,2	0,8	-29,7%	-27,8%	-37,9%
Other land	2.2	2,8	26,4%	-18,0%	1,7%
Other collateral[46]	17,9	11,7	-34,6%	-39,0%	-43,6%

Weighted average, arithmetic average and median revaluation can be distanced relative to each other due to either existence of outliers in terms of relative revaluation or in terms of collateral value (both relatively big and relatively small sizes). Weighted average takes into account collateral value giving bigger weights to bigger collaterals while arithmetic average and median values perceive all revaluations if they were revaluations of collaterals of the same size.

Overall, the main drivers of collateral value change compared to pre-AQR appraisals are:

- Usage of a comparative approach based on not comparable analogs or application of not valid adjustments to these analogs;
- Absence of regular revaluation for a part of collaterals which can lead to usage of non-actual information in collateral valuation;
- Application of haircuts based on expert opinion rather than valid statistics on collateral foreclosures or regulatory haircuts.

Changes of collateral value used in provisions calculation by the bank as of 1 April 2019 were also driven by imperfections of the current valuation standards in the Republic of Kazakhstan that should be in line with international valuation standards: insufficient granularity of requirements to approach eligibility, sufficient justification of expert judgments and assumptions used, reliability and confirmability of used statistics, etc.

4.4.3. Credit file review and projection of findings

Table 36 represents the results of debtors' reclassification in all portfolios of assets valued at amortized cost:

- Pre-AQR total share of stage 3 debtors in all bank's assets equals the exposure of debtors assigned to stage 3 by the bank itself divided by the total exposure of all

[46] "Other collateral" type includes cars and other transport, production and other equipment, inventory, etc.

debtors in the respective portfolio. Portfolios that were not in the AQR scope are also included;

- Post-AQR total share of debtors in stage 3 in all bank's assets due to IFRS effect is equal to:
  - For exposures in the AQR scope: sum of exposure of debtors classified by the bank as stage 3 and the exposure of debtors reclassified to stage 3 based on all IFRS triggers used for AQR divided by the total exposure of all debtors in the respective portfolio. Portfolios that were not in the AQR scope are also included;
  - For exposures not in the AQR scope: sum of exposure of debtors classified by the bank as stage 3 divided by the total exposure of all debtors in the respective portfolio. Portfolios that were not in the AQR scope are also included.

Table 36: Share of debtors in stage 3 in all bank's assets (including assets which are not in the AQR scope) (%)

Pre-AQR total share of debtors in stage 3 in all banks' assets (%)	Post-AQR total share of debtors in stage 3 in all bank's assets due to IFRS effect (%)
17,1%	18,3%

Post-AQR weighted average share of stage 3 debtors in all portfolios of the bank equals 18,3%. Hence, the share of post-AQR stage 3 debtors has not increased significantly if additional IFRS reclassifications are accounted for. The bank's CET1 capital allows the bank to hold fully adequate provisions for credit impaired debtors.

Key reclassification trigger is the >90 DPD (days past due) for at least one of the debtor's exposures.

Post-classification, the bank team estimated the level of expected credit loss (ECL).

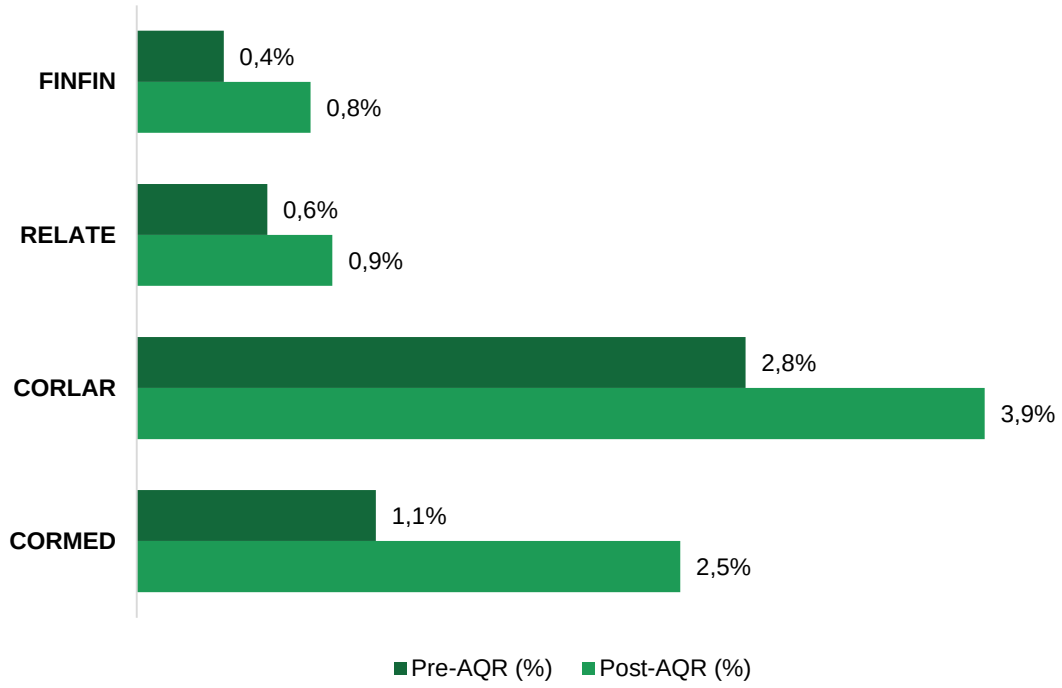
Figure 14 represents the change in ECL ratio in each portfolio of assets valued at amortized cost:

- Pre-AQR ECL is equal to the sum of ECL of exposures in stages 1, 2 and 3 for sampled debtors in the respective portfolio calculated by the bank divided by the exposure of sampled debtors in respective portfolio[47];
  Post-AQR ECL is equal to the sum of ECL of exposures in stages 1, 2 and 3 calculated by the bank team for sampled debtors in the respective portfolio as a result of credit file review, projection of findings and collective provisioning analysis, divided by the exposure of sampled debtors in the respective portfolio.

As depicted in Figure 14, the most significant change in ECL was observed in "medium corporate exposures" and "large corporate exposures" portfolios.

[47] According to information provided by banks during AQR.

Figure 14: Pre- and Post-AQR Expected Credit Loss (%)



- *The table does not show portfolios with insignificant number of debtors due to ECL calculation results not being representative;*
- *Portfolios "loans to individuals secured by real estate" (RETEST), "car loans & other collateralized retail exposures" (RETCAR) and "consumer loans, credit cards and other retail exposures" (RETCON) are not presented on the chart as ECL for these portfolios is calculated fully as a result of collective provisioning analysis – corresponding results are presented in the following section.*

4.4.4. Collective provisioning analysis

The following table shows shares of portfolios selected for the collective provisioning analysis for which the challenger model calculations performed by the bank team resulted in expected credit loss (ECL) estimates exceeding, equal to or below bank's calculations.

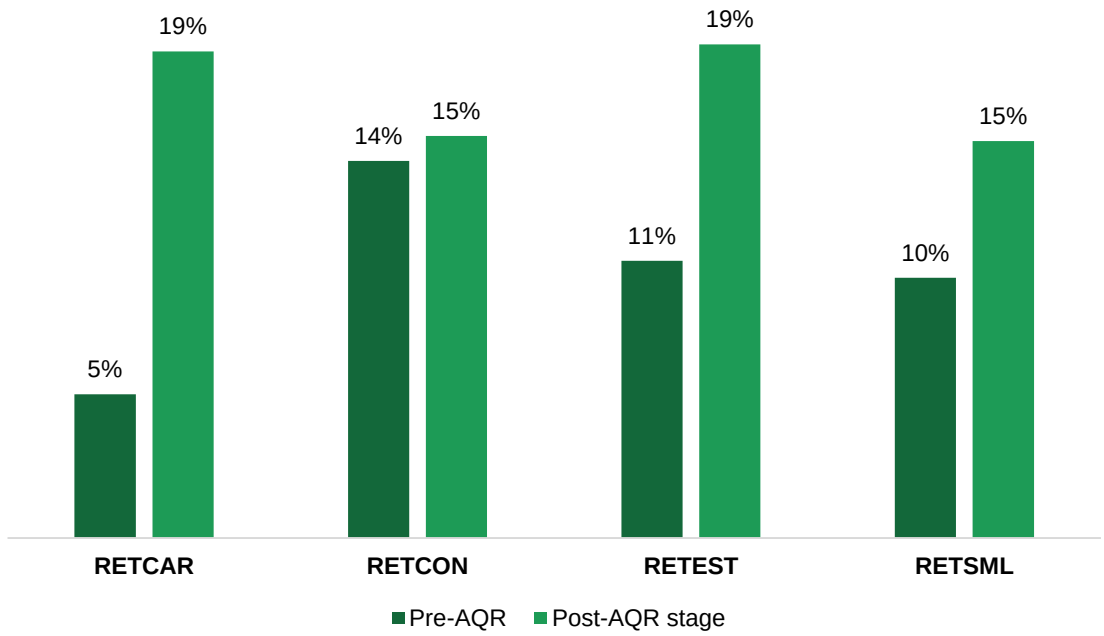
4 retail portfolios were in-scope for the collective provisioning analysis.

For all of the in-scope portfolios, the challenger model resulted in ECL estimate above bank's calculation.

Table 37: Scope of the collective provisioning analysis (%)

# of portfolios	Challenger model resulted in lower ECL	Challenger model didn't result in lower ECL
4	100%	0%

Figure 15: ECL per portfolio type (%)[48]



ECL in "small business exposures" portfolio includes credit file review outcomes for the largest debtors of this portfolio.

Table below shows approximated driver analysis of ECL increase for each portfolio type. The impact is assessed by sensitivity analysis of the challenger model and a review of the bank's models.

Table 38: Drivers behind ECL increase, % of total ECL increase

Portfolio type[48]	Understated PD	Understated LGD	CFR projections
Total	**4%**	**96%**	**0%**
RETCAR	0%	100%	0%
RETCON	100%	0%	0%
RETEST	0%	97%	3%
RETSML	0%	100%	0%

ECL increase drivers were approximated by sensitivity analysis of the challenger model. PD – probability of default; LGD – loss given default; CFR – credit file review.

The table shows relative contribution of each of the drivers to the ECL revaluation based on the bank team's calculation for each portfolio. Thus, "Understated PD" and "Understated LGD" factors demonstrate the share of ECL revaluation driven solely by PD and LGD adjustments used for collective provisioning analysis, and "CFR projections" factor demonstrates the share of ECL revaluation driven solely by the changes in risk parameters for debtors not sampled for CFR. The share of sampled debtors to be reclassified from stage 1 to stages 2 & 3 and from stage 2 to stage 3 was calculated based on the CFR outcomes. The resulting findings were projected to the non-sampled part of the portfolio and collective provisioning analysis was then based on the adjusted impairment staging distribution.

[48] Portfolio descriptions corresponding to portfolio codes are presented in Table 1.

Section 7.5.9 of the AQR Manual contains a detailed description of the process of implementation of CFR adjustments in the collective provisioning analysis.

The main drivers of adjustments to the ECL calculations by the bank were:

- **PD:** Lack of proper accounting for the cases of restructurings (incl. refinancing), write-offs, exposure sales and transfers to third parties, insufficient usage of impairment triggers and not sufficiently conservative selection of time horizon for cures in default rate statistics and calibration of the probability of default models;
- **LGD:** Calibration of / historical data used for loss given default models does not fully account for the probability of sale of collaterals, overstates recoveries on partially written-off exposure.

4.4.5. Fair value exposures review

As depicted in Table 39 and Table 40, IFRS adjustments were driven by revaluation of bonds, while prudential adjustments were mainly due to revaluation of on-balance real estate.

Table 39: Fair value assets revaluations – adjustments

Asset type	Adjustments prior to tax offsetting			
	KZT BN	*Weighted average revaluation*	*Arithmetic average revaluation*	*Median revaluation*
Bonds	-1,2	-1,3%	-1,5%	-0,8%
Derivatives	0,0	N/A	N/A	N/A
Total	**-1,2**	**N/A**	**N/A**	**N/A**

No material impact on derivative valuation is explained by no significant issues discovered during derivative pricing models review and CVA impact being non-material.

Table 40: Fair value assets revaluations – prudential adjustments

Asset type	Revaluation per asset		
	Weighted average revaluation	*Arithmetic average revaluation*	*Median revaluation*
Real estate	-8%	-13%	-9%

Key drivers of valuation change:

- Usage of incomparable analogs in valuation reports used to calculate book value;
- Systematic problems in pricing procedures for foreclosed collaterals leading to foreclosed collaterals being sold at prices below their book values – when assets were sold past 1 April 2019, the transaction price was used as the market value.

4.4.6. Determination of AQR-adjusted capital adequacy ratios

Post AQR, ForteBank had a surplus of k1 capital of 9,1% of risk-weighted assets (Table 41).

Table 41: k1 capital adjustments

Value		Explanation
1. Pre-AQR CET1 capital adequacy as of 1 April 2019	**16,8%**	**CET1 capital as reported by the bank as of 1 April 2019 as a percentage of total risk-weighted assets (RWAs)**
2. AQR adjustments, KZT BN, as of 1 April 2019	-2,6	Adjustments for exposure in scope for credit file review, fair value assets revaluation: revaluation of bonds and derivatives, decrease of capital impact from the decrease of taxable profits in 2019 and increase in deferred tax assets, adjustments in regulatory reporting
3. Bank's post-AQR k1 ratio (final result) as of 1 April 2019	**16,6%**	**Bank's AQR-adjusted k1 ratio (final result)**

Prudential impact is fully reflected in the set of measures communicated to banks in the acts of inspection. The Agency will regularly monitor implementation of these measures through SREP process and targeted on-site inspections.

4.5. CenterCredit Bank

4.5.1. Portfolio sampling

The following table shows proportion of exposure sampled for credit file review (CFR) analysis for all portfolios of assets valued at amortized cost. The first column contains the share of on-balance and off-balance sheet exposures selected for CFR (as a share of total exposure of the portfolio within the AQR scope). For example, if for "corporate exposures secured by real estate" (COREST) portfolio KZT 100 were included in the AQR scope, of which KZT 90 have been selected for CFR review, the value in the first column would be equal to 90%. The second column shows distribution of resulting sample between portfolios (share of a portfolio's exposure sampled for CFR in the overall CFR sample). For example, if total sample for CFR was equal to KZT 1000 and COREST sample was equal to 90, then the value in the second column would be equal to 9%.

Table 42: Sampling rates by portfolio type (%)

Portfolio[49]	Sampling rates	Weight of portfolio in overall sample for CFR
CORMED	88%	17%
RETEST	8%	3%
COREST	100%	8%
CORLAR	100%	70%
DISASS	100%	1%
RELATE	100%	0%
RETLAR	100%	1%

Some borrowers from "small business exposures" portfolios were included in the scope of CFR (as an exception, due to large loans or credit lines of those borrowers) – this fact is not reflected in the table above due to the anomalous nature of such debtors.

4.5.2. Collateral valuation

As can be seen from Table 43, overall collateral revaluation for the bank is about 38% with more than 95% of this effect coming from "commercial & industrial real estate" and "other collateral" revaluations.

Collateral revaluation results were used as inputs into the credit file review. In other words, they are fully accounted for in the results there, thus they do not represent standalone impact in any form[50]. Within credit file review, the impact of collateral revaluation is taken into account as a change in potential recoveries, but one also has to take into account that collateral revaluation does not have direct impact on expected credit loss (ECL) calculation. In other words, 1 KZT downward revaluation is not equal to 1 KZT ECL upward recalculation due to the following reasons:

- Many facilities have quite high coverage by collaterals thus even a decrease in collateral value may have no impact on actual recoveries of such exposures;
- Many facilities can be covered by debtors' cash flows without the need to foreclose collaterals;
- In ECL calculation the final value is weighted based on probability of scenarios, and the probability of collateral foreclosure scenario may vary for different borrowers.

[49] Portfolio descriptions corresponding to portfolio codes are presented in Table 1.
[50] While revaluations in work block 8 "Fair value exposures review" reflect standalone impact and are not connected to the results of credit file review.

Table 43: Collateral revaluations (KZT BN, % of pre-AQR valuation)

Collateral type	Pre-AQR aggregated value post haircuts (KZT BN)	Post-AQR aggregated value post haircuts (KZT BN)	Weighted average revaluation (%)	Arithmetic average revaluation (%)	Median revaluation (%)
Residential real estate	23,6	24,0	2,0%	24,8%	17,3%
Commercial & industrial real estate	372,6	250,7	-32,7%	-19,2%	-24,7%
Agricultural land	8,1	6,2	-23,7%	-16,4%	-26,2%
Other land	14,9	11,9	-20,5%	40,3%	20,3%
Other collateral[51]	104,6	31,9	-69,5%	-62,5%	-63,2%

Weighted average, arithmetic average and median revaluation can be distanced relative to each other due to either existence of outliers in terms of relative revaluation or in terms of collateral value (both relatively big and relatively small sizes). Weighted average takes into account collateral value giving bigger weights to bigger collaterals while arithmetic average and median values perceive all revaluations if they were revaluations of collaterals of the same size.

Overall, the main drivers of collateral value change compared to pre-AQR appraisals are:

- Usage of a comparative approach based on not comparable analogs;
- Application of haircuts based on expert opinion rather than valid statistics on collateral foreclosures or regulatory haircuts;
- Lack of collaterals' state monitoring which results in appraisal reports not considering the current state of collateral at valuation date (e.g., valuation of finished object as one undergoing construction).

Changes of collateral value used in provisions calculation by the bank as of 1 April 2019 were also driven by imperfections of the current valuation standards in the Republic of Kazakhstan that should be in line with international valuation standards: insufficient granularity of requirements to approach eligibility, sufficient justification of expert judgments and assumptions used, reliability and confirmability of used statistics, etc.

4.5.3. Credit file review and projection of findings

Table 44 represents the results of debtors' reclassification in all portfolios of assets valued at amortized cost:

- Pre-AQR total share of stage 3 debtors in all bank's assets equals the exposure of debtors assigned to stage 3 by the bank itself divided by the total exposure of all debtors in the respective portfolio. Portfolios that were not in the AQR scope are also included;
- Post-AQR total share of debtors in stage 3 in all bank's assets due to IFRS effect is equal to:
  - For exposures in the AQR scope: sum of exposure of debtors classified by the bank as stage 3 and the exposure of debtors reclassified to stage 3 based on all IFRS triggers used for AQR divided by the total exposure of all debtors in the respective portfolio. Portfolios that were not in the AQR scope are also included;

[51] "Other collateral" type includes cars and other transport, production and other equipment, inventory, etc.

- For exposures not in the AQR scope: sum of exposure of debtors classified by the bank as stage 3 divided by the total exposure of all debtors in the respective portfolio. Portfolios that were not in the AQR scope are also included.

Table 44: Share of debtors in stage 3 in all bank's assets (including assets which are not in the AQR scope) (%)

Pre-AQR total share of debtors in stage 3 in all banks' assets (%)	Post-AQR total share of debtors in stage 3 in all bank's assets due to IFRS effect (%)
19,2%	23,5%

Post-AQR weighted average share of stage 3 debtors in all portfolios of the bank equals 23,5%. The bank's CET1 capital with capital adequacy increase measures allows the bank to hold adequate provisions for credit impaired debtors.

Key reclassification trigger is the restructuring due to deterioration of the debtor's financial conditions.

Post-classification, the bank team estimated the level of expected credit loss (ECL).

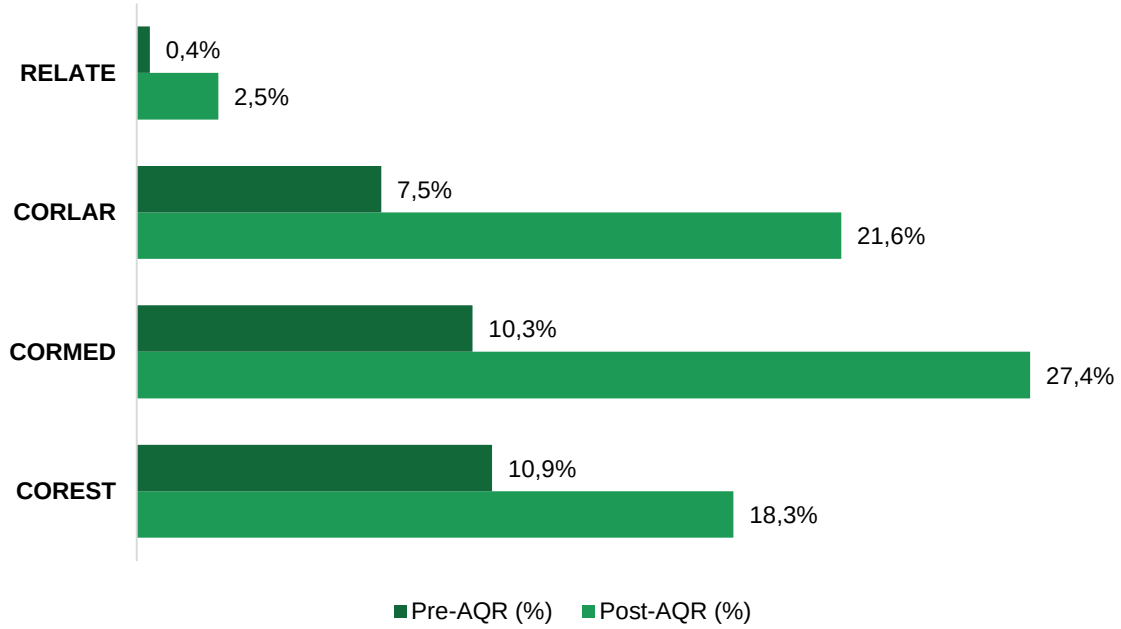
Figure 16 represents the change in ECL ratio in each portfolio of assets valued at amortized cost:

- Pre-AQR ECL is equal to the sum of ECL of exposures in stages 1, 2 and 3 for sampled debtors in the respective portfolio calculated by the bank divided by the exposure of sampled debtors in respective portfolio[52];
- Post-AQR ECL is equal to the sum of ECL of exposures in stages 1, 2 and 3 calculated by the bank team for sampled debtors in the respective portfolio as a result of credit file review, projection of findings and collective provisioning analysis, divided by the exposure of sampled debtors in the respective portfolio.

As depicted in Figure 16, the most significant change in ECL was observed in "medium corporate exposures" and "large corporate exposures" portfolios.

[52] According to information provided by banks during AQR.

Figure 16: Pre- and Post-AQR Expected Credit Loss (%)



- *The table does not show portfolios with insignificant number of debtors due to ECL calculation results not being representative;*
- *Portfolios "loans to individuals secured by real estate" (RETEST) and "consumer loans, credit cards and other retail exposures" (RETCON) are not presented on the chart as ECL for these portfolios is calculated fully as a result of collective provisioning analysis – corresponding results are presented in the following section.*

4.5.4. Collective provisioning analysis

The following table shows shares of portfolios selected for the collective provisioning analysis for which the challenger model calculations performed by the bank team resulted in expected credit loss (ECL) estimates exceeding, equal to or below bank's calculations.

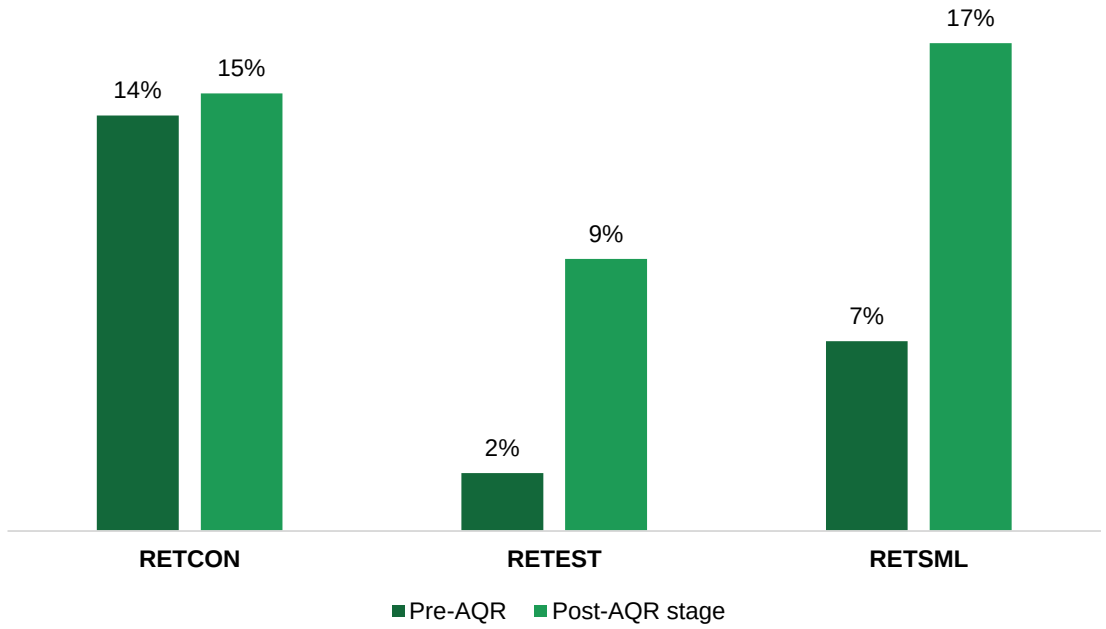
4 portfolios (retail portfolios and stage 1 & 2 debtors in corporate portfolios) were in-scope for the collective provisioning analysis.

For all of the in-scope portfolios, the challenger model resulted in ECL estimate above bank's calculation.

Table 45: Scope of the collective provisioning analysis (%)

# of portfolios	Challenger model resulted in lower ECL	Challenger model didn't result in lower ECL
4	100%	0%

Figure 17: ECL per portfolio type (%)[53]



ECL in "small business exposures" portfolio includes credit file review outcomes for the largest debtors of this portfolio.

For corporate portfolios not fully sampled for credit file review ECL for debtors in stages 1 and 2 is calculated within the collective provisioning analysis process. Increases in ECL rates are presented together with the credit file review (CFR) outcomes.

Table below shows approximated driver analysis of ECL increase for each portfolio type. The impact is assessed by sensitivity analysis of the challenger model and a review of the bank's models.

Table 46: Drivers behind ECL increase, % of total ECL increase

Portfolio type[53]	Understated PD	Understated LGD	CFR projections
Total	**0%**	**63%**	**37%**
CORMED	0%	37%	63%
RETCON	0%	100%	0%
RETEST	0%	38%	62%
RETSML	0%	100%	0%

ECL increase drivers were approximated by sensitivity analysis of the challenger model. PD – probability of default; LGD – loss given default; CFR – credit file review.

The table shows relative contribution of each of the drivers to the ECL revaluation based on the bank team's calculation for each portfolio. Thus, "Understated PD" and "Understated LGD" factors demonstrate the share of ECL revaluation driven solely by PD and LGD adjustments used for collective provisioning analysis, and "CFR projections" factor demonstrates the share of ECL revaluation driven solely by the changes in risk parameters for debtors not sampled for CFR. The share of sampled debtors to be reclassified from stage 1 to stages 2 & 3 and from stage 2 to stage 3 was calculated based on the CFR outcomes.

[53] Portfolio descriptions corresponding to portfolio codes are presented in Table 1.

The resulting findings were projected to the non-sampled part of the portfolio and collective provisioning analysis was then based on the adjusted impairment staging distribution. Section 7.5.9 of the AQR Manual contains a detailed description of the process of implementation of CFR adjustments in the collective provisioning analysis.

The main drivers of adjustments to the ECL calculations by the bank were:

- **LGD:** Calibration of / historical data used for loss given default models does not fully account for the probability of sale of collaterals (e.g. cases when collateral ownership has already been transferred);
- **LGD:** Lack of differentiation in the risk models, e.g. similar LGD values applied to exposures with different risk profiles.

4.5.5. Fair value exposures review

As depicted in Table 47 and Table 48, adjustments were driven by correction to derivative pricing models and bonds revaluation, while prudential adjustments were mainly due to revaluation of on-balance real estate.

Table 47: Fair value assets revaluations – adjustments

Asset type	Adjustments prior to tax offsetting			
	KZT BN	*Weighted average revaluation*	*Arithmetic average revaluation*	*Median revaluation*
Bonds	-0,4	-3,4%	-5,5%	-2,4%
Derivatives	-1,1	N/A	N/A	N/A
Total	**-1,5**	**N/A**	**N/A**	**N/A**

Table 48: Fair value assets revaluations – prudential adjustments

Asset type	Revaluation per asset		
	Weighted average revaluation	*Arithmetic average revaluation*	*Median revaluation*
On-balance real estate	-19%	-20%	-18%

Key drivers of valuation change:

- Expected cash flows not discounted by the bank when pricing derivatives;
- Initial recognition of foreclosed collaterals at price above market value;
- Not applying discounts reflecting expected price decrease compared to market value when pricing foreclosed collaterals.

4.5.6. Determination of AQR-adjusted capital adequacy ratios

Post AQR, CenterCredit Bank's capital surplus taking into account the impact of AQR and capital adequacy improvement measures is assessed at around 0,5-2,5% of risk-weighted assets (Table 49). In terms of the impact of the capital adequacy improvement measures, it is mostly driven by the measures implemented by the bank and its shareholders since AQR as well as the agreed capital injection by the shareholders (the impact is KZT 39,1 BN). Section 5 contains detailed description of capital adequacy improvement measures for each participating bank. Within AQR there have been adjustments applied to prudential reporting which led to correction of k1 capital by KZT 1,0 BN and k2 capital by KZT 0,1 BN (on top of k1 capital adjustment).

Table 49: k1 capital adjustments

Value		Explanation
1. Pre-AQR CET1 capital adequacy as of 1 April 2019	**9,1%**	**CET1 capital as reported by the bank as of 1 April 2019 as a percentage of total risk-weighted assets (RWAs)**
2. AQR adjustments including approved plans under the Program for Increasing Financial Resilience, KZT BN, as of 1 April 2019	-59,8	Adjustments for exposure in scope for credit file review, fair value assets revaluation: revaluation of bonds and derivatives, decrease of capital impact from the decrease of taxable profits in 2019 and increase in deferred tax assets, adjustments in regulatory reporting
3. Post-AQR CET1 capital adequacy prior to accounting for the measures taken by the bank and the measures under the Framework Agreement (interim calculation)	4,1%	Post-AQR CET1 capital adequacy prior to accounting for the measures taken by the bank and the measures under the Framework Agreement (interim calculation)
4. Measures undertaken by the bank and its shareholders between 1 April 2019 and 31 December 2019, KZT BN	+33,3	Impact from capital adequacy improvement measures: improvement of portfolio quality, NPL write-offs, securing additional collateral between 1 April 2019 and 31 December 2019
5. Post-AQR CET1 capital adequacy accounting for measures taken by the bank and its shareholders between 1 April 2019 and 31 December 2019 (interim calculation)	7,1%	Post-AQR CET1 capital adequacy accounting for measures taken by the bank and its shareholders between 1 April 2019 and 31 December 2019 prior to accounting for measures under the Framework Agreement (interim calculation)
6. Measures taken under the Framework Agreement signed on 25 February 2020, KZT BN	+26,4 (+5,8 / +20,6)	Impact of the capital adequacy improvement measures as part of participation in the Program for Increasing Financial Resilience of the Banking Sector (details in Section 5): 1. Requirements from the shareholders to inject capital within 3 months following 25 February 2020; 2. Increase of capital adequacy by the shareholders through participation in the Program for Increasing Financial Resilience of the Banking Sector leveraging the asset protection instrument;
7. Bank's post-AQR k1 ratio (final result)	**8,0-10,0%**	**Bank's AQR-adjusted k1 ratio post capital adequacy improvement measures (final result)**

Prudential impact is fully reflected in the set of measures communicated to banks in the acts of inspection. The Agency will regularly monitor implementation of these measures through SREP process and targeted on-site inspections.

4.6. ATF Bank

4.6.1. Portfolio sampling

The following table shows proportion of exposure sampled for credit file review (CFR) analysis for all portfolios of assets valued at amortized cost. The first column contains the share of on-balance and off-balance sheet exposures selected for CFR (as a share of total exposure of the portfolio within the AQR scope). For example, if for "corporate exposures secured by real estate" (COREST) portfolio KZT 100 were included in the AQR scope, of which KZT 90 have been selected for CFR review, the value in the first column would be equal to 90%. The second column shows distribution of resulting sample between portfolios (share of a portfolio's exposure sampled for CFR in the overall CFR sample). For example, if total sample for CFR was equal to KZT 1000 and COREST sample was equal to 90, then the value in the second column would be equal to 9%.

Table 50: Sampling rates by portfolio type (%)

Portfolio[54]	Sampling rates	Weight of portfolio in overall sample for CFR
COREST	95%	24%
CORLAR	74%	56%
CORMED	85%	11%
RETEST	16%	1%
CORGOV	100%	0%
FINFIN	100%	4%
GOVGOV	100%	0%
RELATE	100%	0%
RETLAR	100%	2%

Loans to central government ministries (if present) and exposures with NBK from the "government entities exposures" portfolio were excluded from CFR and analyzed using a simplified approach.

Due to their specific nature some of the exposures from fully sampled portfolios (e.g. "government entities exposures" and "financial institutions exposures") were not reviewed within CFR. Also, some borrowers from "small business exposures" portfolios were included in the scope of CFR (as an exception, due to large loans or credit lines of those borrowers) – this fact is not reflected in the table above due to the anomalous nature of such debtors.

4.6.2. Collateral valuation

As can be seen from Table 51, overall upward collateral revaluation for the bank is about 3,6% with this effect mostly coming from upward revaluation of "commercial & industrial real estate", what is partially balanced by revaluation in "other land".

Collateral revaluation results were used as inputs into the credit file review. In other words, they are fully accounted for in the results there, thus they do not represent standalone impact in any form[55]. Within credit file review, the impact of collateral revaluation is taken into account as a change in potential recoveries, but one also has to take into account that collateral revaluation does not have direct impact on expected credit loss (ECL) calculation.

[54] Portfolio descriptions corresponding to portfolio codes are presented in Table 1.
[55] While revaluations in work block 8 "Fair value exposures review" reflect standalone impact and are not connected to the results of credit file review.

In other words, 1 KZT downward revaluation is not equal to 1 KZT ECL upward recalculation due to the following reasons:

- Many facilities have quite high coverage by collaterals thus even a decrease in collateral value may have no impact on actual recoveries of such exposures;
- Many facilities can be covered by debtors' cash flows without the need to foreclose collaterals;
- In ECL calculation the final value is weighted based on probability of scenarios, and the probability of collateral foreclosure scenario may vary for different borrowers.

Table 51: Collateral revaluations (KZT BN, % of pre-AQR valuation)

Collateral type	Pre-AQR aggregated value post haircuts (KZT BN)	Post-AQR aggregated value post haircuts (KZT BN)	Weighted average revaluation (%)	Arithmetic average revaluation (%)	Median revaluation (%)
Residential real estate	26,9	29,3	8,9%	40,2%	5,9%
Commercial & industrial real estate	152,1	175,3	15,3%	8,9%	20,8%
Agricultural land	3,9	2,2	-44,6%	-48,1%	-85,4%
Other land	77,6	63,1	-18,7%	-4,8%	-18,4%
Other collateral[56]	20,0	20,8	3,7%	-14,3%	-10,3%

Weighted average, arithmetic average and median revaluation can be distanced relative to each other due to either existence of outliers in terms of relative revaluation or in terms of collateral value (both relatively big and relatively small sizes). Weighted average takes into account collateral value giving bigger weights to bigger collaterals while arithmetic average and median values perceive all revaluations if they were revaluations of collaterals of the same size.

Overall, the main drivers of collateral value change compared to pre-AQR appraisals are:

- Usage of a comparative approach based on not comparable analogs;
- Usage of cost approach which can lead both to over- and undervaluation;
- Absence of regular revaluation for some collaterals and absence of regular update on other encumbrances on collaterals and collaterals being under arrest, which can lead to usage of non-actual information in collateral valuation.

Changes of collateral value used in provisions calculation by the bank as of 1 April 2019 were also driven by imperfections of the current valuation standards in the Republic of Kazakhstan that should be in line with international valuation standards: insufficient granularity of requirements to approach eligibility, sufficient justification of expert judgments and assumptions used, reliability and confirmability of used statistics, etc.

4.6.3. Credit file review and projection of findings

Table 52 represents the results of debtors' reclassification in all portfolios of assets valued at amortized cost:

- Pre-AQR total share of stage 3 debtors in all bank's assets equals the exposure of debtors assigned to stage 3 by the bank itself divided by the total exposure of all

[56] "Other collateral" type includes cars and other transport, production and other equipment, inventory, etc.

debtors in the respective portfolio. Portfolios that were not in the AQR scope are also included;

- Post-AQR total share of debtors in stage 3 in all bank's assets due to IFRS effect is equal to:
  - For exposures in the AQR scope: sum of exposure of debtors classified by the bank as stage 3 and the exposure of debtors reclassified to stage 3 based on all IFRS triggers used for AQR divided by the total exposure of all debtors in the respective portfolio. Portfolios that were not in the AQR scope are also included;
  - For exposures not in the AQR scope: sum of exposure of debtors classified by the bank as stage 3 divided by the total exposure of all debtors in the respective portfolio. Portfolios that were not in the AQR scope are also included.

Table 52: Share of debtors in stage 3 in all bank's assets (including assets which are not in the AQR scope) (%)

Pre-AQR total share of debtors in stage 3 in all banks' assets (%)	Post-AQR total share of debtors in stage 3 in all bank's assets due to IFRS effect (%)
29,1%	32,6%

Post-AQR weighted average share of stage 3 debtors in all portfolios of the bank equals 32,6%. The bank's CET1 capital with capital adequacy increase measures allows the bank to hold adequate provisions for credit impaired debtors.

Key reclassification triggers:

- >90 DPD (days past due) for at least one of the debtor's exposures;
- Restructuring due to deterioration of the debtor's financial conditions.

Post-classification, the bank team estimated the level of expected credit loss (ECL).

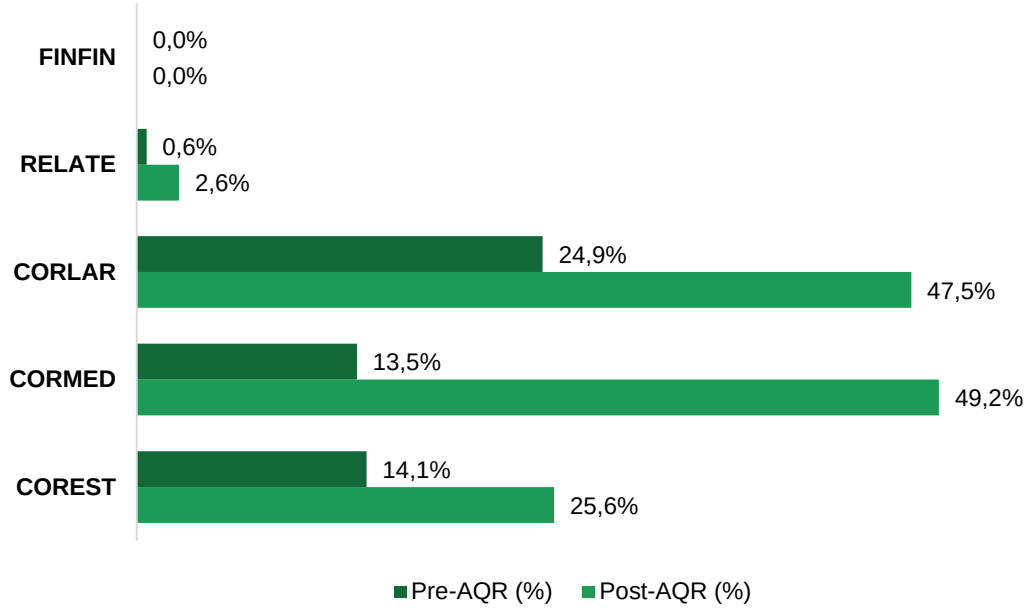
Figure 18 represents the change in ECL ratio in each portfolio of assets valued at amortized cost:

- Pre-AQR ECL is equal to the sum of ECL of exposures in stages 1, 2 and 3 for sampled debtors in the respective portfolio calculated by the bank divided by the exposure of sampled debtors in respective portfolio[57];
- Post-AQR ECL is equal to the sum of ECL of exposures in stages 1, 2 and 3 calculated by the bank team for sampled debtors in the respective portfolio as a result of credit file review, projection of findings and collective provisioning analysis, divided by the exposure of sampled debtors in the respective portfolio.

As depicted in Figure 18, the most significant change in ECL was observed in "medium corporate exposures" and "large corporate exposures" portfolios.

[57] According to information provided by banks during AQR.

Figure 18: Pre- and Post-AQR Expected Credit Loss (%)



- *The table does not show portfolios with insignificant number of debtors due to ECL calculation results not being representative;*
- *Portfolios "loans to individuals secured by real estate" (RETEST) and "consumer loans, credit cards and other retail exposures" (RETCON) are not presented on the chart as ECL for these portfolios is calculated fully as a result of collective provisioning analysis – corresponding results are presented in the following section.*

4.6.4. Collective provisioning analysis

The following table shows shares of portfolios selected for the collective provisioning analysis for which the challenger model calculations performed by the bank team resulted in expected credit loss (ECL) estimates exceeding, equal to or below bank's calculations.

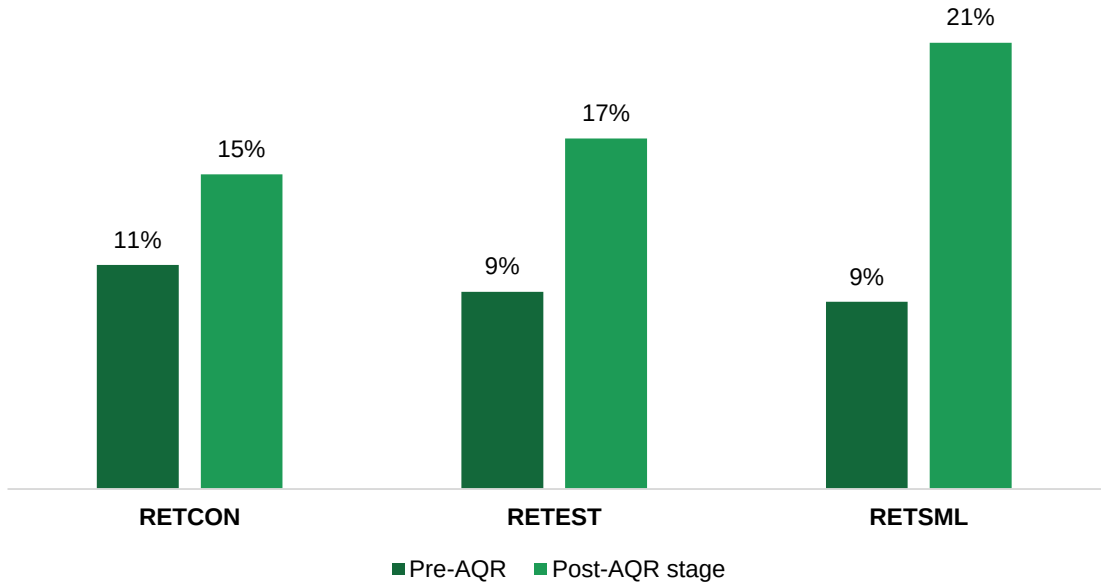
6 portfolios (retail portfolios and stage 1 & 2 debtors in corporate portfolios) were in-scope for the collective provisioning analysis.

For all of the in-scope portfolios, the challenger model resulted in ECL estimate above bank's calculation.

Table 53: Scope of the collective provisioning analysis (%)

# of portfolios	Challenger model resulted in lower ECL	Challenger model didn't result in lower ECL
6	100%	0%

Figure 19: ECL per portfolio type (%)[58]



For corporate portfolios not fully sampled for credit file review ECL for debtors in stages 1 and 2 is calculated within the collective provisioning analysis process. Increases in ECL rates are presented together with the credit file review (CFR) outcomes.

Table below shows approximated driver analysis of ECL increase for each portfolio type. The impact is assessed by sensitivity analysis of the challenger model and a review of the bank's models.

Table 54: Drivers behind ECL increase, % of total ECL increase

Portfolio type[58]	Understated PD	Understated LGD	CFR projections
Total	**7%**	**52%**	**40%**
COREST	14%	16%	70%
CORLAR	16%	2%	82%
CORMED	0%	0%	100%
RETCON	9%	91%	0%
RETEST	0%	68%	32%
RETSML	0%	100%	0%

ECL increase drivers were approximated by sensitivity analysis of the challenger model. PD – probability of default; LGD – loss given default; CFR – credit file review

The table shows relative contribution of each of the drivers to the ECL revaluation based on the bank team's calculation for each portfolio. Thus, "Understated PD" and "Understated LGD" factors demonstrate the share of ECL revaluation driven solely by PD and LGD adjustments used for collective provisioning analysis, and "CFR projections" factor demonstrates the share of ECL revaluation driven solely by the changes in risk parameters for debtors not sampled for CFR. The share of sampled debtors to be reclassified from stage 1 to stages 2 & 3 and from stage 2 to stage 3 was calculated based on the CFR outcomes.

[58] Portfolio descriptions corresponding to portfolio codes are presented in Table 1.

The resulting findings were projected to the non-sampled part of the portfolio and collective provisioning analysis was then based on the adjusted impairment staging distribution. Section 7.5.9 of the AQR Manual contains a detailed description of the process of implementation of CFR adjustments in the collective provisioning analysis.

The main drivers of adjustments to the ECL calculations by the bank were:

- **PD:** Lack of proper accounting for the restructuring cases (incl. hidden restructuring), insufficient usage of impairment triggers and not sufficiently conservative definition of time horizon for cures in default rate statistics and calibration of the probability of default models;
- **LGD:** Calibration of / historical data used for loss given default models does not fully account for the probability of sale of collaterals.

4.6.5. Fair value exposures review

As depicted in Table 55 and Table 56, adjustments were driven by correction to derivative pricing models, while prudential adjustments were mainly due to revaluation of real estate. While direct revaluation of bonds was out of scope for ATF Bank, the securities were still analyzed for embedded non-standard derivatives, such as floored coupon or callability by the issuer, and correct accounting, i.e. ensuring that any such embedded derivatives are properly reflected on bank's books and considered during valuation.

Table 55: Fair value assets revaluations – adjustments

Asset type	Adjustments prior to tax offsetting			
	KZT BN	*Weighted average revaluation*	*Arithmetic average revaluation*	*Median revaluation*
Bonds	0,0	0,0%	0,0%	0,0%
Derivatives	-0,1	N/A	N/A	N/A
Total	**-0,1**	**N/A**	**N/A**	**N/A**

Table 56: Fair value assets revaluations – prudential adjustments

Asset type	Revaluation per asset		
	Weighted average revaluation	*Arithmetic average revaluation*	*Median revaluation*
On-balance real estate	-28%	-11%	-10%

Key drivers of valuation change:

- Overly optimistic expectations of future cash flows used in valuation of on-balance real-estate;
- Usage of incomparable analogs in valuation reports used to calculate book value.

4.6.6. Determination of AQR-adjusted capital adequacy ratios

Post AQR, ATF Bank's capital surplus taking into account the impact of AQR and capital adequacy improvement measures is assessed at around 0,5-2,5% of risk-weighted assets (Table 57). In terms of the impact of the capital adequacy improvement measures, it is mostly driven by the measures implemented by the bank and its shareholders since AQR as well as the agreed capital injection by the shareholders (the impact is KZT 90,3 BN). Section 5 contains detailed description of capital adequacy improvement measures for each participating bank.

Table 57: k1 capital adjustments

Value		Explanation
1. Pre-AQR CET1 capital adequacy as of 1 April 2019	**8,9%**	**CET1 capital as reported by the bank as of 1 April 2019 as a percentage of total risk-weighted assets (RWAs)**
2. AQR adjustments including approved plans under the Program for Increasing Financial Resilience, KZT BN, as of 1 April 2019	-124,2	Adjustments for exposure in scope for credit file review, fair value assets revaluation: revaluation of bonds and derivatives, decrease of capital impact from the decrease of taxable profits in 2019 and increase in deferred tax assets, adjustments in regulatory reporting
3. Post-AQR CET1 capital adequacy prior to accounting for the measures taken by the bank and the measures under the Framework Agreement (interim calculation)	-1,5%	Post-AQR CET1 capital adequacy prior to accounting for the measures taken by the bank and the measures under the Framework Agreement (interim calculation)
4. Measures undertaken by the bank and its shareholders between 1 April 2019 and 31 December 2019, KZT BN	+80,0	Impact from capital adequacy improvement measures: improvement of portfolio quality, NPL write-offs, securing additional collateral between 1 April 2019 and 31 December 2019
5. Post-AQR CET1 capital adequacy accounting for measures taken by the bank and its shareholders between 1 April 2019 and 31 December 2019 (interim calculation)	5,2%	Post-AQR CET1 capital adequacy accounting for measures taken by the bank and its shareholders between 1 April 2019 and 31 December 2019 prior to accounting for measures under the Framework Agreement (interim calculation)
6. Measures taken under the Framework Agreement signed on 25 February 2020, KZT BN	+44,1 (+10,3 / +33,8)	Impact of the capital adequacy improvement measures as part of participation in the Program for Increasing Financial Resilience of the Banking Sector (details in Section 5): 1. Requirements from the shareholders to inject capital within 3 months following 25 February 2020; 2. Increase of capital adequacy by the shareholders through participation in the Program for Increasing Financial Resilience of the Banking Sector leveraging the asset protection instrument.
7. Bank's post-AQR k1 ratio (final result)	**8,0-10,0%**	**Bank's AQR-adjusted k1 ratio post capital adequacy improvement measures (final result)**

Prudential impact is fully reflected in the set of measures communicated to banks in the acts of inspection. The Agency will regularly monitor implementation of these measures through SREP process and targeted on-site inspections.

4.7. Eurasian Bank

4.7.1. Portfolio sampling

The following table shows proportion of exposure sampled for credit file review (CFR) analysis for all portfolios of assets valued at amortized cost. The first column contains the share of on-balance and off-balance sheet exposures selected for CFR (as a share of total exposure of the portfolio within the AQR scope). For example, if for "corporate exposures secured by real estate" (COREST) portfolio KZT 100 were included in the AQR scope, of which KZT 90 have been selected for CFR review, the value in the first column would be equal to 90%. The second column shows distribution of resulting sample between portfolios (share of a portfolio's exposure sampled for CFR in the overall CFR sample). For example, if total sample for CFR was equal to KZT 1000 and COREST sample was equal to 90, then the value in the second column would be equal to 9%.

Table 58: Sampling rates by portfolio type (%)

Portfolio[59]	Sampling rates	Weight of portfolio in overall sample for CFR
COREST	100%	5%
CORLAR	100%	37%
CORMED	100%	28%
FINFIN	100%	6%
RELATE	100%	23%
RETLAR	100%	1%

Due to their specific nature some of the exposures from fully sampled portfolios (e.g. "financial institutions exposures") were not reviewed within CFR. Also, some borrowers from "small business exposures" portfolios were included in the scope of CFR (as an exception, due to large loans or credit lines of those borrowers) – this fact is not reflected in the table above due to the anomalous nature of such debtors.

4.7.2. Collateral valuation

As can be seen from Table 59, overall collateral revaluation for the bank is about 8,2% with more than 75% of this effect coming from agricultural and other land revaluations.

Collateral revaluation results were used as inputs into the credit file review. In other words, they are fully accounted for in the results there, thus they do not represent standalone impact in any form[60]. Within credit file review, the impact of collateral revaluation is taken into account as a change in potential recoveries, but one also has to take into account that collateral revaluation does not have direct impact on expected credit loss (ECL) calculation. In other words, 1 KZT downward revaluation is not equal to 1 KZT ECL upward recalculation due to the following reasons:

- Many facilities have quite high coverage by collaterals thus even a decrease in collateral value may have no impact on actual recoveries of such exposures;
- Many facilities can be covered by debtors' cash flows without the need to foreclose collaterals;
- In ECL calculation the final value is weighted based on probability of scenarios, and the probability of collateral foreclosure scenario may vary for different borrowers.

[59] Portfolio descriptions corresponding to portfolio codes are presented in Table 1.
[60] While revaluations in work block 8 "Fair value exposures review" reflect standalone impact and are not connected to the results of credit file review.

Table 59: Collateral revaluations (KZT BN, % of pre-AQR valuation)

Collateral type	Pre-AQR aggregated value post haircuts (KZT BN)	Post-AQR aggregated value post haircuts (KZT BN)	Weighted average revaluation (%)	Arithmetic average revaluation (%)	Median revaluation (%)
Residential real estate	14,5	14,2	-2,0%	7,2%	0,0%
Commercial & industrial real estate	64,5	63,7	-1,3%	0,3%	0,0%
Agricultural land	5,4	0,3	-95,0%	-59,9%	-95,8%
Other land	3,4	2,4	-30,6%	-25,5%	-16,8%
Other collateral[61]	10,1	9,4	-7,1%	12,8%	0,0%

Weighted average, arithmetic average and median revaluation can be distanced relative to each other due to either existence of outliers in terms of relative revaluation or in terms of collateral value (both relatively big and relatively small sizes). Weighted average takes into account collateral value giving bigger weights to bigger collaterals while arithmetic average and median values perceive all revaluations if they were revaluations of collaterals of the same size.

Overall, the main drivers of collateral value change compared to pre-AQR appraisals are:

- Usage of a comparative approach based on not comparable analogs or application of not valid adjustments to these analogs;
- Usage of cost approach which can lead both to over- and undervaluation;
- Lack of collaterals' state monitoring which results in appraisal reports not considering the current state of collateral at valuation date (e.g., damaged collaterals are valued as normal ones).

Changes of collateral value used in provisions calculation by the bank as of 1 April 2019 were also driven by imperfections of the current valuation standards in the Republic of Kazakhstan that should be in line with international valuation standards: insufficient granularity of requirements to approach eligibility, sufficient justification of expert judgments and assumptions used, reliability and confirmability of used statistics, etc.

4.7.3. Credit file review

Table 60 represents the results of debtors' reclassification in all portfolios of assets valued at amortized cost:

- Pre-AQR total share of stage 3 debtors in all bank's assets equals the exposure of debtors assigned to stage 3 by the bank itself divided by the total exposure of all debtors in the respective portfolio. Portfolios that were not in the AQR scope are also included;
- Post-AQR total share of debtors in stage 3 in all bank's assets due to IFRS effect is equal to:
  - For exposures in the AQR scope: sum of exposure of debtors classified by the bank as stage 3 and the exposure of debtors reclassified to stage 3 based on all IFRS triggers used for AQR divided by the total exposure of all debtors in the respective portfolio. Portfolios that were not in the AQR scope are also included;
  - For exposures not in the AQR scope: sum of exposure of debtors classified by the bank as stage 3 divided by the total exposure of all debtors in the

[61] "Other collateral" type includes cars and other transport, production and other equipment, inventory, etc.

respective portfolio. Portfolios that were not in the AQR scope are also included.

Table 60: Share of debtors in stage 3 in all bank's assets (including assets which are not in the AQR scope) (%)

Pre-AQR total share of debtors in stage 3 in all banks' assets (%)	Post-AQR total share of debtors in stage 3 in all bank's assets due to IFRS effect (%)
30,6%	30,8%

Post-AQR weighted average share of stage 3 debtors in all portfolios of the bank equals 30,8%. Hence, the share of post-AQR stage 3 debtors has not increased significantly if additional IFRS reclassifications are accounted for. The bank's CET1 capital with capital adequacy increase measures allows the bank to hold adequate provisions for credit impaired debtors.

Key reclassification trigger is the restructuring due to deterioration of the debtor's financial conditions.

Post-classification, the bank team estimated the level of expected credit loss (ECL).

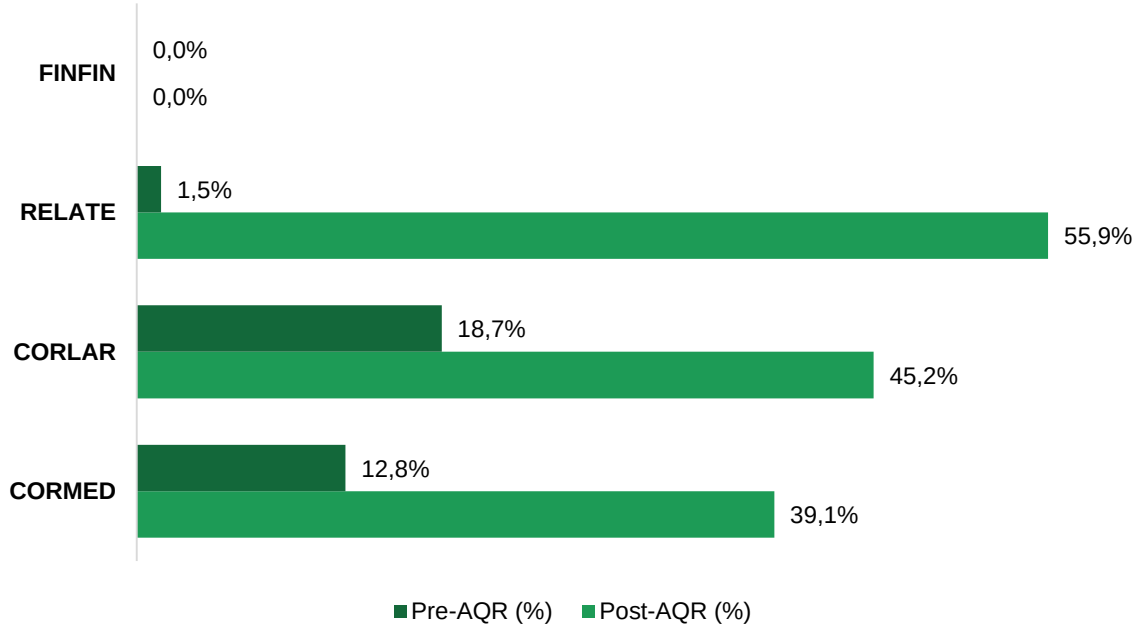
Figure 20 represents the change in ECL ratio in each portfolio of assets valued at amortized cost:

- Pre-AQR ECL is equal to the sum of ECL of exposures in stages 1, 2 and 3 for sampled debtors in the respective portfolio calculated by the bank divided by the exposure of sampled debtors in respective portfolio[62];
  Post-AQR ECL is equal to the sum of ECL of exposures in stages 1, 2 and 3 calculated by the bank team for sampled debtors in the respective portfolio as a result of credit file review, projection of findings and collective provisioning analysis, divided by the exposure of sampled debtors in the respective portfolio.

As depicted in Figure 20, the most significant change in ECL was observed in "related party exposures" and "large corporate exposures" portfolios.

[62] According to information provided by banks during AQR.

Figure 20: Pre- and Post-AQR Expected Credit Loss (%)



- *The table does not show portfolios with insignificant number of debtors due to ECL calculation results not being representative;*
- *Portfolios "car loans & other collateralized retail exposures" (RETCAR) and "consumer loans, credit cards and other retail exposures" (RETCON) are not presented on the chart as ECL for these portfolios is calculated fully as a result of collective provisioning analysis – corresponding results are presented in the following section.*

4.7.4. Collective provisioning analysis

The following table shows shares of portfolios selected for the collective provisioning analysis for which the challenger model calculations performed by the bank team resulted in expected credit loss (ECL) estimates exceeding, equal to or below bank's calculations.

3 retail portfolios were in-scope for the collective provisioning analysis.

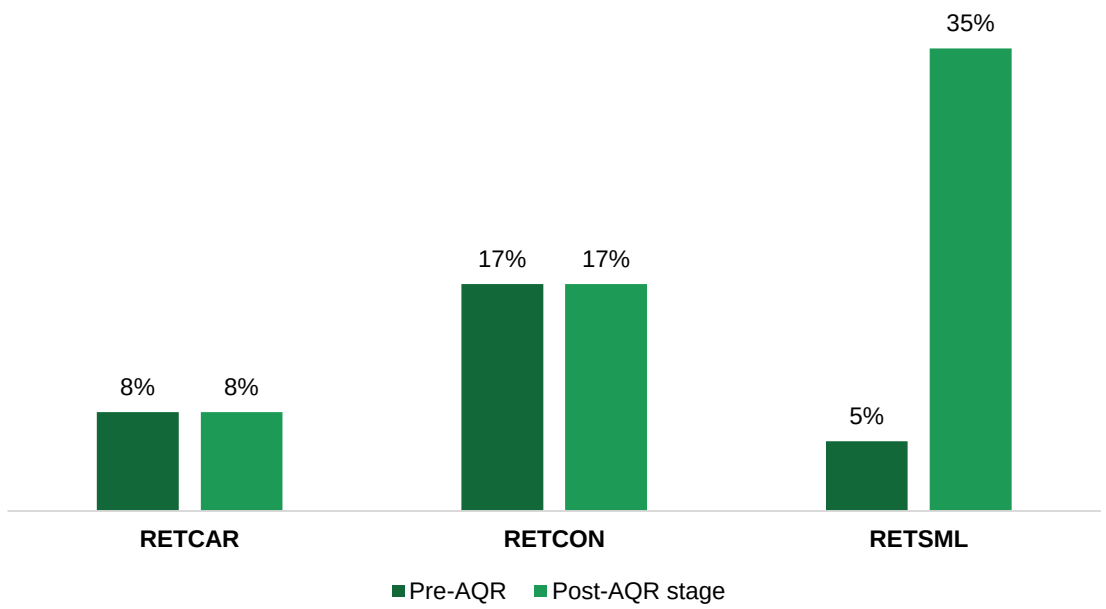
For 67% of the in-scope portfolios, the challenger model resulted in ECL estimate below bank's calculation.

Table 61: Scope of the collective provisioning analysis (%)

# of portfolios	Challenger model resulted in lower ECL	Challenger model didn't result in lower ECL
3	33%	67%

Loans from "loans to individuals secured by real estate" portfolio were excluded from the AQR scope for this bank.

Figure 21: ECL per portfolio type (%)[63]



ECL in "small business exposures" portfolio includes credit file review outcomes for the largest debtors of this portfolio.

Table below shows approximated driver analysis of ECL increase for each portfolio type. The impact is assessed by sensitivity analysis of the challenger model and a review of the bank's models.

Table 62: Drivers behind ECL increase, % of total ECL increase

Portfolio type[63]	Understated PD	Understated LGD	CFR projections
Total	**0%**	**100%**	**0%**
RETCAR	-	-	-
RETCON	-	-	-
RETSML	0%	100%	0%

ECL increase drivers were approximated by sensitivity analysis of the challenger model. PD – probability of default; LGD – loss given default; CFR – credit file review.

The table shows relative contribution of each of the drivers to the ECL revaluation based on the bank team's calculation for each portfolio. Thus, "Understated PD" and "Understated LGD" factors demonstrate the share of ECL revaluation driven solely by PD and LGD adjustments used for collective provisioning analysis, and "CFR projections" factor demonstrates the share of ECL revaluation driven solely by the changes in risk parameters for debtors not sampled for CFR. The share of sampled debtors to be reclassified from stage 1 to stages 2 & 3 and from stage 2 to stage 3 was calculated based on the CFR outcomes. The resulting findings were projected to the non-sampled part of the portfolio and collective provisioning analysis was then based on the adjusted impairment staging distribution. Section 7.5.9 of the AQR Manual contains a detailed description of the process of implementation of CFR adjustments in the collective provisioning analysis.

[63] Portfolio descriptions corresponding to portfolio codes are presented in Table 1.

The main drivers of adjustments to the ECL calculations by the bank were:

- **LGD**: Calibration of / historical data used for loss given default models uses limited and not fully accurate statistics of cash recoveries and does not fully account for the probability of sales for collaterals (e.g., cases when collateral ownership has already been transferred, or collateral is under arrest).

4.7.5. Fair value exposures review

As depicted in Table 63 and Table 64, adjustments were driven by correction to fair value loan portfolios, while prudential adjustments were mainly due to revaluation of real estate.

Table 63: Fair value assets revaluations – adjustments

Asset type	Adjustments prior to tax offsetting			
	KZT BN	*Weighted average revaluation*	*Arithmetic average revaluation*	*Median revaluation*
Bonds	-0,5	-0,3%	-1,9%	-0,3%
Fair value loan portfolios	-4,4	N/A	N/A	N/A
Derivatives	0,0	N/A	N/A	N/A
Total	**-4,9**	**N/A**	**N/A**	**N/A**

No material impact on derivative valuation is explained by no significant issues discovered during derivative pricing models review and CVA impact being non-material.

Table 64: Fair value assets revaluations – prudential adjustments

Asset type	Revaluation per asset		
	Weighted average revaluation	*Arithmetic average revaluation*	*Median revaluation*
On-balance real estate	-21%	-21%	-20%

Key drivers of valuation change:

- Overly optimistic expectations of future cash flows used in valuation of fair value loans;
- Treating real estate at cost and non-application of IFRS 36 “Impairment of Assets” – not recognizing impairment when required.

4.7.6. Determination of AQR-adjusted capital adequacy ratios

Post AQR, Eurasian Bank’s capital surplus taking into account the impact of AQR and capital adequacy improvement measures is assessed at around 0,5-2,5% of risk-weighted assets (Table 65). In terms of the impact of the capital adequacy improvement measures, it is mostly driven by the measures implemented by the bank and its shareholders since AQR as well as the agreed capital injection by the shareholders (the impact is KZT 48,4 BN). Section 5 contains detailed description of capital adequacy improvement measures for each participating bank.

Table 65: k1 capital adjustments

Value		Explanation
1. Pre-AQR CET1 capital adequacy as of 1 April 2019	**10,0%**	**CET1 capital as reported by the bank as of 1 April 2019 as a percentage of total risk-weighted assets (RWAs)**
2. AQR adjustments including approved plans under the Program for Increasing Financial Resilience, KZT BN, as of 1 April 2019	-89,9	Adjustments for exposure in scope for credit file review, fair value assets revaluation: revaluation of bonds and derivatives, decrease of capital impact from the decrease of taxable profits in 2019 and increase in deferred tax assets, adjustments in regulatory reporting
3. Post-AQR CET1 capital adequacy prior to accounting for the measures taken by the bank and the measures under the Framework Agreement (interim calculation)	0,0%	Post-AQR CET1 capital adequacy prior to accounting for the measures taken by the bank and the measures under the Framework Agreement (interim calculation)
4. Measures undertaken by the bank and its shareholders between 1 April 2019 and 31 December 2019, KZT BN	+45	Impact from capital adequacy improvement measures: improvement of portfolio quality, NPL write-offs, securing additional collateral between 1 April 2019 and 31 December 2019
5. Post-AQR CET1 capital adequacy accounting for measures taken by the bank and its shareholders between 1 April 2019 and 31 December 2019 (interim calculation)	5,0%	Post-AQR CET1 capital adequacy accounting for measures taken by the bank and its shareholders between 1 April 2019 and 31 December 2019 prior to accounting for measures under the Framework Agreement (interim calculation)
6. Measures taken under the Framework Agreement signed on 25 February 2020, KZT BN	+44,9 (+3,5 / +41,4)	Impact of the capital adequacy improvement measures as part of participation in the Program for Increasing Financial Resilience of the Banking Sector (details in Section 5): 1. Requirements from the shareholders to inject capital within 3 months following 25 February 2020; 2. Increase of capital adequacy by the shareholders through participation in the Program for Increasing Financial Resilience of the Banking Sector leveraging the asset protection instrument.
7. Bank's post-AQR k1 ratio (final result)	**8,0-10,0%**	**Bank's AQR-adjusted k1 ratio post capital adequacy improvement measures (final result)**

Prudential impact is fully reflected in the set of measures communicated to banks in the acts of inspection. The Agency will regularly monitor implementation of these measures through SREP process and targeted on-site inspections.

4.8. First Heartland Jysan Bank

4.8.1. Portfolio sampling

The following table shows proportion of exposure sampled for credit file review (CFR) analysis for all portfolios of assets valued at amortized cost. The first column contains the share of on-balance and off-balance sheet exposures selected for CFR (as a share of total exposure of the portfolio within the AQR scope). For example, if for "corporate exposures secured by real estate" (COREST) portfolio KZT 100 were included in the AQR scope, of which KZT 90 have been selected for CFR review, the value in the first column would be equal to 90%. The second column shows distribution of resulting sample between portfolios (share of a portfolio's exposure sampled for CFR in the overall CFR sample). For example, if total sample for CFR was equal to KZT 1000 and COREST sample was equal to 90, then the value in the second column would be equal to 9%.

Table 66: Sampling rates by portfolio type (%)

Portfolio[64]	Sampling rates	Weight of portfolio in overall sample for CFR
RETEST	20%	2%
CORLAR	100%	61%
CORMED	100%	18%
FINFIN	100%	19%
OTHASS	100%	1%
RELATE	100%	0%

Due to their specific nature some of the exposures from fully sampled portfolios (e.g. "financial institutions exposures") were not reviewed within CFR. Also, some borrowers from "small business exposures" portfolios were included in the scope of CFR (as an exception, due to large loans or credit lines of those borrowers) – this fact is not reflected in the table above due to the anomalous nature of such debtors.

4.8.2. Collateral valuation

As can be seen from Table 67, overall revaluation for the bank is about 13,2% with this effect mostly coming from "commercial & industrial real estate" and "other collateral" revaluations, what is to some extent balanced by upward revaluation in "residential real estate".

Collateral revaluation results were used as inputs into the credit file review. In other words, they are fully accounted for in the results there, thus they do not represent standalone impact in any form[65]. Within credit file review, the impact of collateral revaluation is taken into account as a change in potential recoveries, but one also has to take into account that collateral revaluation does not have direct impact on expected credit loss (ECL) calculation. In other words, 1 KZT downward revaluation is not equal to 1 KZT ECL upward recalculation due to the following reasons:

- Many facilities have quite high coverage by collaterals thus even a decrease in collateral value may have no impact on actual recoveries of such exposures;
- Many facilities can be covered by debtors' cash flows without the need to foreclose collaterals;
- In ECL calculation the final value is weighted based on probability of scenarios, and the probability of collateral foreclosure scenario may vary for different borrowers.

[64] Portfolio descriptions corresponding to portfolio codes are presented in Table 1.
[65] While revaluations in work block 8 "Fair value exposures review" reflect standalone impact and are not connected to the results of credit file review.

Table 67: Collateral revaluations (KZT BN, % of pre-AQR valuation)

Collateral type	Pre-AQR aggregated value post haircuts (KZT BN)	Post-AQR aggregated value post haircuts (KZT BN)	Weighted average revaluation (%)	Arithmetic average revaluation (%)	Median revaluation (%)
Residential real estate	6,4	6,6	4,1%	24,8%	18,5%
Commercial & industrial real estate	25,8	24,9	-3,5%	2,7%	2,9%
Agricultural land	0,3	0,2	-42,5%	-41,2%	-41,2%
Other land	1,6	1,1	-28,5%	8,8%	5,9%
Other collateral[66]	3,9	0,0	-100,0%	-100,0%	-100,0%

Weighted average, arithmetic average and median revaluation can be distanced relative to each other due to either existence of outliers in terms of relative revaluation or in terms of collateral value (both relatively big and relatively small sizes). Weighted average takes into account collateral value giving bigger weights to bigger collaterals while arithmetic average and median values perceive all revaluations if they were revaluations of collaterals of the same size.

Overall, the main drivers of collateral value change compared to pre-AQR appraisals are:

- Usage of a comparative approach based on not comparable analogs or application of not valid adjustments to these analogs;
- Absence of regular revaluation for some collaterals and absence of regular update on other encumbrances on collaterals and collaterals being under arrest, which can lead to usage of non-actual information in collateral valuation;
- Absence of application of sales cost haircut while estimating collateral value.

Changes of collateral value used in provisions calculation by the bank as of 1 April 2019 were also driven by imperfections of the current valuation standards in the Republic of Kazakhstan that should be in line with international valuation standards: insufficient granularity of requirements to approach eligibility, sufficient justification of expert judgments and assumptions used, reliability and confirmability of used statistics, etc.

4.8.3. Credit file review and projection of findings

Table 68 represents the results of debtors' reclassification in all portfolios of assets valued at amortized cost:

- Pre-AQR total share of stage 3 debtors in all bank's assets equals the exposure of debtors assigned to stage 3 by the bank itself divided by the total exposure of all debtors in the respective portfolio. Portfolios that were not in the AQR scope are also included;
- Post-AQR total share of debtors in stage 3 in all bank's assets due to IFRS effect is equal to:
  - For exposures in the AQR scope: sum of exposure of debtors classified by the bank as stage 3 and the exposure of debtors reclassified to stage 3 based on all IFRS triggers used for AQR divided by the total exposure of all debtors in the respective portfolio. Portfolios that were not in the AQR scope are also included;

[66] "Other collateral" type includes cars and other transport, production and other equipment, inventory, etc.

- For exposures not in the AQR scope: sum of exposure of debtors classified by the bank as stage 3 divided by the total exposure of all debtors in the respective portfolio. Portfolios that were not in the AQR scope are also included.

Table 68: Share of debtors in stage 3 in all bank's assets (including assets which are not in the AQR scope) (%)

Pre-AQR total share of debtors in stage 3 in all banks' assets (%)	Post-AQR total share of debtors in stage 3 in all bank's assets due to IFRS effect (%)
55,1%	55,1%

Post-AQR weighted average share of stage 3 debtors in all portfolios of the bank equals 55,1%. Hence, the share of post-AQR stage 3 debtors has not increased significantly if additional IFRS reclassifications are accounted for. The bank's CET1 capital allows the bank to hold fully adequate provisions for credit impaired debtors.

Key reclassification triggers:

- >90 DPD (days past due) for at least one of the debtor's exposures;
- Restructuring due to deterioration of the debtor's financial conditions.

Post-classification, the bank team estimated the level of expected credit loss (ECL).

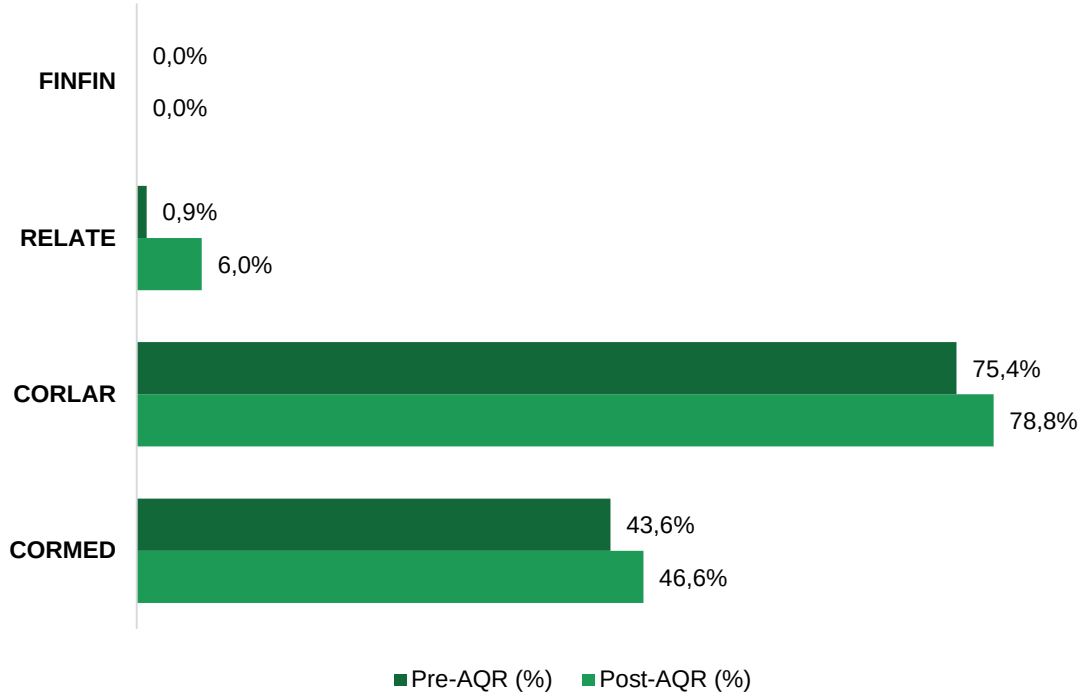
Figure 22 represents the change in ECL ratio in each portfolio of assets valued at amortized cost:

- Pre-AQR ECL is equal to the sum of ECL of exposures in stages 1, 2 and 3 for sampled debtors in the respective portfolio calculated by the bank divided by the exposure of sampled debtors in respective portfolio[67];
- Post-AQR ECL is equal to the sum of ECL of exposures in stages 1, 2 and 3 calculated by the bank team for sampled debtors in the respective portfolio as a result of credit file review, projection of findings and collective provisioning analysis, divided by the exposure of sampled debtors in the respective portfolio.

As depicted in Figure 22, the most significant change in ECL was observed in "large corporate exposures" and "related party exposures" portfolios.

[67] According to information provided by banks during AQR.

Figure 22: Pre- and Post-AQR Expected Credit Loss (%)



- *The table does not show portfolios with insignificant number of debtors due to ECL calculation results not being representative;*
- *Portfolios "loans to individuals secured by real estate" (RETEST), "consumer loans, credit cards and other retail exposures" (RETCON) and "car loans & other collateralized retail exposures" (RETCAR) are not presented on the chart as ECL for these portfolios is calculated fully as a result of collective provisioning analysis – corresponding results are presented in the following section.*

4.8.4. Collective provisioning analysis

The following table shows shares of portfolios selected for the collective provisioning analysis for which the challenger model calculations performed by the bank team resulted in expected credit loss (ECL) estimates exceeding, equal to or below bank's calculations.

4 retail portfolios were in-scope for the collective provisioning analysis.

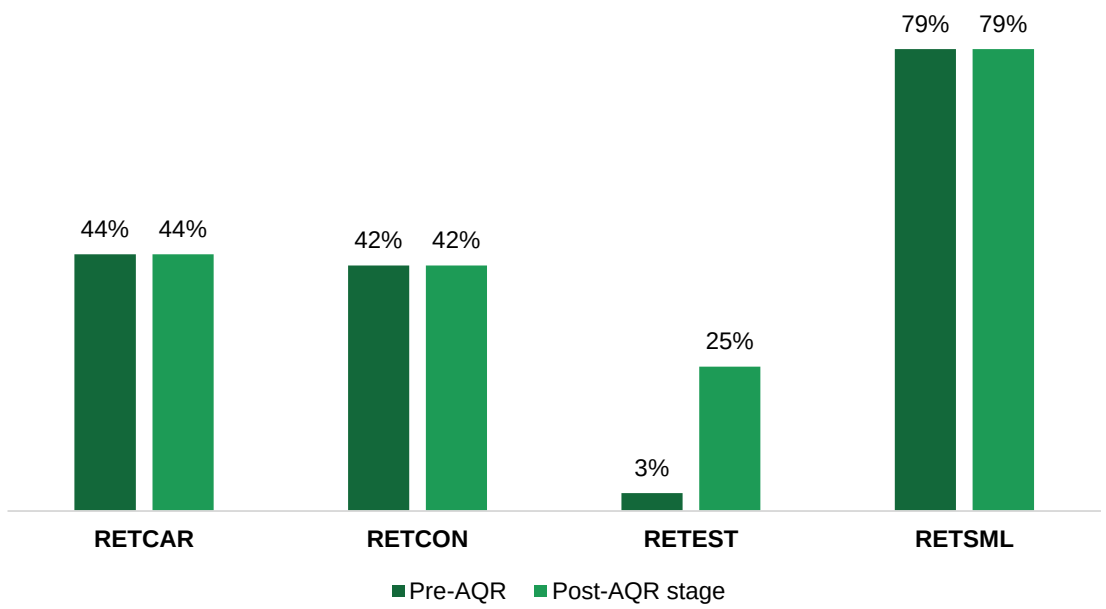
For 75% of the in-scope portfolios, the challenger model resulted in ECL estimate below bank's calculation.

Table 69: Scope of the collective provisioning analysis (%)

# of portfolios	Challenger model resulted in lower ECL	Challenger model didn't result in lower ECL
4	25%	75%

"Corporate exposures secured by real estate" portfolio was excluded from the AQR scope for this bank.

Figure 23: ECL per portfolio type (%)[68]



ECL in "small business exposures" portfolio includes credit file review outcomes for the largest debtors of this portfolio.

Table below shows approximated driver analysis of ECL increase for each portfolio type. The impact is assessed by sensitivity analysis of the challenger model and a review of the bank's models.

Table 70: Drivers behind ECL increase, % of total ECL increase

Portfolio type[68]	Understated PD	Understated LGD	CFR projections
Total	**0%**	**46%**	**54%**
RETCAR	-	-	-
RETCON	-	-	-
RETEST	0%	46%	54%
RETSML	-	-	-

ECL increase drivers were approximated by sensitivity analysis of the challenger model. PD – probability of default; LGD – loss given default; CFR – credit file review.

The table shows relative contribution of each of the drivers to the ECL revaluation based on the bank team's calculation for each portfolio. Thus, "Understated PD" and "Understated LGD" factors demonstrate the share of ECL revaluation driven solely by PD and LGD adjustments used for collective provisioning analysis, and "CFR projections" factor demonstrates the share of ECL revaluation driven solely by the changes in risk parameters for debtors not sampled for CFR. The share of sampled debtors to be reclassified from stage 1 to stages 2 & 3 and from stage 2 to stage 3 was calculated based on the CFR outcomes. The resulting findings were projected to the non-sampled part of the portfolio and collective provisioning analysis was then based on the adjusted impairment staging distribution.

[68] Portfolio descriptions corresponding to portfolio codes are presented in Table 1.

Section 7.5.9 of the AQR Manual contains a detailed description of the process of implementation of CFR adjustments in the collective provisioning analysis.

The main drivers of adjustments to the ECL calculations by the bank were:

- **LGD:** Calibration of / historical data used for loss given default models does not fully account for the probability of sale of collaterals (e.g. cases when collateral ownership has already been transferred).

4.8.5. Fair value exposures review

As depicted in Table 71 and Table 72, adjustments were driven by correction to fair value loan portfolios, while prudential adjustments were mainly due to revaluation of on-balance real estate.

Table 71: Fair value assets revaluations – adjustments

Asset type	Adjustments prior to tax offsetting			
	KZT BN	*Weighted average revaluation*	*Arithmetic average revaluation*	*Median revaluation*
Bonds	-0,2	-8,2%	-13,6%	-11,0%
Fair value loan portfolios	-11,8	N/A	N/A	N/A
Derivatives	0,0	N/A	N/A	N/A
Total	**-12,0**	**N/A**	**N/A**	**N/A**

No material impact on derivative valuation is explained by no significant issues discovered during derivative pricing models review and CVA impact being non-material.

Table 72: Fair value assets revaluations – prudential adjustments

Asset type	Revaluation per asset		
	Weighted average revaluation	*Arithmetic average revaluation*	*Median revaluation*
On-balance real estate	-56%	-40%	-41%

Key drivers of valuation change:

- Incorrect methodology for valuation of fair value loan portfolio – improper storage and usage of historical default data, understated probabilities of default (PDs) compared to statistics, discounting cash flows at effective interest rate not discounting rate, as required by article B17 of IFRS 13;
- Treating real estate at cost and non-application of IFRS 36 “Impairment of Assets” – not recognizing impairment when required.

4.8.6. Determination of AQR-adjusted capital adequacy ratios

Post AQR First Hearland Jysan Bank had a surplus of k1 capital of 10,1% of risk-weighted assets (Table 73).

Table 73: k1 capital adjustments

Value		Explanation
1. Pre-AQR CET1 capital adequacy as of 1 April 2019	**22,9%**	**CET1 capital as reported by the bank as of 1 April 2019 as a percentage of total risk-weighted assets (RWAs)**
2. AQR adjustments, KZT BN, as of 1 April 2019	-17,6	Adjustments for exposure in scope for credit file review, fair value assets revaluation: revaluation of bonds and derivatives, decrease of capital impact from the decrease of taxable profits in 2019 and increase in deferred tax assets, adjustments in regulatory reporting
3. Bank's post-AQR k1 ratio (final result) as of 1 April 2019	**17,8%**	**Bank's AQR-adjusted k1 ratio (final result)**

Prudential impact is fully reflected in the set of measures communicated to banks in the acts of inspection. The Agency will regularly monitor implementation of these measures through SREP process and targeted on-site inspections.

4.9. Bank RBK

4.9.1. Portfolio sampling

The following table shows proportion of exposure sampled for credit file review (CFR) analysis for all portfolios of assets valued at amortized cost. The first column contains the share of on-balance and off-balance sheet exposures selected for CFR (as a share of total exposure of the portfolio within the AQR scope). For example, if for "corporate exposures secured by real estate" (COREST) portfolio KZT 100 were included in the AQR scope, of which KZT 90 have been selected for CFR review, the value in the first column would be equal to 90%. The second column shows distribution of resulting sample between portfolios (share of a portfolio's exposure sampled for CFR in the overall CFR sample). For example, if total sample for CFR was equal to KZT 1000 and COREST sample was equal to 90, then the value in the second column would be equal to 9%.

Table 74: Sampling rates by portfolio type (%)

Portfolio[69]	Sampling rates	Weight of portfolio in overall sample for CFR
RETEST	28%	3%
CORINV	100%	25%
CORLAR	100%	18%
CORMED	100%	24%
FINFIN	100%	0%
OTHASS	100%	9%
RELATE	100%	13%
RETLAR	100%	7%

Due to their specific nature some of the exposures from fully sampled portfolios (e.g. "financial institutions exposures") were not reviewed within CFR. Also, some borrowers from "small business exposures" portfolios were included in the scope of CFR (as an exception, due to large loans or credit lines of those borrowers) – this fact is not reflected in the table above due to the anomalous nature of such debtors.

4.9.2. Collateral valuation

As can be seen from Table 75, overall collateral revaluation for the bank is about 24,2% with 70% of this effect coming from "other land" and "other collateral" revaluations.

Collateral revaluation results were used as inputs into the credit file review. In other words, they are fully accounted for in the results there, thus they do not represent standalone impact in any form[70]. Within credit file review, the impact of collateral revaluation is taken into account as a change in potential recoveries, but one also has to take into account that collateral revaluation does not have direct impact on expected credit loss (ECL) calculation. In other words, 1 KZT downward revaluation is not equal to 1 KZT ECL upward recalculation due to the following reasons:

- Many facilities have quite high coverage by collaterals thus even a decrease in collateral value may have no impact on actual recoveries of such exposures;
- Many facilities can be covered by debtors' cash flows without the need to foreclose collaterals;
- In ECL calculation the final value is weighted based on probability of scenarios, and the probability of collateral foreclosure scenario may vary for different borrowers.

[69] Portfolio descriptions corresponding to portfolio codes are presented in Table 1.
[70] While revaluations in work block 8 "Fair value exposures review" reflect standalone impact and are not connected to the results of credit file review.

Table 75: Collateral revaluations (KZT BN, % of pre-AQR valuation)

Collateral type	Pre-AQR aggregated value post haircuts (KZT BN)	Post-AQR aggregated value post haircuts (KZT BN)	Weighted average revaluation (%)	Arithmetic average revaluation (%)	Median revaluation (%)
Residential real estate	24,9	20,1	-19,4%	5,9%	1,6%
Commercial & industrial real estate	97,1	92,7	-4,5%	4,2%	0,0%
Agricultural land	4,5	0,5	-89,5%	-79,4%	-92,9%
Other land	15,6	5,4	-65,4%	-38,6%	-30,0%
Other collateral[71]	56,4	31,9	-43,4%	-33,8%	-31,8%

Weighted average, arithmetic average and median revaluation can be distanced relative to each other due to either existence of outliers in terms of relative revaluation or in terms of collateral value (both relatively big and relatively small sizes). Weighted average takes into account collateral value giving bigger weights to bigger collaterals while arithmetic average and median values perceive all revaluations if they were revaluations of collaterals of the same size.

Overall, the main drivers of collateral value change compared to pre-AQR appraisals are:

- Usage of a comparative approach based on not comparable analogs;
- Absence of regular revaluation for some collaterals and absence of regular update on other encumbrances on collaterals and collaterals being under arrest, which can lead to usage of non-actual information in collateral valuation;
- Lack of collaterals' state monitoring which results in appraisal reports not considering the current state of collateral at valuation date (e.g., valuation of finished object as one undergoing construction).

Changes of collateral value used in provisions calculation by the bank as of 1 April 2019 were also driven by imperfections of the current valuation standards in the Republic of Kazakhstan that should be in line with international valuation standards: insufficient granularity of requirements to approach eligibility, sufficient justification of expert judgments and assumptions used, reliability and confirmability of used statistics, etc.

4.9.3. Credit file review and projection of findings

Table 76 represents the results of debtors' reclassification in all portfolios of assets valued at amortized cost:

- Pre-AQR total share of stage 3 debtors in all bank's assets equals the exposure of debtors assigned to stage 3 by the bank itself divided by the total exposure of all debtors in the respective portfolio. Portfolios that were not in the AQR scope are also included;
- Post-AQR total share of debtors in stage 3 in all bank's assets due to IFRS effect is equal to:
  - For exposures in the AQR scope: sum of exposure of debtors classified by the bank as stage 3 and the exposure of debtors reclassified to stage 3 based on all IFRS triggers used for AQR divided by the total exposure of all debtors in the respective portfolio. Portfolios that were not in the AQR scope are also included;
  - For exposures not in the AQR scope: sum of exposure of debtors classified by the bank as stage 3 divided by the total exposure of all debtors in the

[71] "Other collateral" type includes cars and other transport, production and other equipment, inventory, etc.

respective portfolio. Portfolios that were not in the AQR scope are also included.

Table 76: Share of debtors in stage 3 in all bank's assets (including assets which are not in the AQR scope) (%)

Pre-AQR total share of debtors in stage 3 in all banks' assets (%)	Post-AQR total share of debtors in stage 3 in all bank's assets due to IFRS effect (%)
16,2%	21,3%

Post-AQR weighted average share of stage 3 debtors in all portfolios of the bank equals 21,3%. The bank's CET1 capital allows the bank to hold fully adequate provisions for credit impaired debtors.

Key reclassification trigger is the restructuring due to deterioration of the debtor's financial conditions.

Post-classification, the bank team estimated the level of expected credit loss (ECL).

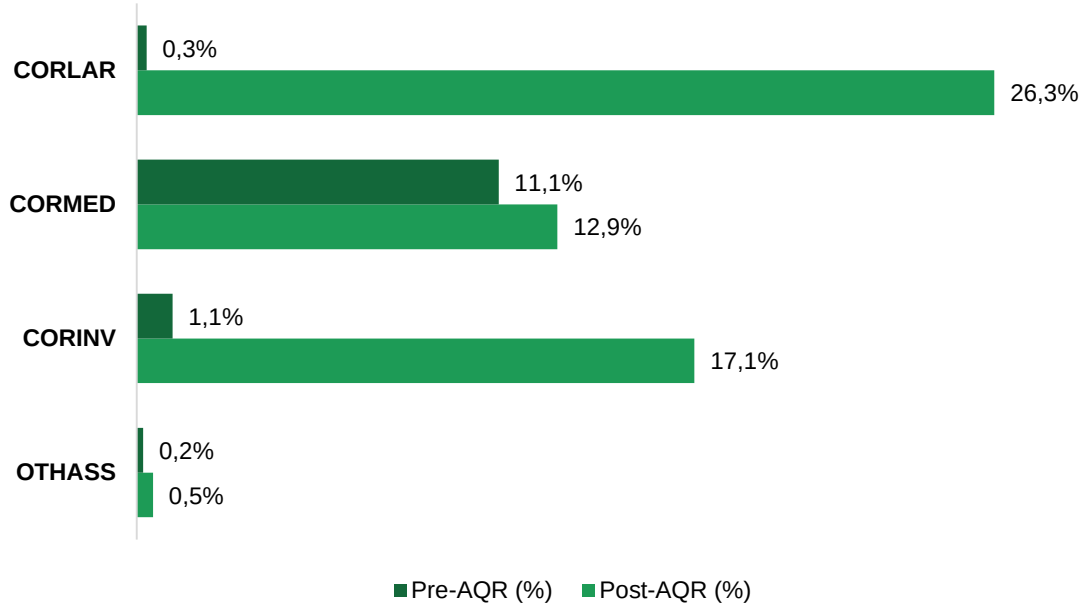
Figure 24 represents the change in ECL ratio in each portfolio of assets valued at amortized cost:

- Pre-AQR ECL is equal to the sum of ECL of exposures in stages 1, 2 and 3 for sampled debtors in the respective portfolio calculated by the bank divided by the exposure of sampled debtors in respective portfolio[72];
- Post-AQR ECL is equal to the sum of ECL of exposures in stages 1, 2 and 3 calculated by the bank team for sampled debtors in the respective portfolio as a result of credit file review, projection of findings and collective provisioning analysis, divided by the exposure of sampled debtors in the respective portfolio.

As depicted in Figure 24, the most significant change in ECL was observed in "large corporate exposures" and "investment loans" portfolios.

[72] According to information provided by banks during AQR.

Figure 24: Pre- and Post-AQR Expected Credit Loss (%)



- *The table does not show portfolios with insignificant number of debtors due to ECL calculation results not being representative;*
- *Portfolios "loans to individuals secured by real estate" (RETEST) and "consumer loans, credit cards and other retail exposures" (RETCON) are not presented on the chart as ECL for these portfolios is calculated fully as a result of collective provisioning analysis – corresponding results are presented in the following section.*

4.9.4. Collective provisioning analysis

The following table shows shares of portfolios selected for the collective provisioning analysis for which the challenger model calculations performed by the bank team resulted in expected credit loss (ECL) estimates exceeding, equal to or below bank's calculations.

3 retail portfolios were in-scope for the collective provisioning analysis.

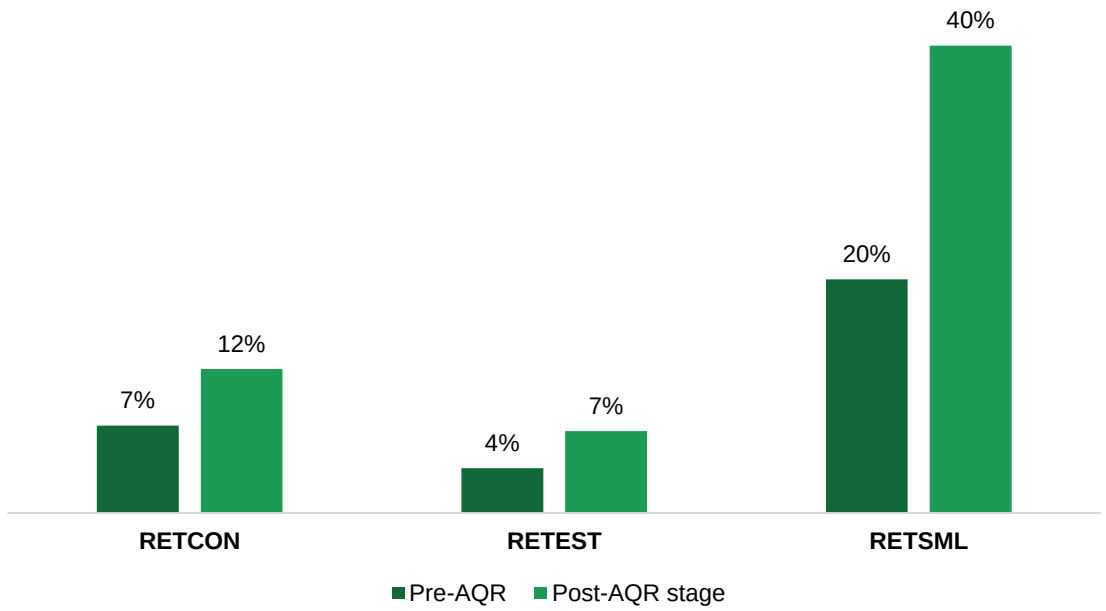
For all of the in-scope portfolios, the challenger model resulted in ECL estimate above bank's calculation.

Table 77: Scope of the collective provisioning analysis (%)

# of portfolios	Challenger model resulted in lower ECL	Challenger model didn't result in lower ECL
3	100%	0%

Loans from "corporate exposures secured by real estate" portfolio were excluded from the AQR scope for this bank.

Figure 25: ECL per portfolio type (%)[73]



ECL in "small business exposures" portfolio includes credit file review outcomes for the largest debtors of this portfolio.

Table below shows approximated driver analysis of ECL increase for each portfolio type. The impact is assessed by sensitivity analysis of the challenger model and a review of the bank's models.

Table 78: Drivers behind ECL increase, % of total ECL increase

Portfolio type[73]	Understated PD	Understated LGD	CFR projections
Total	**0%**	**92%**	**8%**
RETCON	0%	100%	0%
RETEST	0%	39%	61%
RETSML	0%	100%	0%

ECL increase drivers were approximated by sensitivity analysis of the challenger model. PD – probability of default; LGD – loss given default; CFR – credit file review.

The table shows relative contribution of each of the drivers to the ECL revaluation based on the bank team's calculation for each portfolio. Thus, "Understated PD" and "Understated LGD" factors demonstrate the share of ECL revaluation driven solely by PD and LGD adjustments used for collective provisioning analysis, and "CFR projections" factor demonstrates the share of ECL revaluation driven solely by the changes in risk parameters for debtors not sampled for CFR. The share of sampled debtors to be reclassified from stage 1 to stages 2 & 3 and from stage 2 to stage 3 was calculated based on the CFR outcomes. The resulting findings were projected to the non-sampled part of the portfolio and collective provisioning analysis was then based on the adjusted impairment staging distribution. Section 7.5.9 of the AQR Manual contains a detailed description of the process of implementation of CFR adjustments in the collective provisioning analysis.

[73] Portfolio descriptions corresponding to portfolio codes are presented in Table 1.

The main drivers of adjustments to the ECL calculations by the bank were:

- **LGD:** Lack of formalized approach to write-offs of defaulted loans which leads to skewed data used in recoveries statistics and calibration of the loss given default models;
- **LGD:** Calibration of / historical data used for loss given default models does not fully account for the probability of sale of collaterals (e.g. cases when collateral ownership has already been transferred).

4.9.5. Fair value exposures review

As depicted in Table 79 and Table 80, adjustments were driven by revaluation of bonds, while prudential adjustments were mainly due to revaluation of on-balance real estate.

Table 79: Fair value assets revaluations – adjustments

Asset type	Adjustments prior to tax offsetting			
	KZT BN	*Weighted average revaluation*	*Arithmetic average revaluation*	*Median revaluation*
Bonds	-0,1	-1,7%	-1,3%	-1,3%
Derivatives	0,0	N/A	N/A	N/A
Total	**-0,1**	**N/A**	**N/A**	**N/A**

Most bonds selected for revaluation were found to be valued correctly or below fair value. No material impact on derivative valuation is explained by no significant issues discovered during derivative pricing models review and CVA impact being non-material.

Table 80: Fair Value assets revaluations – prudential adjustments

Asset type	Revaluation per asset		
	Weighted average revaluation	*Arithmetic average revaluation*	*Median revaluation*
On-balance real estate	-16%	-16%	-16%

Key drivers of valuation change:

- Usage of incomparable analogs in valuation reports used to calculate book value.

4.9.6. Determination of AQR-adjusted capital adequacy ratios

Post AQR, Bank RBK a surplus of k1 capital of 6,6% of risk-weighted assets (Table 81).

Table 81: k1 capital adjustments

Value		Explanation
1. Pre-AQR CET1 capital adequacy as of 1 April 2019	**14,6%**	**CET1 capital as reported by the bank as of 1 April 2019 as a percentage of total risk-weighted assets (RWAs)**
2. AQR adjustments, KZT BN, as of 1 April 2019	-2,7	Adjustments for exposure in scope for credit file review, fair value assets revaluation: revaluation of bonds and derivatives, decrease of capital impact from the decrease of taxable profits in 2019 and increase in deferred tax assets, adjustments in regulatory reporting
3. Bank's post-AQR k1 ratio (final result) as of 1 April 2019	**14,1%**	**Bank's AQR-adjusted k1 ratio (final result)**

Prudential impact is fully reflected in the set of measures communicated to banks in the acts of inspection. The Agency will regularly monitor implementation of these measures through SREP process and targeted on-site inspections.

4.10. Alfa-Bank

4.10.1. Portfolio sampling

The following table shows proportion of exposure sampled for credit file review (CFR) analysis for all portfolios of assets valued at amortized cost. The first column contains the share of on-balance and off-balance sheet exposures selected for CFR (as a share of total exposure of the portfolio within the AQR scope). For example, if for "corporate exposures secured by real estate" (COREST) portfolio KZT 100 were included in the AQR scope, of which KZT 90 have been selected for CFR review, the value in the first column would be equal to 90%. The second column shows distribution of resulting sample between portfolios (share of a portfolio's exposure sampled for CFR in the overall CFR sample). For example, if total sample for CFR was equal to KZT 1000 and COREST sample was equal to 90, then the value in the second column would be equal to 9%.

Table 82: Sampling rates by portfolio type (%)

Portfolio[74]	Sampling rates	Weight of portfolio in overall sample for CFR
COREST	100%	1%
CORLAR	100%	44%
CORMED	100%	30%
FINFIN	100%	20%
GOVGOV	100%	4%
RELATE	100%	1%
RETLAR	**100%**	**0%**

Loans to central government ministries (if present) and exposures with NBK from the "government entities exposures" portfolio were excluded from CFR and analyzed using a simplified approach.

Due to their specific nature some of the exposures from fully sampled portfolios (e.g. "government entities exposures" and "financial institutions exposures") were not reviewed within CFR. Also, some borrowers from "small business exposures" portfolios were included in the scope of CFR (as an exception, due to large loans or credit lines of those borrowers) – this fact is not reflected in the table above due to the anomalous nature of such debtors.

4.10.2. Collateral valuation

As can be seen from Table 83, overall upward collateral revaluation for the bank is about 22% with more than 85% of this effect coming from "commercial & industrial real estate" and "other collateral" revaluations.

Collateral revaluation results were used as inputs into the credit file review. In other words, they are fully accounted for in the results there, thus they do not represent standalone impact in any form[75]. Within credit file review, the impact of collateral revaluation is taken into account as a change in potential recoveries, but one also has to take into account that collateral revaluation does not have direct impact on expected credit loss (ECL) calculation. In other words, 1 KZT downward revaluation is not equal to 1 KZT ECL upward recalculation due to the following reasons:

[74] Portfolio descriptions corresponding to portfolio codes are presented in Table 1.
[75] While revaluations in work block 8 "Fair value exposures review" reflect standalone impact and are not connected to the results of credit file review.

- Many facilities have quite high coverage by collaterals thus even a decrease in collateral value may have no impact on actual recoveries of such exposures;
- Many facilities can be covered by debtors' cash flows without the need to foreclose collaterals;
- In ECL calculation the final value is weighted based on probability of scenarios, and the probability of collateral foreclosure scenario may vary for different borrowers.

Table 83: Collateral revaluations (KZT BN, % of pre-AQR valuation)

Collateral type	Pre-AQR aggregated value post haircuts (KZT BN)	Post-AQR aggregated value post haircuts (KZT BN)	Weighted average revaluation (%)	Arithmetic average revaluation (%)	Median revaluation (%)
Residential real estate	0,4	0,5	23,0%	33,7%	29,2%
Commercial & industrial real estate	7,2	9,6	32,1%	25,3%	25,3%
Agricultural land	0,1	0,1	68,6%	99,5%	43,3%
Other land	0,7	0,9	44,0%	39,2%	32,6%
Other collateral[76]	8,4	9,3	11,1%	21,0%	18,0%

Weighted average, arithmetic average and median revaluation can be distanced relative to each other due to either existence of outliers in terms of relative revaluation or in terms of collateral value (both relatively big and relatively small sizes). Weighted average takes into account collateral value giving bigger weights to bigger collaterals while arithmetic average and median values perceive all revaluations if they were revaluations of collaterals of the same size.

Overall, the main drivers of collateral value change compared to pre-AQR appraisals are:

- Usage of a comparative approach based on not comparable analogs or application of not valid adjustments to these analogs;
- Lag between collateral data update (collateral value and status, etc.) and its integration into internal data systems which can lead to use of non-actual information in provisions estimation;
- Absence of taking into account special aspects of regional markets context, markets with restricted demand or supply, complex production units and equipment, etc.

Changes of collateral value used in provisions calculation by the bank as of 1 April 2019 were also driven by imperfections of the current valuation standards in the Republic of Kazakhstan that should be in line with international valuation standards: insufficient granularity of requirements to approach eligibility, sufficient justification of expert judgments and assumptions used, reliability and confirmability of used statistics, etc.

4.10.3. Credit file review

Table 84 represents the results of debtors' reclassification in all portfolios of assets valued at amortized cost:

- Pre-AQR total share of stage 3 debtors in all bank's assets equals the exposure of debtors assigned to stage 3 by the bank itself divided by the total exposure of all debtors in the respective portfolio. Portfolios that were not in the AQR scope are also included;

[76] "Other collateral" type includes cars and other transport, production and other equipment, inventory, etc.

- Post-AQR total share of debtors in stage 3 in all bank's assets due to IFRS effect is equal to:
  - For exposures in the AQR scope: sum of exposure of debtors classified by the bank as stage 3 and the exposure of debtors reclassified to stage 3 based on all IFRS triggers used for AQR divided by the total exposure of all debtors in the respective portfolio. Portfolios that were not in the AQR scope are also included;
  - For exposures not in the AQR scope: sum of exposure of debtors classified by the bank as stage 3 divided by the total exposure of all debtors in the respective portfolio. Portfolios that were not in the AQR scope are also included.

Table 84: Share of debtors in stage 3 in all bank's assets (including assets which are not in the AQR scope) (%)

Pre-AQR total share of debtors in stage 3 in all banks' assets (%)	Post-AQR total share of debtors in stage 3 in all bank's assets due to IFRS effect (%)
6,1%	6,1%

Post-AQR weighted average share of stage 3 debtors in all portfolios of the bank equals 6,1%. Hence, the share of post-AQR stage 3 debtors has not increased significantly if additional IFRS reclassifications are accounted for. The bank's CET1 capital allows the bank to hold fully adequate provisions for credit impaired debtors.

Key reclassification trigger is the restructuring due to deterioration of the debtor's financial conditions.

Post-classification, the bank team estimated the level of expected credit loss (ECL).

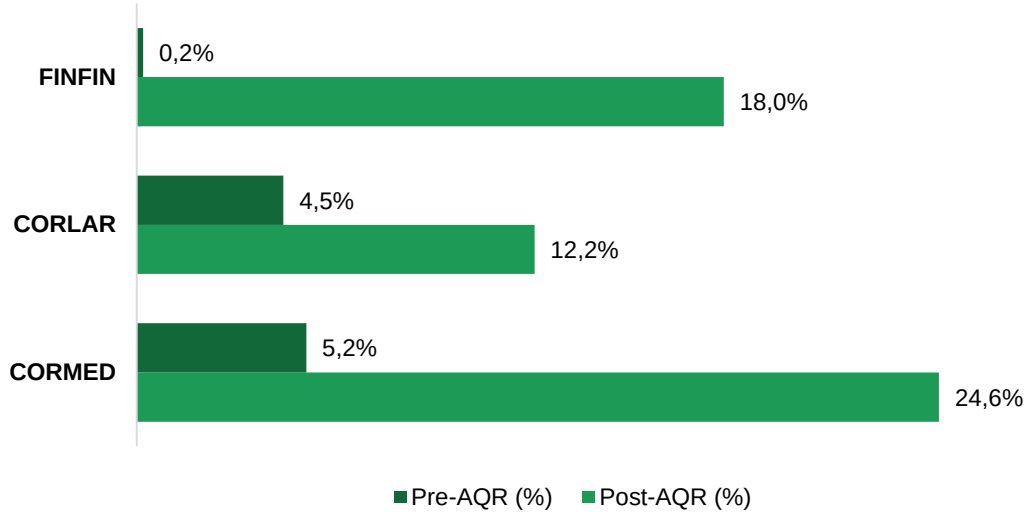
Figure 26 represents the change in ECL ratio in each portfolio of assets valued at amortized cost:

- Pre-AQR ECL is equal to the sum of ECL of exposures in stages 1, 2 and 3 for sampled debtors in the respective portfolio calculated by the bank divided by the exposure of sampled debtors in respective portfolio[77];
- Post-AQR ECL is equal to the sum of ECL of exposures in stages 1, 2 and 3 calculated by the bank team for sampled debtors in the respective portfolio as a result of credit file review, projection of findings and collective provisioning analysis, divided by the exposure of sampled debtors in the respective portfolio.

As depicted in Figure 26, the most significant change in ECL was observed in "medium corporate exposures" and "financial institutions exposures" portfolios.

[77] According to information provided by banks during AQR.

Figure 26: Pre- and Post-AQR Expected Credit Loss (%)



- *The table does not show portfolios with insignificant number of debtors due to ECL calculation results not being representative;*
- *Portfolio "consumer loans, credit cards and other retail exposures" (RETCON) is not presented on the chart as ECL for this portfolio is calculated fully as a result of collective provisioning analysis – corresponding results are presented in the following section.*

4.10.4. Collective provisioning analysis

The following table shows shares of portfolios selected for the collective provisioning analysis for which the challenger model calculations performed by the bank team resulted in expected credit loss (ECL) estimates exceeding, equal to or below bank's calculations.

2 retail portfolios were in-scope for the collective provisioning analysis.

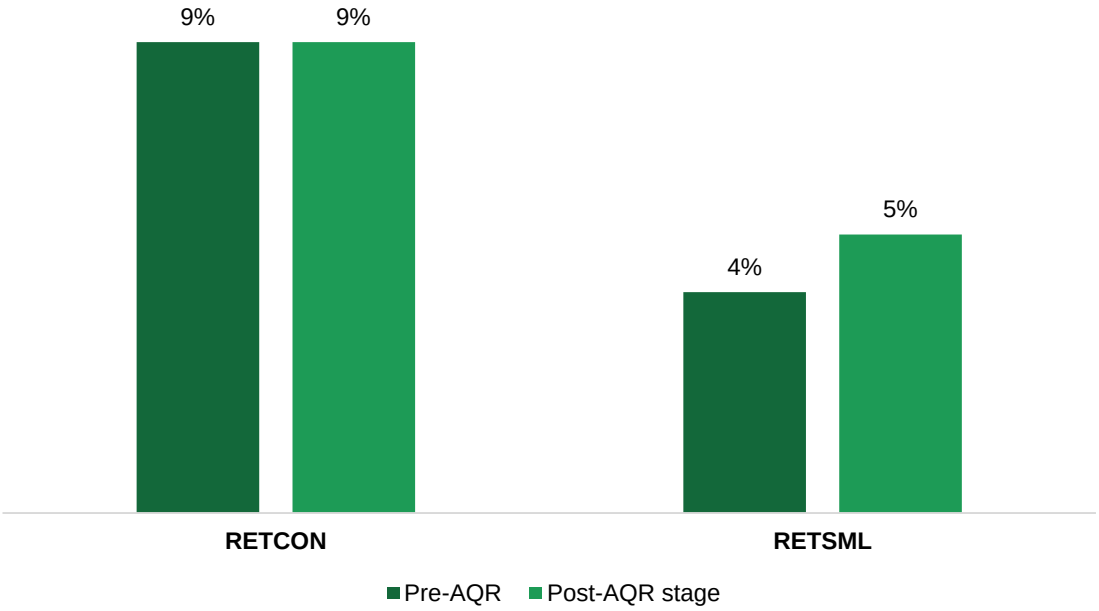
For both portfolios the challenger model resulted in ECL estimate below bank's calculation.

Table 85: Scope of the collective provisioning analysis (%)

# of portfolios	Challenger model resulted in lower ECL	Challenger model didn't result in lower ECL
2	0%	100%

Loans from "loans to individuals secured by real estate" portfolio were excluded from the AQR scope for this bank.

Figure 27: ECL per portfolio type (%)[78]



ECL in "small business exposures" portfolio includes credit file review outcomes for the largest debtors of this portfolio.

Table below shows approximated driver analysis of ECL increase for each portfolio type. The impact is assessed by sensitivity analysis of the challenger model and a review of the bank's models.

Table 86: Drivers behind ECL increase, % of total ECL increase

Portfolio type[78]	Understated PD	Understated LGD	CFR projections
Total	**-**	**-**	**-**
RETCON	-	-	-
RETSML	-	-	-

ECL increase drivers were approximated by sensitivity analysis of the challenger model. PD – probability of default; LGD – loss given default; CFR – credit file review.

The table shows relative contribution of each of the drivers to the ECL revaluation based on the bank team's calculation for each portfolio. Thus, "Understated PD" and "Understated LGD" factors demonstrate the share of ECL revaluation driven solely by PD and LGD adjustments used for collective provisioning analysis, and "CFR projections" factor demonstrates the share of ECL revaluation driven solely by the changes in risk parameters for debtors not sampled for CFR. The share of sampled debtors to be reclassified from stage 1 to stages 2 & 3 and from stage 2 to stage 3 was calculated based on the CFR outcomes. The resulting findings were projected to the non-sampled part of the portfolio and collective provisioning analysis was then based on the adjusted impairment staging distribution. Section 7.5.9 of the AQR Manual contains a detailed description of the process of implementation of CFR adjustments in the collective provisioning analysis.

[78] Portfolio descriptions corresponding to portfolio codes are presented in Table 1.

4.10.5. Fair value exposures review

As depicted in Table 87 and Table 88, adjustments were non-material, while prudential adjustments were mainly due to revaluation of on-balance real estate. While direct revaluation of bonds was out of scope for Alfa-Bank, the securities were still analyzed for embedded non-standard derivatives, such as floored coupon or callability by the issuer, and correct accounting, i.e. ensuring that any such embedded derivatives are properly reflected on bank's books and considered during valuation.

Table 87: Fair value assets revaluations – adjustments

Asset type	Adjustments prior to tax offsetting			
	KZT BN	*Weighted average revaluation*	*Arithmetic average revaluation*	*Median revaluation*
Bonds	0,0	0%	0%	0%
Derivatives	0,0	N/A	N/A	N/A
Total	**0,0**	**N/A**	**N/A**	**N/A**

No material impact on derivative valuation is explained by no significant issues discovered during derivative pricing models review and CVA impact being non-material.

Table 88: Fair Value assets revaluations – prudential adjustments

Asset type	Revaluation per asset		
	Weighted average revaluation	*Arithmetic average revaluation*	*Median revaluation*
On-balance real estate	-25%	-46%	-46%

Key drivers of valuation change:

- Treating real estate at cost and non-application of IFRS 36 "Impairment of Assets" – not recognizing impairment when required;
- Systematic problems in pricing procedures for foreclosed collaterals leading to foreclosed collaterals being sold at prices below their book values – when assets were sold past 1 April 2019, the transaction price was used as the market value.

4.10.6. Determination of AQR-adjusted capital adequacy ratios

Post AQR, Alfa-Bank had a surplus of k1 capital of 8,8% of risk-weighted assets (Table 89).

Table 89: k1 capital adjustments

Value		Explanation
1. Pre-AQR CET1 capital adequacy as of 1 April 2019	**17,3%**	**CET1 capital as reported by the bank as of 1 April 2019 as a percentage of total risk-weighted assets (RWAs)**
2. AQR adjustments, KZT BN, as of 1 April 2019	-3,9	Adjustments for exposure in scope for credit file review, fair value assets revaluation: revaluation of bonds and derivatives, decrease of capital impact from the decrease of taxable profits in 2019 and increase in deferred tax assets, adjustments in regulatory reporting
3. Bank's post-AQR k1 ratio (final result) as of 1 April 2019	**16,3%**	**Bank's AQR-adjusted k1 ratio (final result)**

Prudential impact is fully reflected in the set of measures communicated to banks in the acts of inspection. The Agency will regularly monitor implementation of these measures through SREP process and targeted on-site inspections.

4.11. Altyn Bank

4.11.1. Portfolio sampling

The following table shows proportion of exposure sampled for credit file review (CFR) analysis for all portfolios of assets valued at amortized cost. The first column contains the share of on-balance and off-balance sheet exposures selected for CFR (as a share of total exposure of the portfolio within the AQR scope). For example, if for "corporate exposures secured by real estate" (COREST) portfolio KZT 100 were included in the AQR scope, of which KZT 90 have been selected for CFR review, the value in the first column would be equal to 90%. The second column shows distribution of resulting sample between portfolios (share of a portfolio's exposure sampled for CFR in the overall CFR sample). For example, if total sample for CFR was equal to KZT 1000 and COREST sample was equal to 90, then the value in the second column would be equal to 9%.

Table 90: Sampling rates by portfolio type (%)

Portfolio[79]	Sampling rates	Weight of portfolio in overall sample for CFR
RETEST	19%	2%
CORLAR	100%	41%
CORMED	100%	55%
FINFIN	100%	2%
RELATE	100%	0%

Due to their specific nature some of the exposures from fully sampled portfolios (e.g. "financial institutions exposures") were not reviewed within CFR.

4.11.2. Collateral valuation

As can be seen from Table 91, overall collateral revaluation for the bank is about 34%, with the whole effect coming from "commercial & industrial real estate" revaluation, what is partially balanced by upward revaluation in "residential real estate".

Collateral revaluation results were used as inputs into the credit file review. In other words, they are fully accounted for in the results there, thus they do not represent standalone impact in any form[80]. Within credit file review, the impact of collateral revaluation is taken into account as a change in potential recoveries, but one also has to take into account that collateral revaluation does not have direct impact on expected credit loss (ECL) calculation. In other words, 1 KZT downward revaluation is not equal to 1 KZT ECL upward recalculation due to the following reasons:

- Many facilities have quite high coverage by collaterals thus even a decrease in collateral value may have no impact on actual recoveries of such exposures;
- Many facilities can be covered by debtors' cash flows without the need to foreclose collaterals;
- In ECL calculation the final value is weighted based on probability of scenarios, and the probability of collateral foreclosure scenario may vary for different borrowers.

[79] Portfolio descriptions corresponding to portfolio codes are presented in Table 1.
[80] While revaluations in work block 8 "Fair value exposures review" reflect standalone impact and are not connected to the results of credit file review.

Table 91: Collateral revaluations (KZT BN, % of pre-AQR valuation)

Collateral type	Pre-AQR aggregated value post haircuts (KZT BN)	Post-AQR aggregated value post haircuts (KZT BN)	Weighted average revaluation (%)	Arithmetic average revaluation (%)	Median revaluation (%)
Residential real estate	6,6	7,5	13,2%	11,2%	10,5%
Commercial & industrial real estate	7,8	1,9	-76,0%	-23,3%	-20,5%
Agricultural land	n/a	n/a	n/a	n/a	n/a
Other land	n/a	n/a	n/a	n/a	n/a
Other collateral[81]	0,3	0,4	37,8%	37,6%	37,6%

Weighted average, arithmetic average and median revaluation can be distanced relative to each other due to either existence of outliers in terms of relative revaluation or in terms of collateral value (both relatively big and relatively small sizes). Weighted average takes into account collateral value giving bigger weights to bigger collaterals while arithmetic average and median values perceive all revaluations if they were revaluations of collaterals of the same size.

Overall, the main drivers of collateral value change compared to pre-AQR appraisals are:

- Usage of a comparative approach based on not comparable analogs or application of not valid adjustments to these analogs;
- Usage of cost approach which can lead both to over- and undervaluation.

Changes of collateral value used in provisions calculation by the bank as of 1 April 2019 were also driven by imperfections of the current valuation standards in the Republic of Kazakhstan that should be in line with international valuation standards: insufficient granularity of requirements to approach eligibility, sufficient justification of expert judgments and assumptions used, reliability and confirmability of used statistics, etc.

4.11.3. Credit file review and projection of findings

Table 92 represents the results of debtors' reclassification in all portfolios of assets valued at amortized cost:

- Pre-AQR total share of stage 3 debtors in all bank's assets equals the exposure of debtors assigned to stage 3 by the bank itself divided by the total exposure of all debtors in the respective portfolio. Portfolios that were not in the AQR scope are also included;
- Post-AQR total share of debtors in stage 3 in all bank's assets due to IFRS effect is equal to:
  - For exposures in the AQR scope: sum of exposure of debtors classified by the bank as stage 3 and the exposure of debtors reclassified to stage 3 based on all IFRS triggers used for AQR divided by the total exposure of all debtors in the respective portfolio. Portfolios that were not in the AQR scope are also included;
  - For exposures not in the AQR scope: sum of exposure of debtors classified by the bank as stage 3 divided by the total exposure of all debtors in the respective portfolio. Portfolios that were not in the AQR scope are also included.

[81] "Other collateral" type includes cars and other transport, production and other equipment, inventory, etc.

Table 92: Share of debtors in stage 3 in all bank's assets (including assets which are not in the AQR scope) (%)

Pre-AQR total share of debtors in stage 3 in all banks' assets (%)	Post-AQR total share of debtors in stage 3 in all bank's assets due to IFRS effect (%)
0,3%	0,8%

Post-AQR weighted average share of stage 3 debtors in all portfolios of the bank equals 0,8%. Hence, the share of post-AQR stage 3 debtors has not increased significantly if additional IFRS reclassifications are accounted for. The bank's CET1 capital allows the bank to hold fully adequate provisions for credit impaired debtors.

Key reclassification trigger is the restructuring due to deterioration of the debtor's financial conditions.

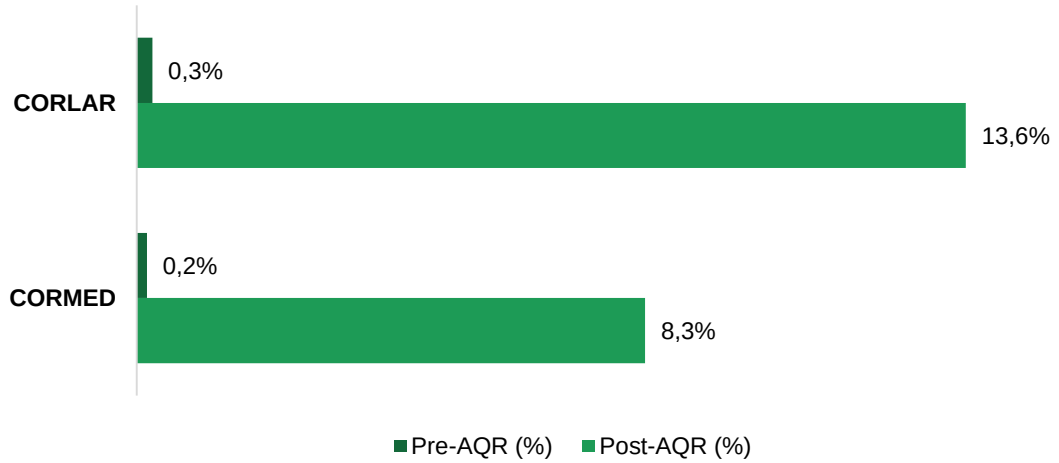
Post-classification, the bank team estimated the level of expected credit loss (ECL).

Figure 28 represents the change in ECL ratio in each portfolio of assets valued at amortized cost:

- Pre-AQR ECL is equal to the sum of ECL of exposures in stages 1, 2 and 3 for sampled debtors in the respective portfolio calculated by the bank divided by the exposure of sampled debtors in respective portfolio[82];
- Post-AQR ECL is equal to the sum of ECL of exposures in stages 1, 2 and 3 calculated by the bank team for sampled debtors in the respective portfolio as a result of credit file review, projection of findings and collective provisioning analysis, divided by the exposure of sampled debtors in the respective portfolio.

As depicted in Figure 28, the most significant change in ECL was observed in "large corporate exposures" portfolio.

Figure 28: Pre- and Post-AQR Expected Credit Loss (%)



- *The table does not show portfolios with insignificant number of debtors due to ECL calculation results not being representative;*

[82] According to information provided by banks during AQR.

- *Portfolios "loans to individuals secured by real estate" (RETEST) and "consumer loans, credit cards and other retail exposures" (RETCON) are not presented on the chart as ECL for these portfolios is calculated fully as a result of collective provisioning analysis – corresponding results are presented in the following section.*

4.11.4. Collective provisioning analysis

The following table shows shares of portfolios selected for the collective provisioning analysis for which the challenger model calculations performed by the bank team resulted in expected credit loss (ECL) estimates exceeding, equal to or below bank's calculations.

2 retail portfolios were in-scope for the collective provisioning analysis.

For 50% of the in-scope portfolios, the challenger model resulted in ECL estimate below bank's calculation.

Table 93: Scope of the collective provisioning analysis (%)

# of portfolios	Challenger model resulted in lower ECL	Challenger model didn't result in lower ECL
2	50%	50%

"Corporate exposures secured by real estate" portfolio was excluded from the AQR scope for this bank.

Figure 29: ECL per portfolio type (%)[83]

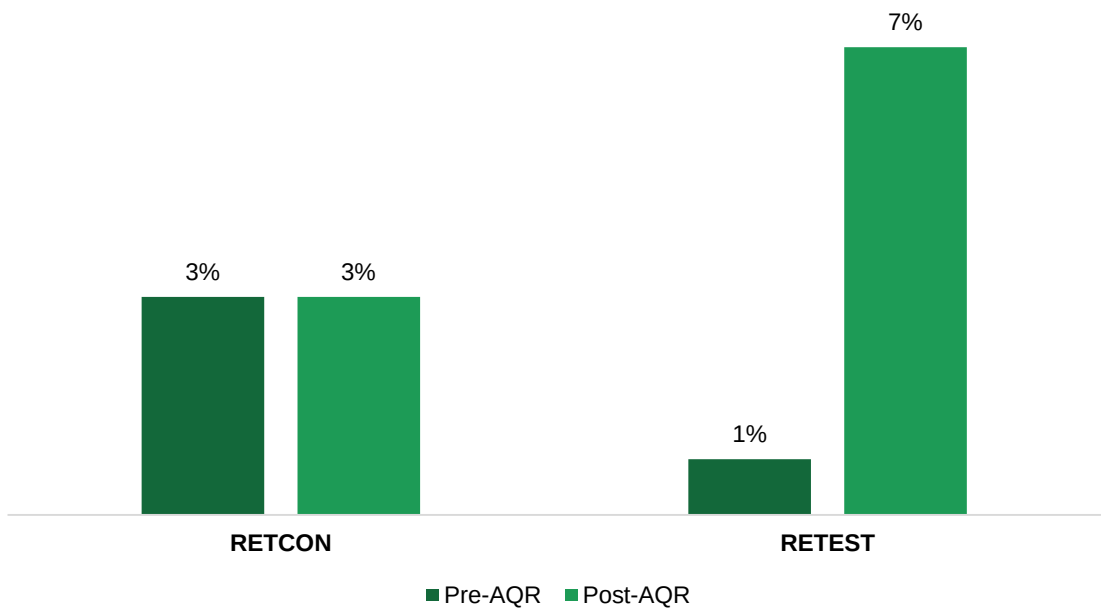


Table below shows approximated driver analysis of ECL increase for each portfolio type. The impact is assessed by sensitivity analysis of the challenger model and a review of the bank's models.

[83] Portfolio descriptions corresponding to portfolio codes are presented in Table 1.

Table 94: Drivers behind ECL increase, % of total ECL increase

Portfolio type[83]	Understated PD	Understated LGD	CFR projections
Total	**14%**	**13%**	**72%**
RETCON	-	-	-
RETEST	14%	13%	72%

ECL increase drivers were approximated by sensitivity analysis of the challenger model. PD – probability of default; LGD – loss given default; CFR – credit file review.

The table shows relative contribution of each of the drivers to the ECL revaluation based on the bank team's calculation for each portfolio. Thus, "Understated PD" and "Understated LGD" factors demonstrate the share of ECL revaluation driven solely by PD and LGD adjustments used for collective provisioning analysis, and "CFR projections" factor demonstrates the share of ECL revaluation driven solely by the changes in risk parameters for debtors not sampled for CFR. The share of sampled debtors to be reclassified from stage 1 to stages 2 & 3 and from stage 2 to stage 3 was calculated based on the CFR outcomes. The resulting findings were projected to the non-sampled part of the portfolio and collective provisioning analysis was then based on the adjusted impairment staging distribution. Section 7.5.9 of the AQR Manual contains a detailed description of the process of implementation of CFR adjustments in the collective provisioning analysis.

The main drivers of adjustments to the ECL calculations by the bank were:

- **PD**: Occasionally excessive simplification of probability of default calculation, e.g. usage of external PD rates for corporate debtors without calibration to market specifics, absence of PD values on loans issued before 01 January 2018;
- **LGD**: Calibration of / historical data used for loss given default models does not fully account for the probability of sale of collaterals (e.g. collateral ownership has already been transferred).

4.11.5. Fair value exposures review

As depicted in Table 95 and Table 96, adjustments were non-material, while prudential adjustments were mainly due to revaluation of on-balance real estate.

Table 95: Fair value assets revaluations – adjustments

Asset type	Adjustments prior to tax offsetting			
	KZT BN	*Weighted average revaluation*	*Arithmetic average revaluation*	*Median revaluation*
Bonds	0,0	0,0%	0,0%	0,0%
Derivatives	0,0	N/A	N/A	N/A
Total	**0,0**	**N/A**	**N/A**	**N/A**

All bonds selected for revaluation were found to be valued correctly or below fair value. No material impact on derivative valuation is explained by no significant issues discovered during derivative pricing models review and CVA impact being non-material.

Table 96: Fair Value assets revaluations – prudential adjustments

Asset type	Revaluation per asset		
	Weighted average revaluation	*Arithmetic average revaluation*	*Median revaluation*
On-balance real estate	-17%	-8%	-6%

Key drivers of valuation change:

- Non-application of discounts reflecting the auctioning process when valuing on-balance real estate.

4.11.6. Determination of AQR-adjusted capital adequacy ratios

Post AQR, Altyn Bank had a surplus of k1 capital of 11,9% of risk-weighted assets (Table 97).

Table 97: k1 capital adjustments

Value		Explanation
1. Pre-AQR CET1 capital adequacy as of 1 April 2019	**19,4%**	**CET1 capital as reported by the bank as of 1 April 2019 as a percentage of total risk-weighted assets (RWAs)**
2. AQR adjustments, KZT BN, as of 1 April 2019	0,0	Adjustments for exposure in scope for credit file review, fair value assets revaluation: revaluation of bonds and derivatives, decrease of capital impact from the decrease of taxable profits in 2019 and increase in deferred tax assets, adjustments in regulatory reporting
3. Bank's post-AQR k1 ratio (final result) as of 1 April 2019	**19,4%**	**Bank's AQR-adjusted k1 ratio (final result)**

Prudential impact is fully reflected in the set of measures communicated to banks in the acts of inspection. The Agency will regularly monitor implementation of these measures through SREP process and targeted on-site inspections.

4.12. Nurbank

4.12.1. Portfolio sampling

The following table shows proportion of exposure sampled for credit file review (CFR) analysis for all portfolios of assets valued at amortized cost. The first column contains the share of on-balance and off-balance sheet exposures selected for CFR (as a share of total exposure of the portfolio within the AQR scope). For example, if for "corporate exposures secured by real estate" (COREST) portfolio KZT 100 were included in the AQR scope, of which KZT 90 have been selected for CFR review, the value in the first column would be equal to 90%. The second column shows distribution of resulting sample between portfolios (share of a portfolio's exposure sampled for CFR in the overall CFR sample). For example, if total sample for CFR was equal to KZT 1000 and COREST sample was equal to 90, then the value in the second column would be equal to 9%.

Table 98: Sampling rates by portfolio type (%)

Portfolio[84]	Sampling rates	Weight of portfolio in overall sample for CFR
CORINV	100%	14%
CORLAR	100%	19%
CORMED	100%	30%
FINFIN	100%	13%
OTHASS	100%	19%
RELATE	100%	5%
RETLAR	100%	0%

Due to their specific nature some of the exposures from fully sampled portfolios (e.g. "financial institutions exposures") were not reviewed within CFR. Also, some borrowers from "small business exposures" portfolios were included in the scope of CFR (as an exception, due to large loans or credit lines of those borrowers) – this fact is not reflected in the table above due to the anomalous nature of such debtors.

4.12.2. Collateral valuation

As can be seen from Table 99, overall collateral revaluation for the bank is about 25,6%, which is mostly driven by "commercial & industrial real estate" and "other collateral" revaluations what is a bit balanced by upward revaluation in "other land".

Collateral revaluation results were used as inputs into the credit file review. In other words, they are fully accounted for in the results there, thus they do not represent standalone impact in any form[85]. Within credit file review, the impact of collateral revaluation is taken into account as a change in potential recoveries, but one also has to take into account that collateral revaluation does not have direct impact on expected credit loss (ECL) calculation. In other words, 1 KZT downward revaluation is not equal to 1 KZT ECL upward recalculation due to the following reasons:

- Many facilities have quite high coverage by collaterals thus even a decrease in collateral value may have no impact on actual recoveries of such exposures;
- Many facilities can be covered by debtors' cash flows without the need to foreclose collaterals;

[84] Portfolio descriptions corresponding to portfolio codes are presented in Table 1.
[85] While revaluations in work block 8 "Fair value exposures review" reflect standalone impact and are not connected to the results of credit file review.

- In ECL calculation the final value is weighted based on probability of scenarios, and the probability of collateral foreclosure scenario may vary for different borrowers.

Table 99: Collateral revaluations (KZT BN, % of pre-AQR valuation)

Collateral type	Pre-AQR aggregated value post haircuts (KZT BN)	Post-AQR aggregated value post haircuts (KZT BN)	Weighted average revaluation (%)	Arithmetic average revaluation (%)	Median revaluation (%)
Residential real estate	6,8	6,3	-7,6%	-19,6%	-10,2%
Commercial & industrial real estate	63,6	60,5	-4,8%	-6,8%	-11,9%
Agricultural land	0,9	0,7	-23,6%	-41,6%	-23,6%
Other land	4,6	5,0	8,7%	-30,1%	-29,6%
Other collateral[86]	25,5	2,9	-88,8%	-54,8%	-52,2%

Weighted average, arithmetic average and median revaluation can be distanced relative to each other due to either existence of outliers in terms of relative revaluation or in terms of collateral value (both relatively big and relatively small sizes). Weighted average takes into account collateral value giving bigger weights to bigger collaterals while arithmetic average and median values perceive all revaluations if they were revaluations of collaterals of the same size.

Overall, the main drivers of collateral value change compared to pre-AQR appraisals are:

- Usage of a comparative approach based on not comparable analogs or application of not valid adjustments to these analogs;
- Usage of cost approach which can lead both to over- and undervaluation;
- Absence of regular revaluation for some collaterals and absence of regular update on other encumbrances and arrests on collaterals which can lead to usage of non-actual information in collateral valuation.

Changes of collateral value used in provisions calculation by the bank as of 1 April 2019 were also driven by imperfections of the current valuation standards in the Republic of Kazakhstan that should be in line with international valuation standards: insufficient granularity of requirements to approach eligibility, sufficient justification of expert judgments and assumptions used, reliability and confirmability of used statistics, etc.

4.12.3. Credit file review

Table 100 represents the results of debtors' reclassification in all portfolios of assets valued at amortized cost:

- Pre-AQR total share of stage 3 debtors in all bank's assets equals the exposure of debtors assigned to stage 3 by the bank itself divided by the total exposure of all debtors in the respective portfolio. Portfolios that were not in the AQR scope are also included;
- Post-AQR total share of debtors in stage 3 in all bank's assets due to IFRS effect is equal to:
  - For exposures in the AQR scope: sum of exposure of debtors classified by the bank as stage 3 and the exposure of debtors reclassified to stage 3 based on all IFRS triggers used for AQR divided by the total exposure of all debtors

[86] "Other collateral" type includes cars and other transport, production and other equipment, inventory, etc.

in the respective portfolio. Portfolios that were not in the AQR scope are also included;

- For exposures not in the AQR scope: sum of exposure of debtors classified by the bank as stage 3 divided by the total exposure of all debtors in the respective portfolio. Portfolios that were not in the AQR scope are also included.

Table 100: Share of debtors in stage 3 in all bank's assets (including assets which are not in the AQR scope) (%)

Pre-AQR total share of debtors in stage 3 in all banks' assets (%)	Post-AQR total share of debtors in stage 3 in all bank's assets due to IFRS effect (%)
36,5%	36,5%

Post-AQR weighted average share of stage 3 debtors in all portfolios of the bank equals 36,5%. Hence, the share of post-AQR stage 3 debtors has not increased significantly if additional IFRS reclassifications are accounted for. The bank's CET1 capital with capital adequacy increase measures allows the bank to hold adequate provisions for credit impaired debtors.

Key reclassification triggers:

- >90 DPD (days past due) for at least one of the debtor's exposures;
- Restructuring due to deterioration of the debtor's financial conditions.

Post-classification, the bank team estimated the level of expected credit loss (ECL).

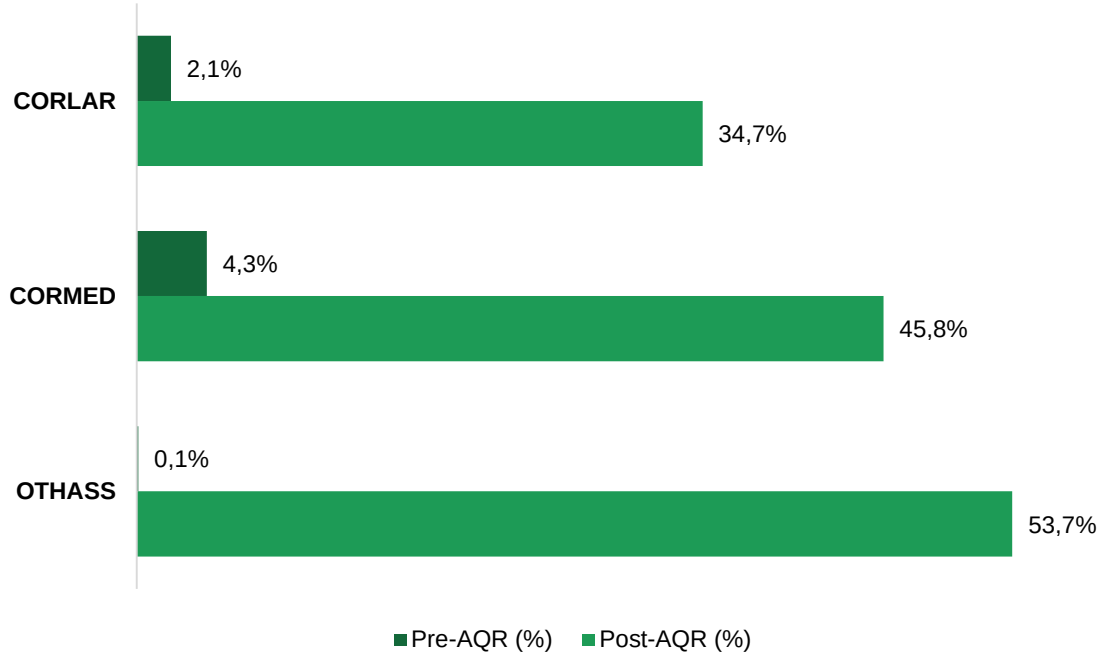
Figure 30 represents the change in ECL ratio in each portfolio of assets valued at amortized cost:

- Pre-AQR ECL is equal to the sum of ECL of exposures in stages 1, 2 and 3 for sampled debtors in the respective portfolio calculated by the bank divided by the exposure of sampled debtors in respective portfolio[87];
- Post-AQR ECL is equal to the sum of ECL of exposures in stages 1, 2 and 3 calculated by the bank team for sampled debtors in the respective portfolio as a result of credit file review, projection of findings and collective provisioning analysis, divided by the exposure of sampled debtors in the respective portfolio.

As depicted in Figure 30, the most significant change in ECL was observed in "other assets" and "medium corporate exposures" portfolios.

[87] According to information provided by banks during AQR.

Figure 30: Pre- and Post-AQR Expected Credit Loss (%)



- *The table does not show portfolios with insignificant number of debtors due to ECL calculation results not being representative;*
- *Portfolio "consumer loans, credit cards and other retail exposures" (RETCON) is not presented on the chart as ECL for this portfolio is calculated fully as a result of collective provisioning analysis – corresponding result is presented in the following section.*

4.12.4. Collective provisioning analysis

The following table shows shares of portfolios selected for the collective provisioning analysis for which the challenger model calculations performed by the bank team resulted in expected credit loss (ECL) estimates exceeding, equal to or below bank's calculations.

2 portfolios were in-scope for the collective provisioning analysis.

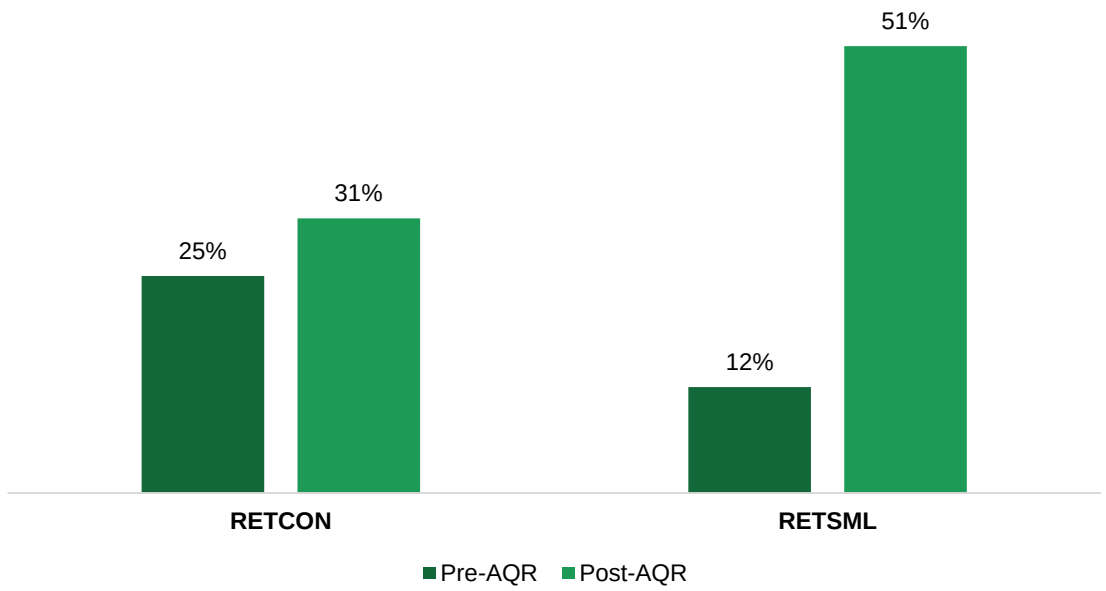
For both of the in-scope portfolios, the challenger model resulted in ECL estimate above bank's calculation.

Table 101: Scope of the collective provisioning analysis (%)

# of portfolios	Challenger model resulted in lower ECL	Challenger model didn't result in lower ECL
2	100%	0%

Loans from "corporate exposures secured by real estate" and from "loans to individuals secured by real estate" portfolios were excluded from the AQR scope for this bank.

Figure 31: ECL per portfolio type (%)[88]



ECL in "small business exposures" portfolio includes credit file review outcomes for the largest debtors of this portfolio.

Table below shows approximated driver analysis of ECL increase for each portfolio type. The impact is assessed by sensitivity analysis of the challenger model and a review of the bank's models.

Table 102: Drivers behind ECL increase, % of total ECL increase

Portfolio type[88]	Understated PD	Understated LGD	CFR projections
Total	**11%**	**89%**	**0%**
RETCON	95%	5%	0%
RETSML	2%	98%	0%

ECL increase drivers were approximated by sensitivity analysis of the challenger model. PD – probability of default; LGD – loss given default; CFR – credit file review.

The table shows relative contribution of each of the drivers to the ECL revaluation based on the bank team's calculation for each portfolio. Thus, "Understated PD" and "Understated LGD" factors demonstrate the share of ECL revaluation driven solely by PD and LGD adjustments used for collective provisioning analysis, and "CFR projections" factor demonstrates the share of ECL revaluation driven solely by the changes in risk parameters for debtors not sampled for CFR. The share of sampled debtors to be reclassified from stage 1 to stages 2 & 3 and from stage 2 to stage 3 was calculated based on the CFR outcomes. The resulting findings were projected to the non-sampled part of the portfolio and collective provisioning analysis was then based on the adjusted impairment staging distribution. Section 7.5.9 of the AQR Manual contains a detailed description of the process of implementation of CFR adjustments in the collective provisioning analysis.

The main drivers of adjustments to the ECL calculations by the bank were:

[88] Portfolio descriptions corresponding to portfolio codes are presented in Table 1.

- **PD**: Occasionally excessive simplification of probability of default calculation, e.g. no estimation or simplified approach to calculation for certain types of products (e. g. leasing, guarantees, receivables);
- **PD**: Lack of proper accounting for the cases of restructurings (incl. refinancing and hidden restructuring) in default rate statistics and calibration of the probability of default models;
- **LGD**: Lack of proper accounting for observed recoveries statistics (e.g. disintegrated systems) and collateral value (e.g. mistakes in data storage) in loss given default models.

4.12.5. Fair value exposures review

As depicted in Table 103 and Table 104, adjustments were non-material, while prudential adjustments were mainly due to revaluation of on-balance real estate.

Table 103: Fair value assets revaluations – adjustments

Asset type	Adjustments prior to tax offsetting			
	KZT BN	*Weighted average revaluation*	*Arithmetic average revaluation*	*Median revaluation*
Bonds	0,0	0,0%	0,0%	0,0%
Derivatives	0,0	N/A	N/A	N/A
Total	**0,0**	**N/A**	**N/A**	**N/A**

Most bonds selected for revaluation were found to be valued correctly or below fair value. No material impact on derivative valuation is explained by no significant issues discovered during derivative pricing models review and CVA impact being non-material.

Table 104: Fair Value assets revaluations – prudential adjustments

Asset type	Revaluation per asset		
	Weighted average revaluation	*Arithmetic average revaluation*	*Median revaluation*
On-balance real estate	-21%	-41%	-32%

Key drivers of valuation change:

- Usage of incomparable analogs and unjustified assumptions (e.g. overly optimistic cash flow expectations or valuing incomplete construction as complete) in appraisal reports used for calculating book value.

4.12.6. Determination of AQR-adjusted capital adequacy ratios

Post AQR, Nurbank's capital surplus taking into account the impact of AQR and capital adequacy improvement measures is assessed at around 0,5-2,5% of risk-weighted assets (Table 105). In terms of the impact of the capital adequacy improvement measures, it is mostly driven by the measures implemented by the bank and its shareholders since AQR as well as the agreed capital injection by the shareholders (the impact is KZT 43,4 BN). Section 5 contains detailed description of capital adequacy improvement measures for each participating bank. Within AQR there have been adjustments applied to prudential reporting which led to correction of k1 capital by KZT 14,7 BN, and k2 capital by KZT 0,4 BN (on top of k1 capital adjustment).

Table 105: k1 capital adjustments

Value		Explanation
1. Pre-AQR CET1 capital adequacy as of 1 April 2019	**16.7%**	**CET1 capital as reported by the bank as of 1 April 2019 as a percentage of total risk-weighted assets (RWAs)**
2. AQR adjustments including approved plans under the Program for Increasing Financial Resilience, KZT BN, as of 1 April 2019	-95,5	Adjustments for exposure in scope for credit file review, fair value assets revaluation: revaluation of bonds and derivatives, decrease of capital impact from the decrease of taxable profits in 2019 and increase in deferred tax assets, adjustments in regulatory reporting
3. Post-AQR CET1 capital adequacy prior to accounting for the measures taken by the bank and the measures under the Framework Agreement (interim calculation)	-8,3%	Post-AQR CET1 capital adequacy prior to accounting for the measures taken by the bank and the measures under the Framework Agreement (interim calculation)
4. Measures undertaken by the bank and its shareholders between 1 April 2019 and 31 December 2019, KZT BN	+22,5	Impact from capital adequacy improvement measures: improvement of portfolio quality, NPL write-offs, securing additional collateral between 1 April 2019 and 31 December 2019
5. Post-AQR CET1 capital adequacy accounting for measures taken by the bank and its shareholders between 1 April 2019 and 31 December 2019 (interim calculation)	-2,4%	Post-AQR CET1 capital adequacy accounting for measures taken by the bank and its shareholders between 1 April 2019 and 31 December 2019 prior to accounting for measures under the Framework Agreement (interim calculation)
6. Measures taken under the Framework Agreement signed on 25 February 2020, KZT BN	+41,8 (+20,9 / +52,1 / -31,2)	Impact of the capital adequacy improvement measures as part of participation in the Program for Increasing Financial Resilience of the Banking Sector (details in Section 5): 1. Requirements from the shareholders to inject capital within 3 months following 25 February 2020; 2. Increase of capital adequacy by the shareholders through participation in the Program for Increasing Financial Resilience of the Banking Sector leveraging the asset protection instrument; 3. Requirement for the bank to raise provisions from income generated on subordinated debt.
7. Bank's post-AQR k1 ratio (final result)	**8,0-10,0%**	**Bank's AQR-adjusted k1 ratio post capital adequacy improvement measures (final result)**

To implement the asset protection instrument a decision has been made to include Nurbank in the existing National Bank Program for Increasing Financial Resilience providing a possibility to issue subordinated debt under the Program conditions. Nurbank complies with the requirements for taking part in the Program, is implementing measures for increasing financial resilience, is taking the highest capital raising requirements for the shareholders and requirement to limit risk exposures.

Prudential impact is fully reflected in the set of measures communicated to banks in the acts of inspection. The Agency will regularly monitor implementation of these measures through SREP process and targeted on-site inspections.

4.13. Home Credit Bank

4.13.1. Portfolio sampling

In accordance with AQR portfolio definition, 92% of loan exposure of Home Credit Bank has been classified as retail. The remaining assets were excluded from the scope of AQR completely as they did not meet criteria for inclusion. Therefore, only “consumer loans, credit cards & other retail exposures” portfolio was selected for AQR and no sampling has been performed for the purposes of credit file review (CFR).

4.13.2. Collective provisioning analysis

The following table shows shares of portfolios selected for the collective provisioning analysis for which the challenger model calculations performed by the bank team resulted in expected credit loss (ECL) estimates exceeding, equal to or below bank’s calculations.

For the in-scope portfolio, the challenger model resulted in ECL estimate above bank’s calculation.

Table 106: Scope of the collective provisioning analysis (%)

# of portfolios	Challenger model resulted in lower ECL	Challenger model didn’t result in lower ECL
1	100%	0%

There are no corporate loans and no “loans to individuals secured by real estate” portfolios in the bank.

Figure 32: ECL per portfolio type (%)[89]

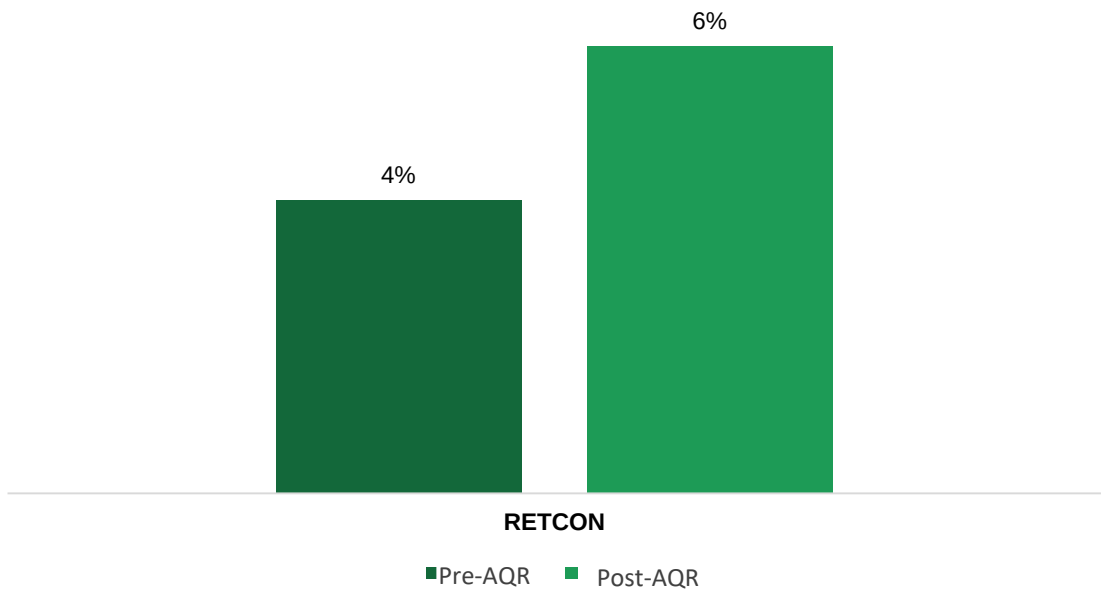


Table below shows approximated driver analysis of ECL increase for each portfolio type. The impact is assessed by sensitivity analysis of the challenger model and a review of the bank’s models.

[89] Portfolio descriptions corresponding to portfolio codes are presented in Table 1.

Table 107: Drivers behind ECL increase, % of total ECL increase

Portfolio type[89]	Understated PD	Understated LGD	CFR projections
Total	**59%**	**41%**	**-**
RETCON	59%	41%	-

ECL increase drivers were approximated by sensitivity analysis of the challenger model. PD – probability of default; LGD – loss given default; CFR – credit file review.

The table shows relative contribution of each of the drivers to the ECL revaluation based on the bank team's calculation for each portfolio. Thus, "Understated PD" and "Understated LGD" factors demonstrate the share of ECL revaluation driven solely by PD and LGD adjustments used for collective provisioning analysis, and "CFR projections" factor demonstrates the share of ECL revaluation driven solely by the changes in risk parameters for debtors not sampled for CFR. The share of sampled debtors to be reclassified from stage 1 to stages 2 & 3 and from stage 2 to stage 3 was calculated based on the CFR outcomes. The resulting findings were projected to the non-sampled part of the portfolio and collective provisioning analysis was then based on the adjusted impairment staging distribution. Section 7.5.9 of the AQR Manual contains a detailed description of the process of implementation of CFR adjustments in the collective provisioning analysis.

The main drivers of adjustments to the ECL calculations by the bank were:

- **PD**: Lack of proper accounting for the cases of restructurings (incl. hidden restructuring), lack of sufficient usage of impairment triggers in default rate statistics and calibration of the probability of default models (e.g. fall in debtor's income as a sign of financial distress);
- **LGD**: Loss given default models use limited and not fully accurate statistics of cash recoveries, there is a need to update and enforce compliance with write-off policies to ensure quality of data used for assessment of recoveries.

4.13.3. Fair value exposures review

As depicted in Table 108, adjustments were driven by correction to derivative pricing models. While direct revaluation of bonds was out of scope for Home Credit Bank, the securities were still analyzed for embedded non-standard derivatives, such as floored coupon or callability by the issuer, and correct accounting, i.e. ensuring that any such embedded derivatives are properly reflected on bank's books and considered during valuation. Revaluation of on-balance real estate was out of scope for Home Credit Bank.

Table 108: Fair value assets revaluations – adjustments

Asset type	Adjustments prior to tax offsetting			
	KZT BN	*Weighted average revaluation*	*Arithmetic average revaluation*	*Median revaluation*
Bonds	0,0	0,0%	0,0%	0,0%
Derivatives	-0,5	N/A	N/A	N/A
Total	**-0,5**	**N/A**	**N/A**	**N/A**

Key drivers of valuation change:

- Usage of improper forward FX rates when pricing derivatives.

4.13.4. Determination of AQR-adjusted capital adequacy ratios

Post AQR, Home Credit Bank had a surplus of k1 capital of 6,3% of risk-weighted assets (Table 109).

Table 109: k1 capital adjustments

Value		Explanation
1. Pre-AQR CET1 capital adequacy as of 1 April 2019	**13,8%**	**CET1 capital as reported by the bank as of 1 April 2019 as a percentage of total risk-weighted assets (RWAs)**
2. AQR adjustments, KZT BN, as of 1 April 2019	-0,4	Adjustments for exposure in scope for credit file review, fair value assets revaluation: revaluation of bonds and derivatives, decrease of capital impact from the decrease of taxable profits in 2019 and increase in deferred tax assets, adjustments in regulatory reporting
3. Bank's post-AQR k1 ratio (final result) as of 1 April 2019	**13,7%**	**Bank's AQR-adjusted k1 ratio (final result)**

Prudential impact is fully reflected in the set of measures communicated to banks in the acts of inspection. The Agency will regularly monitor implementation of these measures through SREP process and targeted on-site inspections.

4.14. VTB Bank

4.14.1. Portfolio sampling

The following table shows proportion of exposure sampled for credit file review (CFR) analysis for all portfolios of assets valued at amortized cost. The first column contains the share of on-balance and off-balance sheet exposures selected for CFR (as a share of total exposure of the portfolio within the AQR scope). For example, if for "corporate exposures secured by real estate" (COREST) portfolio KZT 100 were included in the AQR scope, of which KZT 90 have been selected for CFR review, the value in the first column would be equal to 90%. The second column shows distribution of resulting sample between portfolios (share of a portfolio's exposure sampled for CFR in the overall CFR sample). For example, if total sample for CFR was equal to KZT 1000 and COREST sample was equal to 90, then the value in the second column would be equal to 9%.

Table 110: Sampling rates by portfolio type (%)

Portfolio[90]	Sampling rates	Weight of portfolio in overall sample for CFR
RETEST	24%	6%
COREST	100%	4%
CORINV	100%	19%
CORLAR	100%	51%
CORMED	100%	16%
OTHASS	100%	4%
RELATE	100%	1%

Some borrowers from "small business exposures" portfolios were included in the scope of CFR (as an exception, due to large loans or credit lines of those borrowers) – this fact is not reflected in the table above due to the anomalous nature of such debtors.

4.14.2. Collateral valuation

As can be seen from Table 111, overall upward revaluation for the bank is about 39,2% with the effect mostly coming from "residential real estate" and "commercial & industrial real estate" upward revaluations, what is partially balanced by revaluation in "other land" and "other collateral".

Collateral revaluation results were used as inputs into the credit file review. In other words, they are fully accounted for in the results there, thus they do not represent standalone impact in any form[91]. Within credit file review, the impact of collateral revaluation is taken into account as a change in potential recoveries, but one also has to take into account that collateral revaluation does not have direct impact on expected credit loss (ECL) calculation. In other words, 1 KZT downward revaluation is not equal to 1 KZT ECL upward recalculation due to the following reasons:

- Many facilities have quite high coverage by collaterals thus even a decrease in collateral value may have no impact on actual recoveries of such exposures;
- Many facilities can be covered by debtors' cash flows without the need to foreclose collaterals;
- In ECL calculation the final value is weighted based on probability of scenarios, and the probability of collateral foreclosure scenario may vary for different borrowers.

[90] Portfolio descriptions corresponding to portfolio codes are presented in Table 1.

[91] While revaluations in work block 8 "Fair value exposures review" reflect standalone impact and are not connected to the results of credit file review.

Table 111: Collateral revaluations (KZT BN, % of pre-AQR valuation)

Collateral type	Pre-AQR aggregated value post haircuts (KZT BN)	Post-AQR aggregated value post haircuts (KZT BN)	Weighted average revaluation (%)	Arithmetic average revaluation (%)	Median revaluation (%)
Residential real estate	5,0	6,6	32,3%	42,2%	38,8%
Commercial & industrial real estate	12,1	18,7	54,4%	25,9%	15,0%
Agricultural land	n/a	n/a			
Other land	0,3	0,2	-22,3%	-35,1%	-63,2%
Other collateral[92]	3,0	2,8	-7,7%	10,2%	-9,2%

Weighted average, arithmetic average and median revaluation can be distanced relative to each other due to either existence of outliers in terms of relative revaluation or in terms of collateral value (both relatively big and relatively small sizes). Weighted average takes into account collateral value giving bigger weights to bigger collaterals while arithmetic average and median values perceive all revaluations if they were revaluations of collaterals of the same size.

Overall, the main drivers of collateral value change compared to pre-AQR appraisals are:

- Usage of a comparative approach based on not comparable analogs;
- Usage of cost approach which can lead both to over- and undervaluation;
- Usage of an income approach where future cash flows forecasts are often based only on the expert judgement of an appraiser and do not have any objective justification.

Changes of collateral value used in provisions calculation by the bank as of 1 April 2019 were also driven by imperfections of the current valuation standards in the Republic of Kazakhstan that should be in line with international valuation standards: insufficient granularity of requirements to approach eligibility, sufficient justification of expert judgments and assumptions used, reliability and confirmability of used statistics, etc.

4.14.3. Credit file review and projection of findings

Table 112 represents the results of debtors' reclassification in all portfolios of assets valued at amortized cost:

- Pre-AQR total share of stage 3 debtors in all bank's assets equals the exposure of debtors assigned to stage 3 by the bank itself divided by the total exposure of all debtors in the respective portfolio. Portfolios that were not in the AQR scope are also included;
- Post-AQR total share of debtors in stage 3 in all bank's assets due to IFRS effect is equal to:
    - For exposures in the AQR scope: sum of exposure of debtors classified by the bank as stage 3 and the exposure of debtors reclassified to stage 3 based on all IFRS triggers used for AQR divided by the total exposure of all debtors in the respective portfolio. Portfolios that were not in the AQR scope are also included;
    - For exposures not in the AQR scope: sum of exposure of debtors classified by the bank as stage 3 divided by the total exposure of all debtors in the

[92] "Other collateral" type includes cars and other transport, production and other equipment, inventory, etc.

respective portfolio. Portfolios that were not in the AQR scope are also included.

Table 112: Share of debtors in stage 3 in all bank's assets (including assets which are not in the AQR scope) (%)

Pre-AQR total share of debtors in stage 3 in all banks' assets (%)	Post-AQR total share of debtors in stage 3 in all bank's assets due to IFRS effect (%)
12,5%	12,6%

Post-AQR weighted average share of stage 3 debtors in all portfolios of the bank equals 12,6%. Hence, the share of post-AQR stage 3 debtors has not increased significantly if additional IFRS reclassifications are accounted for. The bank's CET1 capital allows the bank to hold fully adequate provisions for credit impaired debtors.

Key reclassification trigger is the restructuring due to deterioration of the debtor's financial conditions.

Post-classification, the bank team estimated the level of expected credit loss (ECL).

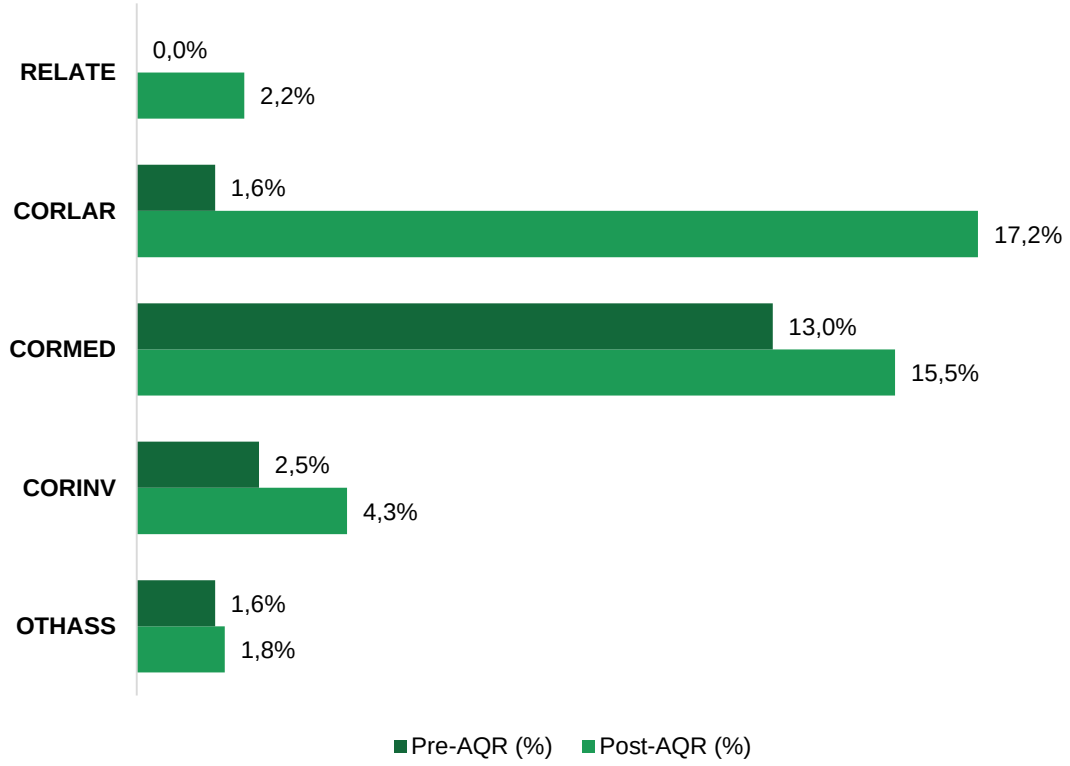
Figure 33 represents the change in ECL ratio in each portfolio of assets valued at amortized cost:

- Pre-AQR ECL is equal to the sum of ECL of exposures in stages 1, 2 and 3 for sampled debtors in the respective portfolio calculated by the bank divided by the exposure of sampled debtors in respective portfolio[93];
- Post-AQR ECL is equal to the sum of ECL of exposures in stages 1, 2 and 3 calculated by the bank team for sampled debtors in the respective portfolio as a result of credit file review, projection of findings and collective provisioning analysis, divided by the exposure of sampled debtors in the respective portfolio.

As depicted in Figure 33, the most significant change in ECL was observed in "large corporate exposures" and "medium corporate exposures" portfolios.

[93] According to information provided by banks during AQR.

Figure 33: Pre- and Post-AQR Expected Credit Loss (%)



- *The table does not show portfolios with insignificant number of debtors due to ECL calculation results not being representative;*
- *Portfolios "loans to individuals secured by real estate" (RETEST) and "consumer loans, credit cards and other retail exposures" (RETCON) are not presented on the chart as ECL for these portfolios is calculated fully as a result of collective provisioning analysis – corresponding results are presented in the following section.*

4.14.4. Collective provisioning analysis

The following table shows shares of portfolios selected for the collective provisioning analysis for which the challenger model calculations performed by the bank team resulted in expected credit loss (ECL) estimates exceeding, equal to or below bank's calculations.

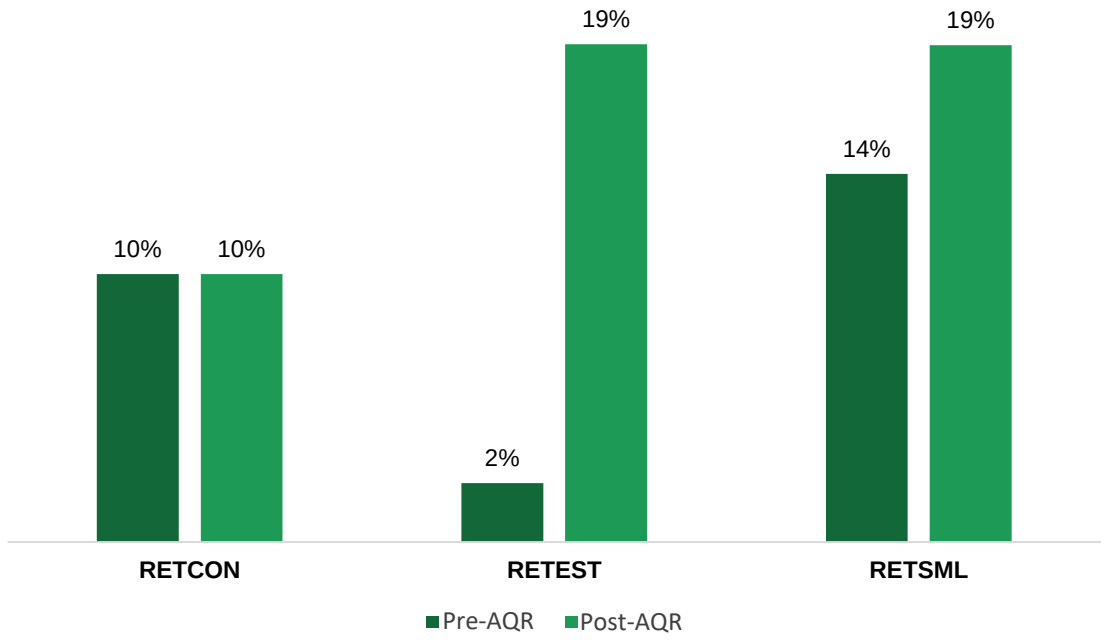
3 retail portfolios were in-scope for the collective provisioning analysis.

For 33% of the in-scope portfolios, the challenger model resulted in ECL estimate below bank's calculation.

Table 113: Scope of the collective provisioning analysis (%)

# of portfolios	Challenger model resulted in lower ECL	Challenger model didn't result in lower ECL
3	67%	33%

Figure 34: ECL per portfolio type (%)[94]



ECL in "small business exposures" portfolio includes credit file review outcomes for the largest debtors of this portfolio.

Table below shows approximated driver analysis of ECL increase for each portfolio type. The impact is assessed by sensitivity analysis of the challenger model and a review of the bank's models.

Table 114: Drivers behind ECL increase, % of total ECL increase

Portfolio type[94]	Understated PD	Understated LGD	CFR projections
Total	**1%**	**71%**	**28%**
RETCON	-	-	-
RETEST	1%	59%	40%
RETSML	0%	100%	0%

ECL increase drivers were approximated by sensitivity analysis of the challenger model. PD – probability of default; LGD – loss given default; CFR – credit file review.

The table shows relative contribution of each of the drivers to the ECL revaluation based on the bank team's calculation for each portfolio. Thus, "Understated PD" and "Understated LGD" factors demonstrate the share of ECL revaluation driven solely by PD and LGD adjustments used for collective provisioning analysis, and "CFR projections" factor demonstrates the share of ECL revaluation driven solely by the changes in risk parameters for debtors not sampled for CFR. The share of sampled debtors to be reclassified from stage 1 to stages 2 & 3 and from stage 2 to stage 3 was calculated based on the CFR outcomes. The resulting findings were projected to the non-sampled part of the portfolio and collective provisioning analysis was then based on the adjusted impairment staging distribution. Section 7.5.9 of the AQR Manual contains a detailed description of the process of implementation of CFR adjustments in the collective provisioning analysis.

[94] Portfolio descriptions corresponding to portfolio codes are presented in Table 1.

The main drivers of adjustments to the ECL calculations by the bank were:

- **PD:** Probability of default models feature arguable simplifications, e.g. discrete approach for receivables based on days past due (PD=100% after certain number of days past due reached, and 0% before that);
- **LGD:** Loss given default models use limited statistics of recoveries (limited range of data used, recoveries are taken into account partially);
- **LGD:** Calibration of / data used for loss given default models does not fully account for the probability of realization for collaterals (e.g. cases when collateral ownership has already been transferred) and uses a simplified set of realization parameters.

4.14.5. Fair value exposures review

As depicted in Table 115, adjustments were non-material. While direct revaluation of bonds was out of scope for VTB Bank, the securities were still analyzed for embedded non-standard derivatives, such as floored coupon or callability by the issuer, and correct accounting, i.e. ensuring that any such embedded derivatives are properly reflected on bank's books and considered during valuation. Revaluation of on-balance real estate was out of scope for VTB Bank.

Table 115: Fair value assets revaluations – adjustments

Asset type	**Adjustments prior to tax offsetting**			
	KZT BN	*Weighted average revaluation*	*Arithmetic average revaluation*	*Median revaluation*
Bonds	0,0	0,0%	0,0%	0,0%
Derivatives	0,0	N/A	N/A	N/A
Total	**0,0**	**N/A**	**N/A**	**N/A**

No material impact on derivative valuation is explained by no significant issues discovered during derivative pricing models review and CVA impact being non-material.

4.14.6. Determination of AQR-adjusted capital adequacy ratios

Post AQR, VTB Bank had a surplus of k1 capital of 5,2% of risk-weighted assets (Table 116).

Table 116: k1 capital adjustments

Value		Explanation
1. Pre-AQR CET1 capital adequacy as of 1 April 2019	**13,4%**	**CET1 capital as reported by the bank as of 1 April 2019 as a percentage of total risk-weighted assets (RWAs)**
2. AQR adjustments, KZT BN, as of 1 April 2019	-1,0	Adjustments for exposure in scope for credit file review, fair value assets revaluation: revaluation of bonds and derivatives, decrease of capital impact from the decrease of taxable profits in 2019 and increase in deferred tax assets, adjustments in regulatory reporting
3. Bank's post-AQR k1 ratio (final result) as of 1 April 2019	**12,7%**	**Bank's AQR-adjusted k1 ratio (final result)**

Prudential impact is fully reflected in the set of measures communicated to banks in the acts of inspection. The Agency will regularly monitor implementation of these measures through SREP process and targeted on-site inspections.

5. Remediation plans

5.1. Conclusions and system-wide measures based on AQR outcomes

The purpose of AQR was to provide a **systematic assessment of banks' approaches** to a number of key aspects of credit processes, impairment staging, provisioning and capital calculation, embedment of risk into business processes, data and systems, models, etc.

For the first time in the history of banking supervision, **such a massive independent review** was conducted across all of the above-mentioned areas **based on global best practices** with more than 500 auditors from the largest international audit firms engaged, along with the leading international asset quality review and banking supervision experts.

Given the scale of this review, its outcomes are aimed not at reflecting specific changes in provisions for a specific loan or borrower but to result in a **systematic transformation of the entire banking sector**, taking the financial system to a more advanced level meeting the highest international standards. To achieve these objectives, the measures provided to the participating banks after the AQR include **systemic guidance on how to change processes, policies, models, systems and data**, which will eventually lead to the following:

- **Consistent application** of accounting standards and prudential standards by all market players;
- **Improved transparency, granularity and reliability** of asset quality and capital adequacy information for both the banks themselves and the regulator and other market participants;
- **Significant improvement in efficiency of the banks' processes** leading to a positive effect on the performance of the banks and their clients;
- **More accurate assessment of risks** and risk-adjusted **returns**, which will also lead to further portfolio quality improvements, decreases in stage 3 shares in banks' portfolios, recovery of lending to healthy sectors of the economy;
- **Digitalization of internal processes of the banks** which will significantly improve not only **customer experience** but also **competitiveness** of the banks, especially taking into account growing competition from foreign banks, which – starting from December 2020 – will be able to open branches in Kazakhstan in accordance with Kazakhstan's WTO agreement;
- Greater portfolio transparency, more efficient processes and higher digitalization will significantly **strengthen the investment attractiveness of Kazakhstan's financial sector** for domestic and international investors.

The review identified some **positive developments with respect to the bank's business processes and risk management frameworks achieved over the recent years**, including the following:

- **Overall, the banks have successfully completed the challenging IFRS 9 transition process**, including developing new approaches to financial assets classification, calculating provisions and book value of the assets in line with the new, more complex standard;
- **Significant progress** has been made with respect to the **embedment of risk metrics models** over the recent years, including in relation to the IFRS 9 transition;
- Overall, the banks demonstrate quite **highly accurate valuations of derivatives and bonds** on their balance sheets, and do not take material risks pertaining to these instruments;

- **Some banks delivered fairly accurate collateral valuations**, which were valued at even higher level during AQR than when estimating provisions by the banks themselves;
- **In the past few years, banks have introduced stricter criteria for related party lending**, which has significantly reduced the issues related to this line of business.

As for the remediation actions identified for the majority of participants, **banks are actively implementing improvements** across the following focus areas:

- Formalization of rules and detailing out **criteria for classification of financial assets** into assets valued at amortized cost or at fair value;
- Improvements in accounting **policies and rules for hedging**;
- Detailing the criteria for classification of assets within **the fair value hierarchy**;
- Adoption of a more extensive and detailed list of criteria for **classification of debtors to impairment stage 2 and stage 3**;
- Implementation of detailed criteria to determine **loan / borrower "cure"**;
- Detailing criteria for the assessment of **credit conversion factors**;
- Expansion of definition criteria and rules with respect to **related parties**, and detailing definition criteria with respect to **connected borrowers**;
- Implementing **CVA calculations** for derivatives;
- Development of quality assurance processes for **collateral and on-balance sheet real estate appraisal**;
- Elaboration of rules for the calculation of capital adequacy in order to **rule out any possible leveraged equity**, including through subsidiaries;
- **Development of credit processes to support a three lines of defense model**, including independence of the bank's risk management function;
- Automation of credit file data storage and improvement of **credit file data quality requirements**;
- Development of detailed requirements for **calculating non-market conditions discounts** for new or restructured loans;
- Further development of **risk models (PD, LGD, EAD, etc.)** including ensuring high quality of **statistical data** used in modelling**;**
- Implementation of all approaches and adjustments implemented at the head office across **all subsidiaries in scope for consolidation** in accordance with IFRS 10;
- Embedding **of adjusted key risk metrics into all key business processes**, including:
    - Calibration of risk appetite limits;
    - Business planning, budgeting and strategy development;
    - Calculation of risk-adjusted returns at transaction, borrower and portfolio level;
    - KPIs for BU managers, and variable component of their compensations;
    - Portfolio and capital management.

The Agency will monitor the implementation of these remediation plans on a regular basis as part of regular inspections and SREP. If the plans are not met, the Agency will adjust its SREP score and take relevant regulatory measures following SREP, including, but not limited to, an idiosyncratic capital add-on. It should be noted that SREP will focus on the measures identified following the AQR, but data will not be requested on a scale comparable with the AQR.

5.2. Remediation plans for banks – Program participants

Following AQR adjustments, as of 1 April 2019, four banks (CenterCredit Bank, ATF Bank, Eurasian Bank and Nurbank) used the opportunity to implement all required measures to improve asset quality by assuming responsibilities for capital increase and risk limitations.

It should be noted that the banks' portfolios **have undergone material changes** since 1 April 2019.

- Banks took into account the AQR outcomes and **started to resolve the identified issues**, e.g.:
  - Fixing issues with availability and quality of data used for risk assessment, ECL calculation, etc.
  - Non-performing exposure management actions, including partial recoveries on such exposures;
  - Using updated AQR-adjusted collateral valuations in ECL calculations;
  - Updating internal policies and procedures to properly capture impairment triggers and refinement of provisioning approaches;
- At the same time **changes were observed in portfolios** themselves as the banks started to exercise measures to improve asset quality, including securing additional collateral on certain exposures, exercising collections on some troubled exposures, managed to collect repayments or wrote off lower credit quality exposures, etc.

Within the scope of existing Program for Increasing the Financial Resilience of the Banking Sector established in 2017, the Government of Kazakhstan, NBK and the Agency defined an additional instrument for asset protection (Asset Protection Scheme), which will ensure the stability of those four above mentioned banks in the short- and long-term.

The mechanism includes two core components:

1. **Shareholder capital injection.** An agreement with shareholders has been reached to provide additional capital that would cover more than 50% of the difference between AQR adjustments and the amount of provisions the banks are creating as part of the Program for Increasing the Financial Resilience. This will have an immediate positive effect on capital adequacy, allowing the banks to fully reflect the required ECL shares on the highest-risk assets within the AQR scope.

2. **Asset protection instrument.** In order to complete the Program for Increasing the Financial Resilience, the JSC "Problem Loan Fund" will provide a 5-year guarantee which will enable a higher coverage of assets by provisions or capital. The guarantee is a non-cash instrument provided to the participants of the Program for Increasing the Financial Resilience for a fee and recognized under IFRS as an instrument which provides coverage for potential risks of decreasing balance sheet value of the banks' assets. This means that the guarantee provides the time and opportunity for the shareholders to cover the remaining risks themselves without using budget funds and for a fee. In addition, under this scheme the government is getting additional income from the shareholders.

   Banks / shareholders need to fulfil a set of obligations implied by the instrument which imposes a number of **strict limitations on the banks and the shareholders**:

   - No unjustified release of provisions on some assets to raise provisions on the assets covered by the guarantee;
   - No hidden restructurings including prepayment of exposures from originating new loans to the same debtor or a connected debtor;
   - No transactions with assets on non-market conditions;
   - Compliance with relevant regulations.

In addition, banks and their shareholders are also required to abide by the following conditions:

- Dividend payout ban;
- Restrictions on high risk loan origination;
- Mergers and acquisitions ban;
- Ban on new exposure origination to related parties and requirement to decrease existing related party portfolios;
- Restrictions on management compensation;
- Restrictions on business entertainment and hospitality expenses;
- Restrictions on decision-making for assets covered by the Program.

To implement the asset protection instrument a decision has been made to include Nurbank in the existing NBK Program for Increasing Financial Resilience providing a possibility to issue subordinated debt under the Program conditions. Nurbank complies with the requirements for taking part in the Program, is implementing measures for increasing financial resilience, is taking the highest capital raising requirements for the shareholders and requirement to limit risk exposures.

Further details on the instrument and the outcomes in terms of improvements of capital adequacy and portfolio asset quality will be provided over the course of the instrument duration, including a description of key performance indicators for the implemented measures, as well as NBK and the Agency's conclusions on the sufficiency of the implemented measures for maintaining financial stability.

This means that taking into account AQR outcomes and all implemented measures, **all banks** in scope of AQR have **sufficient CET1 capital** to comply with regulatory requirements and cover expected credit loss **without using budget funds**.

6. Next steps

The AQR has provided a basis and a starting point for NBK and the Agency to further progress on implementing actions aimed at **strengthening and developing the banking system** of Kazakhstan, **its ability to withstand crisis events**, as well as enhancing **transparency of the financial system** in the national and international context. In particular, the AQR findings confirm that the focus of NBK and the Agency on the evolution towards a risk-based supervisory model is an essential step and the cornerstone of **financial stability**.

The AQR is a crucial building block in a **broader transformation of NBK's and the Agency's supervisory framework** that will be centered around three key strategic priorities:

- A. Implementation and enhancement of supervisory measures required to bridge the gaps identified by AQR, including the introduction of respective corrective measures. Such measures may include:

- **Articulating specific supervisory requirements for the areas where the gaps were identified during AQR.** This initiative will be implemented during 2020, including the following areas:

  - **Specifying requirements for provisions calculation**
    - **Application of credit impairment triggers**, including those related to the borrower's financials;
    - **Detailing loan restructuring criteria** due to the deterioration of the borrower's financials, taking into account changes in the loan NPV;
    - **Specifying requirements for financial statements acceptable for the borrower credit review**;
    - Detailing criteria for classifying borrowers as **related parties** including principal-agent / trust-trustee scenarios;
    - Expanding the definitions **of default and recovery**;
  - **Detailing rules for valuation of assets held at fair value,** including **elaborating requirements for applying the fair value hierarchy** under IFRS 13;
  - **Risk model requirements**
    - Developing **requirements** for regular back testing and quality of **risk models**;
    - Developing **requirements to the frequency and procedures for model development and validation**;
  - Formalizing the rules to apply the regulatory requirements to the bank's entire consolidation scope;
  - Imposing stricter requirements for the valuation of collateral and on-balance real estate;
  - Improving the mechanism of applying idiosyncratic capital add-ons based on the SREP outcome, which will encourage the banks to immediately implement the prescribed remediation plans as a result of the reviews. This initiative is to be implemented during the current SREP cycle and includes detailing the rules for application of the capital add-ons and formalization of rules to account for insufficient provisioning by the banks in the capital add-ons.

- B. Further evolution towards **risk-based supervision**.

  From 2019 the regulator has shifted from a formalized banking supervision to risk-based supervision (RBS) which allows to assess the banks based on assessment of

their risks. The basic component of RBS is SREP framework (Supervisory Review and Evaluation Process) which is aimed at assessment of risks of each individual bank and allows to segment the banks by risk level, their capital and liquidity adequacy.

- **Improving SREP to take into account the experience acquired during the AQR**. SREP framework is a regular process to assess quantitative and qualitative characteristics of banks' activities and risks across four key categories:

  - Firstly, bank's business model and profitability are reviewed;
  - Secondly, corporate governance and risk management are evaluated. This review is conducted to assess the compliance of the bank with requirements and standards of the internal policies;
  - Thirdly, risks to capital adequacy are assessed. An analysis of capital sufficiency to cover certain risks is conducted (credit risk, interest rate risk of the banking book, market risk, operational risk, etc.);
  - Finally, risks to liquidity are assessed. The level of the bank's liquidity sufficiency is reviewed for a scenario of potential outflow of deposits and other funding sources of the bank.

  If required, the final stage of SREP is application of the supervisory response measures which are defined based on the conducted analysis. Plans for further development of SREP and RBS include the following:

  - Implementation of corrective measures plans by the banks following the results of AQR will be monitored by the regulator as part of SREP;
  - Implementation by the banks of the regulatory measures will impact the supervisory assessment of the bank within SREP which will have implications on the supervisory response measures;
  - Roll-out of the capital add-on instrument. Capital add-on is an idiosyncratic additional requirement on top of minimum prudential thresholds.

- **Development of the regulator's analytical tools and regulatory reporting. This initiative is to be implemented during 2020 and 2021 and includes the following:**

  - **Expansion of regulatory reporting formats** to integrate all the necessary information;
  - **Development of automated quality control tools** for submitted regulatory reports;
  - **Development of big data-based models** within the Agency to measure risk metrics for all portfolios in each bank and system as a whole;
  - **Development of scenario analysis models** within the Agency for detailed assessment of portfolio quality and capital adequacy.

- C. Further actions to improve soundness and stability of the financial system.

- Developing an **efficient supervisory stress testing framework** in line with the leading international prudential standards but limiting the burden on the banks. This initiative will be implemented in the second half of 2020 and early 2021 and includes the following:

- **Development of a supervisory stress testing methodology** in line with the international leading practices and at the same time reflecting Kazakhstan's situation;
- Pilot measurement of key metrics under stress;
- Integration of **stress testing results** as a component for calculation of the **regulatory capital add-on** within **SREP**.

– Implementation of **recovery and resolution plans** to ensure the banks' resilience in a crisis covered by their own and shareholders' resources. This initiative is to be implemented during 2021 and subsequent years and includes the following:

- **Development of requirements** designed to ensure that the banks' recovery and resolution plans are realistic;
- **Pilot cycles** of recovery and resolution planning;
- Integration of **recovery and resolution planning results** as a component for calculation of the **regulatory capital add-on** within **SREP**.

Appendix A: List of abbreviations

Agency	Agency for Regulation and Development of the Financial Market of the Republic of Kazakhstan
AQR	Asset Quality Review
AQR Manual	Asset Quality Review Manual dated 26 July 2019, available at https://www.nationalbank.kz/?docid=3610&switch=russian
CET1	Common equity Tier 1
CFR	Credit file review
CPMO	Central Program Management Office
CVA	Credit valuation adjustment
DIV	Data integrity validation
EAD	Exposure at default
ECB	European Central Bank
ECL	Expected credit loss
EIR	Effective interest rate
EVS	European Valuation Standards
IFRS	International Financial Reporting Standards
IAS	International Accounting Standards
ISIN	International Securities Identification Number
KASE	Kazakhstan Stock Exchange
KPI	Key performance indicator
KZT	Kazakhstani tenge
LGD	Loss given default
NBK	National Bank of Kazakhstan
PD	Probability of default
PP&A	Processes, policies and accounting practices
RBS	Risk-based supervision
RWA	Risk-weighted assets
SICR	Significant increase of credit risk
SPPI	Solely for payment of principal and interest
SREP	Supervisory Review and Evaluation Process