

UDC 336.7

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

Abstract: Kazakhstan has moved from cash to card payments very quickly, and experiments in other countries show that people tend to spend more when they pay by card. This study asks whether the regions of Kazakhstan that moved away from cash faster also had faster growth in bank loans to households. I used National Bank of Kazakhstan data for all 20 regions: the value of cashless card payments and card cash withdrawals in 2023, 2024 and 2025, and outstanding household loans on 1 January 2024, 2025 and 2026. Across the 20 regions, growth in cashless payments in 2024 was strongly correlated with growth in household loans ($r = 0.66$, $p = 0.002$). A leave-one-out check showed that this result depended on one region, Zhetysu: without it, the correlation fell to 0.17 ($p = 0.48$). Zhetysu is one of three regions created in June 2022, and in 2024 these three regions had the fastest growth in card cash withdrawals in the country, while the regions they were separated from grew slowly or declined. When the new regions were excluded, or merged back into their former regions, none of the correlations was significant. The change in the cashless share of card turnover, which measures the move away from cash directly, was not related to consumer loan growth in either year. At the regional level, the shift to cashless payments has not come with faster borrowing, and regional statistics for 2023 and 2024 need care because of the 2022 boundary change.

Keywords: cashless payments; household credit; consumer loans; regional statistics; Kazakhstan; correlation; influential observations

1. Introduction

In Kazakhstan, paying by card or by phone has become the normal way to pay. According to the National Bank of Kazakhstan, cashless payments made with cards in the country reached 186.3 trillion tenge in 2025, compared with 142.6 trillion tenge in 2023, while the number of cash withdrawals with cards went down over the same period [1, 2]. The Global Findex survey shows the same change from the side of households: the share of adults in Kazakhstan who made or received a digital payment rose from 77.9% in 2021 to 85.0% in 2024 [3]. At the same time, bank lending to households grew fast. Outstanding bank loans to households in tenge increased from 16.7 trillion tenge on 1 January 2024 to 24.8 trillion tenge on 1 January 2026, and about two thirds of this amount are consumer loans [4].

There is a reason to think these two trends could be connected. Research in consumer psychology has shown for a long time that the way people pay changes how much they spend. Feinberg found that credit card cues alone made people more willing to spend [5]. In real

transactions of high value, Prelec and Simester found that people's willingness to pay could be up to twice as high when they were told to pay by credit card instead of cash [6]. Soman showed that spending depends on how strongly a payment method makes people notice the amount they pay and how soon the money actually leaves their account [7]. Raghbir and Srivastava found that people were willing to spend more when a credit card logo was present, and that they spent more with a stored-value certificate than with cash of the same value [8]. One explanation is the "pain of paying": giving up money is unpleasant, and this feeling is weaker when paying is separated from consuming [9]. Card payments have also been linked to more impulsive purchases [10].

Most of this evidence comes from experiments or from data on individual shoppers. At a larger scale, Humphrey described how cards replaced cash in consumer payments in the United States [11], and Li, Wu and Xiao found that the development of digital finance in China was associated with higher household consumption [12]. Borrowing on cards can also be a reasonable choice for a household when other kinds of credit are more costly to arrange [13].

Kazakhstan's regions give a natural setting to look at this question. The share of cashless payments in card turnover is very different from region to region: in 2023 it ranged from 69.4% in North Kazakhstan region to 91.4% in the city of Almaty [1]. If paying by card makes people spend and borrow more, then the regions that are moving away from cash faster might also be the regions where household debt grows faster. But this does not follow automatically. A pattern that holds for individuals does not have to appear in regional totals, and a correlation between regional figures can appear or disappear for reasons that have nothing to do with how individuals behave [14].

This study uses data for the 20 regions of Kazakhstan in 2024 and 2025 and asks three questions:

- Was faster growth in cashless card payments associated with faster growth in household loans?
- Was the move away from cash itself, measured as the change in the cashless share of card turnover, associated with faster growth in consumer loans?
- How much do the results depend on single regions, in particular on the three regions created in 2022?

2. Data and methods

Payments data. Data on payments come from the National Bank of Kazakhstan releases "Payment cards and electronic banking services". Table 5 of each release shows the use of payment cards in Kazakhstan by region: the number and value of cashless operations and the number and value of cash withdrawals for the previous calendar year. I used the releases of 29 January 2024 (No. 244), 30 January 2025 (No. 256) and 30 January 2026 (No. 268), which cover 2023, 2024 and 2025 [1, 2, 15]. In each year the 20 regions add up exactly to the national total in the table.

Loan data. Data on loans come from the National Bank files "Loans of the banking sector to the population by region" for 2024 and 2025 [4]. These files give outstanding loans at the start of every month for each region, split into national and foreign currency and, separately, into mortgage, consumer and other loans. In National Bank statistics, loans to the population are loans to individuals for purposes not related to business, issued by second-tier banks and the Development Bank of Kazakhstan [16]; loans that sole proprietors take for their business are

not included. I used balances in national currency on 1 January 2024, 2025 and 2026. Loans in foreign currency are too small to matter: they were 0.02% of all household loans on 1 January 2024 and 0.01% on 1 January 2026.

Regions. The analysis covers 17 regions and the cities of Astana, Almaty and Shymkent. Three of the regions are new. By Presidential Decree No. 887 of 3 May 2022, which came into force on 8 June 2022, Abai region was separated from East Kazakhstan region, Zhetysu region from Almaty region, and Ulytau region from Karaganda region. The administrative centre of Almaty region was moved from Taldykorgan, which became the centre of Zhetysu, to Qonaev [17]. This change matters for the results (Section 3.3).

Checking the data. Before the analysis, every value in the working spreadsheet was compared with the original publications: 240 payment values (20 regions, 3 years, 4 indicators) and 60 loan values (20 regions, 3 dates). No differences were found.

Measures. For each region and year I calculated:

- growth in cashless payments, the percentage change in the value of cashless card operations compared with the previous year;
- the cashless share, the value of cashless operations divided by the value of cashless operations plus cash withdrawals, in per cent, and its change in percentage points;
- growth in household loans and in consumer loans, the percentage change in outstanding loans from 1 January of one year to 1 January of the next.

Payments in a calendar year are compared with the change in loans over the same year. For 2024 this means cashless payments in 2024 compared with 2023, and loans on 1 January 2025 compared with 1 January 2024. The cash side of these data covers only cash that was taken out with a card. Cash that people receive in other ways and spend without a card is not in the data, so the cashless share describes card turnover, not all spending in a region.

Analysis. For each year I calculated the Pearson correlation coefficient r and the Spearman rank correlation ρ across the regions. With 20 observations, a correlation has to be at least 0.44 in absolute value to be significant at the 5% level in a two-sided test. Because one region is 5% of such a small sample, I also used a leave-one-out check: the correlation was calculated 20 more times, each time without one region. This is a simple form of the idea behind Cook's distance, which measures how much a result depends on one observation [18], and it follows Anscombe's advice to look at the data behind a correlation and not only at the coefficient [19]. Finally, the analysis was repeated in two ways that take the 2022 boundary change into account: first without the three new regions (17 regions), and then with each new region added back to the region it was separated from, which restores the boundaries before 2022 (17 units). The first calculations were made in Microsoft Excel with the CORREL function, and all results were then checked again in Python with the SciPy library.

3. Results

3.1 The national picture

Table 1 shows the main national figures. Cashless card payments grew by 15.9% in 2024 and by 12.8% in 2025. The value of cash withdrawals also grew, but more slowly, and the number of withdrawals went down every year, from 241.6 million in 2023 to 233.9 million in 2025. As a result, the cashless share of card turnover increased from 86.2% to 87.2%. Across

regions, the share was lowest in North Kazakhstan region (69.4% in 2023 and 72.9% in 2025) and highest in the city of Almaty in 2023 (91.4%) and in Almaty region in 2025 (91.7%).

Household loans grew by 23.9% in 2024 and by 19.8% in 2025. Consumer loans grew even faster in 2024, by 33.5%, and their share in all household loans rose from 61.8% to 67.3% between the start of 2024 and the start of 2026.

Table 1. Card payments and household loans in Kazakhstan, 2023-2025

Indicator	2023	2024	2025
Cashless card payments, trillion tenge	142.6	165.2	186.3
Card cash withdrawals, trillion tenge	22.9	25.4	27.3
Number of card cash withdrawals, million	241.6	238.4	233.9
Cashless share of card turnover, %	86.2	86.7	87.2
Household loans at the end of the year, trillion tenge	16.7	20.7	24.8
Consumer loans, % of household loans	61.8	66.6	67.3

Loans are balances in national currency on 1 January of the following year. Sources: National Bank of Kazakhstan releases No. 244, 256 and 268 (Table 5); regional loan files for 2024 and 2025.

3.2 Growth in cashless payments and growth in loans

In 2024, the regions where cashless payments grew faster also tended to have faster growth in household loans (Figure 1). The correlation was strong: $r = 0.66$ ($p = 0.002$) and $\rho = 0.54$ ($p = 0.015$). For consumer loans it was a little stronger, $r = 0.70$ ($p = 0.001$). In 2025 the relationship was much weaker: $r = 0.27$ ($p = 0.24$) for all household loans and $r = 0.27$ ($p = 0.26$) for consumer loans.

When I first got $r = 0.66$ for 2024, it looked like a clear answer to the main question. The leave-one-out check changed this (Figure 2). Removing any one of 19 regions left the correlation between 0.63 and 0.77. Removing Zhetysu region dropped it to 0.17 ($p = 0.48$), far below the significance threshold. For 2025, without Zhetysu, the correlation was -0.01. In other words, most of the 2024 result came from one point. In 2024 Zhetysu had by far the fastest growth in both variables: cashless payments rose by 63.5% (the median for all regions was 15.1%) and household loans by 49.7% (median 22.8%).

3.3 Zhetysu and the 2022 boundary change

Zhetysu's cashless share did not go up in 2024. It went down, from 82.6% to 81.7%, because card cash withdrawals in the region grew even faster than cashless payments, by 74.2%. So the region that produced the strong correlation was not moving away from cash at all.

Cash withdrawals in all regions (Figure 3) help to explain why. The three largest increases in 2024 were in exactly the three regions created in 2022: Zhetysu (+74.2%), Ulytau (+29.7%) and Abai (+29.5%). The regions they were separated from showed the opposite: Almaty region -32.2%, East Kazakhstan -6.2% and Karaganda +2.3%, while the median for the other 14 regions was +6.9%. Each of the three new regions had faster growth in cash withdrawals than every one of the other 17 regions (Mann-Whitney $U = 51$, the largest possible value, $p < 0.001$).

When each new region is added together with its former region, these jumps cancel out (Table 2). In 2024, card cash withdrawals in Zhetysu and Almaty region together grew by only 0.9%, in Abai and East Kazakhstan together by 5.8%, and in Ulytau and Karaganda together by 6.0%. All three are close to the median of the other regions. In 2025 the new regions were already close to normal.

Table 2. Growth in 2024 in the regions created in 2022 and in the regions they were separated from

Region	Card cash withdrawals, %	Cashless payments, %	Household loans, %
Zhetysu	+74.2	+63.5	+49.7
Almaty region	-32.2	+19.0	+26.9
Together	+0.9	+31.5	+40.0
Abai	+29.5	+25.9	+33.4
East Kazakhstan	-6.2	+10.3	+19.0
Together	+5.8	+16.5	+24.3
Ulytau	+29.7	+16.1	+23.4
Karaganda	+2.3	+7.2	+18.8
Together	+6.0	+8.4	+19.4
Median of the other 14 regions	+6.9	+14.4	+22.3

"Together" is the growth of the sum of the two regions. Author's calculations based on National Bank of Kazakhstan data.

This pattern suggests that in 2024 part of the card activity was still being moved between the old and the new regions in the statistics, for example as cards, accounts or cash machines were counted in the new region instead of the old one. The data do not show how exactly this happened, so this is a likely explanation and not a proven fact. It also does not explain everything. Zhetysu and Almaty region together still had faster growth than the other regions in cashless payments (31.5% against a median of 14.4%) and in household loans (40.0% against 22.3%), so the area of the former Almaty region really did grow fast in 2024. Either way, the strong correlation for 2024 depended on how the activity of one area was divided between two regions.

3.4 Taking the boundary change into account

Table 3 shows the correlations with the two corrections for the 2022 boundary change. Without the three new regions, the 2024 correlation between growth in cashless payments and growth in household loans is 0.05 ($p = 0.84$). With the new regions merged back into their former regions, it is 0.26 ($p = 0.32$). Once the boundary change is taken into account, none of the correlations in Table 3 is significant at the 5% level in either year. The strongest one left is between growth in cashless payments and growth in consumer loans in 2024 for the merged regions, $r = 0.42$ ($p = 0.09$), and it drops to 0.26 when the merged Almaty region is removed. The Spearman coefficients lead to the same conclusions. Using the value of loans issued during the year instead of balances, which is possible only for 2025, gives the same result: none of the four correlations is significant (all $p > 0.07$).

Table 3. Pearson correlations across regions under three ways of treating the 2022 boundary change

Measure	Regions	2024, r (p)	2025, r (p)
Cashless growth and household loan growth	All 20	0.66 (0.002)	0.27 (0.242)
	Without new regions (17)	0.05 (0.838)	0.09 (0.718)
	New regions merged (17)	0.26 (0.321)	0.24 (0.361)

Cashless growth and consumer loan growth	All 20	0.70 (0.001)	0.27 (0.256)
	Without new regions (17)	0.31 (0.232)	0.23 (0.379)
	New regions merged (17)	0.42 (0.091)	0.21 (0.417)
Change in cashless share and consumer loan growth	All 20	-0.16 (0.504)	-0.20 (0.407)
	Without new regions (17)	0.17 (0.522)	-0.21 (0.429)
	New regions merged (17)	0.29 (0.251)	-0.14 (0.592)

"New regions merged" means that Zhetysay is added to Almaty region, Abai to East Kazakhstan and Ulytau to Karaganda. Author's calculations.

3.5 The cashless share and consumer loans

The measure that is closest to the research question is the change in the cashless share, because it shows how much a region actually moved from cash to cards and not only how much its card payments grew. This measure was not related to consumer loan growth in any version of the analysis (Table 3, Figure 4). In 2024 the correlation was -0.16 ($p = 0.50$), and in 2025 it was -0.20 ($p = 0.41$). The level of the cashless share at the start of the year was not related to consumer loan growth either ($r = -0.09$, $p = 0.71$ for 2024; $r = 0.36$, $p = 0.12$ for 2025).

Two regions show this well. In 2024, Turkestan and Akmola regions moved away from cash more than almost any other region: their cashless shares rose by 5.6 and 5.8 percentage points, while the median change was 0.7. (The only larger increase, in Almaty region, is affected by the boundary change described in Section 3.3.) Consumer loans in these two regions grew by 33.4% and 35.6%, very close to the median of 35.4%. The fastest move to cashless payments did not come with any unusual growth in borrowing.

4. Discussion

The main answer to the research question is negative. Across the regions of Kazakhstan, a faster move away from cash did not go together with faster growth in household or consumer loans in 2024 or 2025. The only strong correlation in the data, between growth in cashless payments and growth in loans in 2024, depends on one region and on how activity was divided between old and new regions after 2022.

Looking back, it is not surprising that a correlation like $r = 0.66$ appeared. Both variables are measured in money, and both grow when a region's economy, prices and population grow, so a region that grows fast in general will be high on both axes. With only 20 regions, one such region is enough to create a strong correlation. This is the situation Anscombe described when he showed that the same correlation coefficient can come from very different data [19]. For me the practical lesson was that a correlation coefficient is not a result on its own. It has to be checked with a plot and with a leave-one-out test before it is interpreted.

The negative result does not mean that the card effect found in experiments [6, 7] is absent in Kazakhstan. Regional data cannot answer that question. A person may spend more when paying by card, while regional totals are driven mostly by other things, such as incomes, prices, the spread of banking apps and national lending conditions. Robinson made the general point that correlations between group figures do not show how individuals behave [14]. In Kazakhstan there is also little variation left to work with: in most regions more than 80% of card turnover is

already cashless, and in 2024 the median region moved by less than one percentage point. Household loans, on the other hand, grew by at least 15.8% in every region in 2024, which suggests that the main reasons for the growth in lending were common to the whole country. Studies that do find a link between digital finance and consumption, such as the study by Li, Wu and Xiao for China [12], use data on thousands of households, which gives them far more statistical power than 20 regions and two years.

A second finding of this paper is about the data. In 2024, two years after the new regions were formed, the regional card statistics still showed large shifts between the new regions and their former regions. Any study that compares growth by region in 2023 and 2024 can be affected, especially a study that pays attention to single regions. Merging each new region with its former region, as in Section 3.4, is a simple way to avoid this problem.

5. Conclusion, limitations and recommendations

This study looked at whether the move from cash to cashless payments in the regions of Kazakhstan was accompanied by faster growth in bank loans to households. A strong correlation appeared for 2024 ($r = 0.66$), but it depended on one region, Zhetysu, and disappeared once the 2022 boundary change was taken into account. The change in the cashless share of card turnover, which measures the move away from cash directly, was not related to consumer loan growth in either year. At the level of regions, there is no evidence that the shift to cashless payments was driving household borrowing in 2024 and 2025.

Limitations

Small sample. Twenty regions and two years give little statistical power, so a real correlation of moderate size could be missed.

Cash is measured only in part. The data include only cash that was taken out with cards. Cash received as wages or from other people and spent without a card is not counted.

Balances and flows. Loans are balances at a date, while payments are totals over a year. Loans issued during the year are a closer match to payments, but in the files used they are available for 2024 and 2025 only, so this check was possible for 2025 alone.

Regional attribution. The publications do not explain how banks assign card operations and loans to regions. Section 3.3 shows that this assignment changed for the new regions.

Nominal values. All values are in current tenge and are not adjusted for inflation. Inflation differs between regions to some extent, which adds noise to the growth rates.

Revisions. The National Bank revises December data after the end of the year [20]. The values used here are the ones available in September 2026.

Correlation only. Even a significant correlation would not show that one variable causes the other.

Recommendations

For researchers who use Kazakhstan's regional statistics for 2023 and 2024: check every result for dependence on single regions, and treat Abai, Zhetysu and Ulytau with care, for example by merging them with their former regions. A short methodological note from the National Bank on how card operations were reassigned to the new regions would help users of these tables.

For future work on this question, data on individual households or bank customers would be needed to see whether people who switch to cards also borrow more. Longer regional series, after the statistics for the new regions settle, would also make a regional test more reliable.

Data availability

The National Bank releases used in this study are publicly available at the links given in the references. The regional loan files and the spreadsheet with all calculations are available from the author on request. I could not find a stable public link to the regional loan files on the National Bank website.

AI-use disclosure

The author collected the data from the National Bank publications, built the spreadsheets and made the first correlation and leave-one-out calculations in Microsoft Excel. Generative AI tools were used for language editing, for structural revision of the text, and to help re-check the calculations and produce the figures in Python. All numbers in the paper were checked against the original National Bank publications.

Conflicts of interest

The author declares no conflicts of interest.

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Figures

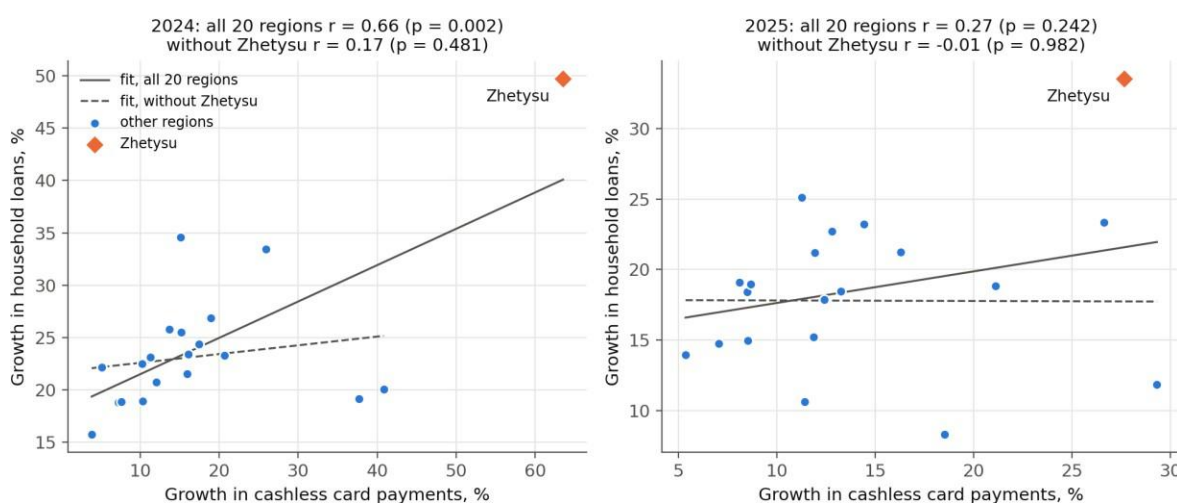


Figure 1. Growth in cashless card payments and growth in household loans across 20 regions, 2024 and 2025. Lines show linear fits with and without Zhetysu.

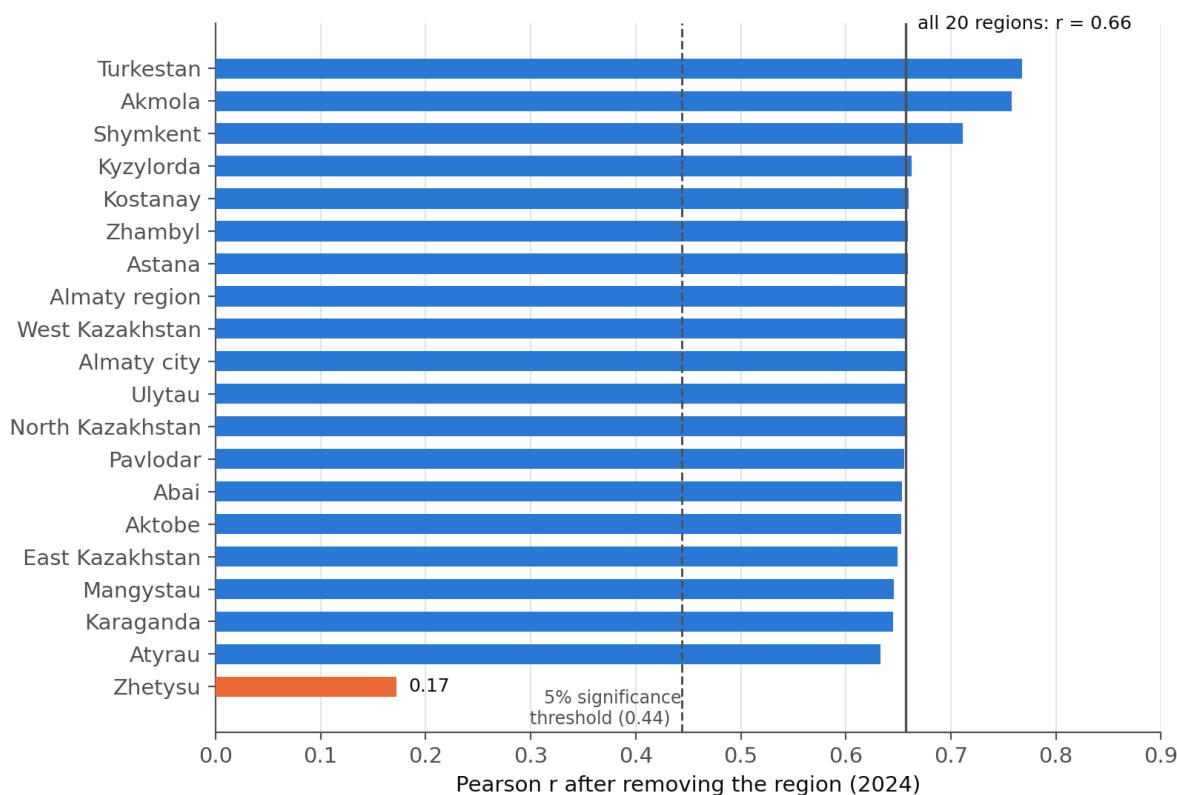


Figure 2. Leave-one-out check for 2024: the correlation between growth in cashless payments and growth in household loans after removing each region in turn.

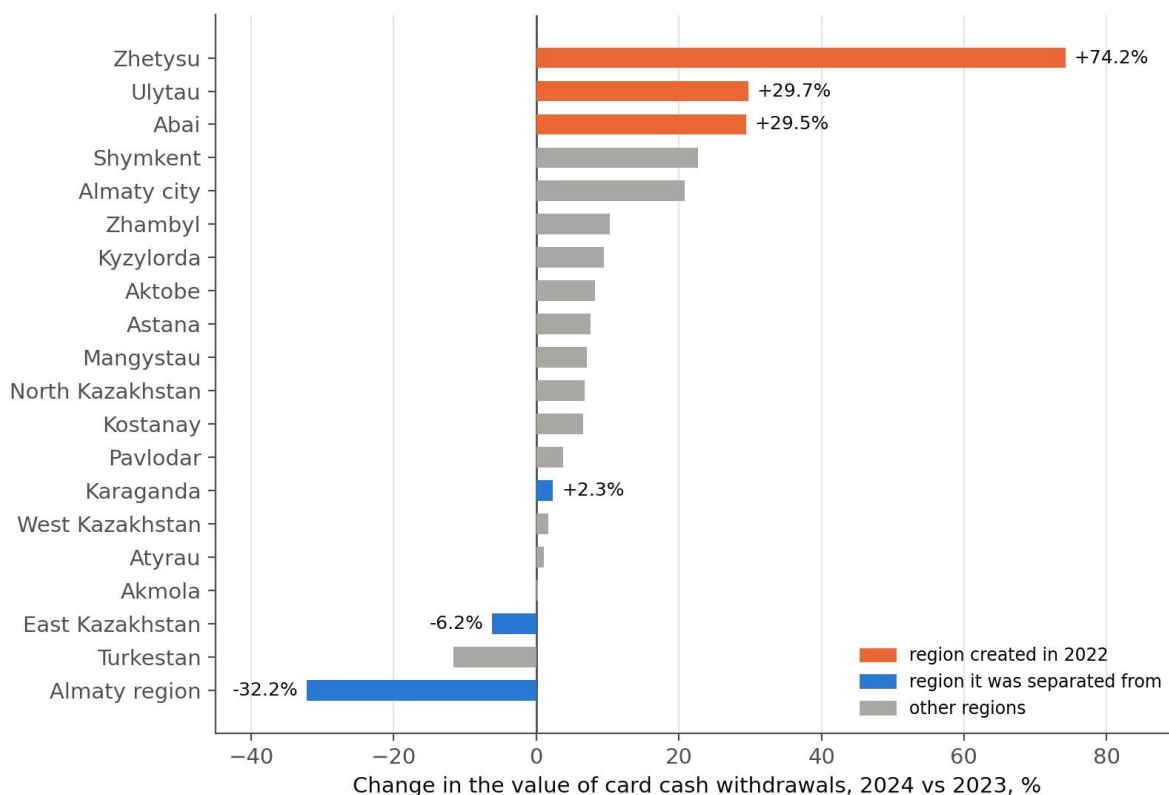


Figure 3. Change in the value of card cash withdrawals in 2024 compared with 2023, by region.

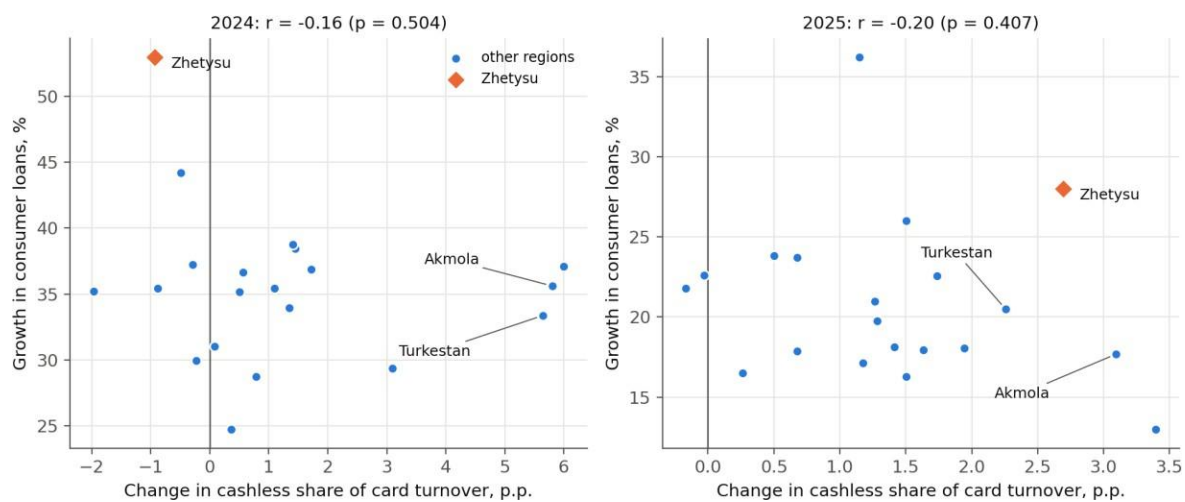


Figure 4. Change in the cashless share of card turnover and growth in consumer loans across 20 regions, 2024 and 2025.

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