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ORIGINAL ARTICLE

Digital Financial Transactions and Household Economic Behaviour in Kazakhstan

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Abstract
The acceleration of digitalization of financial services and the expansion of non-cash and online transactions is transforming the economic behavior of households, changing the structure of consumption, borrowing and saving, as well as strengthening the relationship between retail business activity and banking financial instruments. The study aims to assess the impact of digital financial transactions on household behaviour in Kazakhstan, focusing on consumption, borrowing, savings, retail activity, household lending, and deposit accumulation within the banking system. The study's methodological basis is a quantitative approach using a system of indicators reflecting households' financial behaviour, including consumption, credit activity, savings, and digital transactions. The study covers the period 2014–2024 and is based on macroeconomic and financial indicators characterising the dynamics of consumption, lending, savings, and digital payments. The results showed that in 2014-2024, household deposits increased from 4.3 to 23.0 trillion tenge, household loans from 3.7 to 20.3 trillion tenge, the number of online transactions increased almost 190-fold, and the volume of digital payments almost 500-fold. Regression models confirmed a significant association of digital transactions with consumption, lending, deposits, and retail turnover; R2 values were 0.973, 0.958, 0.979, and 0.940, respectively. The findings show that the digitalization of financial transactions enhances not only household financial activity but also the development of the retail business environment, as online payments and digital services increase consumption intensity and support the growth of Kazakhstan's consumer market.

KEYWORDS
Finance, Digital Finance, Digital Economy, Household Behaviour, Household Economy, Consumer Lending, Business Activity, Consumption

1 | INTRODUCTION

The digitalisation of financial services and payment systems changes banking activity, retail markets, and consumer finance by accelerating the circulation of financial resources and expanding the use of digital transactions (Ure, 2021). The integration of online banking, FinTech platforms, cashless payments, and digital lending instruments increases retail turnover, household borrowing, and consumer spending. As digital financial services become integrated into everyday economic activity, financial transactions are performed more frequently and at lower transaction costs, thereby increasing the macroeconomic significance of household financial behaviour. However, even in developed financial markets, unresolved issues remain regarding systematic inefficiency in households' decision-making: overborrowing, misallocation of funds, and the loss of available financial resources through product use. Households incur high costs for account and credit card services, with a substantial share attributable to peculiarities in decision-making. A significant portion of interest payments and fees can be eliminated through simple changes in everyday financial behaviour (Stango & Zinman, 2009).

Households spend money immediately after receiving income. Moreover, even when income is known in advance and should be distributed equally, households tend to spend 50–75% of it. At the same time, the level of liquid savings remains low, and debt obligations and the accumulation of illiquid assets continue (Beshears et al., 2018). These behavioural patterns influence not only household financial stability but also broader economic processes through their impact on retail consumption, banking sector liquidity, and consumer lending activity.

Digital platforms enhance the influence of financial instruments on consumer behaviour by integrating payments and lending into a single digital space (Frost et al., 2019). The expansion of FinTech infrastructure and digital payment systems is changing retail trade and financial services by combining purchasing, lending, and payment operations on digital platforms. Financial transactions are conducted within a single environment and become part of everyday economic activity. Online payment platforms in China expand the use of digital financial services and increase transaction activity by simplifying payments and access to credit instruments (Zhao et al., 2024). In Europe, online banking services reinforce existing differences in the use of financial instruments. In the Czech Republic, some customer groups remain cost-conscious and use a limited set of transactions, while others utilise a wider range of electronic payments and digital banking services (Soukal & Draessler, 2019).

Research by the Bank for International Settlements also shows that digital payments and FinTech infrastructure are transforming the savings mechanism. The shift from cash to digital forms of storing funds changes household liquidity preferences: the share of funds held in accounts increases, the role of cash savings declines, and integration with investment and credit products expands. Thus, digital transactions are not simply a payment tool but a factor transforming economic behaviour. Under these conditions, the structure of financial decisions becomes more accelerated and less reflective.

An analysis of international experience shows that changes in household financial activity accompany the spread of digital and online payment services. However, the nature of these changes varies across countries and institutional settings. This creates a need to examine how the expansion of digital transactions affects household behaviour, banking activity, retail turnover, and consumer finance dynamics in Kazakhstan. Thus, the study aims to assess the impact of digital financial transactions on household behavior in Kazakhstan, focusing on consumption, borrowing, savings, retail activity, household lending, and deposit accumulation within the banking system.

2 | LITERATURE REVIEW

The development of digital finance, FinTech, and online payments has changed the structure of financial services, consumer payments, and household lending. Shahrokhi (2008) demonstrated that the development of e-finance has expanded the use of electronic financial transactions and changed the mechanism for providing financial services. Digital finance and FinTech have strengthened the role of digital technologies in banking operations and the provision of financial services (Gomber et al., 2017), including access to credit and payment instruments (Agarwal & Zhang, 2020). Agur et al. (2020) and Alwahidin et al. (2023) showed that the development of digital financial services has increased the use of online payments, mobile banking, and electronic payments, and has affected household consumption and the structure of financial transactions.

Human behaviour in financial decisions depends on when the decision is made. The closer financial decisions are to current consumption, the less attention is given to future financial outcomes (Friedman, 1957; Feldstein, 1964; Frederick et al., 2002). Therefore, the decision to save some part of the income is overwhelmed by current expenses. As a result, households save less, or not at all, because many decisions are made without further evaluation of long-term consequences. Kahneman (2003) demonstrated that decision-making occurs either quickly and automatically or through more controlled, deliberate decisions. Therefore, Adams et al. (2014) concluded that current desires are stronger than plans, leading to a consistent deviation from plans in favour of current decisions. Within households, differences between spending and saving priorities further affect financial decision-making.

Behavioural economics explains how people make financial decisions about purchases, spending, and saving. Zeller and Sharma (2000) stated that for households with limited income, loans and savings help to cope with income instability. Simple and accessible options are driven by time constraints, which influence spending patterns and increase the propensity to borrow (Bertrand et al., 2006). Financial decisions also depend on how credit conditions are presented. People often focus on simplified indicators, such as the monthly payment amount, instead of the total loan cost (Altman, 2012). More importantly, individuals focus on the immediate payment. Therefore, instalments and deferred payments play a significant role in avoiding upfront payment (Reisch & Zhao, 2017). Credit product terms,

such as payment breakdowns, terms, and the format of information presentation, determine how easy it is to make a borrowing decision and how the debt burden is structured (Fömötör et al., 2017). These characteristics are taken into account when designing consumer protection mechanisms, as simply disclosing information does not change behaviour if it is not perceived and used in decision-making (Lefevre & Chapman, 2017).

One of the key ways digital technologies have impacted consumer behaviour is the reduction in search and selection time when shopping online. First, access to information and reduced search costs expand the opportunities for comparison and intensify competition (Smith et al., 2001). Second, the digital environment develops new decision-making models through the speed, accessibility, and constant availability of online services (Goldfarb et al., 2015). As a result, purchases are increasingly made at the moment of need, as access to products become continuous, and Automated payments and stored data simplify the purchasing process (Lim et al., 2023). Ultimately, the need to postpone a purchase disappears. Specifics of product presentation also affect the purchasing behaviour. The absence of physical contact with a product reduces the likelihood of impulse decisions based on visual perception (Huyghe et al., 2017). At the same time, the convenience of digital channels and constant access to products increases overall consumption. The digital environment creates a constant flow of information that influences choices, as consumers rely on other users' opinions (Alghizzawi, 2019).

People often behave irrationally, spend more now, fail to save, and continue to pay for things they do not use simply because they have already paid for them (Thaler, 2016). Companies often offer terms that seem convenient but are ultimately less beneficial. That is, prices may deviate from actual values not because of objective factors but because of human behaviour. Such a person is inclined to spend more and save less than a rational person because, at any given moment, a "current" person prefers to consume now rather than think about the future, creating an internal conflict between current and future decisions (Liu et al., 2020). As a result, if a person has money, they spend it faster rather than distributing it evenly, and their behaviour becomes highly dependent on current income. If they have money, they spend it. Constraints also play a stronger role, such as the inability to borrow money, because a person does not save for the future. People undervalue future payments and overvalue current decisions. Cheng and Huo (2025) showed that present bias causes a person to perceive a future payment as less significant than it actually is. A person is more likely to agree to purchase a product if the payment is deferred because they mentally underestimate future expenses. Buyer behaviour changes not because the product is better or worse, but because the time of payment and the perception of future money are distorted.

People make spending and borrowing decisions not based on their current income but on their expected future income. Therefore, if income is lower today but expected to increase in the future, people take out a loan and “postpone” consumption. Vandone (2009) found that borrowing behaviour is linked to household consumption patterns and their expectations of future income. Families borrow

when current expenses exceed available income. As a result, spending often increases faster than income. In particular, such expenses are incurred for housing, education, childcare, and durable goods. Under these conditions, loans are used to finance current consumption and large household expenses before income increases. Also, with lower average incomes, people are more likely to borrow as they consume more, whereas with higher incomes, they can manage without borrowing. Income is not the only important factor; its stability is also important: if income is unstable, people borrow less and save more. However, increasing credit card debt reduces the rate of spending growth (Ekici & Dunn, 2010). Subsequently, accumulated debt requires interest payments, and part of the income is spent not on new purchases but on paying off old obligations. Zinman (2015) showed that the bulk of household borrowing is not related to everyday (food) consumption but to expenses in large non-food categories such as housing, cars, and education. Credit initially increases consumption, then begins to constrain it. A temporary economic recovery occurs when credit supply expands (Mian & Sufi, 2018). Friedman (2018) also argued that current consumption decisions depend on expected future income rather than only on current earnings. After gaining access to loans to maintain their living standards, families rely on loans (Kizyma, 2019; Garber et al., 2024). Thus, credit drives a surge in current spending and a decline in future consumption.

Differences in savings between men and women arise from differences in income and risk tolerance (Fisher, 2010). For example, with lower incomes, women have less left over after expenses, so even if they want to save, their ability to save is limited. Kamas and Preston (2015) showed that women tend to make more cautious decisions and are risk-averse, so with limited income, they exercise greater control over their spending and are less likely to engage in active savings. Moreover, they show that, with limited resources and a high share of mandatory expenses, households save less and rely on simple forms of savings, as they are unable to reallocate funds to higher-yielding instruments (Suppakitjarak & Krishnamra, 2015). After covering current expenses, many households have limited opportunities to accumulate savings (Barrafrem et al., 2024). Lower female-to-male wage ratios increase the share of income spent on mandatory expenses, reducing the amount of funds available for savings.

Existing research in household and digital finance primarily examines individual aspects of household financial behaviour. Some studies focus on the impact of digital payments and online services on consumption and retail trade. In contrast, others analyse consumer lending, savings behaviour, and the influence of income on household financial decisions. Gender income differences and their impact on consumption and savings are also considered separately. At the same time, the literature contains few studies that integrate digital transactions, consumption, lending, deposits, and the gender wage ratio within a single model of household financial behaviour. This article comprehensively examines the relationships among digital payments, consumption, consumer lending, household deposits, and the gender wage ratio in Kazakhstan using macroeconomic and banking indicators for

2014–2024.

3 | METHODOLOGY

According to the literature review, the methodology used quantitative methods. Fisher (2010) used empirical analysis of household data, employing statistical methods to identify differences in savings behaviour (regression). Ekici and Dunn (2010) used regression analysis to estimate the impact of credit card debt on consumption growth (regression analysis). Suppakitjarak and Krishnamra (2015) and Garber et al. (2024) used econometric analysis to identify factors influencing savings patterns (descriptive statistics and regression analysis) and to estimate the impact of credit expansion on consumption using aggregate data (regression analysis). Thus, the regression approach and the analysis of variable dependencies, including correlation analysis, form the basis of the methodological framework underlying the current study.

Firstly, a set of indicators was developed for the analysis presented in the article. In the analysis, annual macroeconomic and financial indicators for Kazakhstan for the period 2014–2024 were used, obtained from official sources, the Bureau of National Statistics of the Republic of Kazakhstan, and the National Bank of the Republic of Kazakhstan. The sample included indicators reflecting deposits, household lending, consumer spending, retail turnover, non-cash and online transactions, and cash withdrawals (Table 1).

Table 1. Variable definitions and coding of indicators

Code	Variable	Interpretation	Unit
DEP	Total Deposits	Overall deposit base of the banking system	billion tenge
DEP_HH	Household Deposits	Household saving behaviour	billion tenge
WAGE_RATIO	Female-to-Male Wage Ratio	Gender disparity in earnings	ratio
LOAN_HH	Household Loans	Household borrowing behaviour	billion tenge
NPL	Non-Performing Loans	General level of credit risk	billion tenge
NPL_AMT	NPL Amount	Total volume of overdue debt	billion tenge
CONS_FOOD	Food Expenditure	Essential household consumption	tenge per household
CONS_NONFOOD	Non-Food Expenditure	Discretionary household consumption	tenge per household
POS_TRX	POS Transactions (Volume)	Frequency of cashless payment transactions	million transactions
POS_AMT	POS Transactions (Value)	Value of cashless payment transactions	billion tenge
WEB_TRX	Online Transactions (Volume)	Frequency of online payment transactions	million transactions
WEB_AMT	Online Transactions (Value)	Value of online payment transactions	billion tenge
CASH_TRX	Cash Withdrawals (Volume)	Cash withdrawal activity	million transactions
CASH_AMT	Cash Withdrawals (Value)	Value of cash withdrawals	billion tenge
RETAIL_PC	Retail Turnover per Capita	Consumer market activity	tenge per capita

Note: compiled by the authors based on Bureau of National Statistics and National Bank of Kazakhstan

The selected variables are grouped according to the key dimensions of household financial behaviour. The first group includes variables reflecting savings behaviour and financial resources (DEP, DEP_HH), which characterise the accumulation of funds within the banking system and the role of households in deposit formation. The second group includes variables related to borrowing behaviour and financial risk (LOAN_HH, NPL, NPL_AMT), enabling the analysis of credit activity and the quality of debt servicing. These indicators reflect both the scale of household borrowing and the associated level of credit risk. The third group consists of variables describing consumption behaviour and consumer market activity (CONS_FOOD, CONS_NONFOOD, RETAIL_PC). Food expenditure reflects essential consumption, non-food expenditure captures discretionary spending, and retail turnover per capita represents overall consumer market activity. The fourth group includes variables related to digital and cash payment behaviour (POS_TRX, POS_AMT, WEB_TRX, WEB_AMT, CASH_TRX, CASH_AMT), reflecting the frequency and value of cashless, online, and cash transactions. In addition, WAGE_RATIO is included as a structural factor capturing income differences and

their potential influence on household financial decisions.

To test the proposed hypotheses, correlation analysis was conducted to identify statistically significant relationships between the variables. The hypotheses are presented in Table 2. Based on the identified relationships, regression models were constructed to assess the influence of selected independent variables on household behaviour.

Table 2. Research hypotheses and model specification

No.	Hypothesis
H1	The growth of digital transactions (POS_AMT) increases household food consumption (CONS_FOOD), while gender wage inequality (WAGE_RATIO) reduces it.
H2	Household borrowing (LOAN_HH) is driven by non-food consumption expenditures (CONS_NONFOOD).
H3	Expansion of digital payments (WEB_AMT) contributes to the accumulation of household deposits (DEP_HH), while the female-to-male wage ratio has a negative effect (WAGE_RATIO).
H4	Growth in online transaction activity (WEB_TRX) increases retail turnover per capita (RETAIL_PC).

Note: compiled by the authors based on the literature review

The proposed hypotheses are based on the findings of the conducted literature review, which identifies stable relationships between digital financial instruments and household behaviour.

The first hypothesis builds on studies showing that digital payments simplify purchasing and increase consumption frequency (Goldfarb et al., 2015; Lim et al., 2023). At the same time, behavioural research indicates that limited income constrains consumption and leads to more controlled spending patterns (Fisher, 2010; Kamas & Preston, 2015).

The second hypothesis is supported by research demonstrating that borrowing is closely linked to non-food consumption. Credit is primarily used to finance discretionary expenditures (Zinman, 2015; Vandone, 2009). Behavioural studies also showed that instalment payments reduce the perceived cost of purchases and stimulate borrowing (Reisch & Zhao, 2017; Cheng & Huo, 2025).

The third hypothesis follows from studies indicating that digital payments change the mechanism of savings formation. The transition from cash to digital transactions increases the share of funds held in accounts and supports deposit accumulation (Frost et al., 2019). At the same time, income differences limit the ability to save and affect savings behaviour (Suppakitjarak & Krishnamra, 2015).

The fourth hypothesis is based on evidence that digital platforms increase consumer activity through easier access to goods and their constant availability (Smith et al., 2001; Alghizzawi, 2019).

4 | RESULTS

The first stage of the analysis examines the dynamics of key indicators characterising household financial behaviour. This analysis allows us to identify general trends in savings, credit use, expenditure distribution, and the transition to digital payment methods, which form the basis for subsequent verification of statistical

relationships. Figure 1 further shows the dynamics of household deposits and savings for the period 2014–2024.

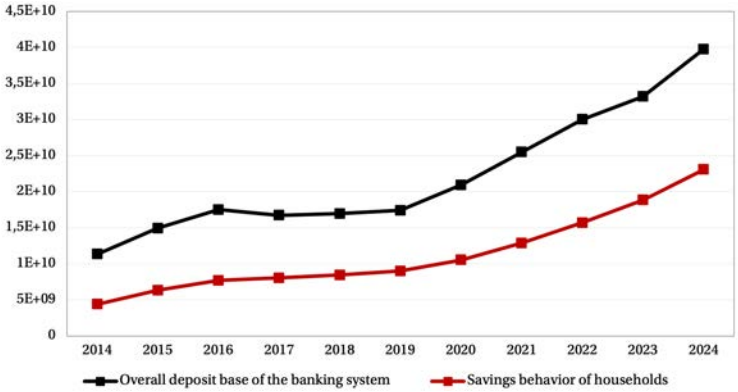

Figure 1. Dynamics of total deposits and household deposits in Kazakhstan, trillion tenge

More and more financial transactions are being conducted through the banking system, resulting in some funds remaining in accounts and deposits. Total deposits increased from 11.3 trillion to 39.8 trillion tenge, while household deposits grew from 4.3 trillion to 23.0 trillion tenge. The banking system's deposit base grew unevenly. After increasing in 2014–2016, deposit growth slowed between 2017 and 2019 and reached its lowest level before the pandemic. In 2020, deposits began to increase again and continued to grow in subsequent years. Household deposits increased steadily throughout the period, from 4.3 trillion tenge in 2014 to 23.0 trillion tenge in 2024. Household savings increased more than fivefold. Household funds are increasingly being stored in the banking system and used to accumulate and safeguard financial resources.

Figure 2 further shows household borrowing indicators and credit risk levels.

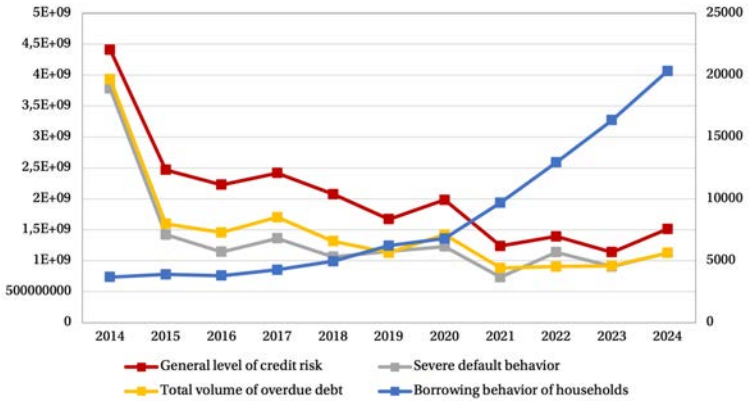

Figure 2. Dynamics of household loans and credit risk indicators in Kazakhstan, trillion tenge

Household loans increased from 3.7 trillion tenge in 2014 to 20.3 trillion tenge in 2024. The highest growth was observed after 2020. Credit risk indicators generally declined. The overall credit risk level decreased from 4.4 trillion to 1.5 trillion tenge, and the volume of overdue loans decreased from 3.9 trillion to 1.1 trillion tenge. Some indicators increased slightly in 2017, 2020, and 2024, but their values remained below 2014 levels. The growth in consumer lending did not lead to a corresponding increase in problem loans in the banking system.

People have increasingly used borrowed funds to purchase goods and pay for current expenses, rather than relying solely on their own income and savings. The growth in lending demonstrates that consumer loans are increasingly used to purchase goods, pay for services, and cover other everyday expenses. As a result, some consumption has come to be supported by bank lending. The volume of loans grew significantly faster than the volume of bad debt. People began taking out more loans, but overdue debt and credit risks did not increase at the same rate. The expansion of consumer lending did not lead to a sharp deterioration in the quality of the loan portfolio.

Figure 3 further shows the structure of household consumption.

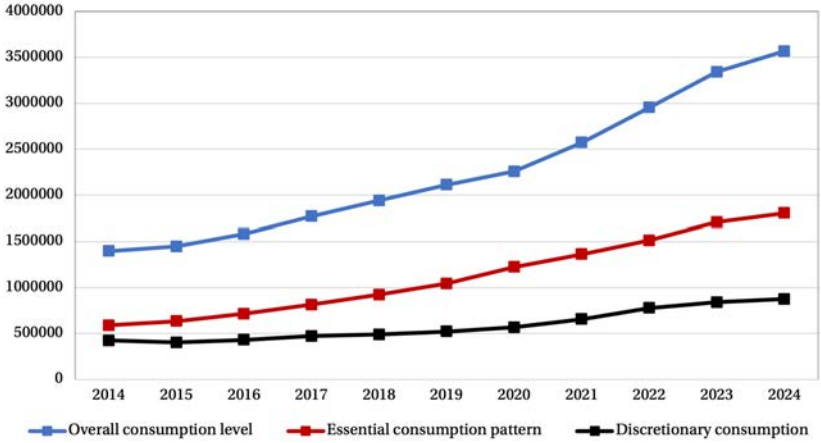

Figure 3. Dynamics of household consumption expenditures and retail turnover in Kazakhstan, tenge

Household spending increased throughout the period. Food expenditures increased faster than non-food expenditures. Moreover, non-food consumption grew at almost half the rate. Overall consumption increased from 1.39 million tenge in 2014 to 3.56 million tenge in 2024. Food expenditures increased from 589 thousand tenge to 1.8 million tenge, while non-food expenditures doubled, from 424 thousand tenge to 875 thousand tenge. The highest growth in food expenditures was observed after 2020. Most of the household budgets during the observed period were spent on essential daily expenses. As a result, funds for additional expenditures remained limited. Consequently, non-food consumption increased more slowly.

Figure 4 further shows the dynamics of non-cash and digital payments.

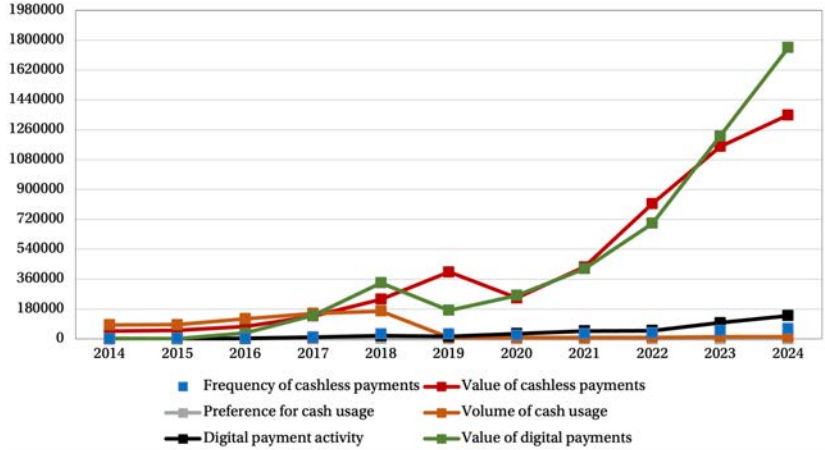

Figure 4. Dynamics of cashless and online payment transaction values in Kazakhstan, billion tenge

Online payments grew faster than traditional non-cash transactions. Financial transactions, particularly mobile banking, banking apps, and online payments for goods and services, were increasing. The volume of non-cash payments during the period under review increased more than 28-fold, reaching 1.3 million tenge in 2024. The number of non-cash transactions increased almost 24-fold, reaching 62.3 thousand. The growth in digital payments was even more dramatic. The number of online transactions increased almost 190-fold, reaching 140.5 thousand transactions, while the volume of digital payments increased almost 500-fold, reaching 1.7 million tenge. The most rapid growth was observed after 2020. The number of cash transactions has decreased by almost 77 times since 2018, falling to 22.6 million transactions in 2019. The volume of cash transactions has decreased by more than 20-fold, falling to 8.2 thousand tenge. From 2020 to 2024, cash transaction figures remained significantly below 2018 levels.

Kazakhstan's financial system increasingly relied on banking and digital transactions. The growth of deposits, lending, and digital payments indicates an increase in the volume of financial transactions within the banking system. At the same time, the share of mandatory expenses, primarily food products, increased. Consumer lending grew faster than non-performing debt, and digital payments gradually replaced cash transactions. Banking apps, online payments, and digital financial services have become widely used in retail financial transactions and consumer payments.

After examining the dynamics of the indicators, it is necessary to determine which indicators are related to each other and how these relationships manifest. To do this, a correlation analysis is conducted, which allows us to identify the presence and direction of relationships between household financial behaviour

indicators.

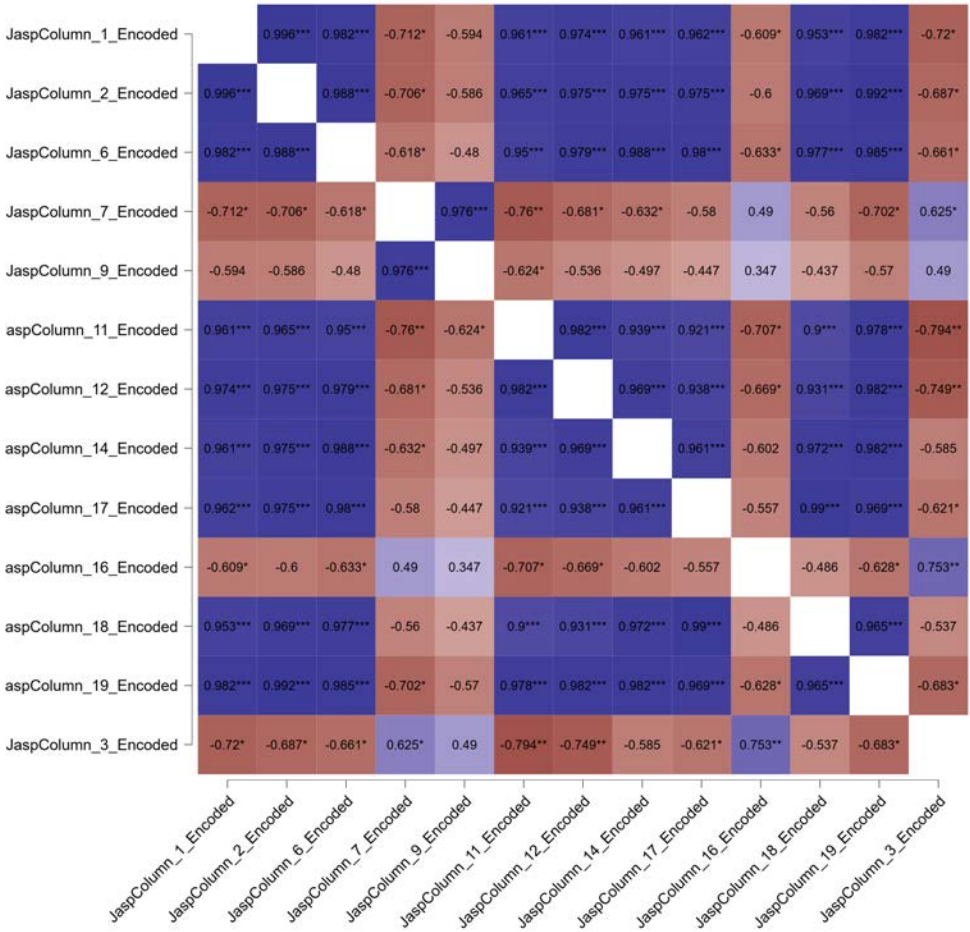

Figure 5. Correlation matrix for models' specifications

Correlation analysis revealed statistically significant relationships between financial resources, consumption, and digital transactions. The highest correlation coefficients were observed for household spending, non-cash transaction volumes, and credit activity (0.93–0.99). There is growth in digital payments, accompanied by expansion in consumer spending and lending, indicating the growing role of digital financial services in the consumer market. Negative coefficients between non-performing loans (NPL) and consumption (ranging from -0.6 to -0.76) indicated a decrease in current spending as the debt burden increased. This relationship indicates a limitation in consumer activity, as evidenced by an increase in non-performing loans and greater financial risks in the consumer lending system.

The ratio of female to male wages demonstrated a negative correlation with indicators of consumption and digital transactions (up to -0.79). These results indicate that women's lower incomes limit consumption and the use of digital payment instruments. High correlation coefficients (above 0.93) between non-food spending, digital transactions, and retail turnover indicate that growth in non-food consumption is accompanied by increased digital payment activity and expansion of the retail market.

Based on the identified relationships, a regression analysis is conducted to assess which factors influence household behaviour and to what extent. The results of the regression analysis for the selected models are presented below (Table 3).

Table 3. Model summary of regression results

Dep. Var.	Model	R	R^2	Adj. R^2	RMSE
CONS_FOOD	M_0	0.000	0.000	0.000	431041.972
CONS_FOOD	M_1	0.986	0.973	0.966	79708.435
LOAN_HH	M_0	0.000	0.000	0.000	5724.597
LOAN_HH	M_1	0.979	0.958	0.953	1243.372
DEP_HH	M_0	0.000	0.000	0.000	5.724×10^9
DEP_HH	M_1	0.989	0.979	0.973	9.371×10^8
RETAIL_PC	M_0	0.000	0.000	0.000	259600.856
RETAIL_PC	M_1	0.989	0.940	0.933	67082.930

Note: compiled by the authors

The coefficient of determination (R^2) values indicate that a high proportion of the variation in the dependent variables is explained. For the first model (CONS_FOOD), an R^2 of 0.973 indicated that the included factors explain 97.3% of the variation in food expenditures. Similarly, for the second model (LOAN_HH), $R^2 = 0.958$ indicated that the included factors accounted for 95.8% of the variation in household borrowing. For the third model (DEP_HH), the highest explanatory power ($R^2 = 0.979$) indicated that the selected factors explain 97.9% of the variation in household deposits. For the fourth model (RETAIL_PC), R^2 indicated that 94.0% of the variation in per capita retail sales is explained by the included variables.

To assess the overall significance of the models, an analysis of variance is performed (Table 4).

The F-statistics indicate that all regression models are statistically significant: 142.218 for CONS_FOOD, 202.977 for LOAN_HH, 182.574 for DEP_HH, and 140.757 for RETAIL_PC. In all models, the explained variance substantially exceeds the residual variance, confirming the high explanatory power of the selected variables. Thus, in the CONS_FOOD model, the explained variation equals 1.807×10^{12}, compared with the residual variation of 5.083×10^{10}. Similar patterns are observed in the other models, where the explained variance exceeds the residual variance by approximately 20 times for LOAN_HH, 45 times for DEP_HH, and 15 times for

RETAIL_PC. These results indicate that the selected variables explain a substantial share of variation in household consumption, borrowing, deposits, and retail turnover. At the same time, given the limited number of annual observations and the presence of common upward trends in macroeconomic and financial indicators, the results should be interpreted as evidence of strong statistical associations rather than direct causal effects.

Table 4. ANOVA results of regression models

Dep. Var.	Component	Sum of Squares	df	Mean Square	F	p
CONS_FOOD	Regression	1.807×10^{12}	2	9.036×10^{11}	142.218	$< .001$
	Residual	5.083×10^{10}	8	6.353×10^{9}		
	Total	1.858×10^{12}	10			
LOAN_HH	Regression	3.138×10^{8}	1	3.138×10^{8}	202.977	$< .001$
	Residual	1.391×10^{7}	9	1.546×10^{6}		
	Total	3.277×10^{8}	10			
DEP_HH	Regression	3.207×10^{20}	2	1.603×10^{20}	182.574	$< .001$
	Residual	7.025×10^{18}	8	8.781×10^{17}		
	Total	3.277×10^{20}	10			
RETAIL_PC	Regression	6.334×10^{11}	1	6.334×10^{11}	140.757	$< .001$
	Residual	4.050×10^{10}	9	4.500×10^{9}		
	Total	6.739×10^{11}	10			

Note: compiled by the authors

To determine the influence of individual factors on dependent variables, regression coefficients are considered (Table 5).

In the first model (CONS_FOOD), the coefficient for POS_AMT was positive ($\beta = 0.721$). Therefore, the results confirmed an increase in consumption and in non-cash transactions. The coefficient for WAGE_RATIO was negative ($\beta = -0.373$). The results revealed that consumption dynamics decrease as the female-to-male wage ratio declines, indicating lower consumption levels with increasing wage gaps between males and females. In the LOAN_HH model, the coefficient for CONS_NONFOOD was positive and extremely high ($\beta = 0.979$). In the DEP_HH model, WEB_AMT has a positive coefficient, indicating that deposits grow as digital transactions increase. WAGE_RATIO has a negative coefficient, indicating lower savings levels under lower female-to-male wage ratios. In the RETAIL_PC model, WEB_TRX has a strong positive coefficient, indicating that higher online activity is associated with higher retail trade.

Multicollinearity indicators are within acceptable limits (VIF < 2), indicating a lack of strong correlation between the independent variables and the robustness of the obtained estimates. In Table 6, the summarised results of the regression analysis are presented.

Table 5. Regression coefficients and model parameters

Model	Sub.	Predictor	Unstd.	Std. Err.	Std.	t	p	Toler.	VIF
CONS_FOOD	M_0	(Intercept)	1.121×10^6	129964.044		8.626	$< .001$		
	M_1	(Intercept)	1.876×10^6	225625.664		8.317	$< .001$		
		POS_AMT	0.679	0.068	0.721	9.996	$< .001$	0.658	1.519
		WAGE_RATIO	−36349.916	7022.657	−0.373	−5.176	$< .001$	0.658	1.519
LOAN_HH	M_0	(Intercept)	8448.745	1726.031		4.895	$< .001$		
	M_1	(Intercept)	−10512.974	1382.720		−7.603	$< .001$		
		CONS_NONFOOD	0.032	0.002	0.979	14.247	$< .001$	1.000	1.000
DEP_HH	M_0	(Intercept)	1.136×10^{10}	1.726×10^9		6.582	$< .001$		
	M_1	(Intercept)	1.624×10^{10}	2.502×10^9		6.494	$< .001$		
		WEB_AMT	8595.043	625.337	0.844	13.745	$< .001$	0.711	1.406
		WAGE_RATIO	-3.025×10^8	7.943×10^7	−0.234	−3.808	0.005	0.711	1.406
RETAIL_PC	M_0	(Intercept)	655826.862	78272.603		8.379	$< .001$		
	M_1	(Intercept)	444301.106	26962.493		16.478	$< .001$		
		WEB_TRX	5.615	0.473	0.969	11.864	$< .001$	1.000	1.000

Note: compiled by the authors

The growth of transactions related to food consumption, according to the existing studies, is contingent on the quality of service industry. Grocery purchases are increasingly moving to online platforms and delivery services, driving greater use of digital payment instruments in everyday consumption. The results on the negative relationship with WAGE_RATIO confirmed that consumption opportunities differ across men and women due to unequal wage distributions. Lower female-to-male wage ratios are associated with more restrained consumption patterns and stronger expenditure rationalisation. Under higher female-to-male wage ratios, consumption activity becomes more intensive, including more frequent purchases and wider use of online shopping services. Differences in male and female wages, therefore, affect both the overall level and the structure of household consumption.

Table 6. Hypotheses results

Hypothesis	Confirmed	Explanation
H1: Digital transactions and female-to-male wage ratio influence food consumption (CONS_FOOD).	Confirmed	POS_AMT positive and significant, WAGE_RATIO negative and significant, indicating lower consumption levels under larger differences between male and female wages, model $R^2 = 0.973$
H2: Non-food consumption drives household borrowing (LOAN_HH).	Confirmed	CONS_NONFOOD strong positive effect ($\beta = 0.979$), high explanatory power $R^2 = 0.958$
H3: Digital payments and female-to-male wage ratio affect household deposits (DEP_HH).	Confirmed	WEB_AMT positive, WAGE_RATIO negative, indicating lower savings levels under larger differences between male and female wages, both significant, $R^2 = 0.979$
H4: Online transaction activity increases retail trade (RETAIL_PC).	Confirmed	WEB_TRX strong positive effect ($\beta = 0.969$), $R^2 = 0.940$

Note: compiled by the authors

The results for H1 are consistent with those of Goldfarb et al. (2015) and Lim et al. (2023), who found that the development of digital payments and online services increases the frequency of purchases and consumer activity. In the study on Kazakhstan, the growth of non-cash transactions was associated with increased grocery spending. Fisher (2010) and Kamas and Preston (2015) found that income differences influence consumption patterns and limit spending at lower income levels. In the study on Kazakhstan, a lower female-to-male wage ratio is associated with lower consumption levels and more limited consumer spending.

The results for H2 are consistent with those of Vandone (2009), Zinman (2015), and Cheng and Huo (2025), who found a relationship among consumer credit, non-food expenditures, and the use of installment plans. In the study on Kazakhstan, non-food consumption showed a strong positive relationship with household credit volume. The results show that consumer loans were used primarily to finance non-food expenses and current consumption.

The results for H3 are consistent with those of Frost et al. (2019), who found that digital payments increase the amount of funds retained within the banking system. In the Kazakhstan study, the rise in online transactions was accompanied by higher household deposits, as funds were withdrawn less frequently in cash and more often from bank accounts. The lower wage ratio between women and men simultaneously limited both savings opportunities and deposit volumes.

The results of H4 are consistent with those of Smith et al. (2001), Goldfarb et al. (2015), and Alghizzawi (2019), who found that digital platforms and online services increase retail trade and consumer activity. In the Kazakhstan study, the increase in online transactions was accompanied by higher per capita retail turnover and the expansion of digital payments in consumer transactions.

5 | CONCLUSION

The study aimed to analyse how the expansion of digital transactions influences household behavioural patterns in consumption, borrowing, and savings in Kazakhstan, including their effects on retail turnover, household lending, and deposit accumulation within the banking system.

The analysis revealed consistent relationships between digital transactions and key elements of household behaviour. The growth of online transactions affects consumption behaviour by enabling easier access to online shopping, reducing time constraints on purchasing, and increasing spending frequency. At the same time, digital tools increase financial engagement, as reflected in higher account balances.

The development of credit instruments is fueling growth in spending on non-food items and in consumer lending. Online commerce and installment plans have combined the processes of purchasing, payment, and lending in digital consumer markets. The expansion of digital platforms has increased transaction volumes, increased the use of cashless payments, and integrated credit services into retail.

A lower wage ratio between women and men reduces savings and limits consumption. Moreover, the majority of expenditure goes toward essential consumer

spending. Therefore, opportunities for savings are reduced.

Digitalisation simplifies financial transactions and changes household behaviour, strengthening the link between consumption, borrowing, and savings. Linear models confirm the robustness of the identified relationships and allow us to view them as reflecting ongoing changes in economic behaviour. Thus, digitalization of financial services is becoming an important mechanism for transforming household consumption, savings, and credit behavior. For Kazakhstan, this means the need to further develop digital payment services, increase the transparency of credit products, and form a balanced policy aimed at supporting both the financial stability of the population and the development of the retail business environment.

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