

important element in creating a sustainable and effective educational environment.

The data obtained and the recommendations devel-

oped can be used to develop new initiatives and programs aimed at supporting teachers in the face of modern challenges in the educational field.

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A COMPARATIVE ANALYSIS OF TRADITIONAL AND DIGITAL FINANCIAL SERVICES IN KAZAKHSTAN

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ABSTRACT. Today, it is not denied that digital transformation in the financial sector has entirely changed the quality of services in terms of accessibility, speed, cost, customer needs and trust. Importantly, improved efficiency of financial services owing to digitalization patterns has led to increased and additional revenues for entrepreneurship. Hence, many scholars believe that digital financial services are highly likely to contribute to poverty alleviation strategies in less developed areas. However, it is also debated that digital finance tools might even deepen or exacerbate income inequalities causing digital divide gaps. The reason for this is that digitalization can only be beneficial for digitally literate users who live in developed regions with fast-working Internet. Thus, this article aims to make a comparative analysis between traditional and digital financial services in the context of digital divide. To do that, the paper first considered existing literature on comparison scopes between conventional and digital driven services. Mainly, the study used correlation and multiple regression analysis to investigate the individual impacts of traditional and digital finance tools on the overall financial inclusion of Kazakhstani population. The correlation analysis revealed that digital payments and ATMs strongly and positively correlate with the portion of population with access to formal financial services. Multiple regression showed that they both have a positive and significant impact on financial inclusion since DP and ATM are statistically significant at 1% and 5% significance levels, respectively. The main findings implied that when the number of ATMs increases by 1 the financial inclusion increases by 0.1%. While \$1 billion growth in digital payments leads to a 0.6% increase in financial inclusion. Hence, it can be concluded that digital financial tools better serve customers compared to traditional ones since they have a greater effect on financial inclusion.

KEYWORDS: digital transformation, improved efficiency, poverty alleviation, digital divide, comparative analysis, digital payments and ATMs.

Қазақстандағы дәстүрлі және цифрлық қаржылық қызметтерге салыстырмалы талдау

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АҢДАТПА. Бүгінгі таңда қаржы секторындағы цифрлық трансформация қызметтердің қолжетімділігі, жылдамдығы, құны, тұтынушылардың қажеттіліктері мен сенімі бойынша сапасын толығымен өзгерткені жоққа шығарылмайды. Ең маңыздысы, цифрландыру үлгілерінің арқасында қаржылық қызметтердің тиімділігін арттыру кәсіпкерлікке қосымша кірістердің өсуіне әкелді. Осылайша, көптеген ғалымдар цифрлық қаржылық қызметтер аз дамыған аймақтардағы кедейшілікті азайту стратегияларына ықпал етуі мүмкін деп санайды. Дегенмен, цифрлық қаржыландыру құралдарының цифрлық теңсіздікті тудыратын табыс теңсіздігін тіпті тереңдету немесе күшейтуі мүмкін екендігі де талқыланады. Мұның себебі, цифрландыру тек қана жылдам жұмыс істейтін интернеті бар дамыған аймақтарда тұратын цифрлық сауатты пайдаланушылар үшін тиімді болуы мүмкін. Осылайша, бұл мақала цифрлық теңсіздік жағдайында дәстүрлі және цифрлық қаржылық қызметтер арасында салыстырмалы талдау жасауға бағытталған. Ол үшін бұл жұмыс алдымен дәстүрлі және цифрлық басқарылатын қызметтерді салыстыру салаларына арналған әдебиеттерді қарастырды. Негізінен, зерттеу дәстүрлі және цифрлық қаржы құралдарының Қазақстан азаматтарының жалпы қаржылық инклюзиясына жеке әсерін зерттеу үшін корреляциялық және көп регрессиялық талдау әдістеріне сүйенді. Корреляциялық талдау цифрлық төлемдер мен банкоматтардың ресми қаржылық қызметтерге қолжетімділігі бар халықтың бөлігімен күшті және оң байланыста екенін көрсетті. Көптік регрессия олардың екеуі де қаржылық инклюзияға оң және маңызды әсер ететінін көрсетті, өйткені DP және АТМ сәйкесінше 1% және 5% маңыздылық деңгейлерінде статистикалық маңызды болды. Негізгі қорытындылар банкоматтардың саны 1-ге көбейген кезде қаржылық инклюзия 0,1%-ға артатындығын көрсетті. Сандық төлемдердің 1 миллиард долларлық өсуі қаржылық инклюзияның 0,6%-ға өсуіне әкеледі. Демек, цифрлық қаржылық құралдар дәстүрлі құралдармен салыстырғанда тұтынушыларға жақсырақ қызмет етеді деп қорытынды жасауға болады, өйткені олар қаржылық инклюзияға көбірек әсер етеді.

ТҮЙІН СӨЗДЕР: цифрлық трансформация, тиімділікті арттыру, кедейшілікті азайту, цифрлық теңсіздік, салыстырмалы талдау, цифрлық төлемдер және банкоматтар

Сравнительный анализ традиционных и цифровых финансовых услуг в Казахстане

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АННОТАЦИЯ. Сегодня общепризнано, что цифровая трансформация в финансовом секторе полностью изменила качество услуг с точки зрения доступности, скорости, стоимости, потребностей клиентов и доверия. Важно отметить, что повышение эффективности финансовых услуг благодаря цифровизации привело к увеличению и получению дополнительных доходов для предпринимательства. Поэтому многие учёные считают, что цифровые финансовые услуги с высокой вероятностью будут способствовать стратегиям борьбы с бедностью в менее развитых регионах. Однако также обсуждается, что инструменты цифрового финансирования могут даже усугубить неравенство доходов, вызывая цифровой разрыв. Причина этого заключается в том, что цифровизация может быть полезна только для пользователей с высокой цифровой грамотностью, проживающих в развитых регионах с высокоскоростным Интернетом. Целью данной статьи является сравнительный анализ традиционных и цифровых финансовых услуг в контексте цифрового разрыва. Для этого в статье сначала рассматривается существующая литература по возможности сравнения традиционных и цифровых услуг. В основном, в исследовании использовались корреляционный и множественный регрессионный анализ для изучения индивидуального влияния традиционных и цифровых финансовых инструментов на общую финансовую доступность населения Казахстана. Корреляционный анализ показал, что цифровые платежи и банкоматы сильно и положительно коррелируют с долей населения, имеющей доступ к формальным финансовым услугам. Множественная регрессия показала, что оба фактора оказывают положительное и значительное влияние на финансовую доступность, поскольку цифровые платежи и банкоматы статистически значимы на уровнях значимости 1% и 5% соответственно. Основные результаты показали, что при увеличении количества банкоматов на 1 финансовая доступность увеличивается на 0,1%. В то же время рост цифровых платежей на 1 миллиард долларов США приводит к повышению финансовой доступности на 0,6%. Следовательно, можно сделать вывод, что цифровые финансовые инструменты лучше обслуживают клиентов по сравнению с традиционными, поскольку они оказывают большее влияние на финансовую доступность.

КЛЮЧЕВЫЕ СЛОВА: цифровая трансформация, повышение эффективности, борьба с бедностью, цифровой разрыв, сравнительный анализ, цифровые платежи и банкоматы.

INTRODUCTION. An ever-increasing and large-scale tendency undergoing in the financial sector is known as digital transformation. The digitalization of financial services can be defined as the act of adopting digital technologies and transforming traditional operations to open new opportunities for revenue. This revolution allowed conventional financial organizations to reduce operational costs and easily detect systematic errors. From the perspective of customers, digital changes enabled the users to get more user-friendly mobile applications available 24/7. Moreover, promoted efficiency of digital financial services can be explained by hyper-personalized services such as investment advice and help. To be more precise, highly advanced improvements of data storage permitted financial companies to utilize big data in getting real-time information about users and making customer-centric decisions. One example of such data can be the consumer satisfaction value which allows the finance companies to find strategic solutions to meet the consumer needs. According to finance experts, this improvement can increase the revenue to 5-15% and decrease the costs of customer engagement by 50%. Another significant financial technology such as application programming interfaces (APIs) enhanced open access to banking platforms and frictionless use of mobile apps. It means that APIs act as intermediary tools to provide seamless and frictionless share of information between finance companies and digital apps. In addition, the Internet of Things facilitated customers' safe transactions made on mobile and wearable devices [1]. Artificial intelligence and machine learning are also described as powerful digital innovations which can significantly increase the efficiency and productivity of services. For instance, AI-assisted chatbots are said to provide 24/7 available customer help, which is about processing complaints of any type. Importantly, AI can identify suspicious fraud in the data and analyze the preferences of users which might also be useful for service improvement. Hence, it is of great importance for traditional finance companies to embrace digital technologies to compete with modern organizations and survive in the digital ecosystem. This trend raises the question whether the conventional and digital financial services can coexist or not.

Currently, a paradigm of digital shift in the banking sector has gained special attention due to huge increase in the number of online payment, shopping and mobile device users. This in turn gave rise to great changes in customers' needs and experiences leading to the emergence of tech-savvy organizations. The reason for this is that technological advancements in the financial sector have made traditional services way more automated, transparent and hyper-personalized. However, it is not denied that there is a digital divide concept which is the gap between those who have digital financial services available and those who do not [2]. This barrier is generated due to inequalities in accessing digital technologies and services. According to statistics of "Facts and Figures 2024", almost 93% of the population from high-income countries can use the Internet. While only 27% of low-income countries' population is said to use it. This means

that only developed countries can take advantage from digital transformation of the financial sector, while the developing or less-developed countries are undermined in getting benefits of digitalization. This gap also covers the urban and rural areas with 83% and 48% of Internet connectivity, respectively, which can also confirm the digital divide issues related to development. Moreover, approximately 53% of the global population is said to be characterized by digital literacy and 35% of them do not even meet the basic digital literacy standards [3]. All these facts cannot be ignored since they exacerbate the digital divide forcing digitally illiterate population to be excluded from digital financial inclusion. This issue leads to divisions between two groups of consumers, the first of which supports digital financial services, and another portion is against it. Most importantly, the existing features of both digital and traditional financial services including benefits and drawbacks are even giving rise to hybrid models of the two. Thus, at this point, it is crucial to highlight the significance of the comparative analysis of traditional and digital financial services. Hence, this article aims to make a comparative analysis between conventional and digital financial services in the context of digital divide to evaluate which tool better serves the modern customer needs. To achieve this goal the study established the following objectives:

- to investigate how traditional and digital financial sectors serve various segments of population
- to explore how each of the two tools affect financial inclusion and consumer trust
- to understand how conventional and digital financial services are adapted to regulatory demands
- to make comparison between the two models relying on global data and Kazakhstani case studies

MATERIAL AND METHODS. It is not denied that different periods of economic cycles and shocks were the vital pushing tools for technological transformations in various industries. The evolution of financial services from traditional to digital began after the proliferation of computers and the Internet. Early finance services such as banking and trading were carried out with the help of telegraph and telephony in the 19th century. Then primary magnetic cards and ATMs brought automation into the financial system in the 1970s. Lately, mainframe computers were the powerful tools which opened the doors for electronic trading, known as much more systematic and algorithmic. The first stage of authentic digital transformation of the financial sector started in the 1990s, which was characterized by physical branches of banks with no or restricted automation. At this stage, customer documentation was only paper-based, and cash was the only transaction tool. Thus, remote areas could not properly access basic financial services due to time-consuming procedures and inconvenience. The second stage was described by the emergence of digital platforms which permitted real-time transactions. ATM networks were also launched during this period providing the customers with cash available 24/7. Most importantly, this stage of financial digitalization supported a limited number of transactions using mobile phones. Hence, this stage covering the period between 1990 and 2000 is said to significantly improve the efficiency and accessibility of financial services. The third stage which lasted until 2010s had the key features such as online accounts and payments being called the period of "Internet and Mobile Banking". It was said to significantly develop convenience and accessibility of digital financial sector. The last stage of digital transformation continuing until now is called "Fintech Revolution". It includes fintech startups which offer the quickest, inexpensive and customer-centric decisions. Digital-only services, involving

digital wallets, payments and neobanks, are now allowing the customers to obtain seamless and frictionless financial services immediately. Moreover, automated and AI-assisted services made financial systems hyper personalized which in turn substantially increased efficiency. These four stages of the financial evolution were given the names of Finance 1.0, Finance 2.0, Finance 3.0 and Finance 4.0, accordingly. Finance 1.0 is basically defined by the traditional finance system of manual procedures and face-to-face services. While Finance 2.0 is recognized by the emergence of online banking and transactions. Finance 3.0 is characterized by enhanced automation and data processing to make more customer-centric decisions. The last version of the financial revolution is currently undergoing and known as Finance 4.0, which involves technological advancements such as big data, block chain and artificial intelligence [4]. Finance 4.0 has the greatest potential to bolster efficiency and accessibility which in turn leads to sustainable economic growth.

The comparative analysis between traditional and digital finance systems can be made through different dimensions starting from accessibility ending up with data protection. First, it should be emphasized that traditional finance has the core issue of limited access which excludes rural and remote areas from financial inclusion. The term financial inclusion defines how financial services are easily and equally accessed by all economic members of society [5]. The survey results of IMF Financial Access showed that the number of accessible bank branches for less-developed countries' population is less than 5 per 100,000 people. It is estimated to be 13.7 per 100,000 of global population on average. Moreover, the ATMs available for 100,000 people from all around the world are said to be equal to 40 approximately. Importantly, major conventional credit systems support large organizations with a significant amount of assets. It means that businesses of small and medium scales are frequently not provided with necessary financing [6]. At this point, it can be implied that digital finance is the fundamental solution to accessibility issues of traditional finance which leads to the formation of unbanked and underbanked portions of the population. Digital financial inclusion has appeared as the business model integrating technological inventions into operational processes. This model enables the customers to open online bank accounts and make digital payments utilizing mobile devices [7]. Moreover, big data analytics systems of digital finance provide both the financial institutions and users with transparent and secure information. This can prevent information asymmetry among finance companies and households increasing the credits and loans available to customers [8]. All the abovementioned benefits of inclusive digital finance can imply that it is a great substitute of traditional finance in terms of accessibility and availability. On the other hand, there are studies that found the complementary relationship between the two indicating that traditional finance positively affects digital financial systems. Jiang and Zhou investigated Chinese government as the one incorporating digital financial inclusion into national strategies and policies. Their study focused on the development of digital financial inclusion depending on various levels of traditional finance. The main findings of this research demonstrate that the starting level of traditional finance plays a huge role in bolstering digital financial inclusion and point out the complementary effect between each other. Firstly, the authors imply that digital finance directly takes roots in traditional finance showing inheritance pattern rather than replacement of one another. The reason for this is that the growth of digital finance initially relies on the support and investment of traditional finance companies

for technological advancements. Secondly, current trends of the Fintech revolution are financial innovations that require fundamentals to be easily accepted by the customers. Bank branches can be acknowledged as the teaching system which stimulated customers' financial literacy and founded their financial habits [9]. In addition, Yang holds the view digital transformation of the banking sector can be grouped as "comprehensive" and "in-depth". The former is about the entire transformation of business models, while the latter refers to switching to "finance + life" context. It means that traditional banking system shifts its customer base from physical clients to the one including online users as well [10]. Wang et al. also hold the view that the extension of digital finance is highly dependent on the initial expansion pace of traditional finance. They imply that regions with stable and advanced level of conventional finance are said to have extended financial needs offering broader landscape for the development of digital financial inclusion [11].

Another comparison dimension of traditional and digital finance involves the speed of services and operational costs. It is not denied that traditional finance is described as institution-based, which requires the customers to visit financial organizations to get services in the form of loans, insurance, investment and even make transactions. This certainly takes time, making financial services time-consuming and inconvenient. The official report offered by GSMA emphasizes that mobile money is transferred in 30 seconds, while it needs only 10 seconds or transferred instantaneously using mobile apps. However, interbank transactions supported by traditional finance are processed during 1 to 3 working days. In addition, the service of opening bank accounts at physical branches requires 30-90 minutes due to manual verifications and its approval may require up to 3 days in less-developed countries. Lending processing time is another angle to compare the digital and traditional finance tools. The reason for this is that digital lending processes are said to be 10 times faster than those of traditional ones. For instance, digital loan disbursements are permitted instantly or in a day with AI-based scoring systems. In traditional financial organizations lending processes may require 3-7 days or 1-4 weeks for personal and business loans, respectively. Hence, it can be implied that digital finance is much more effective than traditional finance in offering fast and convenient services. Moreover, digital financial services overcome traditional financial tools by significantly lowering the transaction and operating costs. The global remittance costs of transferring \$200 on digital platforms are amounted to 3.3%, while it is about 6.2% using banking services. It is also true that digital payment platforms decrease maintaining costs of bank accounts and transactions costs by 70-90% and 80-90%, accordingly. Due to high maintenance and operational costs of traditional bank accounts there are still people who do not use traditional finance tools at all. According to Findex Database, only 76% of the global population owned bank accounts in 2021. The findings of this survey also indicated that respondents chose "the cost of financial services" and "documentation issues" as the most prevalent reasons of not having bank accounts. This can certainly highlight the significance of digital financial inclusion which can diminish the operational costs and solve documentation problems. Importantly, the way digital financial inclusion reduces transactional costs is identified to be an influential poverty alleviation tool [12]. Experimental results of the study conducted in Kenya showed that the introduction of mobile money system called M-Pesa enhanced resistance to income shocks or crises. Research findings revealed that mobile money users' consumption

did not change during the time of crises, while non-users' consumption declined to 7%. It suggests that reduced transaction costs of digital finance allowed the users to receive and send money even at financial instabilities.

The comparison between traditional and digital finance can also be considered from the perception of fraud risks and customer trust. All the abovementioned characteristics and analytics of digital financial tools indicate that they have privileges in speed and scalability but are much more exposed to cyberattacks and fraud risks. It is mainly due to the fact their infrastructure is online and does not require the physical presence of customers and bank workers. According to statistics from Statista, the amount of fraud loss made in digital payment was estimated to be \$41 billion in 2022. The findings of the Cyber survey reported by Deloitte revealed that more than 74% of financial organizations faced cyberattacks in the same year. Hence, it is considered that traditional financial tools still earn greater trust from customers, but most developed and high-income countries have no problem with trust in digital landscape of financial services. The Gallup Trust Index shows that about 49% of customers from less and middle-developed countries fully trust in digital financial tools, while this figure for traditional finance systems was said to be 72%. Thus, it can be stated that traditional financial tools in low- and middle-income countries are still more trustful compared to digital ones. It is said that traditional financial organizations are totally regulated by the government which enhances their function as credit intermediaries. While Fintech companies based on online Internet platforms are said to have primary role in offering services. Even though Fintech platforms prevent information irregularity they cannot provide the necessary trust of customers, increase the chances of Internet fraud and cyberattack. Hence, digital finance cannot totally replace the "credit intermediary" role of traditional finance.

Having looked at the most noteworthy dimensions of comparison between traditional and digital finance tools, here it is necessary to group them in the context of digital divide. The reason for this is that due to specific features of two ecosystems, both conventional and digital tools may exclude certain groups of populations from the use of financial services. For instance, from the perspective of accessibility of digital finance, those who are without stable Internet and mobile devices are not enabled to access financial services. Comparably, traditional finance tools are only available for those who live in a small proximity to physical branches and ATMs. It can be explained as digital divide caused by income inequalities since both digital and traditional finance are eliminating those who have poor Internet, no mobile devices and live in inaccessible areas with poor banking systems. The accessibility issues of digital finance are also closely connected with digital literacy of customers since digitally illiterate users are often not able to navigate mobile applications. While traditional finance is mainly associated with face-to-face services and might only require a fundamental level of financial knowledge. These digital divide effects are investigated by many scholars including Wang et al. Their study focuses on digitalization of rural economy as an effective driver of rural economic growth in China. The digital rural economy is expected to facilitate entrepreneurial activities and human capital development thereby contributing to income inequality reduction. Promoted integration of various industries and equal environments for social development of different groups are said to lead to poverty alleviation results. However, the empirical analysis of Wang et al. has shown that digital economy has deepened income inequality across rural areas. Many other researchers also support that accessibility and

affordability of digital technologies are said to exacerbate income inequalities [13]. Moreover, Yang et al. have also studied the digital economy through the lens of human capital implying that it has different effects on workers with high and low levels of skills. Their findings suggest that highly skilled human capital can lessen the substitution effects of advanced technologies. But low skilled workers are often disadvantaged and at risk of being replaced by digital technologies. Hence, the authors believe that digital economy excludes many groups from taking benefits of technological advances and further widens the gap between different income groups.

Having considered the theoretical background of comparative analysis between digital and traditional financial tools, this article attempts to do comparative analysis of traditional and digital finance of Kazakhstan based on empirical research. To do that this paper focuses on quantitative techniques known as regression and correlation analysis. The first method is used to explain the causal relationship between dependent and independent variables or to show how explanatory variables affect the outcome. The second one is said to measure how strong and in what direction the linear relationship of investigated variables is. Based on established aim this study has chosen the most significant dependent and independent variables. The period of the chosen data covers the years between 2011 and 2021 due to its availability. Official sites of World Bank and Findex Database were the main sources of data. The following model was constructed based on the literature reviewed within the framework of this research:

$$FI = \beta_0 + \beta_1 DP + \beta_2 ATM + \beta_3 Gini + \epsilon_{it}$$

In this model, FI stands for financial inclusion indicated by access to formal financial services which was taken as dependent variable. On the right-hand side of the equation there are independent variables such as digital payments, ATMs and Gini index. The reason for choosing this set of explanatory variables is that digital payments are the proxy for digital financial tools' accessibility, automated teller machines are accounted for traditional financial services. Hence, it can be said that this model explores the impact of traditional and digital financial tools on overall financial inclusion. Importantly, this article analyzes the

comparison between digital and conventional finance in the context of digital divide. Thus, the Gini index was chosen as the control variable showing the relationship between income inequality and financial inclusion of the population. The first table below demonstrates the definitions of given variables:

Table 1- Dependent and independent variables

Variables	Definitions	Source
FI	Access to formal financial services (%of population)	World Bank Index
DP	Digital payments made by customers (\$billion)	World Bank Index [14]
ATM	Automated teller machines (per 100, 000 people)	World Development Indicators
Gini	Gini index	World Development Indicators [15]

**Note: Compiled by the author based on the World Development Indicators and Findex Database*

RESULTS AND THEIR DISCUSSION. This article relies on multiple regression analysis to explore the impact of digital and traditional finance tools on the overall financial inclusion of Kazakhstani population. Considering these two effects it is expected to get complex results which enable us to make a comparative analysis of digitalized and conventional financial services. Moreover, this study highlights that digitalization of financial services cannot only have benefits in terms of various scopes such as security and accessibility. It means that digital finance tools are privileged compared to traditional ones if and only if the customers live in areas with stable Internet and are digitally literate. Hence, this article compares digital driven and traditional financial services through the lens of digital divide. For this purpose, the model constructed includes control variables such as Gini index since it helps measure the relationship between income inequalities and financial inclusion. Before examining multiple regression results this article looked at correlation analysis results to see the direction and strength of the relationships between explanatory variables and the outcome. The second table below demonstrates the descriptive statistics of chosen variables:

Table 2- Descriptive statistics

	Access to formal financial services	Digital payments made by customers	Automated teller machines	Gini index
Average of figures	63,07	44,72	77,92	27,77
SEs (standard errors)	4,19	7,06	3,06	0,22
Minimums	42,1	12	65,2	26,8
Maximums	81,1	78	95,9	29,2
Sum of figures	693,8	492	857,2	305,5

As shown in Figure 1, there are observable correlations between financial inclusion, digital payments, ATMs, and the Gini index.

The Table 3 given below shows the correlation coefficients of dependent and independent variables.

By looking at the abovementioned correlation matrices and coefficients of chosen variables it can be implied that the percentage of digital payments made by customers strongly and positively correlates with the indicator of financial inclusion. The reason for this is that the first correlation matrix between digital payments

and the portion of customers with access to financial services is upwardly sloping. In addition, the correlation coefficient between the two has a positive sign and is very close to 1 being equal to 0.99. While the second independent variable given as ATM has also coefficient with positive sign and close to 1(0.92). Hence, it can be stated that the number of ATMs per 100,000 users has a strong and positive correlation with the percentage of adult population with available financial services. The correlation coefficient for the third control variable, Gini index, was found to be 0.49, indicating a positive and

medium correlation between financial inclusion and income inequality. The determination coefficients given in the correlation matrices imply that the first correlation between financial inclusion and digital payments has the most accurate and reliable results. It means that financial inclusion is perfectly explained by digital payments made by customers for 99% ($R^2=0.99$). While the correlation between ATM and financial inclusion is accurate for 85% since its $R^2=0.85$. Thus, there is a reason to believe that

digital financial services have a more significant effect on the overall financial inclusion compared to traditional financial services. Importantly, the correlation coefficients among independent variables themselves reveal that there is no multicollinearity between them since they are all below 0.8. The Table 4 below demonstrates the results of multiple regressions.

The Table 3 given below shows the correlation coefficients of dependent and independent variables.

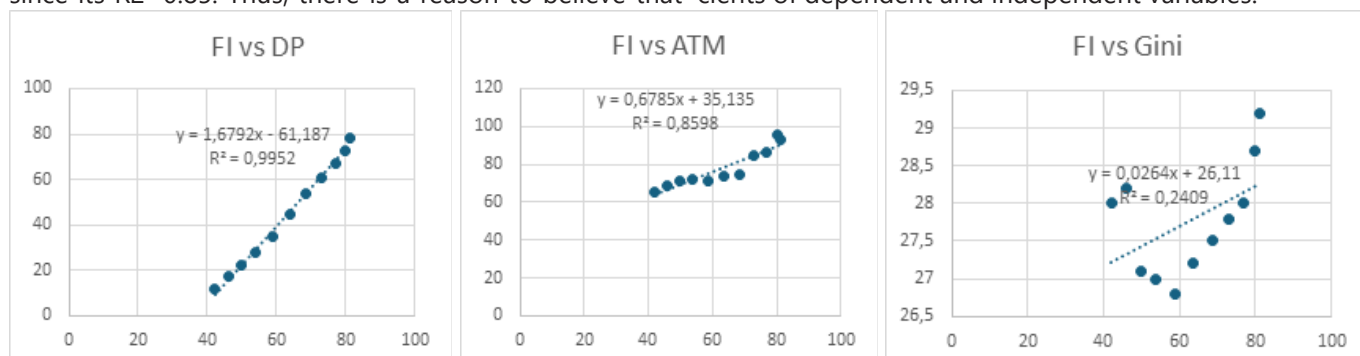


Figure 1 – The correlation graphs between FI and DP, ATM and Gini

*Constructed by the author

Table 3- Results of correlation analysis

	FI	DP	ATM	Gini
FI	1			
DP	0.99	1		
ATM	0.92	0.81	1	
Gini	0.49	0.54	0.67	1

Table 4-Models based on regression results

Independent variables	Model 1	Model 2	Model 3
ATM	1,26 (0,00003)***	-0,06 (0,4)	0,1 (0,05)**
DP		0,62 (2,8E-07)***	0,6 (8,9E-09)***
Gini			-1,66 (0,0005)***
R-squared	0,85	0,99	0,99

*Note: The coefficients are statistically significant at the ***1%, **5%, *10% significance levels

By looking at the abovementioned correlation matrices and coefficients of chosen variables it can be implied that the percentage of digital payments made by customers strongly and positively correlates with the indicator of financial inclusion. The reason for this is that the first correlation matrix between digital payments and the portion of customers with access to financial services is upwardly sloping. In addition, the correlation coefficient between the two has a positive sign and is very close to 1 being equal to 0.99. While the second independent variable given as ATM has also coefficient with positive sign and close to 1(0.92). Hence, it can be stated that the number of ATMs per 100,000 users has a strong and positive correlation with the percentage of adult population with available financial services. The correlation coefficient for the third control variable, Gini index, was found to be 0.49, indicating a positive and medium correlation between financial inclusion and income inequality. The determination coefficients given in the correlation matrices imply that the first correlation between financial inclusion and digital payments has the most accurate and reliable results. It means that financial inclusion is perfectly explained by

digital payments made by customers for 99% ($R^2=0.99$). While the correlation between ATM and financial inclusion is accurate for 85% since its $R^2=0.85$. Thus, there is a reason to believe that digital financial services have a more significant effect on the overall financial inclusion compared to traditional financial services. Importantly, the correlation coefficients among independent variables themselves reveal that there is no multicollinearity between them since they are all below 0.8. The Table 4 below demonstrates the results of multiple regressions.

The main economic model of this study consists of three independent variables which are estimated to be indicators of digital and traditional financial tools and digital divide. But before constructing the equation of this model the article first looked at the individual impact of traditional finance on financial inclusion. The first model from the table above shows that the number of ATMs has a significant and positive impact of financial inclusion since it has a positive coefficient with p-value amounting to 0,00003 (statistically significant at 1% level). But the determination coefficient of this model is equal to 0.85 meaning that bank branches explain the financial inclusion only for 85%. Hence, this model was supplemented by one more independent variable known as digital payments. In the second model from the table above it can be clear that in the presence of DP the variable ATM has a negative impact on financial inclusion and becomes statistically insignificant. While digital payments have a positive and significant influence on financial inclusion with a positive coefficient and p-value accounted for 2,8E-07. Most importantly, the determination coefficient of the second model increased to 0.99, implying that its results are of high quality. Lastly, based on the main purpose of this study dedicated to comparative analysis of digital and traditional finance in the context of digital divide the Gini index was added as an indicator of income inequality. It should be first highlighted that R^2 for this model is equal to 0.99, indicating the perfect credibility of results. One important thing to note is that in the model involving digital divide, digital and traditional finance tools both traditional and digital finance have positive impact on financial inclusion being significant 5% and 1% significance levels, respectively. The third model shows that Gini index negatively influences financial inclusion with statistically significant coefficient at 1% significance level. The following equation can be

constructed based on the results of the third model:

$$FI = 75.5 + 0.1ATM + 0.6GDP - 1.66Gini$$

(6.68E-06)***
(0,05)**
(8,9E-09)***
(0.0005)***

By looking at this equation it can be said that when ATMs increase by 1 per 100,000 people the percentage of customers with access to formal financial services goes up by 0.1%. While \$1 billion growth in digital payments brings a 0.6% increase in financial inclusion indicated by the percentage of population with affordable financial services. Lastly, when the Gini index increases by one financial inclusion decreases by 1.66% points. It can be stated that digital payments' effect on financial inclusion is more significant and greater in magnitude compared to that of bank branches. Moreover, the greater the income inequalities within the population the lower the level of availability of financial services. This means that digital advances incorporated into the financial systems certainly cause digital divide issues which are often associated with income inequalities within society.

The results of this empirical research were then checked for autocorrelation and heteroscedasticity to ensure their accuracy and reliability. To do that, this article first found Darwin-Watson coefficient to determine whether the errors of regression analysis have autocorrelation or not. It is significant to find this coefficient since the presence of autocorrelation violates a key assumption of regression analysis. Hence, the study calculated DW coefficient based on the following formula:

$$DW = \frac{\sum_{i=2}^n (e_i - e_{i-1})^2}{\sum_{i=1}^n e_i^2}$$

The DW coefficient of this research was estimated to be 1.85, which is very close to 2, indicating that there is no autocorrelation in the results of this study. Thus, the results of regression analysis can be trusted. Then, this article checked the results of analysis for heteroscedasticity to confirm that the variance of errors is constant for all independent variables. To do this, Spearman's rank correlation coefficient was calculated by first ranking the variables and finding their differences. Then these differences of ranks for each targeted variable were put in the given formula:

$$\rho = 1 - \left(6 \sum d^2 / n(n^2 - 1) \right)$$

Based this formula it was found that Spearman's rank correlation coefficient for digital payments and financial inclusion is equal to 1. This can reveal that there is a statistically significant and strong positive relationship between the two. While this coefficient for the correlation between ATMs and financial inclusion is equal to 0.98 which is almost equal to 1, meaning that there is a perfectly positive and statistically significant relationship between two variables. Hence, it can be stated that there is no heteroscedasticity in the study and estimations are efficient. This can be an approval of high quality of results with unbiased standard errors and appropriate p-values of variable coefficients.

CONCLUSION. This article made a comparative analysis of digital and traditional finance tools in the context of digital divide. It is evident from current digital transformations of the financial sector that digital finance tools are much more efficient in terms of automation and customer satisfaction. Importantly, mobile applications dedicated for finance purposes are said to offer convenient services available 24/7. Data storage opportunities of digital finance are said to provide transparency of personal data which can be useful for making customer-centric decisions. Internet of things and AI-assisted chatbots are great examples of financial technologies which facilitate customer-based services. However, there exists a digital divide gap between those who can take benefits of digital finance tools and those who cannot. It is closely related to income inequalities between low and high-income countries since this gap contributes to the accessibility and digital literacy of customers. Thus, this study first looked at existing literature to explore different dimensions of comparison such as accessibility, speed of services, operational costs and customer trust. Then all these extents were grouped in relation to digital divide concepts. Further, taking into consideration the theoretical basis of comparison between traditional and digital finance tools, this study conducted quantitative research using correlation and multiple regression analysis. These methods were used to explore the impact of traditional and digital finance tools on the overall financial inclusion of Kazakhstani population. The data for this research were World Development Indicators and Findex Database from the official site of World Bank. The results of correlation analysis have shown that digital payments and ATMs strongly and positively correlate with the portion of population with access to formal financial services (taken as a proxy for financial inclusion). The findings of multiple regression analysis have revealed that both digital and traditional finance tools significantly and positively affect financial inclusion. In a multiple regression model, digital payments and ATMs have a positive coefficient which are statistically significant at 1% and 5% significance levels, accordingly. Moreover, the Gini index has a negative coefficient significant at 1% significance level implying that the greater the income inequality within the population the lower the level of access to financial services. By looking at the equation of the model it can be said that when the number of ATMs add up 1 point the financial inclusion increases by 0.1%. While \$1 billion increase in digital payments lead to a 0.6% growth in financial inclusion level. Hence, it can be concluded that digital financial tools better serve customers compared to traditional ones since they have a greater effect on financial inclusion. Importantly, Darwin-Watson coefficient in the context of autocorrelation test was found to be 1.85 which implies that there is autocorrelation in the analysis. Thus, the results of the study were estimated to be of high quality and can be trusted. In addition, based on Spearman's rank correlation the study confirmed the significant and positive relationship between financial inclusion and independent variables such as digital payments and ATMS.

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TRUST, MERIT, AND REFORM: HOW YOUNG CIVIL SERVANTS PERCEIVE KAZAKHSTAN'S PRESIDENTIAL YOUTH PERSONNEL RESERVE

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ABSTRACT. This article investigates the perceived legitimacy and institutional credibility of Kazakhstan's Presidential Youth Personnel Reserve (PYPR), a flagship meritocratic initiative aimed at accelerating bureaucratic renewal through the competitive promotion of civil servants under 35. Drawing on a nationwide survey conducted during the program's fourth application cycle in June 2025, the study analyzes how eligible public officials assess the fairness, accessibility, and impact of the PYPR in the context of hybrid governance. While state discourse frames the program as a modernizing reform, our findings suggest a disjuncture between rhetorical endorsement and behavioral engagement. Although more than 77% of respondents expressed willingness to recommend the program, only 25.3% intended to apply themselves, indicating a symbolic-behavioral gap. Perceptions of informational opacity, limited career visibility for prior participants, and persistent informal hierarchies contribute to cautious ambivalence. These dynamics reflect broader patterns of symbolic compliance and institutional decoupling as theorized by Meyer and Rowan (1977) and Schedler (2002). Trust in merit-based reform appears not only institutionally contingent but also narratively constructed—shaped by perceptions of fairness, transparency, and narrative inclusion. The study concludes that the long-term viability of the PYPR depends on the state's ability to convert symbolic legitimacy into lived bureaucratic trust, particularly among local-level civil servants. By foregrounding bottom-up perceptions within a top-down reform initiative, the article contributes to ongoing scholarship on bureaucratic modernization, elite reproduction, and the challenges of institutional renewal in transitional political systems.

KEYWORDS: Presidential Youth Personnel Reserve, civil service, public administration, meritocracy, bureaucratic reform, institutional legitimacy.

Доверие, меритократия и реформа: как молодые государственные служащие воспринимают Президентский молодежный кадровый резерв Казахстана

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АННОТАЦИЯ. Данная статья исследует восприятие легитимности и институционального доверия к Президентскому молодежному кадровому резерву (ПМКР) Казахстана — флагманской меритократической инициативе, направленной на обновление бюрократии посредством конкурсного отбора государственных служащих до 35 лет. На основе данных национального опроса, проведенного в июне 2025 года в рамках четвертого набора программы, анализируются мнения молодых чиновников о справедливости, доступности и влиянии ПМКР в условиях гибридного государственного управления. Несмотря на официальную риторику модернизации, результаты указывают на разрыв между декларируемой поддержкой и реальным участием: более 77% опрошенных готовы рекомендовать программу, но лишь 25,3% намерены подать заявку. Причинами такой сдержанности выступают информационная непрозрачность, слабая карьерная видимость предыдущих участников и устойчивость неформальных иерархий. Эти явления интерпретируются через призму теорий символического соответствия и институционального расхождения. Доверие к меритократическим реформам зависит не только от институтов, но и от нарратива — представлений о справедливости, прозрачности и включенности. Статья делает вывод, что долгосрочный успех ПМКР зависит от способности государства превратить символическую легитимность в реальное бюрократическое доверие, особенно на местном уровне. Таким образом, работа вносит вклад в исследование модернизации госаппарата, воспроизводства элит и вызовов институционального обновления в условиях переходных политических систем.

КЛЮЧЕВЫЕ СЛОВА: Президентский молодежный кадровый резерв, государственная служба, государственное управление, меритократия, бюрократическая реформа, институциональная легитимность.