The Role of Electronic Receipt and Payment Instruments in the Development of Banking Services

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Abstract

The development of E-banking plays an essential role in the performance of the economy. This paper examines whether and how the use of electronic devices affects banking transactions? To answer this question, this paper uses the Chakravorti model that estimated this relationship in the United States and employs the data of Iran's banking system for ten banks - including Melli, Sepah, Saderat, Tejarat, Mellat, Refah, Saman, Parsian, Eghtesad Novin, and Pasargad- over 2009 to 2017. The results show that all three positively affect bank cards' volume of transactions among ATMs, POS terminals, and bank cards. In the meantime, the effectiveness of ATMs is more than sale terminal devices.

Keywords: E-Banking, Volume of Banks Transactions, Bank Card, ATM, POS, Number of Branches, Interest Rates of Facilities.

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1. Introduction

The development of financial markets is one of the most vital sources of economic growth. The payment system's role in the economy is to supply money to various economic enterprises, and banking plays an important role in economic growth and development. Today, banks have used information technology in electronic banking to reduce transaction costs and increase the capacity to attract financial resources by increasing the speed, variety, and quality of their services. The financial sector can affect economic growth in two ways; First, by improving resource allocation and accelerating technological development. These effects originate from financial institutions' intermediary role, which can invest the savings at a lower cost and allocate excess funds in various sectors to the required sectors. In other words, financial intermediation can lead to a more efficient allocation of capital. Banks are among the most important and available financial resources for enterprises by attracting liquidity and providing facilities.

The correct and optimal use of loan and credit flows can lead to increased investment, production, employment, and economic growth and development. Credit facilities, directly and indirectly, affect the employment of manufacturing units and new job opportunities. Injecting monetary credits into the flow of production (as working capital) in the short run increases employment due to fixed capital volume. Still, in the long run, the flow of loans and credit becomes fixed capital. It is accompanied by technological changes that can help develop the economy by improving technical knowledge.

The introduction of new electronic payment tools in Iran refers to 1991 and the start of service of Sepah Bank, which provided the first sample of cards to withdraw from ATM terminals to the banking network customers. (Tavakolian, 2011)

The electronic payment network in Iran includes two networks of interbank information exchange network (SHETAB) and card payment electronic network (SHAPARAK). Since 2002, with the beginning of the activity of the interbank information exchange network (SHETAB), the banking card network has started to work in an integrated manner, and now all cards issued by banks are accepted in all terminals installed throughout the country. In 2004, a resolution was introduced regarding e-money, according to which banks were allowed to enter into contracts with payment service providers (PSPs) companies. In this way, banks were able to provide payment services such as installation, commissioning, training, and maintenance of POS terminals at the point of sale of goods and services, as well as setting up software facilities for payment via mobile and Internet to service provider companies. The SHAPARAK network entered its executive phase in 2012, and it was possible to accept and process sales terminal transactions only in this way.

Currently, Iranian banks provide online banking services through various channels, including ATMs, POS terminals, PIN PAD, telephone banking services, mobile banking, SMS banking, banking services conducted through internet banking and systems. The mobile wallet system, using USSD codes and non-cash kiosks. In this study, our focus is on ATMs and POS terminals.

2. Theoretical Basis and Background of Research
2.1. Theoretical Foundations

In general, when discussing monetary theories, the aim is to examine the regular relationship between money and other economic variables. In other words, the set of these theories seeks to identify and explain the behaviors of society regarding the demand for money and how it is affected by economic variables or its effect on the behavior of these variables. (Mojtahed and Hassanzadeh, 2005)

The classic monetary theory lies within the form of Say's law and the quantity theory of money. In 1803, Jan-Batiste Say published a treatise on political economy. He argued that there would be no obstacle to full employment due to a lack of aggregate demand. The claim that "supply creates demand" is an extract from Say's law that seeks to describe the basic characteristics of exchange in a particular economy. It was obvious to classical writers that supply creates equivalent demand. Classical economists, especially Ricardo and Mill, supported Say's law. Not all classical economists accept Say's law and its contents. Malthus says that there is a possibility for the presence of an abundant supply of goods. While Ricardo, Mill, and Say's followers believed that the supply arteries determined total production, Malthus emphasized on-demand as the determining force. But eventually, Ricardo's thoughts prevailed. Ricardo only considered the long term, while Malthus, like Keynes, paid attention to the short term. The functioning of labor and capital markets, which have the support of Say's law, has enabled classical economists with their own theoretical systems to be able to explain the determination of real variables. To study nominal variables, classical economists resort to the quantity theory of money. Many well-known economists have contributed to the development of this theory in expanding its political achievements. These include Hume, Ricardo, Mill, Marshall, Fisher, Pogo, Hayek, and even Keynes. The quantity theory of money has recently been associated with its expansion by money-seekers and Milton Friedman's work.

One of the most important decisions which Baumol & Tobin has analyzed separately is choosing the right time & the right type of changing bonds to the currency. Both of them have emphasized costs & the benefit of keeping money & have arrived at similar conclusions about determinative variables of money trading demand.

Baumol & Tobin believe that the benefit of maintaining money is feeling relaxed, which its cost is losing the profit of keeping the Properties with return (just like bonds).

Deviations in the efficient management of monetary balances for consumer transactions can be explained using the Baumol and Tobin model when profits are made to their assets. (Carbo Valverde, Rodriguez Fernandez, 2014)

If an economic factor (assume that amount as Y) wants to consume real money (assume that amount as Y) during the year, it can keep the money as currency (money without any return) or bonds (with return). The profit rate of bonds in each period is equal to constant R, which states the opportunity cost of keeping money. Indeed, there is a hypothesis that changing bonds into money has a trading cost (called b), which Baumol calls brokerage.

In this framework, the factor K is the real value of the bonds, which is changed to currency in each period, so the total trading cost is equal to $b(\frac{Y}{K})$ which will be the total needed cost of mediation for exchanging bonds to currency and $(\frac{Y}{K})$ is the number of withdrawal of money of accounts. the lost profit of keeping money is equal to $R(\frac{K}{2})$ which $(\frac{K}{2})$ is the average amount of money which is and the real amount of kept money by a person is equal to M/P . so the whole cost is as follow:

$$\text{Total cost} = b\,\frac{Y}{K^2} + R\,\frac{K}{2} \qquad\qquad (1)$$

As you see, the less withdrawals (, the more amount of money kept by people), the less cost of mediation and the more expense of lost profit. The number of withdrawals that can minimize total trading cost is obtained when the amount of increase in the mediation cost resulting from one more withdrawal is exactly equal to the decrease of profit cost resulting from the withdrawal of money.

With partial derivation of equation 1 concerning K and equalize it with zero, we can obtain the optimal value of K, which minimizes the total cost of economic factor as below:

$$\text{So} : \frac{\delta(Total\ cost)}{\delta K} = -b\frac{Y}{K^2} + \frac{R}{2} = 0 \tag{2}$$

The conclusion of the above derivation clears the relation between the second root of the factors of *K* & *Y* as below:

$$K = \sqrt{\frac{2bY}{R}} \tag{3}$$

In this amount of K, the average of real kept money by economic factors is equal to:

$$\frac{M}{P} = \frac{K}{2} = \frac{1}{2}\sqrt{\frac{2bY}{R}} \tag{4}$$

The equation states that the real balance of money trading demand has a direct link with the second root of *Y* & diverse link with the second root of *R*. if the amount of b goes near 0 (zero), the amount of $\frac{M}{P}$ also goes near to zero (0). This means if the cost of mediation is zero (0), money trading demand with also be zero (0) Because in this case, the factor of time withdrawals the money to buy goods or services, so the trading costs will have an essential role on determining the amount of average money which is kept (Serletis, 2007)[1].

Technology and e-banking reduce the cost of converting money (bonds) into bonds. In this way, they cause a reduction of the cash reserves of individuals, and as the cash reserves decrease, the banking system's resources will be increased. As a result, banks provide more resources for granting loans, and banking services will be increased.

Keynes considered two types of demand for money: demand for transactions that was a direct function of income and did not depend on interest rates, and demand for speculation, which was inversely related to interest rates (the opportunity cost of keeping the money). Keynes argued that the demand for money in society comes from the sum of these two demands. In general, we need to understand that speculative demand and trading demand cannot be separated. The money demand function can be presented in general as follows:

$$\frac{M}{P} = m\ (r, y) \tag{5}$$

Keynes, in his theory, states that for investment, all the savings should be gathered. This model, which is based on the bank financial intermediation model, has influenced Keynes growth model (Warner, 2016)

From Kinsey's point of view, economic development requires financial resources. These resources can be provided by increasing liquidity. The development of liquidity can be achieved by increasing the internal funds in the economy, in which banks play a major role in creating money and increasing the internal funds. The development of e-services reduces the liquidity ratio, which causes a further increment of the money multiplier, which supplies the money needed for trading in the economic system. As a result, the development of e-services leads to the development of banking services that

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1 . Serletis

decrease physical money need. So, there is no need to increase domestic currency through the Central Bank, and in this case, there is no need to increase the monetary base, which can cause the greatest inflationary damage.

Money supply has different definitions. The money supply aims to provide financial services to economic agents through various legal and contractual channels. Each money that comes out of the Central Bank and is regarded for creating credit in banking activities is called a monetary base or a strong currency. The monetary base changes according to changes in the Central Bank balance sheet debts and assets. The money multiplier is the interface between money and the monetary base. It is defined as the number of monetary units created by a monetary base unit through the credit creation mechanism. (Shakeri, 2012)

The coefficient is defined as follows:

$$mm = \frac{M_1}{MB} \tag{6}$$

mm is the increasing monetary factor, M_1 is the money storage, and *MB* is the monetary base storage. Money storage is the sum of private demand deposits with banks and coins and banknotes in the people's hands. The monetary base is also expressed as follows according to the Central Bank's monetary base costs:

$$MB = CU + RR + RRT + RE \tag{7}$$

MB is the monetary base storage, *CU* is the sum of cash and banknotes held by people, *D* is the amount of demand deposits of the private sector, *RR* is the amount of legal reserves of banks in the Central Bank, and *RE* is the amount of excess reserves of banks in the Central Bank.

cu is the ratio of the coin and banknotes in the hands of the people to the equivalent private sector demand deposits and *rr* the ratio of the legal reserves of the banks to Central bank to total equivalent private sector demand deposits, *re* the ratio of the additional reserves of the banks in the Central Bank to equivalent total demand deposits, *h* is the ratio of coin and banknotes to money storage, and *z* is the ratio of term deposits and savings to liquidity.

The definition of the supply of funds according to the flow of funds is as follows:

$$M_1 = CU + D \tag{8}$$

Where M_1 The e money storage is equal to the sum of banknotes and coins in the hands of the people (*CU*) and private sector demand deposits (*D*). Another definition of money is a broader definition of M_1 and M_2 is defined as liquidity as follows:

$$M_2 = CU + D + T \tag{9}$$

T is the storage of time and saving deposits. In fact, M_2 is equal to the sum of money and pseudo-money. Suppose cu is the ratio of coins and banknotes inthe hands of the people to the private sector's call deposit and rr the rate of legal reserves of banks to the demand deposits of the private sector, re the rate of additional deposits of banks with the Central Bank to the total demand deposits. In that case, h the ratio of coins and banknotes to The reserve of money and *z* is the ratio of term deposits and savings to liquidity, and *rrt* is the rate of term deposits; in this case, the liquidity multiplier is defined as follows:

$$M_2 = \frac{1}{(1-z)\{(rr+re)+(1-rr-re)\}+rrt.z} MB \qquad (10)$$

In the monetary debate field, there have been new achievements & new measurements & activities & innovations to facilitate meeting the need of human societies. The Central Bank & government should take care of new activities' performance change all kinds of mixing with the volume of money and money demand pattern. They should also monitor all of the steps such as advertising, performance & the maturity of activities. So, realizing the true problem & analyzing the effective factors should always be considered by the Government and the Central Bank. Indeed, the effect of the branch's terminals transaction volume & ATMs on the amount of money demand is negative. So increase in the usage of branch terminals & POSE terminals & ATM terminals should be considered on monetary policies.

The relationship between money supply and non-borrowed reserves arising from Central Bank operations depends on people's preference between cash and demand deposits and the maintenance of surplus reserves by banks or the borrowing of reserves by them through discount rate. (Branson, William, 1997) The definition of money in Iran is in the form of M_2. Due to the liquidity multiplier components, various governments, Central Bank, banks, people, and foreign sectors affect it. As a result, the development of banking services can affect the coefficients related to the Central Bank and the development of payment tools, which causes an increase in multiplication coefficient and increases banks' resources for lending. Hence, it includes the development of banking services.

2.2. Research background
Mazini and Hozuri (2017) showed that e-banking in Iran has reduced private and public banks' costs, and private banks have been more successful in reducing their costs by using electronic banking tools.

Sadeghi and Heidarzadeh (2016) showed that e-banking mechanisms' effectiveness increases the profitability, asset return, and shareholder rights return of selected banks and affects all three.

Shaygani and Dadashi's study (2015) showed that the increase in the number of electronic branches of banks has greatly reduced banking costs and the sensitivity of reducing costs compared to electronic banking in the form of card issuance by the bank is very high.

Bahrami and Zare (2014) found that electronic banking tools such as POS terminals, ATMs, bank telephones, mobile banking, and Internet banking have increased the bank's resources.

Asadzadeh and Kiani (2012) found that the use of information technology has a positive effect on Iranian banks' performance.

Goodarzi and Zobeidi (2008) found that increasing the number of ATM of each bank has positively affected the bank's profitability, which has been increased after the bank joined the SHETAB network. As a result, the expansion of electronic banking has a positive effect on Iranian commercial banks' profitability.

Alghusin, Al-Samadi, Al-Qtish, and Al-Qirem (2017) concluded that bank cards increase the profitability of the banks studied.

Sumra and Manzoor (2011) concluded that illiterate customers do not pay attention to e-banking and are an important obstacle in providing e-banking services and products.

Malhotra (2009) showed that Internet banking services' presentation has no significant relationship with the risk of banks 'profits. In other words, Internet banking

has not increased the profit risk of the bank.

Amromin and Chakravorti (2007) studied the effect of bank card use on-demand for cash. The results showed that demand for low-denomination banknotes and coins has declined due to the increase in the use of debit cards, as sellers no longer need to return the rest of the money to customers. On the other hand, the demand for high banknotes and coins has been less affected by debit cards, indicating that these sizes of banknotes & coins are also used for purposes other than transaction and trading.

Zakaria (2004) indicated that e-banking services have a negative effect on banks' profitability in the short term. This negative effect is due to banks' investment in the field of infrastructure and staff training, but in the long run, this service will have a positive effect on the profitability of banks.

Damar (2004) studied the effect of the creation of ATM related networks on banks' efficiency. This study showed that the creation of related networks of ATMs positively impacted banks' efficiency.

Carbo and Rodriguez (2014) specifically focus on debit cards and examine debit card transactions through ATMs, terminals and their effect on demand for money. The study results show that the intensity of use of ATMs and POS terminals affects each other. ATMs' positive effect on the volume of transactions is less than the negative effect of terminal devices, and the effect of debit cards on demand for money is negative.

Previous studies have mostly discussed the relationship between e-banking and bank profitability, reducing banking costs and money demand. In contrast, the present study examines the role, impact, and severity of each of the e-banking tools to influence the development of Banking services, which have not been studied in other studies, making the path clearer for economists and policymakers.

3. Research Methodology

Considering that the country's banking system does not publish data on revenues from electronic banking, the increase in banking transaction volume is an important factor influencing the increase in fees and even non-fees of banks. In this study, the volume of banking transactions as a proxy and an increase in banking activities' turnover has been used to develop electronic banking tools and a symbol for banking services development.

Ten banks were considered, including Melli, Sepah, Saderat, Tejarat, Mellat, Refah, Saman, Parsian, Eghtesad Novin, and Pasargad, whose data were considered for the years 2009 to 2017.

The selected banks have registered statistics, and in addition, they have the largest volume of banking transactions and the largest market share, and more than 80% of transactions belong to these banks.

The equation used for this study was taken from Chakravorti and Amromin's (2007) work, which is as follows:

TRANS = f (CARD, ATM, LPOS, LLR, inf)

TRANS represents the transaction volume of bank cards. CARD is the number of bank cards, ATM number of ATMs, POS number of sales terminal devices, LR interest rate of bank facilities, and inf is inflation.

The dependent variable of the transaction volume model of bank cards, control variables include an interest rate of facilities and inflation and the number of bank cards, the number of ATMs, and the number of sale terminal devices of the model's independent variables. To investigate the relationship between independent research variables and the volume of banking transactions as a dependent variable, the combined data and panel method are examined in the form of panel data method with constant and random effects. In this study, all variables used except inflation and facility rate were

used logarithmically to analyze the obtained coefficients as an attraction.

The main hypotheses of the research are:
- The number of bank cards issued has a positive effect on the volume of banking transactions.
- The number of ATMs has a positive effect on the volume of banking transactions.
- The number of sales terminal devices has a positive effect on the volume of banking transactions.

4. Model Estimation and Analysis of Findings

Since the performance of different time series models can be affected by different data, before performing any action, we examine the descriptive statistics of the series of research variables in the following table:

Table 1. Descriptive Statistics of Variables

Statistic	Bank Transaction Volume	Number of Bank Cards	ATM	POS Devices	Inflation Rate	Earning Interest Rate
Mean	32.00	15.21	7.14	7.78	14.63	14.40
Max	35.80	17.42	8.77	15.96	25.40	22
Min	28.40	5.24	5.17	4.09	10.40	12
S.D	1.76	2.39	0.90	2.05	4.26	2.70
Skewness	0.24	-2.97	-0.19	1.99	1.24	1.84
Kurtosis	2.29	12.31	2.24	9.18	4.07	5.91
Jarque-Bra	2.32 (0.31)	392.1 (0.00)	2.27 (0.32)	174.1 (0.00)	33.90 (0.00)	101.00 (0.00)

Source: Research Findings

It can be seen that the test of the normal distribution of the mentioned series (Jarque-Bra test) indicates that the density distribution function of the probability of series of the volume of bank transactions and ATMs is normal, and other research variables do not have a normal distribution.

In the next step, using the correlation coefficient table, the relationship between the variables is examined. The Pearson correlation coefficient or *Pearson product-moment correlation coefficient* measures the linear correlation between two random variables. The value of this coefficient varies between -1 and 1, which means: "1" as a complete positive correlation, "0" as no correlation, and "1-" as a complete negative correlation.

Table 2. Pearson Correlation Coefficient of the Study Variables

	Earning Interest Rate	Rate of Inflation	Point of Sale Devices	Number of Bank Cards	ATM	Bank Transaction Volume
Bank Transaction Volume	1 (0.00)					
ATM	0.82 (0.00)	1 (0.00)				
Number of Bank Cards	0.62 (0.00)	0.72 (0.00)	1 (0.00)			
Point of Sale Devices	0.20 (0.07)	0.25 (0. 02)	-0.38 (0.00)	1 (0.00)		
Rate of Inflation	0.17 (0.13)	0.07 (0.50)	0.10 (0.38)	-0.05 (0.64)	1 (0.00)	
Earning Interest Rate	0.57 (0.00)	0.30 (0.00)	0.31 (0.00)	-0.07 (0.49)	-0.18 (0.10)	1 (0.00)

In the above table, if the reported significance level is less than 0.05, the null

hypothesis based on that there is no correlation between the variables is rejected. If the significance level is higher than 0.05, the null hypothesis is not rejected at a 95% confidence level. The positive correlation coefficient indicates a positive relationship, and the negative correlation coefficient indicates the negative relationship between the variables. The results indicate a positive and significant relationship between the indicators of e-banking and the volume of banking transactions.

4.1. Unit Root Test of Research Variables

Given that the existence of random trends in time series can make it difficult to interpret the results of econometrics, the choice of estimation method, and the validity of predictions made using the model, Specifically, despite random processes, it is possible that the diagnostic statistics incorrectly indicate the existence of a relationship between the variables. In this case, econometric equations may be estimated using methods that are not appropriate for the data in question. In addition, pattern-based predictions can be distorted. In recent years, econometric experts have focused on the adverse effects of accidental trends in time series on the results of estimates of ordinary minimum squares. They have introduced new methods to resolve them. In random processes, even in cases where there is no real relationship between the variables, common techniques such as the conventional least-squares method may show a significant relationship between them. Such regressions are known as false regressions.

Engel and Granger (1985) proposed aggregation theory to avoid the false results of false regressions. A group of intangible variables will also accumulate if there is at least one mana linear combination between them. The presence or absence of a correlation relationship between pattern variables strongly influences the predictions made by it. If there is no accumulation in a regression equation, weak predictions will be made by the pattern. Time series economists have created methods to test random trends in time series and regression residues. Also, methods have been proposed to estimate the relationships between variables with a random process.

Before modeling the research, in order to prevent false regressions in the research, the variability of the variables has been studied. For this purpose, we have used the Im, Pesaran, and Shin (IPS) (1997) test. Using tests to see if the time series used is a mana process (with zero accumulation) or divergent (with a non-zero accumulation rate) has been studied. For this purpose, the unit root test has been investigated on research variables. The unit root test is performed in the case of the presence of intercept and round. The results of the table below indicate that the volume of banking transactions, the number of ATMs, and the interest rate of facilities have unique roots and non-stable due to not rejecting the zero hypothesis and would be stable by one differentiation.

But other variables, because the prob value is less than 0.05, reject the null hypothesis based on a single root, and these variables are at the mana level.

Table 3. IPS Root Test

Variable	Variable IPS Test	
	Test Statistics	**Prob**
Bank Transaction Volume	-1.974	0.024
ATM	-4.011	0.000
Number of Bank Cards	-4.584	0.000
Number of Branches	-4.597	0.000
Terminals	-0.667	0.252
Inflation Rate	-3.723	0.000
Facility Interest Rates	5.738	1.000

Source: Estimated results

4.2. Cointegration Test

At this stage, it is necessary to determine the model's optimal level using the criteria for determining the interruption. The optimal interval determination should be based on the number of model variables and sample size. The table below shows the optimal interruption based on different criteria for selecting the selected model's optimal interval. Because the Schwartz criterion causes a lower degree of freedom than other criteria, the optimal interval has been selected based on the Schwartz criterion in this study.

Table 4. Determination of the Optimal Number of Model Interruptions

Number of interruptions	Akaike Statistic	Schwartz Statistic
1	-5.172	*-3.866
2	-4.664	-2.269
3	-4.913	-1.430

Source: Research results

As shown in the table above, this model's optimal interruption based on the interruption Schwartz criterion is one. Before estimating the model, we examine the validity of the long-term relationship between the research variables using the aggregation test.

Table5. Test results are also panel aggregation

Test Statistic	Dependent Variable on Volume of Transaction
Statistic	ADF
T-Statistic	-4.30
Prob	0.000

Source: Estimated results

As the table information shows, for the model in question, the reported error level is less than 5% or 0.05, and the null hypothesis is rejected, so it can be stated that there is a long-term relationship between the variables.

4.3. Explaining the Model and Reviewing the Hypothesis

In order to examine the factors affecting the transaction volume of bank cards, the simplest case is considered first. As mentioned earlier, suppose that intercept and the coefficients between the sections and periods are the same, resulting in erroneous sentences varying between periods and errors. This is the simplest approach that can be estimated using the least-squares method (OLS). Perhaps the most important downside to this is that assuming coefficients fixed are considered highly constrained and may lead to model error. This means we cannot estimate a real relationship between the dependent variable and descriptive variables; therefore, we seek to intervene like the sections. However, this does not mean that this approach is incorrect. In other words, the effects of the cross-section on the dependent variable may be the same. However, it is assumed that the expansion of e-banking on various commercial banks' trading volume is different. Therefore the fixed and random effects are also considered in the model. With this explanation, it is first assumed that the effects of the various variables related to the bank in this study will affect bank card transactions' trading volume. In other words, the share of e-banking of Bank IM or Bank JM will have the same effect on the trading volume of transactions of Bank IM or Bank JM cards. Also, the intercept of the model is the same between different sections (banks). To diagnose whether a combination method is used or a panel data method, we refer to the F-test or the Limer test. If the Limer test allows the use of panel data, then we should realize whether the method of random effects is used or the model with constant effects, in which case we

use the Hausman test.

The results of the F-Limer test:

According to the F-statistic, the assumption of zero width of the same origin and slope for all units will be tested against the panel model. The results are presented in the table below for the research model. Diagnostic test for model estimation as pooled data or panel data with constant effects.

4.3.1. The Results of the F-Limer Test

According to the F-statistic, the zero intercept assumption and the same origin and slope for all units will be tested against the panel model. The results are presented in the table below for the research model.

Table 6. Diagnostic Test for Model Estimation as Pooled data or Panel Data with Fixed Effects

Fitted Models	Statistic	d.f.
F Statistics of Equation	9.90	(61 and 9)

Based on this table, it can be seen that the F-test and the prob value of that hypothesis reject the existence of fixed effects against the Pooled state in both equations. In other words, since the probability level (Prob) obtained in the F-test is less than 0.05, then the null hypothesis based on that the fixed effects on the regression model are redundant is rejected at the 5% (and 10%) level. So estimation of the model in the form of Panel data is preferred to consolidated data.

4.4. Test for Selecting Fixed Effects or Random Effects

In this section, one of the two methods of estimating panel data, which is fixed effects and random effects, must be selected. The Hausman test is used to determine the estimation method in panel data. Based on this test, the rejection of the null hypothesis indicates the fixed effects method's use. Therefore, the Hausman test was performed for different models with different explanatory variables. The Hausman test results, which are reported in the table below, related to the equation of the volume of banking transactions, indicate the rejection of the null hypothesis and the choice of the method of constant effects for the equations.

Table 7. Diagnostic Test for Estimating the model of panel data with constant effects versus panel data with random effects

Fitted Models	Statistic	Prob.
Chi-square Statistics of two equations	27.75	0.000

Table8. Estimation of the Model of Factors Affecting the Transaction Size of Cards Transactions:

	Independent variables coefficients	Model	
		The dependent variable for Size of Cards Transactions	
		Coefficient	Prob value
1	Intercept	*15.08	0.000
2	ATM	*2.28	0.000
3	No. of Cards	*0.12	0.009
4	No. of branches	**-1.17	0.054
5	POSs	*0.21	0.008
6	Inflation rate	*0.04	0.000
7	Interest rate of facilities	*1.97	0.000
	Statistics of Goodness of Fit	Determination coefficient: 0.96 F(Prob): (0,000) 121,17	

Source: The result from the estimation
* Significance in the error level of 1%.
** Significance in the error level of 10%.

Based on the results of the research, it can be stated that the prob values of all the coefficients of the variables at the error levels of 5 and 10% are less than 0.05 and 0.10, which indicates a significant difference from zero for these coefficients and the total significance of the model coefficients.

The variable coefficient of the number of sales terminal devices is 0.21, which indicates the positive and significant effect of this variable on the volume of transactions of bank cards. This means a 1% increase in the number of stable buying terminals will increase the volume of bank card transactions up to 0.21%. Theoretically and experimentally, it is expected that the volume of banking transactions will increase as the number of shopping terminals increases.

Table 9. Summary Results of Hypotheses Test

Row	Hypothesis	Type of Effect	Result of Test
1	The number of bank cards issued in each bank positively affects transaction volume through bank cards.	Direct & meaningful	Hypothesis accepted
2	The number of ATMs has a positive effect on the volume of transactions trading through bank cards.	Direct & meaningful	Hypothesis accepted
3	The number of bank branches has a positive effect on the volume of transactions trading through bank cards.	Indirect & meaningful	Hypothesis accepted
4	The number of devices installed in the bank's terminal positively affects the volume of transactions through bank cards.	Direct & meaningful	Hypothesis accepted

The variable coefficient of the number of ATMs in Equation is 2.28, which indicates the positive and significant effect of this variable on the transaction volume of bank card transactions. The interpretation of the obtained coefficients is as follows: 1% increase in the number of ATMs (other conditions are stable) leads to a 2.28% increase in the transaction volume of bank card transactions. It is expected that increasing the number of ATMs and better banking services will increase the volume of transactions.

Fourth. In the second fitted equation, the variable coefficient of the number of bank cards was significant. The coefficient of the current amount of bank cards issued is 0.12. The result shows that if we have a 1% increase in the number of issued bank cards, there will be a 0.12% increase in bank cards' transaction volume (other conditions are stable).

Diagnostic tests are in line with Jarque- Bra's statistic, the distribution of disruption sentences of the estimated model, is normal. The self-correlation test performed indicates the non-rejection of the null hypothesis based on the absence of self-correlation in the disruption sentences.

Good model fitness statistics such as R2 or coefficient of determination are also obtained in the fitted equations 0.96%, which indicates that the independent variables of the model explain about 96% of the changes of the dependent variable, also according to the high F statistic and its prob value, The total fitted regression is significant.

5. Conclusion

The first hypothesis of the research was that the number of bank cards issued in each bank positively affects the volume of transactions through bank cards. Considering the coefficient of this variable in an equation related to the volume of bank trading transactions, this variable's positive effect has been approved. Based on the results, it has been shown that if the number of issued bank cards increases, the bank can increase access to financial resources for the bank through more financial turnover. In other words, an increase in the number of issued bank cards leads to an increase in transaction

volume of bank trades and, on the other hand, leads to an increase in the bank's profitability and the development of banking services.

The second hypothesis of the study is that the number of ATMs in the bank positively affects the volume of transaction trading's through bank cards. Due to this variable's coefficient in the equation related to the transaction volume of banking transactions, this variable's positive effect was confirmed. Based on the results, it has been shown that this variable has affected the volume of banking transactions based on the above ratio. Based on the results, it can be stated that with the expansion of the use of ATMs and the use of non-face-to-face operations for banking operations, the balance of people's accounts and turnover has been increased, and this can lead to an increase in bank profitability through bank access to cheap financial resources. Accordingly, an increase in ATMs can increase banks' performance and services by increasing the volume of transactions and account balances.

The third hypothesis of the research was rejected. The number of bank branches on the volume of transaction trades through bank cards positively affected this variable's coefficient in the estimated equation. Based on the obtained results, it can be stated that with the increase in the number of branches, it is expected that the use of e-banking services will be decreased, and the issued bank cards will have less effect on the transaction volume. The fourth hypothesis seeks to investigate the effect of the number of POS terminals on the volume of transaction trading through bank cards, confirmed by this variable's positive and significant coefficient in the estimated equation. Based on the results, it has been shown that increasing the number of sales terminal devices through revenue streams such as fees and money laundering in the accounts of individuals and banks can pave the way for the development of banking services.

From the obtained results, it can be understood that ATMs and POS terminals' effect is more than other variables, and in the meantime, ATMs' effect is more than that of terminals. One of the reasons for the low number of POS terminals is that each store has several POS devices from several banks. Based on that, financial turnover is prorated between the sales terminal devices, and their efficiency is reduced. This has attracted the attention of policymakers, who need to pay more attention to this direction in order to be more profitable and develop banking services. The lowest coefficient and the amount of impact is related to the variable of bank cards, which can be due to having multiple cards by individuals and not using some cards because each bank requires people to open an account and receive a card for each lending operation or even to guarantee the process of the loan for others - while in practice, people exchange and learn and pay and operate with one or two main accounts and also receive related cards too, so the per capita number of bank cards in the country is very high, and practically, multiple cards cannot be effective, which is also a problem with having a large number of cards for costumers. In general, it imposes additional costs on the whole society, which is not beneficial for the country's economy. So it is recommended to design cards in the banking system which the information of all accounts can be stored and used in one place. This has been done in some countries and also for national cards in the country. The initial structure for such a possibility has been foreseen. In general, it can be said that facilitating the use of tools for people and proper and logical planning on the proposed variables can make their application more pervasive, and as a result, according to Tobin's theory, reduces liquidity and increases funds in the banking system which eventually Provides conditions for economic growth and development for the country.

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