THE IMPACT OF CASHLESS PAYMENTS ON ECONOMIC GROWTH IN AZERBAIJAN

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Abstract

Our aim is to prove relationship between electronic payments and overall economic growth in Azerbaijan. Using data from Azerbaijan markets over the period 2008-2015, the results confirm that migration to efficient electronic retail payments stimulates overall economic growth and consumption. In this paper, among payment instruments, only payment cards have been used for measuring the impact on economic growth. Retail payment transaction technology itself is also associated positively to real economic aggregates. We also show that initiatives to integrate and harmonize retail payment markets foster consumption and thereby have a beneficial effect for whole economy. Additionally, the findings reveal that the impact of cashless payments on economic growth is more pronounced in Azerbaijan. Our findings are robust to different regression specifications. The study supports the adoption of policies promoting a swift migration to efficient and harmonised electronic payment instruments in Azerbaijan.

Keywords: electronic payments, electronic methods, payment systems, economic growth

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I. Introduction

In the market economy, the need for existence of payment systems in order to transfer individuals and businesses' funds fast, secure and effective confirms that payment systems are inseparable parts of the market infrastructure.

In practice, the payment systems operate reliably with excellent functionalities play significant role in the development of interbank money transfer and securities market.

Recent researches have been done by many international organisations provide information that electronic payments impacts positively on consumption and therefore 1% increase in the value of cashless payments leads to increase in the real GDP as 0.08% and 0.11% in the developed and developing countries respectively [50].

According to Michel Camdessus, the former director of International Monetary Fund (IMF), "the improvement of payment systems is the main priority in the central banks of countries which convert their economy from centrally planned economy to the market economy".

Payment systems are considered one of the main parts of the country's financial infrastructure and that is why reliable and effective operation of it is significantly important. Reliable and effective payment systems is one of the essential factors of continuous operation of financial markets. Adequately established and effectively managed systems help to prevent financial crisis, also provide financial stability and increase economical activity by making the payment process cheaper and simplier.

Payment systems influence importantly on the economical processes being inseparable part of monetary policy. The circulation rate of money as being one of the main economical features is the major factor which fully defines the current situation of the economy and impacts directly on the level of inflation. From this point of view, to regulate the interaction of inflation and payment systems is important.

In market economy, the great value of operations are carried out by the entities every day. In the market economy with the modern financial system, purchase or sale of the products or services are carried out by cash or otherwise by cashless form through the transfer from one bank account to another one. The participants of market economy and furthermore individuals and business processes operate in the real sector and financial market face with uncertainty in terms of acceptance and delivery of payments. This uncertainty depends on the different aspects such as, the choice of tools in order to complete payments on time and effectively and moreover it depends on the number of the interim participants involved in the payment flow. Furthermore, the existence and value of loan for the use of payer in order to eliminate temporary deficit in the money balance of the payer impacts entirely on the effectiveness of payment systems. Finally, the developed markets can tend to operate in the global scale to remove geographical limitations. The factors such as the different location of payer and receiver and time differences of payment systems operations influence on the completion of payments on time.

In market economy, sometimes the parties turn to the participants of contracts which require to carry out payments for goods and services. All economic participants should keep reserve funds in order to fulfill its contractual obligations because of acceptance and delivery uncertainty of payments and execution of payments in cash in market transactions.

Nonetheless, the condition of keeping required huge amount of reserve funds by every participant to fulfill its obligation in terms of payments in order to eliminate the losses which arise from the delay of payments is not eefective. Due to remove time interval between acceptance and use of funds of merchants which operate in the economical real sector, it is more effective that financial institutions like banks ready to provide loans, uses payment services.

II. Literature review

Technological development has become one of the leading aspects after structural changes in the financial market and the born of new financial technologies and tools in the last 3 decades. The major changes create retail payment market by gradually replacing the traditional paper-based payment mechanisms with new electronic payment platform and tools such as payment cards.

Therefore, the issues about payment systems and tools arenot only for researches but they are also a discussion topic for the financial markets. The economics of payment systems has attracted various researchers from the different areas of the economics such as financial economy, macro-economy, monetary policy and regulators [1, 2, 21, 25, 26].

Moreover, most of the researchers have discovered that the extend usage of payment systems stimulates the formation of cashless society and as a consequence cashless payments increase the economic growth(Humphrey and Berger, 1990; Humphrey, 1996; Onley, 1999; Klee, 2004 and Garci-Swart, 2006) [1, 22]. In the cashless society the value of electronic payments is raising by using internet, self-service terminals, smartphones and other various electronic tools by people. In the society there is a positive correlation between the weight of electronic payments and the number of people who have a bank account.

There are several researches examining expenses and profit related to the usage of electronic payment tools by reflecting possible positive impacts of allocation, collection and growth of capital. Allen N. Berger (2003) stated that the productivity is significantly increased as a result of improvement of services by banks such as internet banking, electronic payment technologies, information exchange and other technological developments in the financial system. He defined that, there are important impacts in terms of productivity and getting profit in economic scale as a consequence of decreasing bank expenses which is mainly consist of the expenses of back-office by switching from paper based payments to electronic payment tools [1].

David B. Humphrey (2006) and Iftekhar Hasan (2009) provide information that the development in the usage of electronic payment systems, especially electronic retail payment tools is strongly depend on the improvement of bank operations. The issues about improvement are not only depend on the bank operation expenses but also they are related to the profit aspects (European Central Bank and Netherland Central Bank, 2009). In fact, 32 billion USD was saved in European countries between 1987 and 1999 by switching paper based payments to electronic payment systems which was 0.38% of the aggregate GDP in 1999. Furthermore, it has been discovered that it is possible to save the amount equal to 1% of the country's GDP if the country

purely uses electronic based payment systems and improves the card infrastructure [14, 15, 24, 27, 28]

According to the research done by "Global Insight" organisation with the support of "Visa Inc." international card organisation in 2003, the customer expenses have been increased by 6.5 billion USD in the USA in the last 2 decades. Most of these expenses have been realised with the usage of payment cards. The customers prefer to use payment cards due to tend the usage of more effective and comfortable payment tools in terms of time and expense. In the study the data cover the time period between 1960 and 2002 was used and econometric model which measured the impact of card payments on the private consumption was used [49].

7 hypotheses were claimed in terms of the relationship between electronic payments and economic growth by the researchers investigating European retail payments market (Hasan, Renzis and Schmiedel 2012: 7; Hasan, Renzis and Schmiedel 2013; 6-9) and moreover they tried to prove those hypotheses. Their hypotheses were proved on the basis of Areldlano-Bon methodology by using the retail payments statistics of 27 European countries in the period of between 1995 and 2009 [27, 28].

The presence of wide scale of payment tools and also optimal use of these tools is necessary in order to meet with the increasing customers needs. It has been accepted that retail payment systems should be adopted as a systematically important, because it plays an irreplaceable role in the operations from a customer to a customer and commercial and consequently, it impacts essentially on the general economy (Hasan, Renzis and Schmiedel 2012: 4-8; Hasan, Renzis and Schmiedel 2013: 3-5). Customers must have a broad scale of payment tools choices as globally accepted and with the access to the funds in terms of deposit and credit (Kokkola, 2010: 25-28; Hasan, Renzis and Schmiedel 2012: 3-8; Hasan, Renzis and Schmiedel 2013: 5-7). Similarly, merchants should be provided with the electronic transactions which is fast, high secure and cost less than paper-based transactions [27, 28].

Actually, the elimination of the market imbalance and effective payment infrastructure with the reduced costs help to strengthen trade, service, fund transfer and economical interaction.

With the support of "Visa Inc." international card organisation "Moody's Analytics" organisation did a broad research to examine influence of the electronic payments on the economic growth in 56 countries which make 93% of the world GDP in 2013. As a result, it was defined that there was 983 billion dollar economic growth as a consequence of using electronic payment tools in those countries in the period of 2008-2012. This figure is equivalent of 1.9 million new jobs. Likewise it was discovered that the GDP of developing and developed countries raised by 0.8% and 0.3% respectively, as a result of the increase in the value of electronic payments in the same period. In this time period the world real GDP increased by 0.2% on the basis of electronic payments. Correspondingly, it was found out that 1% increase of the usage of payment cards causes 0.056% and 0.035% increase in the consumption and GDP respectively [50].

Similarly, the same research was done by "Moody's Analytics" on the basis of 70 countries in 2016. In the study for the first time Azerbaijan was included in the list of countries make 95% of the world GDP. According to the result of the research the increase of electronic payments contributed 296 billion USD in 70 countries' GDP in 2011-2015. Electronic payments influence more positively on the economy of the developing countries in comparison with the developed countries economy. In this time scale electronic payments contributed 0.08% and 0.11% additional funds to the GDP of the developed and developing countries respectively. In Azerbaijan, this figure was 0.03%. From Commonwealth of Independent States (CIS), this number was 0.33%, 0.07% and 0.02% in Russian Federation, Ukraine and Kazakhstan respectively and it was 0.22% in Turkey. Generally, it must be stated that electronic payments contributed 0.10% and 0.18% additional funds to the GDP and consumption of 70 countries in the period of 2011 and 2015 and caused opening of 2.6 million new jobs [51].

In the study of "Electronic payments as the main aspect of economic development" done by OlenaSlozko and Anna Pelo the researchers of Ukrainian Academy of Sciences Institute of Economics and Forecasting (2014), it was used correlation demonstrates the statistical relationship between electronic payments and economic growth on the basis of data covers 2009-2012. As a result of this study, it should be mentioned that the correlation between the increase

of the electronic payments value and nominal GDP is equal to 0.78. This means, cashless payments impacts directly positively on the increase of GDP in Ukraine [39].

III. Data and methodology

In order to measure the impact of cashless payments on the economic growth firstly, the impact of cashless payments carried out by payment cards on the final consumption has been measured by using ordinary least squares (OLS) method and afterwards the growth has been defined with the number and percentage by multiplying founded growth rate to the corresponding year's consumption on the basis of the study year's real GDP. It is clear that consumption, investment, government expenditure and net export are the main part of the calculation of GDP with the cost method. Therefore, it is possible to measure the impact of cashless payments on the real GDP after defining its influence on the consumption [19, 20].

As it is known from econometrics, it is possible to define the dependence parameters with OLS. According to OLS, variations should be raised to squares and the smallest value of the sum must be found.

To make calculations by hands requires a huge amount of time, therefore the parameters were realised by "Eviews-7".

First of all, the model to measure the impact of cashless payments carried out by payment cards on the consumption is as below:

$$\Delta LOG(Y_i) = \beta_0 + \Delta\beta_1 LOG(X_1(-1)) + \Delta\beta_2 LOG(X_2(-1)) + \Delta\beta_3 LOG(X_3(-3)) + \Delta\beta_4 LOG(X_4(-2)) + \beta_5 LOG(X_5(-1)) + \beta_6 LOG(X_6) + \varepsilon \quad (3.1)$$

Here,

Y_i - the value of final consumption per capita;

β –(all of them) – coefficients;

X_1 – card penetration (the percentage weight of the ratio of the value of transactions carried out by payment cards to final consumption);

X_2 – the value of cashless payments per capita;

X_3 – the number of payment cards per capita;

X_4 – the value consumption per capita;

X_5 – the value of disposable income per capita;

X_6 – the value of transactions carried out by payment cards per capita;

ε -stochastic residual.

All variables have been illustrated on the basis of logarithmic functions because the measurement of the impact of cashless payments value on the real GDP is expressed with the percentage and there is doubt about the presence of the linear regression between dependent and independent variables.

Moreover, the first difference form is included in the model in advance because of thestationary problem in the time row economic variables as it is known from econometrics as well and the variables included in the model are the economic variables.

Explanatory variables are included in the model in the various lags. The reason for that is the variables have been taken into account on the monthly basis. It is clear that the impact of economic aspects on the consumption is not real in a month. Therefore variables are included in the model in the various lags [19, 20].

Statistical data are collected from the official website of State Statistics Committee and Central Bank of the Republic of Azerbaijan in the time period since November 2008 till 1[st]of January 2016.

All features that characterise the adequacy of the model have been tested. The accuracy of the model has been proved by testing the analysis of existence of the seasonal factors impacts, stationary of the model, unit root test of stationary, homoscedastic and heteroscedastic of the model, general quality of the regression dependency (determination factor (R^2)) and autocorrelation problem of the model [19, 20].

The model shown in (3.1) has been investigated by "E-views" software package and results have been illustrated in the table 1.

➢ As can be seen 1% increase in the number of payment cards per person results with 1.2% increase in consumption. In other words, the number of payment cards is considered as the factor increases consumption.

➢ Disposable income per person is considered as the factor increases consumption as well. It has been proved as theoretically. Such as 1% increase in income results with 0.4% increase in consumption.

➢ Cashless payments value by payment cards per capita is considered as the factor increases consumption, too. Such as 1% increase in cashless payments value results with 0.17% increase in consumption.

Table 1

Factors affecting consumption

Explanatory variables	Coefficients	Probability
The number of payment cards per capita	1.204045	0,0029
The value of disposable income per capita	0,400194	0,0000
The value of cashless payments by payment cards per capita	0,167185	0,0307
The value of payments carried out by payment cards per capita	0,119932	0,0012
Card penetration	0,357881	0,0003
Consumption per person (auto-regression)	-0.22598	0,0101

➢ The value of payments carried out by payment cards per person is considered as the factor increases consumption as well. Such as 1% increase in the value of transactions carried out by payment cards results with 0.12% increase in consumption.

➢ Card penetration (the percentage weight of the ratio of the value of transactions carried out by payment cards to final consumption)is considered as the factor impacts positively on the consumption. As can be seen from the table above 1% increase in card penetration causes 0.36% increase in consumption.

➢ Dependent variable is included in the model with 2 lags because of the auto-regression problem in the model and it can be seen that 2 period before of this period decreases the consumption by 0.23%.

As can be seen from table 1, reliability degree of the non-dependent variable is 97%. This means, coefficients of the variable included in the model are much close to the reality.

As it is mentioned, after defining the impact of the value of cashless payments on the consumption and consumption as a part of the GDP, its impact on GDP is calculated with the percentage and amount. As it is known from macroeconomics, one of the calculation methods of GDP is the cost method and the formula is as below:

$Y = C + I + G + (X - M)$

Here,

Y – GDP;

C – consumption;

I – investment;

G – government expenditure;

X – export;

M – import;

According to the formula, consumption is one of the interesting sides of GDP parts in research projects.

According to State Statistics Committee of the Republic of Azerbaijan, Azerbaijan's nominal GDPis 54.352 billion manat, the consumption is 30.1 billion manatand investment, government expenditure and net export are totally 24.252 billion manat in 2015. These figures are nominal and therefore, it should be divided into deflator. As it is known from macroeconomics, the deflator of GDP is calculated as the formula below:

$$GDP\ deflator = \frac{Nominal\ GDP}{Real\ GDP}$$

According to the formula, the GDP deflator is equal to 0.911 in Azerbaijan in 2015. Nominal GDP should be divided into deflator in order to convert nominal GDP to the real GDP. In that case, the real GDP is 59.662 billion manat, the consumption is 33.041 billion manatand investment, government expenditure and net export is equal to 26.621 billion manat. Afterwards,

as a result of the model (3.1) 0.17% of the real consumption which is 33.041 billion manatis calculated and it is equal to 56 169 700 manat (36 020 071 dollar as of 30.12.2015). This figure is estimated as a growth, 0.094% of real GDP.

After measuring the impact of electronic payments on economic growth in Azerbaijan it has been proved that electronic payments really support to increase value of the country economy.

IV. Conclusion

The results in Table 1 have been obtained through E-views software package based on econometrics model according to the collected data that place in Appendix 1. Initially, the impact of electronic payments on consumption has been calculated and later the consumption has been increased as the growth coefficient and as a result the impact of electronic payments on real GDP has been calculated because one component of real GDP is consumption. This impact is equal to 56 169 700 manat (36 020 071 dollar as of 30.12.2015) or 0.094% of real GDP of 2015.

From this point of view it should be noted that electronic payments influence directly to decrease the value of shadow economy.

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