

## CORRELATION BETWEEN NONCASH PAYMENTS AND ECONOMIC GROWTH: CASE OF REPUBLIC OF MOLDOVA

Ana CÎRLAN

*Academy of Economic Studies of Moldova, MD-2005, Republic of Moldova  
ana.cirlan@ase.md*

Mariana BUNU

*Academy of Economic Studies of Moldova, MD-2005, Republic of Moldova  
bunu.mariana@ase.md*

### Abstract

*The paper contains the authors' research on the subject of impact of cashless payments on economic growth of the Republic of Moldova. By using regression was aimed to show off the relationship of GDP and non-cash payments. The economic effects of cashless payments and their impact on the growth of the national economy in current economic conditions are discussed. The data for calculation were taken from the National Bank of Moldova and from the National Bureau of Statistics of the Republic of Moldova. The analysis focuses on calculation of the level of the value of non-cash payments in GDP of the Republic of Moldova connected to the share of the non-observed economy in GDP. Data confirm a high level of that indicator, thus special enunciation is for the hypothesis that cashless payments contribute to the decrease of the unobserved economy. The linear relationship between non-cash payments and GDP of the Republic of Moldova was described and depicted.*

**Key words:** *cashless payment instruments; economic growth; electronic payment; non-cash payments; unobserved economy.*

**JEL Classification:** E42, O 52

### I. INTRODUCTION

Trends in recent years indicate a significant growth rate in the volume of transactions through cashless payments. Scientific researches in the field reveals the direct impact of increasing the share of cashless payments on the development of the national economy by increasing the speed of transactions and their number, also by reducing the cost of each transaction. Estimates of quantitative effects in this area generally range from tenths to 1.5% of GDP.

Increasing the share of non-cash means of payment up to the complete displacement of cash from circulation in recent years has become one of the most discussed topics on the global financial agenda. The movement towards a cashless economy is one of the priorities of financial regulators in a number of countries, as developed as developing. On the other hand, in almost all countries there can be recognized a low-speed fostering to a developed noncash payment system. A number of barriers along with the simple inertia of markets, slow down the displacement of cash from circulation. About the Republic of Moldova can be stated that is not an exception in the global process. A strategic movement towards a cashless economy has been repeatedly declared, both at the level of state bodies and at the level of financial market participants, but the speed of movement is currently insufficient.

The correlation between noncash payments and economic growth is approved in quantitative, research-based assessments of possible effects and emerging risks. With the abundance of primary research data, there is a lack of concepts that bring them together and allow modeling the effects in applying certain stimulating actions to the realities of Republic of Moldova. The paper is intended to contribute to this area. So, the main goals of research follow (1) to describe the phenomenon of non-cash payments, its current scale in application to the Republic of Moldova and the dynamics based on comparison with global trends and (2) to analyze the possible effects on the economic development of the country from the movement to a cashless economy.

### II. LITERATURE REVIEW

On the global scale, to date, there is a fairly extensive amount of research literature dedicated to the analysis of specific case studies of non-cash payments and their impact on countries or individual industries economy. On cumulative basis, this literature allows to describe the key economic effects of the growth in the share of non-cash funds in circulation.

The link between the increase in the share of cashless payments and economic growth was noted in the hypothesis of Worthington (Worthington, 1995) based on an analysis of empirical data from the UK market. There will be analyzed and developed the hypothesis that a move to widespread cashless payments with a high level of adoption of digital transactions among population will lead to long-term economic growth due to increase in use of payment cards, reduction of costs and increase in overall demand and supply. The outcome would be measured by the increase in the country's GDP per capita and its growth rate (Newstead, 2012). Recent studies confirm the strong role of cashless payments in fostering economic growth and affirm that advanced economies that have moved away from cash transactions would add about 1 percentage point to the annual GDPs. Emerging economies switching to digital transactions can boost annual GDP by as much as 3 percent. The reasons are that cashless transactions can increase the velocity of value transfers, reduce the fraud, provide more transparency. Moreover, promoting of noncash payments lead to shrinking unobserved economy.

For example, Garcia-Schwartz et al. (2004) conducted an empirical analysis of the costs and benefits of switching to non-cash settlement methods using three case studies in the US market (grocery stores, discount centers and electronics stores), showing that firstly, non-cash payments improve and speed up the accounting process, opening up space for innovation and development in the field of financial management of the firm, and secondly contribute to reducing the level of crime and fraud. In the study (Macovei, 2020) it is presented the influence that the CPI has on the GDP in Romania over the period of 28 years.

The topic of increasing the transparency of the economy in the transition to non-cash payments was also studied by Wright et al. (2014), Meta (1999) or Park et al. (2008). The study of Wright et al. (2014) concluded that the cashless system will reduce the high cost of business operations for retail businesses in terms of learned employees, provision of security and will boost retail investments opportunities.

### III. MATERIALS AND METHODS

In addition to convenience and security, the use of electronic payments plays a crucial role in boosting economic growth around the world. The e-commerce trends open the door for new digital payment solutions and new players on the payment market, contributing to the emergence of the cashless society in some countries. Even if in Europe a big share of point-of-sale transactions are still made in cash, Sweden is an example of a highly digitized country, where cash transactions accounted for less than 2 % of the value of payments in 2018.

Several studies show that in economic developed countries, cashless payments usually have a much higher share in GDP than in less developed countries, where the shadow economy continues to persist.

In the Republic of Moldova, from the analysis carried out in table 1, the low level of the value of non-cash payments in GDP can be observed. This result expresses the low level of use of non-cash payment instruments in the Republic of Moldova. However, following the evolution of this indicator, it can be seen that the situation is improving. So, if in 2009 the share of cashless payments in GDP was only 0.5 percent, then in 2021 it increased to 10.1 percent, which means the penetration non-cash payment instruments and their use on a wider scale, replacing cash, compared to 2009, when this indicator established 0.5%.

**Table 1. Share of Non-Cash Payments in GDP in the period 2009-2021**

Year	Value of non-cash payments, million lei	GDP, million lei	Share of non-cash payments in GDP, %
2009	286,6	60 043,3	0,5
2010	431,8	71 849,0	0,6
2011	622,7	82 174,0	0,8
2012	868,0	99 879,0	0,9
2013	1 077,1	100 510,0	1,1
2014	1 488,1	112 050,0	1,3
2015	2 069,2	122 563,0	1,7
2016	3 253,4	134 937,0	2,4
2017	4 847,2	150 369,0	3,2
2018	7 034,5	189 062,6	3,7
2019	10 537,6	206 256,2	5,1
2020	16 289,3	199 734,0	8,2
2021	24 364,3	241 871,0	10,1

Source: developed by the authors based on the Activity Indicators within the payment card payment system  
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of the Republic of Moldova. Retrieved August 2, 2022 from: <http://bnm.md/bdi/pages/reports/dsp/DSP1.xhtml>.

If we were to analyze the case of the Republic of Moldova in terms of the shadow economy, then it is not news that it has been dealing with this phenomenon for many years, and cash remains the main payment instrument, favoring, thus, salary in envelopes, tax evasion, corruption and other negative phenomena. According to the data of the National Bureau of Statistics, presented in the next table, the fact is that, in the period 2009-2020, the share of the non-observed economy in GDP comprised values between 22-28%.

The lowest level of this indicator was recorded in 2011, reaching a value of 21.7%, which would imply a recovery of the economy during the last years, and the highest level was recorded in 2019, reaching level 28.0%.

**Table 2. Share of unobserved economy in GDP in the Republic of Moldova (%)**

Year	Share of unobserved economy in GDP (%)
2009	22,4
2010	22,2
2011	21,7
2012	23,7
2013	23,1
2014	23,2
2015	23,7
2016	22,4
2017	24,5
2018	27,8
2019	28,0
2020	27,4

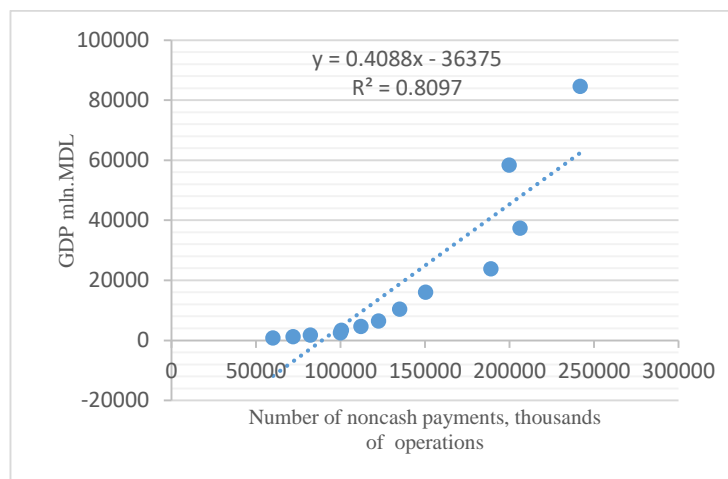
Source: The Non-Observed Economy. Retrieved August 2, 2022 from: <http://www.statistica.md/category.p?l=ro&idc=191&>.

The most affected branches of the economy in this sense are agriculture, forestry and fishing, holding a share of 6.6 percent of the total share of the non-observed economy in GDP. Within these economic sectors, undeclared work, paid in cash, predominates. In the same type, retail trade, transport, catering activities (restaurants) have a significant contribution in the gray economy due to the failure to report all receipts in order to avoid payments to the tax authority, preferring cash transactions.

Considering that in the Republic of Moldova the unobserved economy represents a serious problem, affecting the most important branches of the economy, it is important to identify those measures that, once implemented, would minimize the invisible economy in the Republic of Moldova. In this regard, special emphasis is placed on the hypothesis that cashless payments contribute to the reduction of the unobserved economy. Several studies carried out by various companies such as PwC or Mastercard have identified that there is a high degree of correlation between the number of noncash payments and the size of the gray economy. Thus, it has been observed that countries that register a high number of electronic payments (Great Britain, Luxembourg, Finland, Sweden, etc.) have a lower share of the gray economy in GDP than countries where the use of cash is more preferred (Bulgaria, Romania, Serbia, Bosnia and Herzegovina, etc.), and respectively, register an imposing share of the gray economy. In this case, cashless payments are the element that favors the gray economy, due to the impossibility of tracking cash transactions.

Using the graphical method (cloud of points), the link between non-cash card payments and GDP of the Republic of Moldova was depicted. Thus, from figure 1 it can be seen that there is a linear relationship between the variables mentioned above, and this relationship is direct. Correlogram points are preferentially distributed in quadrants I and III. The dependence between cashless payments and GDP is positive: an increase in the number of cashless payments implies an increase in GDP. The regression line has an upward trend. The figure also illustrates an upward trend.

At the same time, the coefficient of determination (R<sup>2</sup>) reached the level of 80.97 percent, which means that the increase in cashless payments influences the value of GDP by 80.97 percent. Analyzing the variable coefficient x from the regression equation ( $y = 0.4088x - 36375$ ) from figure 1, it can be established that for each increase in the number of cashless payments by one million operations, the GDP will increase by 4088 million lei.



**Figure 1 – Chart of the correlation between the number of cashless payments and GDP in the Republic of Moldova**

Effects of cashless payments on economic growth. The migration from physical payment methods to the digitization of payments worldwide raises a new question: What effects would the higher use of payment cards generate in one national economy?

In scientific research on the role of cashless payments in economic systems, three types of effects on the national economy are highlighted. They are considered as a result of the increase in the weight of cashless settlements in the economy:

- transparency - a group of effects associated with a more efficient and complete accounting of monetary transactions, an increase in the tax base, transparency of taxes and fiscal charges, a decrease in the weight of the shadow economy, a reduction in operating costs, etc. In developed markets, this type of effect represents up to 50% of the total potential gain from cashless payments, it being obvious that the state is the main beneficiary in this area;

- sustainability – economic systems with a higher share of non-cash payments in the total volume of transactions are more resistant to fluctuations in the economic environment, since in the phases of decline and recession, the non-cash monetary fluctuation acts as an additional source of liquidity in the financial system. These effects have a particular relevance in the current conditions of crisis and sanctions for the economy of the Republic of Moldova;

- growth - the development of the share of cashless settlements leads to economic growth by increasing the speed of transactions and their number by reducing the cost of each transaction.

#### IV. CONCLUSION

The performed analysis conducts to draw the following conclusions. Currently, in the Republic of Moldova, according to some researchers, there is a balance of cash and non-cash means of payment, which can be considered sub-optimal. This balance is maintained both by the behavior of economic entities and by the state and dynamics of the market environment:

- the inertia of most actors, due to the relative fall of the reasons for the transition to a cashless economy compared to the barriers imposed;

- the insufficiency and unevenness of digitization, preventing the triggering of a pronounced network effect in the penetration of digital technologies into the country's economic system.

The sub-optimality of the cash and non-cash payments equilibrium lies in the large share of cash and non-cash transactions, as well as the significant size of the shadow economy.

Therefore, the exit from the suboptimal equilibrium of the Moldovan economy is important to realize the benefits of cashless payments in three dimensions.

- Transparency: Increasing the transparency of business in the country and reducing flows from the unseen economy will have direct positive consequences on budgets at all levels. Indirect positive consequences can be a reduction in the cost of servicing transactions, an increase in the trust of counterparties in each other, which will lead to a general reduction of losses in the economy.

- Sustainability: A system with a high proportion of non-cash funds is more resistant to the impact of economic cycles, in particular, in the recession phase, the resources available in the economy are used more efficiently.

- Growth: lower transaction costs, efficient use of money in the economy can lead to increased number of

transactions, i.e., overall economic growth.

Thus, an increase in the share of cashless payments in the economy helps to reduce the invisible sector, the cost of transactions, increase the transparency of business, of the tax base and, consequently, expands the ability of commercial entities to widely use cashless payments through innovative payment instruments.

Thus, the cashless payment system is a set of tools and methods used in the economic activity of entities for the transfer of funds, making mutual settlements and settlement of debt obligations between participants in the formation of GDP. A stable and fast system of payments and settlements is a prerequisite for the efficient functioning of all modern businesses, in all its sectors. It largely determines the efficiency of the economy.

In authors opinion, the choice of the form of cashless payments focuses on the business development of each market participant. The use of non-cash payment instruments will foster the economic activity, increase the solvency of entities and their financial stability.

## REFERENCES

1. Directive (EU) 2015/2366 of the European Parliament and of the Council of 25 November 2015 on payment services in the internal market, amending Directives 2002/65/EC, 2009/110/EC and 2013/36/EU and Regulation (EU) No 1093/2010, and repealing Directive 2007/64/EC. Retrieved August 5, 2022 from: <https://eur-lex.europa.eu/eli/dir/2015/2366/2015-12-23>.
2. Macovei, A. G. (2020). *Impact of the consumer price index on gross domestic product in Romania*, ECOFORUM, Vol 9, nr. 2 (22), 2020
3. Newstead, S. (2012). *Cashless Payments Underpin Economic Growth*. Building Tomorrow.
4. Parke, J., Rigby, J., Parke, A. Cashless and card-based technologies in gambling: A review of the literature. 2008. Centre for the Study of Gambling, University of Salford. Retrieved August 5, 2022 from: [https://www.researchgate.net/publication/265032241\\_Cashless\\_and\\_card-based\\_technologies\\_in\\_gambling\\_A\\_review\\_of\\_the\\_literature](https://www.researchgate.net/publication/265032241_Cashless_and_card-based_technologies_in_gambling_A_review_of_the_literature).
5. Study on impact of electronic payments in economy (PwC, 2014). Retrieved August 5, 2022 from: [https://cdn.cursdeguvernare.ro/wp-content/uploads/2014/12/Studiu-PwC\\_Impactul-platilor-electronice-in-economie.pdf](https://cdn.cursdeguvernare.ro/wp-content/uploads/2014/12/Studiu-PwC_Impactul-platilor-electronice-in-economie.pdf).
6. Slozko, O., Pelo, A. The Electronic Payments as a Major Factor for Further Economic Development. *Economics and Sociology*. 2012. № 3. pp. 130–140.
7. Thomas H. Measuring progress towards a cashless society. MasterCard Advisors analysis, 2013. Retrieved August 5, 2022 from: <https://newsroom.mastercard.com/wp-content/uploads/2014/08/MasterCardAdvisors-CashlessSociety-July-20146.pdf>.
8. Ulian, E. (2022). Interconditionality between the dynamics of mergers and acquisitions and macroeconomic factors, *The European Journal of Accounting, Finance & Business*, Volume 10, Issue 2/ June 2022, DOI: 10.4316/EJAFB.2022.1028.
9. Швандар К. В., Анисимова А. А. Зарубежный опыт развития системы безналичных платежей: практика и результаты. *Финансовый журнал*. 2015, №1 pp. 91-98. Retrieved August 5, 2022 from: [https://www.nifi.ru/images/FILES/Journal/Archive/2015/1/statyi\\_2015\\_1/10\\_shvander.pdf](https://www.nifi.ru/images/FILES/Journal/Archive/2015/1/statyi_2015_1/10_shvander.pdf).
10. Worthington, S. (1995). The cashless society. *International Journal of Retail & Distribution Management*. T. 23, № 7, pp. 31-40.
11. Wali, A., Wright, L. T., Reynolds, P. L. Cashless policy, users' perception and retail marketing performance. *International Conference on the Restructuring of the Global Economy (ROGE)*, Cambridge UK 2014. At: University of Cambridge UK, Volume: 5, number 1. Retrieved August 5, 2022 from: [https://www.researchgate.net/publication/269986252\\_Cashless\\_policy\\_users'\\_perception\\_and\\_retail\\_marketing\\_performance](https://www.researchgate.net/publication/269986252_Cashless_policy_users'_perception_and_retail_marketing_performance).