

## THE IMPACT OF BANKING PAYMENT SYSTEMS ON THE NATIONAL ECONOMY: IMPLICATIONS FOR URBAN–RURAL DISPARITIES AND CASH USAGE

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**ABSTRACT:** *The digital transformation of payment systems has become a central component of financial modernisation, affecting transaction costs, financial intermediation, fiscal transparency and access to formal financial services. This paper examines the evolution and economic implications of banking payment systems in Romania, with particular attention to the coexistence of rapid growth in electronic payments and persistent dependence on cash among vulnerable and rural populations. Using descriptive secondary data from the National Bank of Romania, the National Institute of Statistics and Eurostat, the study analyses card-payment values over 2015–2024 and places these developments in the broader context of financial inclusion, digital infrastructure and urban–rural disparities. The total value of debit- and credit-card payments increased from RON 38.758 billion in 2015 to RON 339.463 billion in 2024, while the corresponding value per inhabitant rose from approximately RON 2.0 thousand to RON 17.8 thousand. At the same time, Romania remained above the EU average in the share of people at risk of poverty or social exclusion, indicating that payment digitalisation and socio-economic convergence do not advance uniformly. The paper argues that payment-system modernisation can improve efficiency, transparency and inclusion, but a policy strategy focused exclusively on cash substitution may create new forms of exclusion. An inclusive transition requires simultaneous investment in payment acceptance, connectivity, financial and digital literacy, and continued access to cash.*

**Keywords:** *Payment Systems; Digital Payments; Cash; Financial Inclusion; Urban–Rural Disparities; Romania; Economic Development*

**JEL Classification:** *E42; G21; G28; O16; O33; R11*

### 1. INTRODUCTION

Payment systems are not merely technical arrangements for transferring funds. They form part of the institutional infrastructure through which households, firms and public authorities participate in economic activity. Their accessibility and efficiency affect transaction costs, liquidity management, financial intermediation and the ability of citizens to use formal

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financial services. In Romania, the relevance of payment systems is amplified by persistent differences between urban and rural areas in cash usage, access to non-cash instruments, banking penetration, digital infrastructure and financial education.

Romania has experienced a substantial modernisation of its payment infrastructure since the 1990s. The transition from paper-based settlement to electronic processing, integration with European payment arrangements and the rapid diffusion of cards, internet banking, mobile banking and instant payments have changed the structure of everyday transactions. Nevertheless, the diffusion of technology has not eliminated cash. Rural communities, older people and lower-income households may face weaker banking infrastructure, lower digital capabilities and greater perceived risks from electronic services.

The central research problem is therefore not whether digital payments are expanding, but whether this expansion is sufficiently inclusive to reduce structural payment gaps. The paper asks three questions: (1) how rapidly has card-payment activity increased in Romania; (2) through which channels can payment-system modernisation affect the national economy; and (3) why can cash remain economically and socially relevant despite financial digitalisation?

The contribution of the study is to connect payment-system development with financial inclusion and territorial inequality. The source material explicitly frames cash usage, non-cash access, banking penetration, digital infrastructure and financial education as indicators of urban–rural differences, rather than treating payments only as a technical banking function.

## 2. LITERATURE REVIEW AND CONCEPTUAL FRAMEWORK

Modern payment systems reduce the time required to transfer funds, support liquidity management and lower operational frictions. At the institutional level, safe settlement infrastructures reduce counterparty and settlement risks and support confidence in the banking system. The Romanian infrastructure combines large-value settlement, retail clearing and securities settlement, while European integration has increased interoperability for euro-denominated and cross-border transactions.

Digital payments may also produce wider macroeconomic effects. Greater transaction traceability can support formalisation and tax compliance, while electronic acceptance can facilitate e-commerce and market access for small firms. Recent European evidence, however, suggests that the relationship between digitalisation and informality is not mechanical: digital payments may narrow specific tax-compliance gaps without automatically eliminating the shadow economy (Mastac, 2025).

Financial inclusion involves more than formal account ownership. Effective participation requires affordable services, accessible infrastructure, usable payment instruments, digital connectivity and sufficient financial and digital capabilities. Negrea and Scarlat (2022) identify physical infrastructure, regional disparities, financial education and consumer preferences as important constraints on greater adoption of digital payments in Romania.

Cash therefore has a dual interpretation. High involuntary reliance on cash can signal incomplete financial inclusion, particularly when consumers lack accounts, payment acceptance or digital skills. At the same time, cash itself can protect payment inclusion because it does not require a smartphone, broadband connection or authentication technology. The policy objective should consequently be an inclusive expansion of payment choice rather than the administrative elimination of cash.

The Romanian case is particularly relevant because financial and digital infrastructures are unevenly distributed. Rural areas may have fewer branches, ATMs and POS terminals, weaker access to high-speed connectivity, older demographic structures and lower household

incomes. These factors can reinforce one another: limited merchant acceptance reduces the usefulness of cards, while low consumer demand weakens incentives for merchants to invest in acceptance infrastructure.

This mechanism can be summarised as: uneven territorial development → unequal financial and digital infrastructure → unequal effective financial inclusion → heterogeneous payment behaviour. Under this framework, persistent cash use is partly an outcome of structural constraints rather than solely a consumer preference.

### 3. DATA AND METHODOLOGY

The empirical component is descriptive and uses secondary data compiled in the source study from the National Bank of Romania (BNR), the Romanian National Institute of Statistics (INSSE) and Eurostat. The principal quantitative series covers 2015–2024 and measures the value of payment transactions using debit and credit cards issued by resident payment service providers. Population data are used to construct per-capita indicators. The analysis is complemented by indicators of poverty and social exclusion to contextualise financial inclusion.

Card-payment value is treated as an observable proxy for financial payment digitalisation. This measure does not directly quantify the share of cash at the point of sale and therefore should not be interpreted as a complete measure of cash substitution. The approach is appropriate for documenting the scale and pace of digital-payment diffusion, while future work should combine it with ATM withdrawals, POS density, account ownership, internet banking and rural–urban indicators.

**Table 1. Evolution of card-payment transactions in Romania, 2015–2024**

| Year | Debit<br>(RON<br>mn) | Credit<br>(RON<br>mn) | Total<br>(RON<br>mn) | Population | Debit pc<br>(RON<br>th.) | Credit pc<br>(RON<br>th.) | Total pc<br>(RON th.) |
|------|----------------------|-----------------------|----------------------|------------|--------------------------|---------------------------|-----------------------|
| 2024 | 308 688              | 30 775                | 339 463              | 19 067 576 | 16.2                     | 1.6                       | 17.8                  |
| 2023 | 250 042              | 26 353                | 276 395              | 19 055 228 | 13.1                     | 1.4                       | 14.5                  |
| 2022 | 207 095              | 22 271                | 229 366              | 19 043 098 | 10.9                     | 1.2                       | 12.0                  |
| 2021 | 154 070              | 16 977                | 171 047              | 19 229 519 | 8.0                      | 0.9                       | 8.9                   |
| 2020 | 114 112              | 13 900                | 128 012              | 19 354 339 | 5.9                      | 0.7                       | 6.6                   |
| 2019 | 94 476               | 14 119                | 108 595              | 19 425 873 | 4.9                      | 0.7                       | 5.6                   |
| 2018 | 71 083               | 12 000                | 83 083               | 19 533 481 | 3.6                      | 0.6                       | 4.3                   |
| 2017 | 53 185               | 9 793                 | 62 978               | 19 643 949 | 2.7                      | 0.5                       | 3.2                   |
| 2016 | 40 174               | 8 147                 | 48 321               | 19 760 585 | 2.0                      | 0.4                       | 2.4                   |
| 2015 | 32 210               | 6 548                 | 38 758               | 19 875 542 | 1.6                      | 0.3                       | 2.0                   |

Source: Author's processing based on BNR, INSSE and Eurostat data reported in the source material.

Note: per-capita figures are expressed in thousand RON and rounded.

Table 1 documents a substantial and sustained expansion of card-payment activity in Romania between 2015 and 2024. The total value of card-payment transactions increased from RON 38.8 billion in 2015 to RON 339.5 billion in 2024, representing an almost ninefold increase over the period. This expansion was driven predominantly by debit-card transactions, which rose from RON 32.2 billion to RON 308.7 billion and accounted for approximately 91% of total card-payment value in 2024. Credit-card payments also increased, from RON 6.5 billion in 2015 to RON 30.8 billion in 2024, although at a considerably slower pace than debit-card payments.

The per-capita indicators reinforce this pattern and show that the increase cannot be attributed to demographic developments. Total card payments per capita rose from approximately RON 2.0 thousand in 2015 to RON 17.8 thousand in 2024, while Romania's population declined slightly over the same period. Debit-card payments per capita increased particularly strongly, from RON 1.6 thousand to RON 16.2 thousand, compared with an increase in credit-card payments from RON 0.3 thousand to RON 1.6 thousand. The acceleration becomes especially visible after 2019: total card payments per capita increased from RON 5.6 thousand in 2019 to RON 17.8 thousand in 2024, suggesting a marked intensification of electronic payment use during and after the pandemic period.

Overall, the evidence indicates a pronounced shift towards card-based payments in Romania, characterised primarily by the growing use of debit rather than credit instruments. However, the rapid increase in the value of card transactions should not, by itself, be interpreted as evidence of an equivalent decline in cash dependence. The table captures the expansion of card-payment activity but does not measure the share of cash in total transactions or establish substitution between payment instruments. It therefore provides strong evidence of payment digitalisation while requiring complementary indicators to assess whether this development has translated into a structural reduction in cash use.

## 4. RESULTS

### 4.1. Acceleration of card payments

The data reveal a pronounced acceleration of electronic payment activity. Total debit- and credit-card payment value rose from RON 38.758 billion in 2015 to RON 339.463 billion in 2024. This corresponds to an increase of approximately 776%, or an 8.76-fold expansion over the decade. Debit-card payments were the main driver, increasing from RON 32.210 billion to RON 308.688 billion. Credit-card payments rose from RON 6.548 billion to RON 30.775 billion.

The per-capita series confirms that this change cannot be attributed to population growth. Total card-payment value per inhabitant increased from approximately RON 2.0 thousand in 2015 to RON 17.8 thousand in 2024, even as the population declined. The strongest structural break is visible around the pandemic period: total per-capita card payments rose from RON 5.6 thousand in 2019 to RON 6.6 thousand in 2020, RON 8.9 thousand in 2021 and RON 12.0 thousand in 2022.

**Table 2. Key indicators of payment digitalisation**

| Indicator                                     | 2015       | 2024       | Change  |
|-----------------------------------------------|------------|------------|---------|
| Debit-card payment value (RON mn)             | 32,210     | 308,688    | +858.4% |
| Credit-card payment value (RON mn)            | 6,548      | 30,775     | +370.0% |
| Total card-payment value (RON mn)             | 38,758     | 339,463    | +775.9% |
| Total card-payment value per capita (RON th.) | 2.0        | 17.8       | 8.9×    |
| Population                                    | 19,875,542 | 19,067,576 | −4.1%   |

Source: Calculations based on Table 1.

## 4.2. Social vulnerability and incomplete convergence

Payment digitalisation has occurred alongside persistent socio-economic vulnerability. The source dataset reports that the share of people at risk of poverty or social exclusion declined substantially in Romania, from 44.5% in 2015 to 27.9% in 2024. The EU average declined from 24.0% to 21.0% over the same endpoints. Romania therefore improved markedly, but a sizeable gap remained in 2024.

**Table 3. People at risk of poverty or social exclusion: Romania and EU benchmark**

| Year | Romania (%) | EU (%) | Romania–EU gap (pp) |
|------|-------------|--------|---------------------|
| 2015 | 44.5        | 24.0   | 20.5                |
| 2024 | 27.9        | 21.0   | 6.9                 |

Source: Eurostat values reported and processed in the source material.

The narrowing of the poverty/exclusion gap is consistent with broader economic convergence, but it does not establish that payment digitalisation caused the improvement. Rather, the two trends demonstrate why payment-system analysis should be embedded in a wider socio-economic framework.

## 4.3. Channels of impact on the national economy

The expansion of modern payment instruments can influence the national economy through several channels. First, faster settlement and electronic processing can reduce transaction and administrative costs. Second, digital payments increase the traceability of commercial flows, potentially improving fiscal compliance and reducing opportunities for unrecorded transactions. Third, broader access to accounts and electronic instruments can deepen financial intermediation and connect households and small firms to e-commerce and formal markets. Fourth, interoperable payment infrastructures facilitate cross-border trade and European market integration.

These effects should nevertheless be interpreted cautiously. The descriptive data document strong co-movement between financial modernisation and economic change but do not identify causal effects. Moreover, the benefits of digitalisation depend on effective access. A payment infrastructure that is technologically advanced at national level may still exclude users in areas with weak connectivity, low merchant acceptance or limited financial literacy.

## 5. DISCUSSIONS

The Romanian evidence points to a hybrid and structurally uneven payment transition, rather than to a linear substitution of cash by digital instruments. On the one hand, the value of card-payment transactions has expanded at an exceptional pace, reflecting the progressive digitalisation of household transactions, the development of payment infrastructure and the increasing integration of the Romanian financial system with European technological and regulatory standards. The rapid growth of card payments documented in the preceding analysis is consistent with a broader transformation in consumer payment behaviour and with the increasing availability of electronic payment channels. On the other hand, this aggregate expansion coexists with the continued importance of cash, particularly among population groups whose effective participation in digital finance is constrained by territorial disparities, lower incomes, age-related barriers, limited digital skills or insufficient access to financial and

technological infrastructure. Romania's payment transition should therefore be understood as a process in which digital adoption and persistent cash dependence can occur simultaneously across different segments of the population and territory.

This distinction is essential for interpreting the broader economic implications of payment-system development. A rising volume and value of card transactions provide evidence of increasing digital adoption, but they cannot, in isolation, be treated as indicators of universal financial inclusion. Formal access to a payment instrument differs conceptually from the capacity to use that instrument regularly, independently and efficiently. In some rural or economically disadvantaged communities, for example, ownership of a bank account or payment card may primarily facilitate the receipt of wages, pensions or social transfers, while a substantial proportion of these funds may subsequently be withdrawn and used in cash. Under such circumstances, card ownership represents formal inclusion in the banking system without necessarily implying a corresponding degree of functional integration into the digital-payment ecosystem. Consequently, indicators based exclusively on account or card ownership may overstate the depth of payment digitalisation if they are not considered alongside actual usage patterns.

The relevant analytical and policy framework should therefore extend beyond the availability of payment instruments to encompass effective use, merchant acceptance, physical and digital accessibility, affordability and consumer capability. These dimensions are mutually reinforcing. Consumers cannot meaningfully substitute digital payments for cash if merchants do not accept electronic instruments, if broadband or mobile connectivity is unreliable, if access to banking services is geographically limited, or if users lack the digital and financial skills required to navigate electronic payment environments securely. Similarly, the benefits associated with payment digitalisation may be distributed unevenly when the fixed costs of devices, connectivity or banking services weigh more heavily on lower-income households. From this perspective, payment accessibility is better understood as a multidimensional capability rather than as the simple possession of a bank account or payment card.

The Romanian case consequently highlights an important distinction between the extensive and intensive margins of financial inclusion. The extensive margin concerns whether individuals have formal access to financial accounts and payment instruments, whereas the intensive margin concerns how frequently, effectively and for what purposes these instruments are actually used. A country may therefore record substantial progress in account penetration and card issuance while retaining significant differences in the intensity of digital-payment use across socio-economic groups and regions. This interpretation is particularly relevant in the context of Romania's pronounced territorial inequalities, since national averages may conceal substantial differences between București-Ilfov and less economically developed or more rural regions. Payment digitalisation may advance rapidly at the aggregate level while remaining incomplete from the perspective of universal accessibility.

The findings also qualify the frequently invoked assumption that reducing cash usage will automatically generate a proportional reduction in economic informality. The expansion of traceable electronic transactions can strengthen transaction transparency, increase the informational capacity of tax administrations and raise the expected costs of concealing taxable activity. At the microeconomic level, evidence linking cash usage with underreporting supports the argument that payment instruments can influence opportunities for tax evasion (Giammatteo, Iezzi, & Zizza, 2021). From this perspective, policies encouraging electronic payments may contribute to formalisation by reducing the anonymity associated with certain cash transactions and by improving the traceability of economic exchanges.

However, the relationship between payment digitalisation and informality is neither automatic nor exclusively technological. Informal economic behaviour is also shaped by institutional quality, perceived fairness of the tax system, enforcement capacity, regulatory

complexity, compliance costs and taxpayers' trust in public institutions. Recent EU evidence suggests that digitalisation can support formalisation but may be insufficient in the absence of complementary institutional conditions, coherent tax policy and sufficiently broad payment-acceptance infrastructure (Mastac, 2025). An expansion of digital-payment opportunities therefore changes the technological environment in which transactions occur, but it does not necessarily eliminate the economic and institutional incentives that generate informal activity in the first place.

These considerations have direct policy implications. A strategy focused narrowly on reducing cash usage risks conflating payment modernisation with financial inclusion and formalisation. A more appropriate objective is to expand the feasible set of secure and affordable payment options available to households and firms while reducing structural barriers to digital participation. This requires simultaneous improvements in digital and financial literacy, connectivity, merchant acceptance, banking accessibility and institutional trust. At the same time, maintaining reasonable access to cash during the transition can perform an inclusion and resilience function for consumers who cannot yet participate fully in digital payment systems or who require alternative means of payment during technological disruptions.

Romania's experience can thus be characterised as a transition from predominantly cash-based payment behaviour towards a more diversified payment ecosystem, rather than as a completed transition to a cashless economy. The rapid expansion of card payments constitutes strong evidence of digital transformation, but the economic significance of this transformation depends on how broadly its benefits and capabilities are distributed across society. The central policy challenge is therefore not simply to maximise the share of digital transactions or minimise the use of cash, but to ensure that payment modernisation improves efficiency, transparency and convenience without creating new forms of financial exclusion. In this sense, successful payment-system development should ultimately be evaluated by the coexistence of digital progress, effective inclusion and consumer choice rather than by the disappearance of cash itself.

## 6. POLICY IMPLICATIONS

Romania's payment strategy should combine the continued expansion of digital payments with explicit safeguards for financial inclusion, accessibility and system resilience. Although the rapid development of electronic payment instruments can generate substantial benefits in terms of transaction efficiency, convenience, traceability and integration with the wider European financial system, these gains cannot be assumed to be distributed uniformly across households, firms and regions. The evidence of persistent socio-economic, territorial and digital disparities suggests that a policy centred exclusively on accelerating the decline of cash could disproportionately affect consumers and businesses that face greater barriers to digital participation. Payment modernisation should therefore be approached as a multidimensional policy objective in which technological progress is accompanied by measures designed to ensure that all population groups retain effective access to essential payment services.

A first policy priority concerns the expansion of affordable electronic-payment acceptance, particularly among small merchants and businesses operating in rural, remote or economically disadvantaged areas. The effectiveness of digital payments depends not only on consumers possessing cards, bank accounts or mobile applications, but also on the existence of a sufficiently dense network of merchants capable of accepting such instruments. Where electronic acceptance entails significant fixed costs, transaction fees or administrative burdens, smaller businesses may have weaker incentives to invest in payment infrastructure. This can create a self-reinforcing constraint: limited merchant acceptance reduces consumers'

incentives to adopt digital payments, while low consumer usage reduces merchants' incentives to provide electronic-payment facilities. Policies that reduce acceptance costs, facilitate access to low-cost point-of-sale technologies and encourage interoperable payment solutions could help overcome this coordination problem and broaden the effective geographical coverage of digital payments.

Infrastructure development represents a second essential component of an inclusive payment strategy. Digital payments increasingly depend on reliable broadband, mobile connectivity and secure technological infrastructure. Consequently, territorial differences in connectivity can translate directly into differences in payment accessibility. In densely populated urban areas, consumers generally benefit from stronger telecommunications infrastructure, greater proximity to banking services and wider merchant acceptance. In rural and sparsely populated areas, by contrast, weaker connectivity and greater distances from financial-service providers may increase the practical costs of digital participation. Investment in broadband and mobile infrastructure should therefore be regarded not merely as a telecommunications or regional-development objective, but also as an integral component of financial inclusion and payment-system modernisation.

A third priority concerns financial and digital capabilities. Access to technology does not necessarily imply the ability or willingness to use it effectively. The transition towards increasingly digital financial services can impose substantial learning costs on individuals with limited digital experience, particularly older consumers and socio-economically vulnerable groups. Difficulties in navigating banking applications, understanding authentication procedures, managing passwords or recognising fraud attempts may discourage adoption even when the necessary infrastructure is technically available. Targeted financial and digital education should consequently complement investments in payment technology. Such initiatives should focus not only on basic operational skills but also on digital security, fraud prevention, consumer rights and confidence in using electronic financial services. Improving these capabilities would strengthen the intensive margin of financial inclusion by enabling individuals who formally possess digital payment instruments to use them effectively and securely.

Interoperability and affordability should constitute additional principles of payment policy. A fragmented ecosystem in which consumers and merchants face multiple incompatible platforms, high transaction costs or complex technical requirements may limit the network benefits normally associated with digitalisation. Interoperable and low-cost payment solutions can reduce barriers to entry, promote competition among service providers and facilitate wider adoption among both consumers and small businesses. From a policy perspective, the objective should therefore extend beyond increasing the number of digital transactions to improving the quality, accessibility and cost-efficiency of the payment infrastructure through which those transactions occur.

At the same time, the expansion of digital payments should not be interpreted as requiring the premature elimination or substantial restriction of cash. As long as access to digital financial services remains uneven, cash continues to perform an important inclusion function for consumers who face technological, economic or capability constraints. It also provides an alternative payment mechanism when electronic systems are temporarily unavailable because of technical failures, connectivity disruptions or other operational shocks. Maintaining reasonable access to cash during the transition can therefore contribute both to social inclusion and to payment-system resilience. The relevant policy question is not whether cash should be preserved indefinitely at existing levels of use, but whether consumers retain a viable alternative while the prerequisites for universal and effective digital participation remain incomplete.

This perspective implies that the appropriate policy objective is not a binary choice between cash and digital payments. Treating the two instruments as mutually exclusive alternatives risks overlooking their different functions within a heterogeneous population and economy. Digital payments can improve efficiency, reduce transaction costs, increase convenience and enhance the traceability of economic activity, whereas cash can continue to provide accessibility, familiarity and operational redundancy for particular users and circumstances. During the transition, these functions may be complementary rather than purely substitutive.

A resilient payment system should therefore be characterised by diversity of instruments and channels. Excessive dependence on any single payment technology may create vulnerabilities, just as excessive dependence on cash may limit the efficiency and transparency gains associated with digitalisation. Payment resilience requires consumers and businesses to have access to alternative mechanisms capable of functioning under different economic, technological and infrastructural conditions. From this perspective, maintaining payment choice is not inconsistent with digital transformation; rather, it can facilitate that transformation by reducing the risk that technological change generates exclusion or excessive dependence on a particular infrastructure.

For Romania, the policy challenge is consequently to manage the transition from a relatively cash-intensive economy towards a more digital payment environment without interpreting digitalisation as an end in itself. Progress should be assessed not only through aggregate indicators such as card-payment values, transaction volumes or the number of payment terminals, but also through measures of effective accessibility, regional coverage, affordability, digital capabilities and actual usage across socio-economic groups. Such an approach would provide a more comprehensive assessment of whether technological development is translating into broadly shared improvements in financial participation.

Ultimately, an inclusive payment strategy should seek to maximise the economic benefits of digitalisation while minimising the risk of exclusion. Technological efficiency and transaction transparency can increase alongside consumer protection, accessibility and payment choice, provided that policy addresses the structural conditions necessary for effective participation. The long-term objective should therefore be a payment ecosystem in which digital instruments become increasingly attractive because they are accessible, affordable, secure and convenient, rather than because cash alternatives have been removed before all consumers are capable of participating effectively. Under this approach, payment modernisation becomes part of a broader strategy of financial inclusion and economic development, with resilience and accessibility serving as essential complements to technological progress.

## 7. CONCLUSIONS

Romania underwent a substantial transformation in payment behaviour between 2015 and 2024, reflecting the broader digitalisation of financial transactions and the progressive integration of electronic payment instruments into everyday economic activity. The empirical evidence presented in this study indicates a particularly strong expansion of card-based payments over the analysed period. The combined value of debit- and credit-card payments increased from RON 38.758 billion in 2015 to RON 339.463 billion in 2024, while total card-payment value per inhabitant rose from approximately RON 2.0 thousand to RON 17.8 thousand. This almost ninefold increase in aggregate card-payment value, accompanied by a similarly pronounced rise in the per-capita indicator, provides clear evidence that electronic payments have acquired substantially greater economic relevance within the Romanian payment system.

The composition of this expansion is also significant. As demonstrated by the preceding analysis, debit-card transactions account for the dominant share of card-payment value and have expanded considerably faster than credit-card payments. This pattern suggests that Romania's digital payment transition has been driven primarily by instruments linked directly to current accounts rather than by an expansion of consumer credit. The evolution is consistent with the progressive normalisation of electronic payments for routine transactions and with the broader development of payment infrastructure. At the same time, the increase in card-payment activity occurred despite a relatively stable or moderately declining population, indicating that the observed expansion cannot be explained by demographic growth. The substantial increase in payments per inhabitant instead points towards a structural change in the intensity with which electronic payment instruments are used.

Nevertheless, the results also demonstrate that the transformation of Romania's payment system remains incomplete and unevenly distributed. Rapid growth in aggregate electronic transactions should not be interpreted as evidence that all households, regions or socio-economic groups have participated equally in the digital transition. Romania continues to exhibit significant disparities in income, poverty exposure, digital capabilities and access to digital financial services. Particularly important in this respect is the contrast between Bucureşti-Ilfov and many other Romanian regions, which illustrates how national averages can conceal substantial territorial heterogeneity. The coexistence of rapidly expanding electronic payments with persistent socio-economic and digital inequalities supports the interpretation of Romania as experiencing a hybrid payment transition rather than a uniform movement towards a fully cashless economy.

This distinction has important implications for the interpretation of cash dependence. Continued cash usage should not necessarily be understood exclusively as the result of consumer preference, habit or resistance to technological change. For some individuals and communities, particularly where banking infrastructure, merchant acceptance, connectivity or digital capabilities remain limited, cash dependence may also reflect a restricted feasible set of payment alternatives. In this context, the distinction between voluntary cash preference and structurally constrained cash reliance becomes analytically important. Consumers who possess a bank account or payment card may still rely predominantly on cash if electronic payments are difficult to use, insufficiently accepted or perceived as costly, complex or insecure. Formal financial inclusion therefore does not automatically translate into effective digital financial participation.

The findings consequently suggest that the economic benefits associated with payment digitalisation are likely to be maximised when technological innovation is accompanied by improvements in financial inclusion, territorial accessibility and digital capability. Electronic payments can potentially reduce transaction costs, increase convenience, strengthen transaction traceability and facilitate participation in increasingly digital markets. However, the magnitude and distribution of these benefits depend on the institutional and infrastructural environment in which payment technologies are introduced. Where digital skills remain weak or payment infrastructure is geographically uneven, technological development alone may not be sufficient to produce universal adoption. Payment modernisation should therefore be evaluated not only through aggregate transaction values but also through the accessibility, affordability and effective usability of payment instruments across different population groups.

From a policy perspective, the Romanian case supports an approach centred on payment choice rather than on the simple replacement of cash. Policies designed to encourage electronic transactions can generate efficiency and transparency gains, but they should be accompanied by measures addressing the structural determinants of digital exclusion. Expanding affordable merchant acceptance, improving broadband and mobile connectivity, strengthening financial and digital literacy and ensuring access to interoperable and low-cost payment services are

therefore complementary components of an inclusive digitalisation strategy. At the same time, reasonable access to cash remains relevant during the transition, both as an inclusion mechanism for consumers facing barriers to digital participation and as an element of payment-system resilience.

The results should, however, be interpreted in light of several methodological limitations. The study is primarily descriptive and therefore identifies patterns and associations rather than causal relationships. Although the observed evolution is consistent with the theoretical expectation that economic development, financial inclusion and digitalisation are associated with changes in payment behaviour, the analysis does not establish that changes in these factors caused the observed expansion of electronic payments or a corresponding reduction in cash dependence. Establishing such relationships would require a more comprehensive econometric framework capable of controlling for observed and unobserved heterogeneity across regions, countries and time.

A further limitation concerns data availability and comparability. In particular, the absence of a harmonised annual measure of cash usage disaggregated by urban and rural residence restricts the possibility of directly quantifying territorial differences in cash dependence over an extended period. Card-payment values provide a robust indication of the expansion of electronic transactions but cannot serve as a direct inverse measure of cash usage. Similarly, account ownership, internet-banking participation and digital-skills indicators capture different dimensions of financial and digital inclusion and should not be interpreted as interchangeable measures. Differences in frequency, geographical coverage and methodological definitions across available datasets consequently limit the extent to which the relationships identified in the study can be tested within a unified empirical framework.

Future research should address these limitations by developing a harmonised longitudinal dataset combining payment, financial, socio-economic and territorial indicators. A Romania–EU panel could incorporate card-payment values and volumes, ATM withdrawals, account ownership, internet-banking usage, digital skills, GDP per capita, poverty and social-exclusion indicators, urbanisation and measures of income inequality. Where sufficiently comparable information becomes available, indicators of merchant acceptance, ATM and bank-branch density, broadband coverage and demographic structure could further improve the empirical specification. Such a dataset would permit a more systematic assessment of the extent to which payment behaviour reflects differences in economic development, financial accessibility and digital capability.

Panel-data methods would represent a natural extension of the present descriptive analysis. Fixed-effects models could be employed to examine whether variation in cash dependence or electronic-payment intensity is systematically associated with changes in financial inclusion, economic development and digitalisation after controlling for time-invariant country or regional characteristics. Time fixed effects could additionally capture common shocks affecting payment behaviour, including technological change, regulatory developments and the acceleration of contactless and remote payments associated with the COVID-19 period. Where data permit, interaction terms between digitalisation, income, poverty and urbanisation could be used to investigate whether the effects of technological development differ systematically according to the socio-economic and territorial environment.

Further research could also distinguish more explicitly between the determinants of access to digital payment instruments and the determinants of their intensive use. This distinction would make it possible to examine whether possession of an account or card translates into regular electronic-payment activity and whether this relationship varies across income groups, age categories and urban–rural locations. Micro-level household or consumer data would be particularly valuable for identifying heterogeneity that aggregate national indicators cannot capture. Such evidence could help determine whether persistent cash usage

primarily reflects preference, infrastructure constraints, digital-capability gaps, concerns regarding security and privacy, or combinations of these factors.

Overall, the Romanian experience illustrates that payment digitalisation should be conceptualised as a broader socio-economic transformation rather than as a purely technological process. The exceptional growth of card payments between 2015 and 2024 demonstrates substantial progress towards a more digital payment environment, but the persistence of socio-economic and territorial inequalities indicates that aggregate digitalisation does not necessarily imply universal capability convergence. The central challenge for Romania is therefore not simply to increase the volume of electronic payments or to reduce cash usage, but to ensure that the transition expands the effective payment choices available to households and firms. A sustainable payment transformation is one in which technological efficiency, transparency and innovation advance together with financial inclusion, territorial accessibility, resilience and consumer capability.

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