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**Managing changes in payment systems
and its effects on western economics**

Theses of the doctoral (PhD) dissertation

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1. Background of the research

Today's globalization is heavily driven by transformative advancements in technology, particularly within financial systems. These technological innovations have reshaped payment landscapes, steering economies worldwide towards increasingly digital frameworks and reducing dependence on cash. Traditional payment methods have been revolutionized into efficient, cashless systems that enable safer, faster transactions and simplified access to funds. As a result, digital payment systems are now more prominent than traditional cash-based methods, providing a practical and effective way to conduct financial transactions in the global market.

In some countries, digital payment systems have become so ingrained in daily life that consumers can complete transactions without ever stepping into a bank. This shift has led to a gradual decline in cash-based payments, as credit-based and digital economies begin to take a more central role in modern financial landscapes. These changes reflect a broader global trend in which cashless systems have begun to transform economies and reshape consumer behaviors.

Extensive exploration has shown that the rise of cashless payment systems plays a significant role in fostering

economic growth, particularly in developing regions. By offering increased access to financial tools, digital payments encourage wider economic participation and create opportunities for more individuals to engage in formal financial activities. This transition not only accelerates transaction processes but also strengthens economic participation by expanding access and improving efficiency within financial systems.

Globally, the shift towards non-cash payments has enabled both individuals and businesses to engage in quicker transactions, keeping money circulating rapidly and contributing to broader economic growth. Despite these developments, previous research has often focused only on the scale of banking industries, which does not provide a complete picture of the quality, efficiency, and stability of financial systems. Measuring only the size of the financial sector overlooks essential aspects of consumer behavior and fails to capture the impact of cashless payment adoption.

While many studies have investigated payment choices and preferences, there remains a gap in understanding how an increase in cashless payment systems influences the overall transition to cashless societies. In some markets, the adoption of cashless policies has aimed to reduce costs associated with cash handling, and this shift highlights a trend that might not be

directly comparable across regions due to differences in economic development and currency strength.

Moreover, recent analyses suggest that as consumers increasingly choose cashless options, their spending behaviors also tend to change. For instance, people are often more inclined to make purchases when using digital payment methods compared to cash, possibly due to the ease and convenience of cashless transactions.

In certain economies, cash remains a favored method because of factors such as personal trust in the banking system, cultural practices, and even memories of past financial instability. These elements indicate that while digital payment systems are on the rise, the complete transition to a cashless society depends on complex factors, including trust in financial institutions, regional economic structures, and the availability of stable currencies.

2. Actuality

This thesis examined the diversity of financial systems, focusing on their development stages and investigating whether shifts in payment systems and the introduction of new payment methods accelerated the transition to a cashless society, thereby transforming the global economy and its international relations.

Furthermore, the digitalization of money and the move towards cashless transactions was considered a global trend, transcending regional boundaries in an increasingly interconnected world. This research offers valuable insights for individuals, consumers, banks, and governments on a global scale. The international integration of the financial sector closely linked to major financial centers such as London, New York, Frankfurt, Hong Kong and Tokyo underscored the relevance of this study. As such, the findings benefit retail clients, individual consumers, retail banks, central banks, and government policymakers in navigating the digitalization of money and the potential transition to cashless economies. These insights contribute to the preparation and strategic planning for future global trade and international economic relations.

In summary, while extensive research had documented the macroeconomic and individual factors influencing digital payment adoption, a specific research gap existed regarding the direct impact of payment system diversity on consumer preference and choice. This thesis addressed this gap by examining how the availability of multiple cashless payment options influenced consumer behavior across different socioeconomic contexts and demographic segments, and how these dynamics collectively drove the broader shift towards cashless economies.

3. Objectives

This thesis has the aim to research the different financial systems, focus on their development state and to find out whether a change in payment systems and new payment methods accelerate the move towards a cashless society and transforms the global economy with its international relations. This represents the research gap. Consequently this thesis tries to provide new findings and knowledge by conducting a thorough literature review for this topic supported by quantitative data in the form of regression analyses. Also the digitalisation of money and the trend to pay cashless is not only limited to a region as we live nowadays in a globalised world. Therefore this thesis can provide new insights and new knowledge in this sphere for individuals, consumers, banks, and governments.

In summary, while the macroeconomic and individual factors influencing digital payment adoption are well documented, there is a distinct research gap in exploring the direct impact of payment system diversity on consumer preference and choice. Specifically, there is a need to understand how the availability of multiple cashless payment options influences consumer behavior in varying socioeconomic contexts and demographic segments, and how

these factors collectively shape the broader transition to cashless economies. This thesis aims to fill this gap by focusing on how an increase in the number of payment systems influences consumer behavior and the adoption of cashless transactions.

4. Hypotheses

To address the complexity of a cashless society and managing such an economy, this dissertation proposes a series of hypotheses to examine the determinants of consumer preference for cashless payment methods and assesses how these preferences influence the broader trend toward a cashless economy. By testing the following hypotheses, the research aims to identify key factors that drive or impede cashless adoption and to shed light on the conditions under which consumers might fully embrace a cashless society, describe the future trends and propose some recommendations on how to manage a smooth transition towards a cashless society.

The hypotheses addressed in this thesis are:

Hypothesis 1: The more payment systems are implemented and the greater the choice, the more likely consumers choose to conduct cashless operations.

Hypothesis 2: Only a handful of payment systems account for the majority of cashless transactions.

Hypothesis 3: When switching from cash to cashless transactions this has a measurable impact on the GDP.

5. Research question

This thesis has the aim to research and analyse whether the amount of different payment systems has an impact on financial transactions and thus changes consumer behaviour and global economics. The dissertation provides new findings and

knowledge by conducting a thorough literature review, quantitative calculations, and survey.

This results in the following research question:

Do changes in the number of payment systems used, to conduct financial transactions, have an impact on consumer preference and choice and thus lead to more cashless transactions?

To answer the research question and provide a precise evaluation of the hypotheses, the study was structured as follows. First, different payment systems in a financial system were described, and methods for measuring transactions were identified and explained. This was achieved through an extensive literature review, utilizing existing research to provide a solid theoretical foundation. Additionally, the concept of a cashless society was outlined, and current payment methods were detailed.

The first half of chapter 6 of the thesis focused on the conducted survey and quantitative data analysis. Regression analysis was performed to build a statistical model that addressed the research question and tested hypotheses 1, 2, and 3. Quantitative data from reliable sources, including the IMF, World Bank, and other credible organizations, were incorporated to ensure a comprehensive analysis.

In the second half of chapter 6, a comparison was drawn between the findings of this study and the results of the previously reviewed literature, along with global trends and statistical observations. This section also detailed strategies for managing and implementing payment systems to ensure efficient financial transactions while maximizing customer and client satisfaction. Hypotheses 1 and 2 were re-analyzed with the gathered data, and additional statistical hypotheses 1 and 2 were tested. The results of these analyses culminated in recommendations and a discussion of their implications for global trade and economics.

Finally, the last part of the thesis summarized the outcomes of the study and offered predictions for the future trajectory of payment systems and the potential evolution toward cashless societies.

6. Methods

This dissertation employed a comprehensive research approach to explore the transition towards a cashless society, integrating both qualitative and quantitative methods. It began with an extensive literature review to define, explain, and evaluate the concept of a cashless society and assess its feasibility. The review also analyzed various payment methods

to evaluate their impact on the global economy and international trade, identifying key payment systems that drive the shift toward a cashless society.

To gather detailed insights, a survey was conducted with 530 participants, ensuring an adequate sample size for robust statistical analysis. Furthermore a redundancy question was included so that bots or anyone not paying attention to the survey and the questions was automatically excluded and eliminated from the survey. The survey consisted of 22 multiple-choice and Likert scale questions designed to assess consumer attitudes and preferences regarding payment systems and the transition to cashless systems. The use of Likert scales allowed for nuanced responses, capturing the intensity of consumer opinions and enabling the identification of trends across different demographic segments.

Quantitative research complemented the survey findings through rigorous regression analyses using statistical software such as Stata and R. These analyses included Ordinary Least Squares (OLS) regression to evaluate the relationship between various payment systems and the pace of transition toward a cashless society. The statistical models assessed the impact of key factors such as digital infrastructure, accessibility to financial services, and cultural or economic drivers. Stata was employed for data management and advanced statistical

modeling, while R was used for data visualization and additional statistical testing, ensuring a comprehensive evaluation of the data.

The literature review utilized reputable academic databases and sources to collect journals, articles, and books pertinent to the research topic. Quantitative data was further sourced from reliable institutions, and the analyses examined how payment systems influence global economic metrics such as GDP, international trade, and financial inclusion.

The integration of survey data and quantitative research allowed for the development of a robust statistical model to illustrate the factors driving the shift to cashless societies. By combining Stata's capabilities in handling large datasets and regression modeling with R's advanced visualization techniques, the research ensured precision and clarity in presenting findings. The study also explored whether shifts in payment systems and cash usage significantly affect consumer behavior and broader economic outcomes.

Critical variables, such as financial service accessibility, merchant adoption, technological infrastructure, and economic and cultural dynamics, were incorporated into the regression models. These factors were analyzed to provide actionable insights into the adoption of cashless systems, benefiting individuals, financial institutions, and policymakers.

The findings offer strategic recommendations for facilitating the transition toward cashless economies while addressing the challenges and opportunities associated with this global trend.

7. The results

7.1 Theses:

- **Increasing the diversity of available payment systems positively influences consumer preferences, encouraging a shift toward cashless transactions by enhancing convenience, accessibility, and adaptability to individual financial habits.**
- **The diversification of payment systems prevents any single payment method from dominating the market, thereby creating and enabling a competitive environment that supports consumer choice and flexibility in a cashless economy.**
- **The shift from cash to cashless transactions has a measurable positive impact on GDP, as increased**

cashless activity enhances transaction efficiency, reduces costs, and stimulates economic growth.

- **The more user-friendly digital payment options are, the more likely users are to choose cashless payment methods, emphasizing the need for developers and payment providers to focus on ease of use to encourage cashless transactions.**
- **Strengthening security measures in digital payment systems can significantly increase user trust, alleviating concerns about personal information security and fraud, and thereby fostering a greater willingness to engage in digital transactions.**
- **Expanding the availability of affordable and accessible digital payment platforms can address user dissatisfaction with current options, encouraging broader adoption of cashless payments, especially for international transactions.**

7.2 Conclusion

In conclusion, this thesis has provided a comprehensive analysis of the impact of payment system diversity on financial transactions and consumer behavior, revealing crucial insights into the evolving landscape of global economics. Through an extensive literature review, quantitative analysis, and consumer surveys, this research highlights a clear and positive correlation between the number of cashless payment options available and the frequency of digital transactions. This correlation is significant across both developed and less-developed nations, indicating that as the availability of cashless options increases, so does the engagement in digital financial behaviors. Notably, the findings suggest that for every additional cashless payment method introduced, there is a statistically significant 2.38% increase in digital spending, showcasing the substantial role that payment diversity plays in consumer decision-making.

The research emphasizes the importance of ease of use and convenience as critical drivers of consumer preference for digital payment methods. This factor emerged as the most influential in the consumer survey, underscoring that the perception of user-friendliness can lead to a remarkable 6.26% increase in digital spending. Such findings are particularly relevant for app developers and payment service providers, as

they indicate the necessity of prioritizing intuitive design and streamlined functionality in digital payment applications. To capitalize on the growing demand for cashless transactions, developers must invest in creating solutions that are not only secure but also accessible and easy to navigate. This focus on user experience is crucial, as it not only enhances consumer satisfaction but also fosters loyalty and encourages repeat usage.

Moreover, the thesis highlights the competitive dynamics of the digital payment landscape. Contrary to the notion that a single dominant payment method may emerge, the findings suggest that consumers do not exhibit excessive reliance on any particular digital payment solution. This competitive environment presents significant opportunities for innovation and market entry, as there remains a diverse range of preferences among users. For instance, the dominance of digital wallets and credit cards, which together account for 70% of e-commerce transactions, indicates that while certain methods are popular, there is still substantial room for other solutions to capture market share.

Additionally, the analysis of the fixed effects models demonstrates that while the number of debit cards per 1,000 people has an insignificant impact on cashless transaction intensity when accounting for the number of POS terminals, the

latter remains a critical factor. The elasticity of cashless transactions concerning the number of POS terminals—though diminished when controlling for other variables—still supports the hypothesis that infrastructure plays a vital role in enabling cashless transactions. This finding emphasizes the importance of investment in POS terminal availability as a means to drive cashless adoption, especially in regions where digital infrastructure is still developing.

The relationship between cashless transactions and economic growth, as indicated by per capita GDP, also underscores the significance of payment system diversity. The thesis found a positive elasticity of 0.026 between cashless retail transaction rates and GDP, suggesting that an increase in digital transactions contributes positively to economic performance. This correlation indicates that enhancing the availability and accessibility of cashless payment systems not only fosters individual consumer spending but also stimulates broader economic growth. As nations strive to improve their economic conditions, the promotion of cashless payment options can serve as a catalyst for increasing per capita GDP, demonstrating a clear pathway for developing countries to elevate their economic status through digital financial inclusion.

Furthermore, the demographic insights gained from the consumer survey reveal significant variances in digital

transaction behaviors across different age groups and geographic locations. Younger consumers, particularly those aged 18-24, displayed higher engagement with digital payments, while rural residents showed lower transaction volumes compared to urban dwellers. These insights suggest that targeted marketing and education strategies may be necessary to enhance adoption rates among demographics that are currently lagging.

8. Recommendations

As the digital economy continues to advance, the recommendations derived from this research carry significant implications for stakeholders throughout the payment ecosystem, including policymakers, financial institutions, businesses, and technology providers. These stakeholders should collaborate to ensure that the transition towards a cashless society is inclusive, efficient, and secure. Policymakers, in particular, have a critical role in establishing regulatory frameworks that promote financial innovation while safeguarding consumer rights and data privacy. By addressing these foundational aspects, they can create an environment that fosters trust and adoption of digital payment systems.

Financial institutions are encouraged to invest in the development of accessible and user-friendly payment solutions that cater to a diverse population. This involves not only leveraging advanced technologies but also ensuring that these solutions address the needs of underserved groups, such as those in rural or economically poor areas. Enhancing digital literacy and building consumer confidence through transparent communication and robust security measures are equally important steps in driving widespread adoption of cashless systems.

Businesses can harness the insights from this research to better understand consumer behavior and preferences, allowing them to design payment options that align with the needs of their target markets. By integrating diverse payment systems, businesses can not only enhance the user experience but also unlock new revenue streams through improved transaction efficiency and reduced operational costs associated with cash handling. In addition, companies that prioritize customer-centric payment experiences are likely to gain a competitive edge in the evolving digital marketplace.

Technology providers and fintech innovators have a unique opportunity to accelerate the transition to cashless economies by introducing cutting-edge solutions that balance functionality with accessibility. From developing secure mobile

wallets to enabling seamless cross-border transactions, their contributions are vital in shaping a global payment landscape that is both inclusive and adaptable to the fast-changing demands of consumers and businesses alike.

The findings of this thesis highlight the intricate interplay between payment system diversity and consumer behavior, emphasizing the importance of adopting a strategic approach to digital payment infrastructure development. Understanding and responding to consumer preferences can empower stakeholders to maximize the potential of cashless transactions. For example, simplifying the onboarding process for digital payment platforms, addressing regional challenges, and ensuring compatibility across different devices and networks can significantly enhance user engagement and satisfaction.

Furthermore, the research underscores the potential of cashless systems to contribute to broader economic objectives, such as reducing transaction costs, enhancing transparency, and boosting financial inclusion. These benefits are particularly relevant in emerging markets, where digital payment adoption can bridge the gap between unbanked populations and formal financial systems. Policymakers and businesses alike can leverage this transformative potential to drive sustainable

development and foster economic participation across diverse regions.

The ongoing innovation in the digital payment space presents a promising outlook for both established players and new entrants. Financial institutions and technology firms that proactively adapt to the dynamic landscape of digital payments are well-positioned to capitalize on emerging opportunities. This includes expanding into underserved markets, developing interoperable solutions that connect various payment platforms, and exploring novel applications such as digital currencies and blockchain-based transactions.

In conclusion, the findings of this research emphasize the importance of a collaborative and forward-thinking approach to navigating the transition toward a cashless society. By fostering innovation, prioritizing inclusivity, and addressing consumer needs, stakeholders can contribute to a more efficient, secure, and inclusive global economy. The continued evolution of digital payments not only offers opportunities for economic growth but also sets the stage for a more connected and equitable financial ecosystem that benefits individuals, businesses, and societies worldwide.

Despite these advances, there remains considerable scope for further research to expand the understanding of cashless economies. One area for exploration involves

examining how regional differences, including cultural, economic, and technological factors, influence the adoption of cashless payment systems. Comparing developed and emerging markets could provide deeper insights into localized challenges and opportunities. Behavioral economics could also play a role in future studies by analyzing how cashless payment systems influence consumer decision-making, spending habits, and financial well-being. Further investigation into the impact of cashless systems on small and medium enterprises, particularly in developing economies, would help address the specific needs of these businesses.

The role of digital currencies, including cryptocurrencies and central bank digital currencies, in cashless payment systems requires further exploration to understand their impact on traditional financial systems and consumer trust. Longitudinal studies assessing the long-term effects of cashless payment adoption on economic growth, financial inclusion, and consumer behavior would provide a more robust foundation for stakeholders. In addition, examining how concerns about data security and privacy affect consumer adoption could inform the development of more secure and trustworthy systems. Research into the environmental implications of cashless systems, including the potential reduction in the production of physical currency and the energy consumption of digital infrastructure,

would offer a new perspective on the sustainability of this transition. Exploring barriers to adoption, such as digital literacy gaps, technological infrastructure limitations, and resistance to change in certain demographics, would help identify actionable solutions to overcome these challenges.

By addressing these areas, future research can expand the understanding of cashless economies and provide stakeholders with actionable knowledge to navigate this rapidly evolving landscape. These insights are essential to ensure that the transition to cashless systems is equitable, efficient, and beneficial for individuals, businesses, and society as a whole.

9. Publications by the author

Ganzha, D. (2022). *Cash and Cashless Payments at the Point of Sale (POS) during the COVID-19 crisis by comparing three African countries*. In H. Kandemir, K. Özdaşlı, & E. Kala (Eds.), *ICONSR 2022 Abstracts & Proceedings Book* (pp. 213-224). Isparta, Turkey: Association of Kutbilge Academicians.

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