The Influence of Behavioural Economic on Spending Patterns in Digital Payment Systems: Empirical Evidence from Germany

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1 Introduction

The landscape of financial transactions has experienced a significant transformation due to recent worldwide policy initiatives and technological advancements, collectively referred to as Fintech. This wave of innovation has led to the emergence of digital payment systems, which are increasingly substituting traditional payment methods.

The progressive digitization of the global economy is fundamentally altering the production, distribution and sale of goods and services on a worldwide scale. This transformation is facilitated by the rapid development of digital platforms and infrastructure within the banking system embedding digital payments deeply into consumers' daily lives and fundamentally changing routine transaction methods. Consequently, there is a growing consensus among experts and stakeholders that cash will eventually become obsolete ushering in an era characterized by a cashless society. [1] The shift towards a cashless society is underpinned by several and multiple factors including but not limited to greater convenience and efficiency offered by digital payments for consumers and businesses alike, reducing the need for physical currency handling and minimizing transaction times. In addition to that, the proliferation of smartphones and internet access has made digital payment platforms more accessible to a broader population fostering widespread adoption.

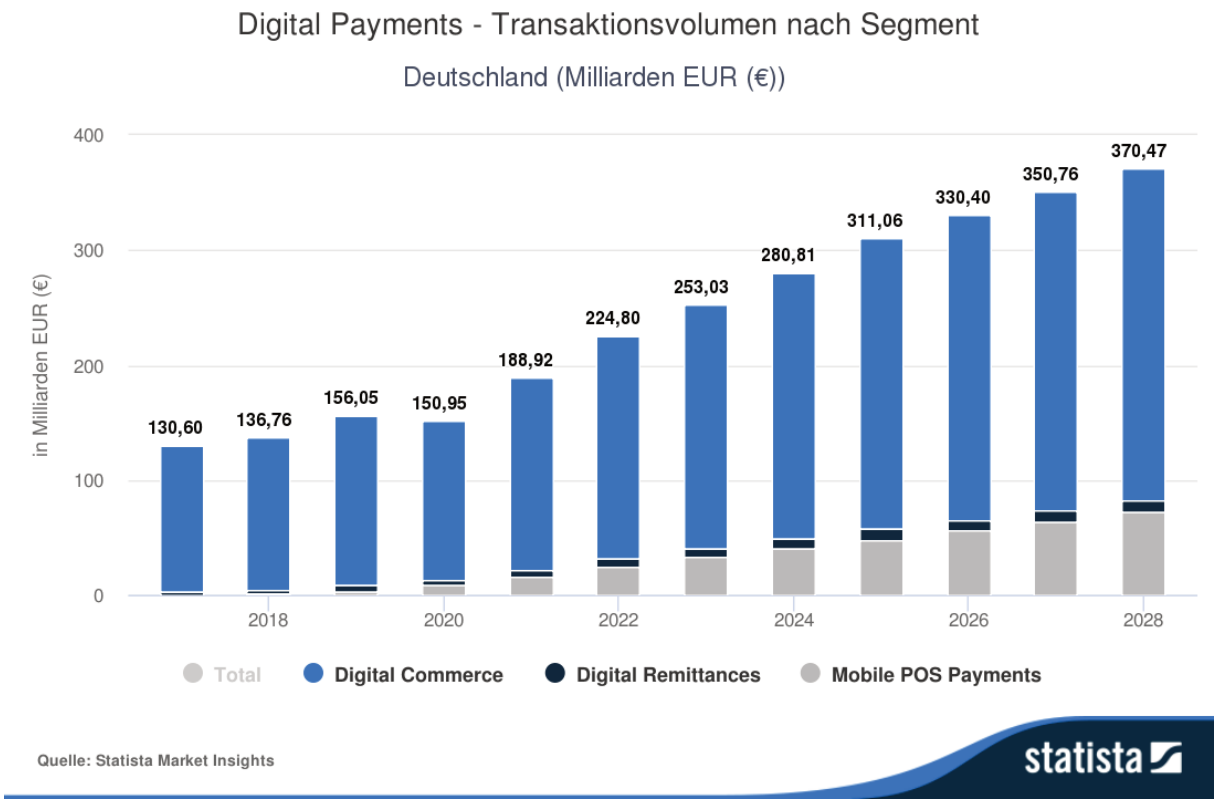
As a result of that, it is worth mentioning that the digital payments market in Germany has been recently expanding fueled by the growing use of e-commerce and mobile payments, along with the increased adoption of contactless payments. The bar chart from Statista Market Insights illustrates the projected growth in digital payments in Germany from 2024 till 2028 highlighting a significant increase in transaction volumes across different segments.

In 2024, the total transaction volume is expected to reach 280.81 billion euros, with Digital Commerce contributing the majority share. This upward trend continues into 2026 with the total volume projected to rise to 330.40 billion euros. By 2028, the total transaction volume is anticipated to further escalate to 370.47 billion euros. Throughout these years, Digital Commerce remains the dominant segment, showcasing its critical role in the digital payments landscape. Meanwhile, Digital Remittances and Mobile POS Payments, though smaller in volume, are also

1. Agarwal, S., Ghosh, P., Li, J. and Ruan, T. (2019). Digital Payments Induce Over-Spending: Evidence from the 2016 Demonetization in India, p.01.

expected to experience steady growth reflecting the increasing adoption and diversification of digital payment methods in Germany. This growth trajectory underscores the expanding digital economy and the shifting consumer preferences towards digital transactions.[2]

Figure 1.1 Digital Payments – Transaction Volume in Germany



Source: Statista. (n.d.). Digital Payments - Deutschland | Statista Marktprognose. [online] Available at: https://de.statista.com/outlook/dmo/fintech/digital-payments/deutschland#transaktionsvolumen.

The beforementioned figures are clear evidence that digital payments have become more entrenched in daily life and have started to reshape financial behaviors and expectations. Consumers for example are increasingly favoring the convenience and speed of digital transactions

2. Statista. (n.d.). Digital Payments - Deutschland | Statista Marktprognose. [online] Available at: https://de.statista.com/outlook/dmo/fintech/digital-payments/deutschland#transaktionsvolumen [Accessed 14 Jul. 2024].

over traditional methods and businesses have now to adapt by offering more digital payment options and investing in the necessary technological infrastructure. [3]

Besides that, digital payments have without doubt influenced consumers' perceptions of costs and have led to psychological discomfort associated with spending that would result in unfavorable financial outcomes—such as excessive expenses, delayed payments, and even indebtedness. In other words, it had harmed some consumers' financial well-being by promoting impulsive buying behaviors as the ease of making payments might encourage spontaneous purchases without due consideration of long-term financial impacts. [4]

Inadequate planning is a fundamental condition for a purchase to be considered impulsive buying that happens with no pre-shopping intentions either to buy the specific product category or to fulfill a specific buying task. This indicates that impulsive purchases occur spontaneously driven significantly by stimuli encountered there. These stimuli often evoke a sudden, powerful, and persistent urge to purchase immediately causing consumers to feel temporarily out of control. This urge to buy likely inhibits careful consideration and reduces consumers' awareness of the consequences of their purchase. [5]

Given the highly stimulus-driven nature of impulse buying, digital payment environments are crucial in enticing consumers to make impulse purchases so that it is essential to examine and clarify the underlying mechanism of the relationship between digital payment patterns and consumer's' spending behavior. This involves understanding the various factors and cognitive mechanisms behind online payment in an effort to develop strategies that mitigate negative outcomes to enhance consumers' awareness of the psychological effects of digital payments and to foster more responsible financial behaviors.

Consequently, a comprehensive study that would serve as an effort to answer the question on **" The Behavioral Economic Perspective of Spending patterns in Digital Payment Systems**

3. Agarwal, S., Ghosh, P., Li, J. and Ruan, T. (2019). Digital Payments Induce Over-Spending: Evidence from the 2016 Demonetization in India, p.01.

4. Ahn, S.Y. and Nam, Y. (2022). Does mobile payment use lead to overspending? The moderating role of financial knowledge. Computers in Human Behaviour, 134, pp.01-02.

5. Vonkeman, C., Verhagen, T. and van Dolen, W. (2017). Role of local presence in online impulse buying. Information & Management, 54(8), p.1039.

“, have been established with the aim of maximizing the benefits of digital payments while minimizing their potential drawbacks.

The purpose of this study is to define the changes in spending behavior by thoroughly examining how behavioral economics affects spending habits within digital payment contexts. The research also aims to amplify the advantages of digital payments and reduce their potential downsides by enhancing their beneficial outcomes while concurrently mitigating adverse effects.

This paper is divided into nine major sections and begins with an introduction that sets the stage for exploring how digital finance reshapes consumer behavior. Following the introduction, the literature review synthesizes existing research on this topic laying a foundation for understanding the evolving financial landscape. Chapter 3 delves into The Concept of Digital Finance providing a clear definition and overview of Fintech discussing the pros and cons of digital finance applications. However, Chapter 4 examines the recent rise of digital payment systems highlighting the forms of various payment methods and opportunities and obstacle of digital payment systems. Chapter 5 then explores consumer spending behaviour focusing on the key determinants, models, and factors that influence e-payment behaviours. It also examines how technological factors contribute to the convergence of consumer spending habits in the context of digital payments. The psychological dimensions of these changes are explored in Chapter 6 which addresses the psychological effects of digital payments beginning with an overview of the topic. It then explores online impulse buying behavior focusing on the roles of technology use, trust, and flow experience. The chapter then examines the concept of the "pain of paying," including its definition and theoretical framework. The methodology section outlines the research design and data collection processes, followed by an analysis and findings that presents and interprets the research results. Finally, the conclusion summarizes the key insights, implications, and recommendations for future research.

2 Literature Review

The rapid evolution of digital payment systems has significantly transformed consumer spending behaviours presenting new challenges and opportunities for understanding economic decision-making. This literature review aims to explore the intersection of behavioural economics and spending patterns within the realm of digital payment systems to offer a detailed understanding of how cognitive biases, emotions, and social influences shape consumer decisions.

The review will also highlight key empirical studies that have investigated the impact of digital payments on consumer spending in and outside Germany providing a comprehensive overview of the current state of research in this area.

First, the paper by **Stroborn, Heitmann, Leibold, and Frank (2004)** provides an in-depth analysis of internet payments in Germany as it highlights the evolution of electronic commerce and digital banking emphasizing security, user convenience, and technological infrastructure.

Using consumer surveys and transaction records, the study analyzes adoption and usage patterns in Germany. However, the paper's findings align with global research, emphasizing security concerns to be the primary factor influencing user adoption.[6]

The study by **Runnemark, Hedman, and Xiao (2015)** investigates the behavioural economics surrounding payment methods specifically whether consumers tend to spend more when using debit cards compared to cash. This study aligns with a broader body of research examining the psychological effects of payment modes on spending behavior.

The authors employ a combination of field experiments and surveys to analyse consumer behavior in various spending contexts. Their findings suggest that consumers do indeed spend more when using debit cards rather than cash. The paper contributes to the literature by specifically focusing on debit cards which are less studied compared to credit cards. It highlights that the tendency to overspend persists even with debit cards which directly withdraw funds from a consumer's bank account and thus are more closely linked to their current financial state. This challenges the assumption that debit cards, due to their immediate impact on the available balance, might curb spending more effectively than credit cards. In summary, Runnemark, Hed-

6. Stroborn, K., Heitmann, A., Leibold, K. and Frank, G. (2004). Internet payments in Germany: a classificatory framework and empirical evidence. Journal of Business Research, 57(12), pp.1431–1437.

man, and Xiao's study provides valuable evidence that the mode of payment significantly influences consumer spending behavior, with debit cards leading to higher expenditures compared to cash. [7]

The study "Impact of Digital Payments on Consumption" by **Arun P. Nambiar, Saranya Devi K., and Anand Sriram S. (2018)** examines the effects of digital payment systems on consumer spending behaviour. The authors explore how the increasing adoption of digital payments, such as mobile wallets, debit and credit cards influences consumption patterns. In other words, the study investigates whether the convenience and ease of digital transactions lead to higher consumer spending compared to traditional payment methods like cash.

Through a combination of quantitative analysis of transaction data and qualitative surveys, the authors found that digital payments do not impact consumer spending. The findings suggest that the seamless and often intangible nature of digital has some drawbacks to which people prefer not to use such as security issues and transaction costs. [8]

The research of **Brown, Nacht, Nellen and Stix (2023)** delve into the convenience and efficiency of cashless payments highlighting how these systems reduce transaction costs and time thereby fostering increased consumer spending. The paper argues that the ease of electronic payments encourages consumers to spend more frequently and in higher amounts compared to cash transactions. The paper also suggests that the intangible nature of digital payments leads to a decreased sense of monetary loss often resulting in higher expenditure. [9]

Qian and Palvia (2020) developed a model to explore this impact of mobile payment systems integration on consumer behavior. Their research highlights the increased security and transparency offered by mobile payments which have collectively enhanced user experience and satisfaction illustrating that a higher perceived value of a payment method leads users to pay less attention to the cost resulting in a looser psychological link between cost and purchase.

7. Runnemark, E., Hedman, J. and Xiao, X. (2015). Do consumers pay more using debit cards than cash? Electronic Commerce Research and Applications, 14(5), pp. 01-19.

8. Nambiar, A.P., Saranya Devi K, Anand Sriram S and Naveen Kumara R (2018). Impact Of Digital Payments on The Consumption. Journal of emerging technologies and innovative research, 5(11), pp.111–121.

9. Brown, M., Nacht, Y., Nellen, T. and Stix, H. (2023). Cashless payments and consumer spending. Social Science Research Network, pp.02-40.

However, the study did not provide sufficient evidence to show that the perceived value of a payment method affects payment transparency.[10]

Jing Xue and Li Lin's (2019) analysis demonstrates that mobile payment significantly affects consumer behavior. Firstly, mobile payment boosts both the volume and intention of luxury consumption with the extensive use of credit payments further intensifying consumers' desire for luxury goods. Secondly, the impact of payment methods on consumer behavior differs by age as mobile and credit payments encourage premature and irrational consumption among younger individuals. Thirdly, there are regional disparities as mobile payments in economically developed areas prompt consumers to spend more readily in advance. Lastly, the influence of payment methods on consumption shows minimal gender differences.[11]

All in all, the previous studies suggest that digital payment systems might lead to increased consumer spending due to their convenience, reduced transaction costs, and the psychological effects of intangible transactions. These findings underscore the importance of considering behavioral economics when analyzing the implications of digital payments on consumer behavior emphasizing the need for further research to better understand these dynamics and their broader economic impacts.

10. Qian, R. and Palvia, P. (2022). "The Impact of Mobile Payment on Consumer Behavior: A Unified Model" (2022). AMCIS 2022 Proceedings. 18, pp.01–11.

11. Xue, J. and Lin, L. (2019). Analysis of the Influence of Mobile Payment on Consumer Behavior. Advances in Social Science, Education and Humanities Research, 328, p. 126.

3 The Concept of Digital Finance

3.1 Definition and Related Risks

The financial industry's development paradigm has undergone significant changes due to the integration of new digital technologies. These advancements have allowed people to use mobile payment, online financing, investment, and digital transfers through electronic wallets connected to secure payment instruments.

This evolution has been mainly represented through digital finance services which have emerged through fintech companies or traditional financial institutions utilizing digital infrastructure like smartphones, personal computers, and tablets. However, "Fintech" combines "financial" and "technology" and, while related to digital finance, is distinct. Although there are no universally accepted definitions for these terms, both of them describe the transformation of the financial industry via information and communication technologies (ICTs). The main difference between both of them is that digital finance focuses on the broad digitalization of financial services whereas fintech pertains to the application of digital technologies to enable and innovate commercial activities in the financial sector.

For a considerable duration, digital finance has consistently delivered substantial advantages, transformed the financial landscape and enhanced accessibility, efficiency, and convenience by reducing information asymmetry and transaction costs optimizing resource allocation and presenting promising development opportunities. Besides all of that, digital finance also supported low-cost, contactless financial services decreasing the reliance on cash and traditional banking and enhanced information sharing leading to more efficient collaboration between service providers and users. [12]

For the above-mentioned benefits, digital finance innovations such as block-chain based currencies, payment methods and financing models have significantly impacted the global economy. Numerous studies have explored the reform of payment methods highlighting how the increased availability and affordability of digital finance are helping millions transition to secure digital transactions that can compromise privacy by leaving electronic traces and reducing the off-book economy suggesting a trend toward a mostly cash-free future.

12. Zou, Z., Liu, X., Wang, M. and Yang, X. (2023). Insight into digital finance and fintech: A bibliometric and content analysis. Technology in Society, 73, pp.01 – 02.

In spite of all the advantages offered by digital finance, the rise of fintech has posed at the same time challenges to existing regulatory frameworks established by central banks while managing financial risks in the era of big data.

It is quite obvious that digital finance relies on infrastructure that collects users' data which can be monetized by fintech companies and used by governments for political monitoring. However, illegal use of this data can lead to privacy breaches, financial fraud and money laundering. Therefore, robust regulatory, organizational and normative standards are necessary to control financial digitalization making government involvement crucial in promoting digital finance and fintech. [13]

As a result of that, financial regulation has started to consider several key risks to make sure that they are still achieving the financial stability, financial integrity, customer protection and financial efficiency as all the four previous strategies encompass the avoidance of crises and the proper functioning of the financial system. So that, all the regulators have aimed to prevent criminal activities such as money laundering and terrorist financing and consumer abuses to focus on enhancing the financial system's positive functions. So, we could all say that financial stability here is the primary concern and the major focus for regulators since the 2008 financial crisis. However, it is worth mentioning that even before 2008, efforts to maintain financial stability centered on identifying major risks and establishing regulatory frameworks like the Basel II Capital Accord which primarily focused on the safety of individual financial institutions. [14]

The shift towards FinTech aggravates cybersecurity threats unique to the financial system impacting financial stability. Vulnerabilities arise from high leverage and asset conversion compounded by reliance on complex digital hubs. Cyberattacks can disrupt payment systems, corrupt data or cripple financial infrastructure leading to significant financial destabilization if not contained. Therefore, cybersecurity has become a critical focus for financial regulators and tech firms globally. It is now considered the most significant source of risk that threaten digital platform as their frequency and severity are rising with a high increase in reported cyber events and entirely new form of attacks with potentially catastrophic consequences.

13. Ibid., pp.09-10.

14. Buckley, R.P., Arner, D.W., Zetzsche, D.A. and Selga, E. (2019). The Dark Side of Digital Financial Transformation: The New Risks of FinTech and the Rise of TechRisk. SSRN Electronic Journal. pp.10-11.

The systemically important financial institutions (SIFIs) that have digitized their operations are facing consequently significant risks from hacking, cybertheft and cyberterrorist and the digitalization and globalization of financial systems has increased the potential scale of fraud and theft allowing attackers to target multiple accounts simultaneously. Regulators, both individually and internationally are consequently focusing on cybersecurity issues.[15]

In addition to cybersecurity, the prominence of data in the digital finance underscores the importance of data protection. Various economies are developing different policies on data usage, ownership and protection. However, the implications of concentrated data and their complex analysis has pushed the legal frameworks to foster growth without undue restriction and which has led to neglecting macroprudential data risks. A shift towards increased accountability for data manipulators is occurring focusing on algorithm transparency and data verification. However, these measures are more suited for post-incident analysis rather than prevention.

In addition to that, the expansion of FinTech into financial intermediation such as online money market funds present risks related to credit and liquidity. Unlike traditional banks that consolidate small deposits into large loans, Fin Techs use a mix of funds and credit. The use of non-traditional banking data to assess credit risk varies significantly making uniform regulatory solutions impractical. All in all, data security and privacy risks differ from cybersecurity in that they are related to data utilization and accuracy rather than protection. Regulators need sufficient resources and mandates to investigate complex data streams and create effective legal risk management frameworks. Internationally harmonized regulations and networks of data specialists sharing best practices can enhance data assessment and management. Supporting existing initiatives and fostering public-private partnerships can help mitigate technical risks and maintain institutional trust across jurisdictions. [16]

3.2 Digital Finance Applications

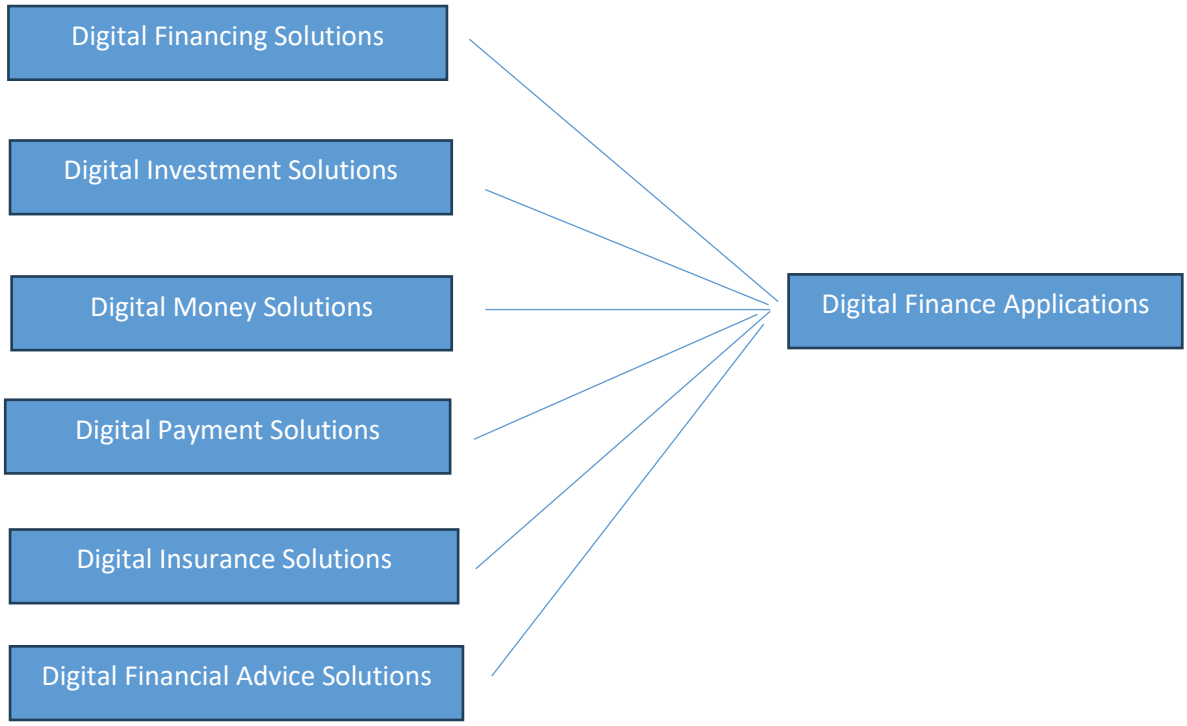
Digital finance applications represent a transformative shift in how financial services are accessed and utilized leveraging technology to offer unprecedented convenience, efficiency, and accessibility. These applications as shown in Figure in 3.2.1 encompass a wide range of services from mobile banking and digital wallets to online lending platforms and investment tools. By

15. Ibid., pp.13-15.

16. Ibid., pp.20-23.

integrating sophisticated algorithms, secure data processing and real-time analytics, digital finance applications enable users to conduct transactions, manage investments, and access credit with ease and security.

Figure 3.2.1 Digital Finance Applications



Source: Author's own representation based on Gerlach, J.M., and Lutz, J.K.T. (2019). Evidence on Usage Behaviour and Future Adoption Intention of FinTech and Digital Finance Solutions. The International Journal of Business and Finance Research, 13(2), p.85.

Digital Financing Solutions (DFS)

Traditionally, banks have served as the primary providers of financial resources requiring corporations and individuals seeking financial support to approach these institutions. However, Digital Financing Solutions (DFS) have revolutionized this process by allowing individuals and firms to bypass the traditional methods by utilizing the Internet to secure necessary funds, thus reducing dependency on traditional banking methods. This includes platforms offering digital solutions in crowdfunding, factoring, leasing, and invoicing.

Electronic invoicing on the other hand provides a fast and reliable way to transmit invoice data in a standardized format enabling automated processing and quicker payment settlements. In

addition to that, leasing allows users to access assets like vehicles and machinery without upfront full payment with various online services now offering lease-financing options. Furthermore, crowdfunding which is to be considered as a significant segment of digital financing, involves raising funds through an open call on the Internet. This method attracts many small contributions from a large number of people reducing transaction costs and time.

Digital Investment Solutions (DIS)

Digital Investment Solutions (DIS) refer to products and services that assist both individuals and institutions in making investment decisions and conducting transactions independently using digital tools and technologies. In the B2C sector, this includes mobile and social trading as well as online brokerage and trading platforms. In the B2B domain, DIS covers high-frequency and algorithmic trading. Moreover, DIS platforms offer advisory services that provide personalized investment advice and management by often leveraging artificial intelligence and machine learning to optimize investment strategies.

Mobile Trading involves trading securities via mobile devices like smartphones and tablets using specialized apps. These platforms provide real-time market access and the ability to trade independently of location and human brokers. Despite its advantages, mobile trading is still developing with challenges such as small screens, poor image resolution, and low computing power impacting user experience.

On the other hand, Social Trading combines securities trading with social media networking offering both traditional exchange-traded products and over-the-counter options like foreign exchange and commodities. This approach gained popularity after the 2008 financial crisis eroded confidence in traditional financial advisors. Social trading platforms allow users to observe, follow and copy the trading strategies of experienced traders effectively offering access to sophisticated investment strategies. In addition to that, Online Brokers perform the same functions as traditional brokers but operate digitally offering lower costs and higher efficiency and Retail investors can access multiple markets, charts, analytics and trading tools through specialized software. However, the lack of face-to-face interaction may lead to imprudent decisions and overconfidence.

Finally High-Frequency and Algorithmic Trading are used by institutional traders to execute predefined trading strategies automatically without human intervention. Digital investments thus represent a significant shift in how investment activities are conducted providing new opportunities and challenges in the financial landscape.

Digital Money Solutions (DMS)

Digital Money Solutions (DMS) are defined as new forms of digital, virtual or cryptocurrencies that exist solely in electronic form and are primarily used online. The most well-known cryptocurrency is Bitcoin introduced in 2008. Bitcoin is not backed by assets or commodities nor is its issuance controlled by any central institution. Instead, it uses cryptographic mechanisms to maintain decentralized control over currency circulation and transaction verification. This is managed through a public transaction system and a shared ledger updated by a decentralized network of private computers participating in the Bitcoin network. This ledger, which contains encrypted account numbers and balances, is stored across multiple nodes in the network ensuring that no single entity controls it. Other notable DMS include Ethereum and Litecoin which offer diverse functionalities such as smart contracts and decentralized applications.

All in all, the terms digital currency, virtual currency, e-money and cryptocurrency refer to types of currency that perform typical monetary functions but exist only electronically and are primarily used online. Digital money serves as a medium of exchange, a unit of account and a store of value, but unlike traditional money, it is exclusively digital.

Digital Payment Solutions (DPS)

Electronic payment has been defined as any payment initiated, processed and received electronically. The demand for e-payments has grown alongside the rise of online shopping. Early e-payment solutions such as online banking was based on traditional bank transfers. However, newer and more user-friendly solutions have since emerged met to the needs of merchants and customers.

Mobile payments are a subset of e-payments involving the use of mobile phones for both initiating and confirming payments. These payments can be made regardless of the payer's location or whether they are at a Point of Sale (POS). Initially focused on mobile banking and shopping, the trend has shifted towards new mobile applications that substitute traditional payment methods like cash, cards or checks. Major Internet companies, such as Google and Amazon, are also developing mobile payment systems which are particularly beneficial in less developed countries with unreliable banking structures.

Peer-to-peer (P2P) payments are another form of digital payments, involving transactions between private individuals such as family members or friends. PayPal is a notable example initially used for payments on eBay. Unlike traditional bank transfers, P2P payments offer imme-

diate transactions with the service provider validating the payment instantly. This method eliminates the need to share bank account details and enhances security. However, there are three main P2P payment models:

1. Nonbank-centric: Involves a nonbank intermediary like PayPal to transfer funds. Users must register with their banking information which can raise security concerns.
2. Bank-centric: Users interact directly with their bank to transfer funds. This model is secure but requires the bank to offer such services.
3. Card-centric: Payments are processed over credit or debit card networks requiring both parties to have compatible cards.

In addition to that, there are E-wallets or digital wallets which function like physical wallets but digitally, storing identification information, facilitating cash and credit payments and holding temporary tokens like vouchers and bus tickets. When integrated into mobile devices, digital wallets can replace not only traditional payment methods but also physical items such as ID cards and tickets.

Digital Insurance Solutions (DInS)

Digital Insurance Solutions (DInS) are digital products and services within the insurance sector. For instance, some platforms enable individuals to form alliances to reduce insurance costs while maintaining a consistent level of protection. Furthermore, DInS include on-demand insurance models for automotive policies and digital platforms that offer personalized and real-time insurance quotes and policy management improving user experience and efficiency in the insurance process.

Digital Financial Advice Solutions (DFAS)

Digital Financial Advice Solutions (DFAS) provide investment proposals designed to function with minimal or no human intervention relying on algorithms and digital onboarding processes that consider predefined parameters such as investment goals, financial background and risk tolerance. These robotic advisors primarily focus on portfolio management services employing investment strategies based on established theories like modern portfolio theory. Additionally, DFAS platforms incorporate advanced data analytics and machine learning techniques to continuously refine investment advice and enhance portfolio performance.[17]

17. Gerlach, J.M. , and Lutz, J.K.T. (2019). Evidence on Usage Behaviour and Future Adoption Intention of FinTech and Digital Finance Solutions. The International Journal of Business and Finance Research, 13(2), p.85.

All in all, digital financial inclusion offers several advantages as It enables banks to cut costs, reducing manual paperwork and decreasing the need for numerous bank branches. Through digital financial inclusion, a significant number of depositors can swiftly switch between banks compelling them to deliver high-quality services or risk losing customers to competitors.

For financial regulators, digital financial inclusion helps decrease the amount of physical cash in circulation which can contribute to lowering high inflation rates in developing countries. It also enhances the welfare of individuals and businesses by providing a dependable digital platform to access and use funds for financial transactions. These benefits are fully realized if the cost of acquiring digital transactional platforms, such as mobile phones and computers, is affordable.

Financial inclusion also benefits low-income households by providing opportunities to save for the future leading to personal financial stability and a more stable deposit base for banks during economic distress. Higher levels of financial inclusion can also boost participation across different economic sectors in the formal financial system strengthening the case for using interest rates as a key policy tool for macroeconomic stability, which positively affects economic growth.[18]

18. Ozili, P.K. (2018). Impact of digital finance on financial inclusion and stability. Borsa Istanbul Review, 18(4), p.331

4 The Rise of Digital Payment Systems

4.1 Preliminary Remarks

The advancement of Information and Communication Technology (ICT) has significantly altered people's lifestyles bringing notable progress in finance, marketing, economics, and operations. During the era of digital innovation, business transactions have increasingly shifted from cash to digital formats and the development of technology in the global business environment has compelled organizations to transition from traditional paper currency to digital payment platforms, commonly known as digital or e-payment systems, as these systems have facilitated monetary transactions for goods and services over the internet.

With the rise of digital payment systems, global payment methods have had to adapt to the latest technologies used by individuals, organizations, businesses, and governments and the digitization of payments has moved from paper and coins to digital systems due to their speed, convenience, and benefits for all users.

Digital payments are now a crucial, secure, fast and convenient mode of payment using the internet fostering economic growth and technological advancement. In addition to that, they are also vital for e-commerce which relies heavily on digital transactions enhancing efficiency, reducing fraud and spurring new innovations in the global payment system.

It is worth mentioning that digital payment systems encompass various services offered by financial institutions, including debit cards, credit cards and net banking. However, concerns about security remain, which ICT experts are addressing to alleviate users' fears.[19]

All in all, we can say that cash and bank deposits, the two main forms of money today, will face strong competition from e-money. While e-money might be more convenient, its stability is uncertain as it relies on issuers fulfilling redemption promises. Banks will need to adapt by enhancing their services, but policymakers should prepare for banking sector disruptions. New digital payment providers might eventually become banks using their data to offer targeted credit indicating the traditional banking model will likely suffer.

Therefore, it is obvious that central banks will play a crucial role in shaping this future as their regulations will impact the adoption of digital monies and their effect on commercial banks.

19. Ghosh, G. (2021). Adoption of Digital Payment System by Consumer: A review of Literature. International Journal of Creative Research Thoughts (IJCRT), 9(2), pp.412-413.

One approach could be allowing selected e-money providers access to central bank reserves under strict conditions potentially creating a form of central bank digital currency (CBDC).[20]

4.2 Forms of Payment Methods

In order to compare and contrast the different payment methods, we can use a simple conceptual framework that highlights four key attributes which are type of payment, value, backstops, and technology.

The first attribute is the type of payment. It can either be a claim or an object. Cash is an object-based payment settled immediately if the object is deemed valid and requiring no information exchange. Alternatively, a debit card payment involves transferring a claim on bank assets necessitating ownership verification and fund transfer registration.

Claim-based payments, which simplify transactions but need complex infrastructure replaced the risky use of coins with letters of credit. Today, most payments are claim-based requiring payer identification, fund verification and transaction registration.

The second attribute is value. For claims, the key question is whether redemption is at a fixed or variable value. Fixed-value claims guarantee redemption at a predetermined face value facilitating straightforward transactions. For instance, a 10-euro bank deposit can be exchanged for 10 euros in cash. These claims are like debt instruments redeemable at face value on demand. Variable-value claims, however, are redeemed at the market value of the backing assets resembling equity instruments with potential for both gains and losses.

The third attribute concerns whether fixed-value claims are backed by the government or rely on private guarantees. Government-backed claims inspire more trust compared to those reliant on business practices and legal structures which we term as private backstops.

The final attribute is technology to determine whether settlement is centralized or decentralized. Centralized transactions go through a proprietary server while decentralized transactions use distributed ledger technologies or blockchain and are settled among multiple servers. These can be either permissioned network, limited to a few trusted entities, or permissionless networks, open to the public.

Based on what was mentioned before, we can distinguish five types of payment methods using a simple conceptual framework which are central bank money, cryptocurrency, b-money (bank-

issued), e-money (issued by private sector providers), and I-money (issued by private investment funds).

- Central Bank Money: This is the most recognizable form of payment consisting of cash we've used for centuries. Cash is an object-based payment denominated in the local currency and issued by the central bank. However, it is settled directly between parties. Its digital equivalent currently under discussion, is Central Bank Digital Currency (CBDC), which unlike cash, wouldn't be anonymous and could use centralized or decentralized validation technology.

- Cryptocurrency: This is also an object-based payment but denominated in its own unit of account and created by non-banks using blockchain technology typically of the permissionless type. Cryptocurrencies can be public coins like Bitcoin and Ethereum or managed coins that attempt to stabilize their value relative to fiat currency through algorithms, though this model is not yet widely tested.

- B-Money: The most widespread claim-based money typically covering commercial bank deposits. Most payments today involve transferring funds between bank accounts. B-money is a debt-like instrument redeemable on demand at face value and often involves centralized technologies like debit cards and wire transfers. Its redemption is backstopped by the government through regulation, supervision, liquidity support from central banks and deposit insurance.

- E-Money: This is a new player in the payment landscape offering claims that can be redeemed in currency at face value upon demand like b-money but without government backstops. Transfers can be centralized as seen in popular payment solutions like Alipay and WeChat Pay in China.

- I-Money: A potential new means of payment resembling e-money but with variable-value redemptions into currency making it an equity-like instrument. I-money represents a claim on assets typically commodities like gold or shares of a portfolio. While private investment funds offer safe and liquid investments, they haven't yet become widespread payment means. However, shares in these funds could be traded directly, creating a new form of payment.

It should be noted that cryptocurrencies are the riskiest form of money but offer the potential for higher returns particularly in the form of capital gains. Public coins, such as Bitcoin, exhibit significant value fluctuations. For example, the daily price volatility of Bitcoin is about ten times higher than that of most G7 currency pairs.

However, central bank money is the most stable store of value in nominal terms. Its stability ultimately relies on the government's solvency and its value can erode in countries with poor

fiscal health. Other forms of money, such as equity-like I-money, inherit the risk of their underlying assets. I-money backed by government bonds is less risky than that backed by stocks. B-money, or bank deposits, also benefits from government guarantees which provide safety as a store of value.

On the other hand, E-money offers stability through guaranteed redemption at face value, but it lacks government backstops. Therefore E-money faces several risks including liquidity, default, market and foreign exchange rate risks along with operational risks like cyber threats.

To mitigate these risks, e-money issuers should invest in safe and liquid assets like short-term government paper or central bank reserves. They also need to ensure the amount of e-money created does not exceed the value of received client funds and should also maintain sufficient capital to cover losses and ensure full redemption of client funds.

On the other hand, regulation of e-money issuers should be strengthened to protect customers and ensure financial stability. E-money providers often hold bank deposits which offer redemption at face value but are exposed to default risk. To minimize default risk, some e-money providers place client funds in trusts managed by trustees from the providers. In summary, while e-money provides a convenient digital payment method, its stability depends on prudent management and legal safeguards to protect against various risks. [21]

4.3 The Opportunities and Obstacles of Digital Payment Systems

Digital payment systems have revolutionized the financial landscape offering unprecedented convenience and efficiency in transactions. It goes without saying that they have provided unmatched simplicity by enabling transactions at any time and from any location, thereby reducing reliance on physical cash or checks which is especially beneficial for online shopping, remote work and international transactions. In addition to that, digital payment methods have been more economical than traditional ones like checks or cash so that businesses nowadays can cut costs associated with handling, processing and transporting physical money and consumers can reduce their use of expensive banking services. Furthermore, digital payment systems have extended financial services to underserved and unbanked populations as mobile banking and e-wallets facilitate access to financial management for people in remote or marginalized areas.

21. Adrian, T. and Mancini Griffoli, T. (2019). The Rise of Digital Money. FinTech Notes, 19(01) , pp.58 – 66.

Advanced encryption, biometric authentication and other security measures make digital payments more secure than traditional payment methods reducing the risks of theft and fraud. Furthermore, digital payments have also created a digital record making it easy for users to track their transactions as this feature aids in financial planning and budget management.

With transactions completing in seconds, digital payments are much faster than traditional methods which is advantageous for businesses needing quick access to funds. Besides that, digital payment methods have simplified cross-border transactions making international trade and remittances more efficient and cost-effective. Digital payment has without doubt impacted the environment positively by decreasing paper production, transportation and reducing reliance on physical currency and paper checks.

All in all, widespread adoption of digital payments has stimulated economic growth by increasing the efficiency and transparency of financial transactions, reducing the informal economy and broadening the tax base. On the other hand, the vast amounts of data generated can be analyzed for consumer insights benefiting both businesses and consumers through seamless integration with other financial services such as savings accounts, investments and loans to provide users a more comprehensive financial system.

It is also worth mentioning that the widespread adoption of digital payments has also brought forth a set of significant challenges that need to be addressed as well. The digitization of financial transactions involves sharing sensitive personal and financial information which is attractive to cybercriminals and data breaches can have serious consequences for individuals, businesses and financial institutions undermining trust in e-payment systems.

As cyberattacks become more sophisticated, e-payment systems are vulnerable to hackers and malicious actors and protecting these systems against evolving threats requires continuous vigilance and investment in robust security measures.

In addition to that, the digital financial landscape often spans multiple jurisdictions, each with different regulatory frameworks and compliance with various requirements such as anti-money laundering (AML) that can be complex and resource-intensive for businesses.

Besides that, E-payment systems depend on reliable technological infrastructure so system downtime, technical glitches or network failures can disrupt transactions and impact business operations and maintaining user trust and business continuity requires prioritizing high availability and quick issue resolution.

Above all of that, e-payment methods may be susceptible to fraud including account takeovers, phishing attacks and unauthorized transactions. The challenge is to develop mechanisms that detect and prevent fraud could impact legitimate users. Last but not least, the diversity of e-payment methods, including different platforms such as technologies and currencies, can lead to fragmentation that hinders seamless cross-platform transactions so that establishing common standards to facilitate interoperability is crucial.

The evolution of financial transactions through digital payment methods has brought significant innovation and convenience. The transition from cash-based transactions to digital systems has reshaped how individuals and businesses exchange value. The growth of mobile wallets, cryptocurrencies, contactless payments and biometric authentication highlights this dynamic change. However, to ensure a secure, inclusive and seamless digital financial experience, it is essential to address the accompanying challenges so that collaboration among technology providers, financial institutions, regulators and consumers is key to leveraging the benefits of digital payments while mitigating potential risks. [22]

22. Nair, A.S. and Kannan, D. .P. (2023). Digital Payment Methods: Challenges And Opportunities. Journal of Namibian Studies, 37(S1), pp. 372-375.

5 Consumer Spending Behaviour

5.1 Comprehensive Overview of the Key Determinants, Models, and Factors influencing e-payment Behaviours

Over the past twenty years, the scope of e-payment research has expanded significantly alongside the surge in publications and most of the prior reviews concentrated on key determinants affecting e-payment behaviour. However, the findings on customer behavior regarding electronic payment adoption highlights factors that influence its acceptance and use, actual usage and satisfaction. These elements create a comprehensive model of customer electronic payment behavior evaluating the connections between perceived ease of use, attitude, usefulness and the intention to adopt.

It is obvious that the rise of modern retail channels like the Internet and mobile commerce necessitates new payment instruments to enable convenient transactions as the widespread adoption of mobile devices has significantly impacted both personal and professional activities suggesting that mobile phones could eventually replace cash-based payments. However, mobile payments remain underutilized, especially in developing countries, with many challenges still to be addressed.

The available literature primarily discusses customer electronic payment behaviour through multiple models by incorporating factors like risk, quality and trust as precursors to ease of use and customer attitude. Other studies focus on examining the impact of factors like gender, education, income, experience, age, privacy and smartphone addiction.

Factors influencing e-payment adoption also include cost, convenience, relative advantages, and security. Studies have highlighted various risks affecting adoption intention, including economic, functional, psychological and social risks though privacy and security risks receive the most attention.

Perceived usefulness, a key element in understanding the desire to use electronic payments, was addressed before and refers to the belief that using a specific system will enhance performance and effectiveness. In digital payments, perceived usefulness influences users' attitudes and intentions to use these systems. Factors affecting perceived usefulness include subjective norms,

perceived security, ease of use, compatibility and reliability. However, results are inconsistent regarding the influence of prior experience, trust, perceived risk, and financial incentives. [23]

It goes without saying that the expansion of the e-commerce sector, along with emerging digital technologies like big data, artificial intelligence, cloud computing, and robotics, is mainly driving the adoption of new technologies. Advances in information communication technology (ICT) have significantly transformed how consumers spend. The implementation of these technologies in the workplace has redefined both internal and external communication and streamlined business processes, leading to benefits such as increased productivity and customer satisfaction.

The research community's interest in technology acceptance within private and organizational contexts began nearly three decades ago as significant evidence had accumulated on user behavior related to technology adoption. As a result of that, numerous models and theories emerged to explain technology acceptance. These theories offer general insights into individual attitudes making them applicable to various research contexts beyond information system management. To provide a comprehensive understanding of technology acceptance, we have identified theoretical and contextual similarities and differences among technology acceptance theories from social psychology and behavioral psychology. These theories offer diverse perspectives on electronic payment acceptance and adoption.[24]

A-Technology Acceptance Model (TAM):

The TAM is one of the most frequently cited frameworks for studying technology adoption. It allows experts to evaluate user intentions and understand the reasons behind the acceptance or rejection of a product or service. It clarifies the relationship between perceived ease of use, perceived usefulness, attitude and adoption intention.

Researchers have extensively tested TAM in the information technology field, demonstrating its accuracy in predicting human attitudes towards technology adoption. Nonetheless, TAM

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23. Sahi, A.M., Khalid, H., Abbas, A.F. and Khatib, S.F.A. (2021). The Evolving Research of Customer Adoption of Digital Payment: Learning from Content and Statistical Analysis of the Literature. Journal of Open Innovation: Technology, Market, and Complexity, 7(4), pp.02-03.

24. Marikyan, D. and Papagiannidis, S. (2023) Unified Theory of Acceptance and Use of Technology: A review. In S. Papagiannidis (Ed), TheoryHub Book, pp. 01-02.

alone does not fully explain customer intentions leading researchers to expand the model with additional constructs like pricing, reliability, mobility and social influences among others.[25] However, it is worth mentioning that the Technology Acceptance Model (TAM) was first adapted from the Theory of Reasoned Action (TRA) to measure user acceptance of information systems. According to TAM, a person's use of technology is influenced directly or indirectly by their behavioral intentions, attitude, perceived usefulness and perceived ease of use of the system.

-Perceived Ease of Use

Perceived Ease of Use is defined as the extent to which a person believes that using a particular system would be free of effort. When users perceive a system as easy to use, it positively affects their actual use of the system, thereby increasing their interest in using it. Many researchers have studied this factor finding it significantly influences user adoption of technology.

-Perceived Usefulness

Perceived Usefulness was defined as the degree to which a person believes that using a specific system will enhance their performance. The greater the perceived benefits of the system, the more likely users are to adopt it. In the context of digital payment services, perceived usefulness is understood as the belief that using these services will improve productivity and performance in transactions. Research has shown that perceived usefulness is a key factor in the adoption of digital payment systems because users find them more effective and practical. Thus, measuring perceived usefulness involves estimating how much a system helps users in their activities.[26]

B-Unified Theory of Acceptance and Use of Technology (UTAUT):

UTAUT is the second most utilized theoretical perspective positing four key determinants of technology adoption: performance expectancy, effort expectancy, social influence and facilitating conditions. Research shows that UTAUT can account for about 70% of the variance in

25. Sahi, A.M., Khalid, H., Abbas, A.F. and Khatib, S.F.A. (2021). The Evolving Research of Customer Adoption of Digital Payment: Learning from Content and Statistical Analysis of the Literature. Journal of Open Innovation: Technology, Market, and Complexity, 7(4), p.06.

26. Laksita Asastani, H., Harisno, Haris Kusumawardhana, V. and Leslie Hendric Spits Warnars, H. (2018). Factors Affecting the Usage of Mobile Commerce using Technology Acceptance Model (TAM) and Unified Theory of Acceptance and Use of Technology (UTAUT). INAPR International Conference, pp.322-323.

behavioral intentions to use technology. Although it was originally designed to justify technology adoption within organizational contexts, many studies have extended it by integrating constructs from TAM. [27]

-Performance Expectancy

This is the belief that using a particular system will improve performance. For instance, the performance expectancy explains how students and teachers perceive the benefits of using Interactive Whiteboards in education.

-Effort Expectancy

This refers to the ease of using the system as the simpler a system is to use; the more likely users are to adopt it. It is worth mentioning that effort expectancy significantly influences users' behavioral intentions.

-Social Influence

This is the degree to which individuals perceive that important others think they should use the new system. Social influence can come from friends, colleagues, or family.

-Facilitating Conditions

This is the belief that the necessary organizational and technical infrastructure exists to support the system's use. An example would be the need for computers and reliable internet connections for accessing multimedia content.

-Behavioral Intention:

This construct measures the strength of one's intention to perform a specific behavior. In the context of information systems, behavioral intention directly influences actual technology use.[28]

C-Innovation Diffusion Theory (IDT):

Innovation is defined as any idea, practice or object that an individual perceives as new, while diffusion refers to the process by which this innovation is communicated over time among members of a social system.

27. Sahi, A.M., Khalid, H., Abbas, A.F. and Khatib, S.F.A. (2021). The Evolving Research of Customer Adoption of Digital Payment: Learning from Content and Statistical Analysis of the Literature. Journal of Open Innovation: Technology, Market, and Complexity, 7(4), p.06.

28. Laksita Asastani, H., Harisno, Haris Kusumawardhana, V. and Leslie Hendric Spits Warnars, H. (2018). Factors Affecting the Usage of Mobile Commerce using Technology Acceptance Model (TAM) and Unified Theory of Acceptance and Use of Technology (UTAUT). INAPR International Conference, p. 322.

Empirical evidence supports IDT's effectiveness in predicting consumer adoption behavior and studies have also noted similarities and complementary aspects between TAM and IDT. [29]

Innovation diffusion theory describes how the characteristics of an innovation influence its spread and successful adoption. Not all new concepts have the same potential for consumer acceptance as some may become popular overnight, while others may take a long time to gain acceptance or may never be widely accepted at all. The attributes of an innovation play a crucial role in determining the speed at which it is adopted by users. Several factors influence this adoption rate including communication channels, the characteristics of social systems, promotional activities and the role of communicators. However, there are five key characteristics of innovations that can serve as indicators for measuring perceptions:

-Relative Advantage

This is the extent to which an innovation is perceived as better than its predecessors and economically beneficial.

-Compatibility

This refers to how consistent an innovation is with existing values, past experiences and the needs of potential adopters. Innovations that align well with these factors are adopted more quickly than those that do not.

-Complexity:

This is the degree to which an innovation is perceived as difficult to understand and use. Higher complexity can hinder the adoption process.

-Trialability (Testability)

This refers to the extent to which an innovation can be experimented with on a small scale. Innovations that can be tried out easily are typically adopted more quickly than those that cannot be tested beforehand.

-Observability:

29. Sahi, A.M., Khalid, H., Abbas, A.F. and Khatib, S.F.A. (2021). The Evolving Research of Customer Adoption of Digital Payment: Learning from Content and Statistical Analysis of the Literature. Journal of Open Innovation: Technology, Market, and Complexity, 7(4), pp.06-07.

This is the degree to which the results of an innovation are visible to others. Innovations with easily observable benefits are adopted more quickly as potential adopters can see the advantages without needing to conduct their own trials.[30]

D-Unified Theory of Acceptance and Use of Technology Two (UTAUT2):

UTAUT2 enhances the predictive power of UTAUT by adding constructs such as price value, motivation and habit. It also considers the moderating effects of age, gender and experience on behavioral intention and technology use. Recent literature has extensively applied UTAUT2, particularly in consumer-centric contexts highlighting its robust applicability.[31]

Due to the evolving nature of information and communication technologies, many researchers have extended UTAUT to better suit specific contexts or improve its predictive accuracy. These adaptations of the model were driven by four main approaches: modifying the model for different contexts, changing endogenous variables, adding attitudinal antecedents and examining various moderating variables. For instance, some studies added new contextual and moderating variables like culture, ethnicity, religion, employment, language, income, education and geographical location.

To address the limitations of UTAUT, UTAUT2 was introduced and aimed to be a comprehensive framework for examining technology acceptance across various contexts. Its first objective was to enhance precision in explaining user behavior. The second objective was to develop a behavioral model for consumer technology acceptance and expanding UTAUT to include new constructs that address behavioral determinants in non-organizational settings. As mentioned before, UTAUT2 introduced three new constructs, hedonic motivation, price value and habit, and modified some relationships in the original model to better fit the context of consumer technology use.

UTAUT2 posits that individual technology use is influenced by hedonic motivation, cost or perceived value and habit, moderated by age, gender and experience.

30. Syahadiyanti, L. and Subriadi, A.P. (2018). Diffusion of Innovation Theory Utilization Online Financial Transaction: Literature Review. International Journal of Economics and Financial Issues, 8(3), p221.

31. Sahi, A.M., Khalid, H., Abbas, A.F. and Khatib, S.F.A. (2021). The Evolving Research of Customer Adoption of Digital Payment: Learning from Content and Statistical Analysis of the Literature. Journal of Open Innovation: Technology, Market, and Complexity, 7(4), p.07.

Hedonic motivation, defined as the pleasure derived from using technology, plays a significant role in technology acceptance. The integration of cost was based on its relative importance in consumer contexts where users bear direct costs associated with technology use.

In UTAUT2, cost is represented by price value defined as the trade-off between perceived benefits and monetary costs. A positive relationship between perceived value and intention to use indicates that users see the benefits as outweighing the costs.

On the other hand, Habit, the extent to which behaviors are performed automatically, was included to account for the automaticity of technology use.

The UTAUT2 model made several theoretical contributions indicating high predictive validity for the consumer segment. The effects of price value, hedonic motivation and habit were significant drivers of consumer technology use. Introducing habit provided an alternative theoretical mechanism for examining technology use by challenging the traditional role of intention as a proxy for behavior. Hedonic motivation was found to be more influential than performance expectancy across various studies and incorporating price value addressed the need to measure the costs of use in consumer contexts.

Finally, UTAUT2 identified the moderating effects of personal factors (gender, age, experience) on the impact of hedonic motivation, price value and habit on behavioral intention and technology use.[32]

E-Other Theoretical Perspectives:

Other theories have been employed in fewer studies. For example, the Theory of Reasoned Action examines the impact of beliefs on behavioral intentions and subsequent actions. This theory has been used to understand customer adoption intentions for e-payments. TAM3, building on TAM integrates multiple constructs to explain technology acceptance with significant predictive power. Innovation Resistance Theory, preferred for studying resistance to innovations, has been used in various contexts such as online shopping and mobile banking. Self-Determination Theory has tested the effects of QR code payment approaches on customer satisfaction. Status Quo Bias Theory explores why customers may resist switching to new systems,

32. Marikyan, D. and Papagiannidis, S. (2023) Unified Theory of Acceptance and Use of Technology: A review. In S. Papagiannidis (Ed), TheoryHub Book, pp. 05-07.

emphasizing the perceived greater potential losses over gains when changing from the current state.[33]

5.2 The Impact of Technological Factors on Consumer Spending Convergence

Across various domains, convergence can signify the homogenization of economic systems, demographic patterns, value systems or consumer behaviors. Convergence can be also defined as the trend where consumers allocate a similar portion of their budget or income to similar products across over time. In other words, convergence examines how similar consumer spending patterns are.

When consumer budget allocations for different products become more alike, the spending levels for the products become more aligned and the significance or priority given to these products also becomes more similar. It is worth mentioning that key factors linked to convergence in literature include advanced communication technology, modernization, urbanization, industrialization and increasing purchasing power. We therefore expect macro-environmental factors, categorized as technological and economic factors to affect the convergence of consumer spending across the German markets. Technological advancements like improved internet infrastructure, higher patent applications and grants and increased investments in telecommunications enable consumers to connect and emulate spending behaviors. According to coevolution theory, technology shapes consumer behavior leading to homogenized spending patterns. Thus, as technology advances, consumer spending convergence increases. On the other hand, economic factors similarly promote convergence by connecting consumers. Industrialization and economic development play central roles in providing access to similar products and services leading to more uniform consumption patterns fostering similar consumption and spending behaviors.[34]

The economic psychology literature often talks about convergence or divergence such as the perspectives of band wagon and snob effects which are related with the aggregation and disparity of consumer behaviours.

33. Sahi, A.M., Khalid, H., Abbas, A.F. and Khatib, S.F.A. (2021). The Evolving Research of Customer Adoption of Digital Payment: Learning from Content and Statistical Analysis of the Literature. Journal of Open Innovation: Technology, Market, and Complexity, 7(4), p.07.

34. Ozturk, A. and Cavusgil, S.T. (2019). Global convergence of consumer spending: Conceptualization and propositions. International Business Review, 28(2), pp.297–298.

When hopeful consumers do what everyone else is doing (or a few leading examples), it results in what economists call the bandwagon effect. Since a lot of people are consuming the same product, demand lines grow. The desire to conform is more tied with mass psychology, everyone wants to be in what they believe represents the 'in' crowd. The desire to "jump on the bandwagon" promotes consumer behaviour converging. On the other hand, the snob effect describes a situation in which a product's demand declines when it is widely used by others but we can say that divergence in consumer behaviour results from consumers who seek out special and distinctive products putting themselves apart from conventional options. [35]

35. Ozturk, A. (2016). Essays on the Convergence of Consumer Spending Patterns across National Markets, pp.22-23.

6 Psychological Impact of Digital Payment

6.1 Preliminary Remarks

Consumer purchasing behavior is a crucial area of study focusing on consumer actions before, during and after buying a product or service. Various factors such as personal, psychological, social and cultural aspects influence these behaviours. In today's competitive market, understanding consumer purchasing behavior is essential for marketing activities and a key element in business decision-making processes. Through this analysis, companies can gain insights into consumer psychology aiding in the development of marketing strategies, product development and pricing. Furthermore, analyzing user behaviour helps service providers understand customer preferences, interests and needs enabling data-driven decisions, service optimization, innovation, customer retention and acquisition to secure a competitive advantage.

Digital payment apps, which allow users to conduct online transactions via smartphones or other devices, represent a form of electronic money used for purchasing goods and services, transferring funds or storing value. These apps have significantly transformed the economic landscape as mentioned before by offering convenience, speed, security and accessibility to both consumers and businesses. On the other hand, digital payment apps have also influenced consumer purchasing decisions by providing more information, options and feedback.

Understanding how psychological factors like attitudes, perceptions and concerns influence behaviour within the digital payment sector is crucial to determine the effects of these psychological factors on consumer behavior and the overall impact of digital payment services.[36]

One of these factors that are influenced by the features of digital payment services is impulsive buying. Impulse buying occurs mainly when a consumer feels a sudden, strong and often uncontrollable urge to make an immediate purchase. This type of buying is typically triggered by a specific stimulus encountered while shopping which can be either the product itself or its external attributes such as search mechanisms and product information. Psychologically, impulse buying is sometimes irresistible due to the sudden and spontaneous nature of the psychological impulse so that individuals with higher impulsivity are more prone to spontaneous purchases and often have flexible shopping lists that accommodate unplanned buying.

36. Karmaker, S., Fardouse Oishi, Mst.E., Qasem, A. and Sharif Sami, S.B. (n.d.). Exploring the Psychological Factors of Consumer Purchase Behavior in Bangladesh on the Adoption of Digital Payment Apps. Department of Computer Science and Engineering School of Data and Sciences Brac University ,pp. 01-02.

In essence, impulse buying involves making an unplanned and sudden purchase decision driven by specific environmental stimuli accompanied by strong feelings of pleasure and excitement. This contrasts with planned behavior which involves intentional decision-making based on structured cognitive intentions often modeled by theories such as the Technology Acceptance Model or the Theory of Planned Behavior.

6.2 Understanding Online Impulse Buying Behaviour: The Roles of Technology Use, Trust, and Flow Experience

Shopping is a crucial part of our everyday lives. However, many purchases are impulsive driven by sudden desires and feelings of excitement. This phenomenon, known as impulse buying and affects a significant portion of online consumers.

Impulse shoppers often struggle to control their urges when exposed to merchandising stimuli on online stores. Online consumers act as both impulse shoppers and system users navigating websites to make purchases. From the impulse shopper perspective, these individuals experience sudden and unplanned purchasing behaviours that are complex and difficult to predict. As system users, they engage with the technical aspects of e-commerce sites such as product searches, payment processes and delivery tracking.

Previous research offers multiple perspectives on online impulse buying. Some studies highlight the role of shopping enjoyment as a mediator influenced by the perceived usefulness of a website and the interactive experience it offers. However, others emphasize the importance of e-store features such as content, design and navigation as precursors to impulse buying mediated by affective perceptions and shopping enjoyment. These studies commonly focus on the hedonic value of digital payment considering individual affective perception as a key mediator between the drivers of e-store use, trust belief and impulse buying behaviour.

While individual affective perception is crucial, these studies often overlook the importance of trust in online impulse buying which leads to an incomplete understanding of the dual role online consumers play as both impulse shoppers and system users.

To address this gap, it is quite essential to include technology use and trust as key drivers with psychological state as a mediator to provide deeper insights into online impulse buying behavior. Flow experience, capturing consumers' emotional reactions and motivations toward online

shopping are critical components as well. Flow experience is driven by both intrinsic and extrinsic motivations and includes sub-constructs like concentration, perceived control and perceived enjoyment.

Regarding technology use, the user interactions with websites including factors like pleasantness, visual appeal, navigability and security play big roles as these factors, collectively termed website design, influence perceived usefulness (PU) reflects users' beliefs about the productivity benefits of using a website.

In addition to that, trust belief plays a vital role in enhancing consumers' willingness to engage with e-vendors as it encompasses competence and integrity and is also linked to the perceived usefulness.

A- Flow Experience:

Flow experience is defined as a psychological state characterized by complete immersion in an activity resulting in a deep sense of involvement. During a flow state, individuals are so engrossed in the activity that everything else fades into the background. This experience is marked by a concentrated focus that filters out irrelevant perceptions and thoughts, a loss of self-consciousness, responsiveness to clear goals and feedback and a sense of emotional control over the environment. Recently, flow experience has been recommended as a crucial metric for assessing online consumer experience as it essentially describes the mood state derived from engaging in an enjoyable activity.

As a result of that flow experience has been identified as a valuable concept for understanding impulse buying, highlighting several key dimensions on enjoyment and concentration as core attributes of flow in online shopping.

In online shopping, perceived enjoyment reflects how pleasurable the activity itself is independent of physical outcomes. Perceived control involves an individual's control over their environment and actions. However, concentration is crucial for experiencing flow requiring individuals to focus intensely on their activity.

B-Technology Use:

Technology use can be examined through two components: design and perceived usefulness (PU). The design of a platform is crucial for how effectively customers find information necessary for online impulse buying. Easy access to information enhances users' ability to search and navigate shaping their initial expectations. Typically, website design is analyzed from a usability perspective which encompasses how easily users can navigate a site including factors

like a well-organized visual layout, quick loading times and information security. Perceived usefulness involves comparing expectations with actual performance outcomes of using an information system which influences subsequent behaviors like evaluating the system's effectiveness for task completion.

C-Trust:

Trust is viewed as a crucial element for mitigating social complexity and reducing the perceived risk of transactions by enhancing expectations of positive outcomes and ensuring confidence in the behavior of those involved.

In digital payment, where transactions are conducted without face-to-face interaction and involve the exchange of money and goods without physical presence, trust is essential to overcome the inherent uncertainties associated with online vendors.

Trust is often identified three core attributes which are benevolence, competence, and integrity. Benevolence refers to the belief that the trustee will act with goodwill and not exploit the situation for personal gain. However, competence is the belief in the trustee's capability to meet expectations and encompasses the trustor's perception of the trustee's skills and knowledge necessary for the transaction. In other words, this translates to the expectation that e-vendors have the expertise to fulfill consumer needs effectively. Finally, integrity involves the expectation that the trustee will be honest and fulfill their promises. [37]

In addition to all of that, it is worth mentioning that there are four distinct types of impulse buying. Pure impulse buying which involves a purchase made without any prior thought or plan. It can be described as escape buying resulting from a sudden urge to buy something not necessarily new or fashionable. Then we have also Reminder impulse buying which recalls a previous decision or experience prompting an on-the-spot impulse purchase. It occurs mainly when a shopper sees a product and recalls low stock at home or an advertisement.

Besides that, there is what is called Planned impulse buying which occurs when a shopper's purchase depends on sale conditions like price specials or coupons. The consumer waits to see what is available at what prices and then decides. The final type of impulsive buying is the

37. Wu, I.-L., Chen, K.-W. and Chiu, M.-L. (2016). Defining key drivers of online impulse purchasing: A perspective of both impulse shoppers and system users. International Journal of Information Management, 36(3), pp.284–289.

Fashion-oriented impulse buying which happens when a customer sees a product in a new style design, or fabric and decides to buy it. [38]

6.3 The Dynamics of the Pain of Paying – Definition and Theoretical Framework

Consumers experience a range of emotions during their purchasing process which influence their marketplace behaviour. A less explored emotion that consumers feel when paying or considering payments is the pain of payment. This term refers to the negative psychological effect that occurs when consumers part with their financial resources.

The concept of pain of payment was first introduced to describe the distress consumers feel after making a purchase. This pain is characterized as the negative emotion experienced immediately after a payment is made.

Early research suggests that consumers track their expenses in mental accounts like a company's accounting system. After making a purchase, consumers create a mental account linking the benefits and costs of that purchase and they monitor these throughout an accounting period to determine if the account is in the red (costs outweigh benefits) or in the black (benefits outweigh costs). However, a more recent explanation is based on the valuation of money as it is viewed as a valuable and limited resource and a source of protection and security essential for survival. The reduction of this valuable resource lowers consumers' sense of security leading to an adverse psychological reaction known as pain of payment so that spending money evokes less pain when other forms of human protection resources, such as social support, are abundant.

Based on these insights, we can define the immediate pain of payment as the negative psychological affective reaction consumers experience immediately after realizing they have lost a certain amount of their resources. However, the anticipated pain of payment is the negative psychological affective reaction consumers experience when they realize they will or may lose a certain amount of their financial resources in the future and this anticipated pain can occur when contemplating a specific future payment or a potential payment.[39]

Former research has identified numerous factors that can impact and intensify the pain of paying. However, the diagram shown below presents a conceptual model of this construct to enhance our comprehension on the factors associated with pain of paying.

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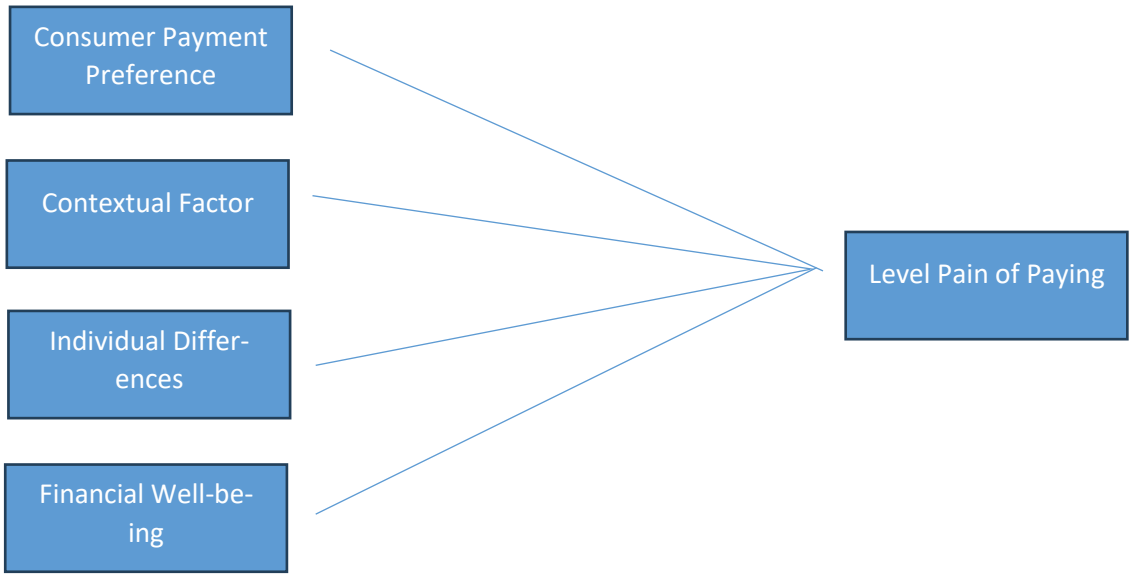
38. Yu K. Han, A. Morgan, G., Kotsiopulos, A. and Kang-Park, J. (1991). Impulse Buying Behaviorof Apparel Purchaser. 9(3). P.16.

39. The pain of payment: A review and research agenda, Reshadi, F. and Fitzgerald, M.P. (2023). The pain of payment: A review and research agenda. Farnoush Reshadi, The Business School, Worcester Polytechnic Institute, Worcester, MA, USA, pp. 1674-1975.

Figure 6.3.1 Pain of Paying Conceptual Model



Source: Kuo, Dr.C.-C. (n.d.). New Innovations in Economics, Business and Management. 1st ed, p.162.

A-Consumer Payment Preferences:

Consumer preferences for payment methods significantly influence the pain of paying which varies based on how and when payments are made. This pain can diminish the enjoyment of shopping and affect consumer spending behaviours.

-Payment Modes

Different payment methods impact consumer behaviour and the term "payment mode" refers to the various methods through which consumers make payments. Certain payment methods are perceived as more painful than others. For instance, many researchers have suggested that paying with cash is more painful than using a credit card for the same amount.

Payment Timing:

The double-entry mental accounting theory explains the reciprocal relationship between consumption pleasure and payment pain, as well as their effects on shopping habits and hedonic incentives. Consumers often feel payment pain when making purchases which can detract from the satisfaction of consumption. However, expenditures already paid for can be enjoyed as if

they were free with the pre-consumption payment pain being alleviated by considering the benefits of the purchase. Consumer preferences for payment timing and the factors influencing these decisions have been heavily investigated and concluded that consumers prefer to prepay for non-durable and hedonic products.

B-Contextual Factors

Consumers may experience varying levels of payment pain depending on the circumstances even when spending the same amount of money.

-Perceived Ownership

The degree of ownership consumers feel over their expenditures can influence the pain of paying. Low perceived ownership can lead to less payment pain and a higher risk of overspending especially among consumers who are less financially responsible. When consumers believe they have less control over their spending, they experience more pain. It is easier to justify expenses and feel less payment pain when consumers perceive that the expense is primarily driven by the situation rather than their own choice.

-Social Support

Social support and money are two forms of protection and security that can be used interchangeably. When one resource is highly valued, the need for the other diminishes. Consumers who feel highly supported by others experience less pain when making purchases. This is because social support reduces the importance of money as a protective mechanism thereby lessening the pain of losing money. The pain-relieving effect of social support is more pronounced for hedonic purchases than for utilitarian ones as the reduced importance of money makes it easier for consumers to justify hedonic expenditures.

-Control over Payment

Consumers experience less pain when they have control over the payment process. When the transaction results from a free decision, such as deciding on a tip at a restaurant, the pain of paying is reduced. In contrast, when a purchase is imposed, such as paying a tax on a meal, the pain of paying is like the suffering of losing money.

C-Individual Differences

Just as sensitivity to physical pain varies among individuals, so does sensitivity to the psychological pain of paying bills. Research have shown that individuals with high payment pain tend to spend significantly less to avoid purchases due to the extreme pain of paying. Conversely, people who experience less payment pain tend to spend more.

D-Financial Well-being

Factors affecting the value of money as a resource also influence the intensity of payment pain.

-Importance of Money

For many consumers, money is a finite and valuable resource and spending it induces emotional pain. Factors that affect the marginal value of money or its availability can increase the importance of this resource, and the pain experienced. Money serves as a form of security and losing it reduces consumers' sense of safety.

-Budget Depletion

When a budget is exhausted or nearly depleted, spending becomes more painful. The amount of pain felt correlates with the proportion of the budget spent. Evidence suggests that the pain of paying intensifies when money is scarce.

-Financial Slack

Financial slack is defined as the perceived surplus of resources available to complete a task without affecting the ability to meet other that require the same resources. When consumers' financial flexibility is limited due to spending, they experience emotional pain. Resource slack theory posits that consumers will experience less pain if they anticipate their financial slack to be replenished soon. [40]

40. Kuo, Dr.C.-C. (n.d.). New Innovations in Economics, Business and Management. 1st ed , pp.162.165.

7 Methodology

The primary objective of this study is to investigate the influence of behavioral economics on spending patterns within the context of digital payment systems in Germany.

This research adopts a quantitative approach utilizing a structured questionnaire distributed via Google Forms to collect data from participants. Quantitative research is well-suited for this study as it allows for the collection of data that can be statistically analyzed to identify patterns and relationships between variables.

The questionnaire is designed to obtain responses that provide insights into the relationship between digital payment usage and consumer spending behavior. Specifically, it aims to measure the frequency and patterns of digital payment usage to understand in what contexts individuals use digital payment systems. This includes examining whether digital payments lead to increased spending or impulse purchases.

The research aims as well to explore the primary reasons for using digital payments to understand the perceived benefits and drivers of adoption. On the other hand, investigating how digital payments influence the pain of paying provides insights into how digital payments might impact this pain compared to cash transactions.

Gathering data on participants' demographic characteristics, such as age, gender, income level, and education level allows for the analysis of how these factors influence digital payment usage and spending behavior. By leveraging the capabilities of Google Forms, the survey has been easily distributed to a broad audience facilitating efficient data collection. The online format also allowed for anonymity and convenience encouraging honest and thoughtful responses from participants. The collected data has been subjected to statistical analysis using Statistical Package for the Social Sciences (SPSS) to draw robust conclusions about the influence of behavioral economics on spending patterns in digital payment systems.

A-Population and Sample

The target population for this study encompasses individuals residing in Germany who use digital payment systems. This broad definition includes a diverse range of users who have integrated digital payments into their lives for different purposes such as shopping, paying bills and transferring money. The focus on this population is driven by the need to understand how widespread adoption of digital payment systems influences consumer spending behavior across the population resided in Germany.

Convenience sampling is a sampling technique where participants are selected based on their availability and willingness to take part in the survey. This method was chosen primarily due to the practical advantages it offers in terms of accessibility and speed of data collection particularly when leveraging online distribution channels like Google Forms.

Google Forms served as the primary tool for distributing the questionnaire. The use of an online survey platform is advantageous for several reasons as it can be easily accessed by anyone with an internet connection making it convenient for participants from different regions to take part in the study. Besides that, participants can also respond anonymously which may encourage more honest and accurate answers especially on sensitive topics such as income level and spending behavior.

To enhance the generalizability of the findings, efforts have been made to ensure that the sample includes a diverse representation of individuals across various demographic categories so that the survey is designed to capture responses from participants residing in different states across Germany. Furthermore, respondents from different age groups are included to explore how digital payment usage and its impact on spending behavior vary across the life span. This includes young adults, middle-aged individuals and older adults. In addition to that, participants from various income brackets are also included with different levels of educational backgrounds to allows the analysis to determine how education and various income levels impacts the perception and use of digital payment systems.

B-Questionnaire Design

The questionnaire is designed to gather comprehensive data that will provide insights into various aspects of digital payment usage and its influence on spending behavior. It is divided into several sections each targeting specific criteria The questions are organized into four main sections: Demographic Information, Digital Payment Usage and Spending Behavior, Behavioral Economics and Spending Patterns, and Additional Feedback.

Demographic Information: [41]

This section aims to capture essential demographic details of the respondents providing a contextual background that allows for segmentation and analysis of the data based on various demographic factors.

41. Akilesh, K.U., Hariharan, G., Karthikeyan, R., Jayasubramanian, Dr.P. and Eahambaram, Dr.C. (2023). A Study on Impact of Digital Payments on Consumer's Spending Behaviour with Special Reference to Coimbatore City. International Journal of Research and Analytical Reviews (IJRAR), 10 (1).

- In which state (Bundesland) do you currently reside in Germany?
- Age
- Gender
- What is your income level?
- What is your education level?

Digital Payment Usage and Spending Behavior: [42]

This section delves into the frequency and purpose of digital payment usage, as well as its impact on spending behavior.

- How frequently do you use digital payment systems?
- How has your spending behaviour changed since you started using digital payment systems?
- What is your primary reason for using digital payment systems?

Behavioral Economics and Spending Patterns:

This section explores the psychological and behavioral aspects of using digital payment systems, focusing on how these systems influence spending decisions and perceptions.

- Do you feel that using digital payments makes it easier for you to make impulse purchases? [43]
- Do you feel that digital payment systems reduce the 'pain' of paying compared to cash? [44]
- How concerned are you about the security of digital payment systems?
- How satisfied are you with your experience using digital payment systems?

-Additional Feedback:

This final section provides respondents with the opportunity to share any additional thoughts, comments, or suggestions regarding digital payment systems and their spending behavior.

- Do you have any additional comments or suggestions regarding digital payment systems and your spending behaviour?

All in all, the questionnaire is structured to systematically capture data across multiple dimensions of digital payment usage and spending behavior that are needed for a detailed analysis of the relationship between digital payments and consumer behavior.

C. Pilot Testing

42. Vinitha Krishna, K. and Shanmugam, V. (2020). Determinants of Customer intention to use Digital payment system. Jour of Adv Research in Dynamical & Control Systems, 12(02).

43. Halim, E., Januardin, R. and Hebrard, M. (n.d.). The Impacts of E-Payment System and Impulsive Buying to Purchase Intention in E-commerce. International Conference on Information Management and Technology (ICIMTech).

44. Reshadi, F. and Fitzgerald, M.P. (2023). The pain of payment: A review and research agenda. he Business School, Worcester PolytechnicInstitute, Worcester, Massachusetts, USA.

Before the main data collection phase, a pilot testing has been conducted to evaluate the clarity, reliability and validity of the questionnaire. Feedback from the pilot test participants has been used to make necessary adjustments to the questionnaire ensuring that the questions are understandable and appropriately measure the intended constructs.

D. Data Collection

After incorporating feedback from the pilot test and making necessary adjustments, the final version of the questionnaire was ready for distribution. The questionnaire has been distributed online via Google Forms.

The survey was open for a period of two weeks to provide participants with sufficient time to complete the questionnaire at their convenience. In total, 106 data points have been collected.

E. Data Analysis

The collected data will be analysed using Statistical Package for the Social Sciences (SPSS). The analysis has involved several steps:

1.Frequency Analysis

A frequency analysis will be conducted to examine the demographic information, digital payment usage and spending behaviour as well as the influence of behavioral economics on spending patterns within the sample. This analysis will allow us to understand the distribution and prevalence of these variables providing insight into the characteristics of the participants and their interactions with digital payment systems.

2.Cross-Tabulation Analysis

Cross-tabulation analysis will be applied to explore key relationships in the data. First, the analysis will examine the relationship between impulsive behaviour and trust in digital payment systems to assess whether higher trust levels correlate with increased impulsive spending based on the previous theoretical framework (See page 34). Secondly, the link between the pain of paying and income level will be explored to determine if income influences the emotional impact of spending through digital channels also based on the previous theoretical framework (See page 38).

3.Chi-Square Test

A Chi-Square test will be conducted to examine the relationships between key variables mentioned before.

4.Fisher's Exact Test

Fisher's Exact Test will also be used when needed to analyze the associations between key variables. This test will first examine the relationship between the variables mentioned before.

5.Measure of Association

Measures of association will be utilized to quantify the strength and direction of relationships between key variables. The analysis will assess the relationship between impulsive behaviour and trust in digital payment systems highlighting how trust levels influence impulsive spending tendencies. Additionally, measures of association will explore the connection between the pain of paying and income level.

6.ANOVA Test Analysis

The Analysis of Variance (ANOVA) test will be utilized to assess whether there are meaningful differences in the average values across multiple groups. Specifically, it will be applied to examine the relationships between spending behaviors and digital Payment usage, Gender and digital Payment use, as well as the combined influence of age and income on spending patterns. By comparing the means of these groups, the ANOVA test will help determine if any observed differences are statistically significant indicating that the variations are unlikely to have occurred by chance and may reflect underlying patterns or associations within the data.

8 Analysis and Finding

8.1 Descriptive Statistical Analysis

8.1.1 Frequency Analysis of Demographic Information:

Table 8.1.1 Frequency Analysis – Demographic Information

2. Age

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	18-24	40	37.7	37.7	37.7
	25-34	50	47.2	47.2	84.9
	35-44	13	12.3	12.3	97.2
	45-54	3	2.8	2.8	100.0
	Total	106	100.0	100.0	

3. Gender

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Female	49	46.2	46.2	46.2
	Male	54	50.9	50.9	97.2
	Other	1	.9	.9	98.1
	Prefer not to say	2	1.9	1.9	100.0
	Total	106	100.0	100.0	

4. What is your income level ?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	€20,000 - €39,999	14	13.2	13.2	13.2
	€40,000 - €59,999	14	13.2	13.2	26.4
	€60,000 - €79,999	7	6.6	6.6	33.0
	€80,000 and over	3	2.8	2.8	35.8
	Under €20,000	68	64.2	64.2	100.0
	Total	106	100.0	100.0	

5. What is your education Level ?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Apprenticeship (Ausbildung)	16	15.1	15.1	15.1
	Bachelor's degree	30	28.3	28.3	43.4
	Doctorate	4	3.8	3.8	47.2
	High school or less	18	17.0	17.0	64.2
	Master's degree	38	35.8	35.8	100.0
	Total	106	100.0	100.0	

Source: Processed questionnaire data by the author

Based on the above table, we can notice that the majority of the respondents are young adults with nearly half of them being in the 25-34 age group (47.2%). However, only a small fraction of respondents is aged between 45-54 (2.8%).

Regarding gender, the sample is relatively balanced in terms of gender with a slight majority of male respondents. Besides that, it is worth mentioning that a small proportion of respondents identified as "Other" or preferred not to disclose their gender (total of 2.8%).

When it comes to income level, most of the respondents (64.2%) have a yearly Income level under €20,000 and only a small fraction of respondents earns €80,000 or more (2.8%).

The sample is well-educated with a significant proportion (35.8%) holding a master's degree. However, there is a diverse range of educational backgrounds among the respondents with a notable portion having high school education or less (17%).

Overall, we can say that the data shows a predominantly young, relatively balanced gender distribution, lower income levels and a high level of education among the respondents.

8.1.2 Frequency Analysis of Digital Payment Usage and Spending Behavior:

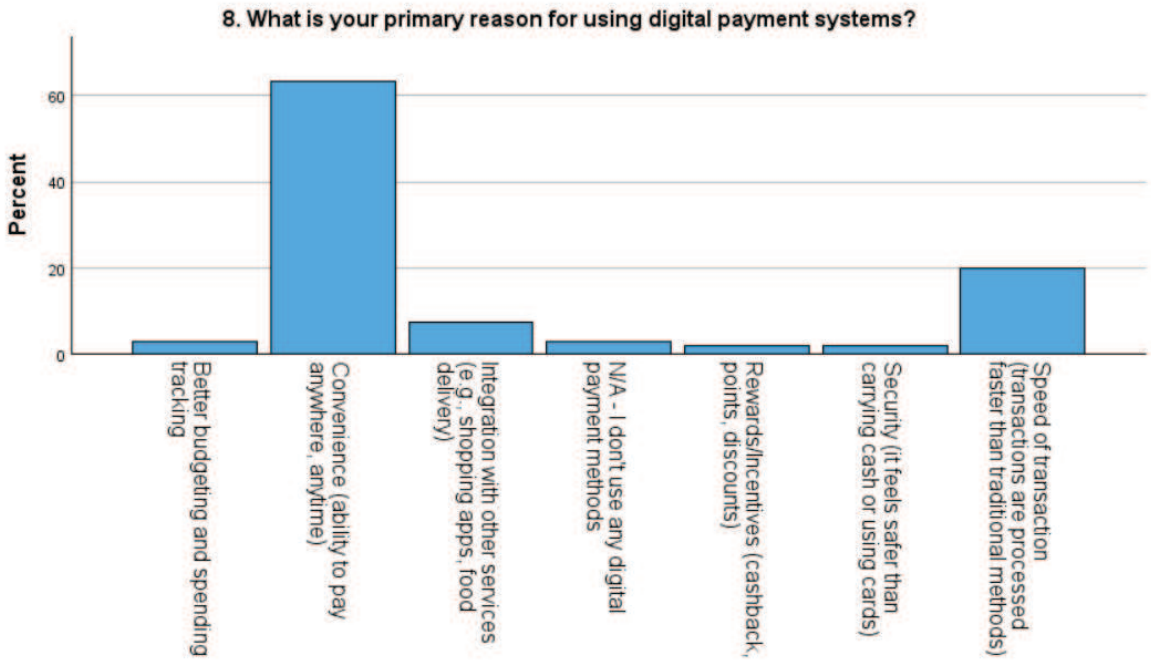
Table 8.1.2 Frequency Analysis – Digital Payment Usage and Spending Behavior

6. How frequently do you use digital payment systems?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		1	.9	.9	.9
	Daily	49	46.2	46.2	47.2
	Monthly	9	8.5	8.5	55.7
	Never	2	1.9	1.9	57.5
	Rarely	2	1.9	1.9	59.4
	Weekly	43	40.6	40.6	100.0
	Total	106	100.0	100.0	

7. How has your spending behaviour changed since you started using digital payment systems?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Decreased somewhat	2	1.9	1.9	1.9
	Increased significantly	27	25.5	25.5	27.4
	Increased somewhat	44	41.5	41.5	68.9
	No change	33	31.1	31.1	100.0
	Total	106	100.0	100.0	



Source: Processed questionnaire data by the author

We can notice from the above table that the most frequent response is "Daily" with 46.2% of respondents using digital payment systems. However, "Weekly" usage is also common accounting for 40.6% of respondents and only a small percentage of respondents reported infrequent usage of "Monthly," "Never," or "Rarely".

Besides that, we can say that the majority of respondents with 68.9% reported an increase in spending since using digital payment systems with "Increased somewhat" being the most common response with 41.5%. A smaller proportion of 31.1% reported no change in spending behavior.

From the above bar charts, we can conclude that convenience is by far the most common reason for using digital payment systems with 63.2% of respondents selecting this option. This suggests that the ability to pay anywhere and anytime is the primary driver for adoption. However, the speed of transaction is the second most common reason chosen by 19.8% of respondents. This indicates that many users value the faster processing times of digital payments compared to traditional methods. On the other hand, a small percentage of respondents (2.8%) do not use any digital payment methods at all indicating a minimal portion of non-users in the sample and finally incentives and security are the least common reasons each chosen by 1.9% of respondents. This suggests that these factors are less significant in influencing the adoption of digital payment systems for this sample.

Overall, the data suggests that digital payment systems are widely used and have led to increased spending for a significant portion of respondents. It also highlights that convenience is the dominant factor driving the use of digital payment systems with speed of transaction also playing a significant role. Other factors such as integration, budgeting, rewards, and security are less influential for the respondents.

8.1.3 Frequency Analysis of Behavioral Economics and Spending Patterns:

Table 8.1.3 Frequency Analysis – Behavioral Economics and Spending Patterns

9. Do you feel that using digital payments makes it easier for you to make impulse purchases?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Agree	51	48.1	48.1	48.1
	Disagree	8	7.5	7.5	55.7
	Neutral	15	14.2	14.2	69.8
	Strongly agree	28	26.4	26.4	96.2
	Strongly disagree	4	3.8	3.8	100.0
	Total	106	100.0	100.0	

10. Do you feel that digital payment systems reduce the 'pain' of paying compared to cash?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		1	.9	.9	.9
	Agree	41	38.7	38.7	39.6
	Disagree	11	10.4	10.4	50.0
	Neutral	17	16.0	16.0	66.0
	Strongly agree	35	33.0	33.0	99.1
	Strongly disagree	1	.9	.9	100.0
	Total	106	100.0	100.0	

11. How concerned are you about the security of digital payment systems?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Neutral	22	20.8	20.8	20.8
	Not concerned at all	8	7.5	7.5	28.3
	Not very concerned	29	27.4	27.4	55.7
	Somewhat concerned	35	33.0	33.0	88.7
	Very concerned	12	11.3	11.3	100.0
	Total	106	100.0	100.0	

12. How satisfied are you with your experience using digital payments systems?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Dissatisfied	1	.9	.9	.9
	Neutral	12	11.3	11.3	12.3
	Somewhat satisfied	45	42.5	42.5	54.7
	Very satisfied	48	45.3	45.3	100.0
	Total	106	100.0	100.0	

Source: Processed questionnaire data by the author

First of all, a majority of respondents of 74,5% feel that digital payments make it easier to make impulse purchases. However, a smaller portion of 11.3% does not feel that digital payments contribute to impulse purchases.

In addition to that, a significant majority of 71,7% believe that digital payments reduce the pain of paying compared to cash and almost 11.3% of our sample disagree on that.

Furthermore, and regarding user's concerns on security, we can notice that responses are varied with the highest percentages being somewhat concerned with 33.0% and 27.4% not being very concerned. However, only 11.3% are very concerned about security.

Finally, and based on the above table, a majority of respondents are satisfied with digital payment systems function with 87.8% and only 0.9% are dissatisfied.

To recap, most respondents perceive digital payments as a contributing factor to impulse purchases behaviour. On the other hand, there is a strong consensus that digital payments make the act of paying less psychologically burdensome compared to using cash. There is also a diverse range of concerns regarding the security of digital payment systems with a significant number expressing some level of concern. However, satisfaction with digital payment systems is generally high among respondents.

8.2 Analysis of Crosstab, Chi-Square, Fisher's Exact and Association Measures

8.2.1 Analysis of Impulsive Behaviour and Trust (Concern)

Table 8.2.1 Analysis of Impulsive Behaviour and Trust (Concern)

9. Do you feel that using digital payments makes it easier for you to make impulse purchases? * 11. How concerned are you about the security of digital payment systems? Crosstabulation

Count

		11. How concerned are you about the security of digital payment systems?					
		Neutral	Not concerned at all	Not very concerned	Somewhat concerned	Very concerned	Total
9. Do you feel that using digital payments makes it easier for you to make impulse purchases?	Agree	11	4	16	17	3	51
	Disagree	1	1	2	3	1	8
	Neutral	3	0	4	8	0	15
	Strongly agree	6	2	6	6	8	28
	Strongly disagree	1	1	1	1	0	4
Total		22	8	29	35	12	106

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	18.025[a]	16	.322
Likelihood Ratio	18.656	16	.287
N of Valid Cases	106		

a. 18 cells (72.0%) have expected count less than 5. The minimum expected count is .30.

Directional Measures

			Value	Asymptotic Standard Error [a]	Approximate T[b]	Approximate Significance
Nominal by Nominal	Lambda	Symmetric	.056	.051	1.073	.283
		9. Do you feel that using digital payments makes it easier for you to make impulse purchases? Dependent	.091	.057	1.524	.128
		11. How concerned are you about the security of digital payment systems? Dependent	.028	.056	.501	.617
	Goodman and Kruskal tau	9. Do you feel that using digital payments makes it easier for you to make impulse purchases? Dependent	.055	.030		.108[c]
		11. How concerned are you about the security of digital payment systems? Dependent	.034	.019		.566[c]

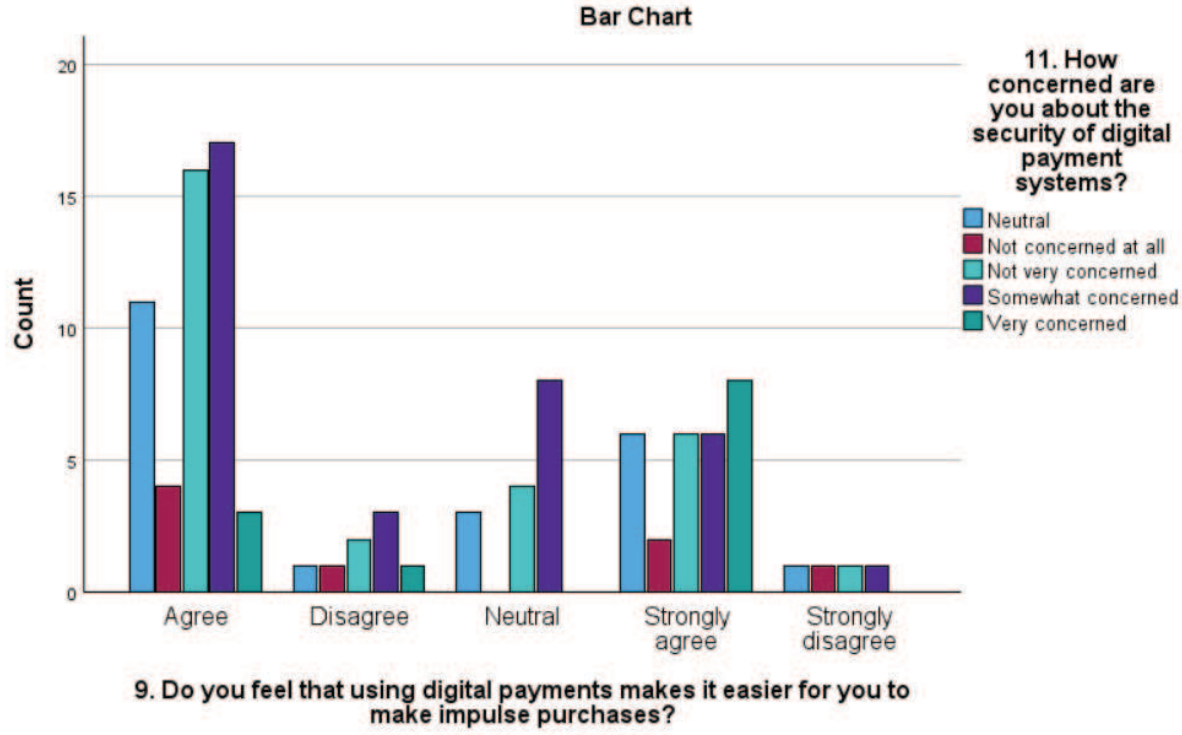
a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

c. Based on chi-square approximation

Symmetric Measures

		Value	Approximate Significance
Nominal by Nominal	Phi	.412	.322
	Cramer's V	.206	.322
	Contingency Coefficient	.381	.322
N of Valid Cases		106	



Source: Processed questionnaire data by the author

Cross-Tabulation Analysis

What we can notice from the above table is that most respondents who agree that digital payments make it easier to make impulse purchases are either somewhat have no trust in digital payment as they are either concerned or very concerned about digital payment security. However, those who are neutral or disagree about impulse purchase ease are more evenly distributed across concern levels though fewer in number.

Chi-Square Test

The Chi-Square test is used here to determine if there is a significant association between two categorical variables. In this case, the variables are impulse purchases and trust in digital payment systems based on the previous theoretical framework (See page 34).

H0: There is no statistically significant association between the impulse buying behaviour and the trust in digital payment systems.

H1: There is statistically significant association between the impulse buying behaviour and the trust in digital payment systems.

Assumption: Significance level 0.05

Pearson Chi-Square has a value of 18.025 with 16 degrees of freedom (df). Since the p-value (0.322) is greater than 0.05 then there is no statistically significant association between trust in digital payment system and the perception of impulse purchase ease using digital payments. The test of Likelihood Ratio also supports the chi-square result with a value of 18.656 and a p-value of 0.287.

Measure of Association

Lambda values are close to zero (0.056 for symmetric and 0.091 and 0.028 for dependent variables) and the low values suggest that knowing one variable does not significantly improve the prediction of the other. The association between the two variables is weak.

Also, the values of Goodman and Kruskal tau are low (0.055 and 0.034 for the dependent variables) and this again suggests a weak association between the variables.

Regarding Phi and Cramer's V, they both have a value of 0.412 and 0.206 respectively with a significance of 0.322 and these values indicate a weak to moderate association between the two variables, but again, it is not statistically significant.

Overall, the chi-square test and other measures indicate that there is no statistically significant relationship between trust in digital payment and the perception of impulse purchase ease using digital payments. However, most respondents who feel digital payments make impulse purchases easier tend to be somewhat or very concerned about payment security, although this association is not statistically significant.

8.2.2 Analysis of the Pain of Paying and Income Level

Table 8.2.2 Analysis of the Pain of Paying and Income Level

10. Do you feel that digital payment systems reduce the 'pain' of paying compared to cash? * 4. What is your income level ? Crosstabulation

Count

		4. What is your income level ?					
		€20,000 - €39,999	€40,000 - €59,999	€60,000 - €79,999	€80,000 and over	Under €20,000	Total
10. Do you feel that digital payment systems reduce the 'pain' of paying compared to cash?		0	0	1	0	0	1
	Agree	4	6	2	2	27	41
	Disagree	0	1	3	0	7	11
	Neutral	4	3	1	0	9	17
	Strongly agree	6	4	0	1	24	35
	Strongly disagree	0	0	0	0	1	1
Total		14	14	7	3	68	106

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)
Pearson Chi-Square	30.332[a]	20	.065	.[b]
Likelihood Ratio	23.021	20	.288	.184
Fisher-Freeman-Halton Exact Test	25.920			.198
N of Valid Cases	106			

a. 24 cells (80.0%) have expected count less than 5. The minimum expected count is .03.

b. Cannot be computed because there is insufficient memory.

Directional Measures

			Value	Asymptotic Standard Error [a]	Approximate T[b]	Approximate Significance	Exact Significance
Nominal by Nominal	Lambda	Symmetric	.039	.038	1.005	.315	
		10. Do you feel that digital payment systems reduce the 'pain' of paying compared to cash? Dependent	.046	.058	.777	.437	
		4. What is your income level ? Dependent	.026	.026	1.005	.315	
	Goodman and Kruskal tau	10. Do you feel that digital payment systems reduce the 'pain' of paying compared to cash? Dependent	.039	.018		.430[c]	.422
		4. What is your income level ? Dependent	.052	.017		.356[c]	.379

a. Not assuming the null hypothesis.

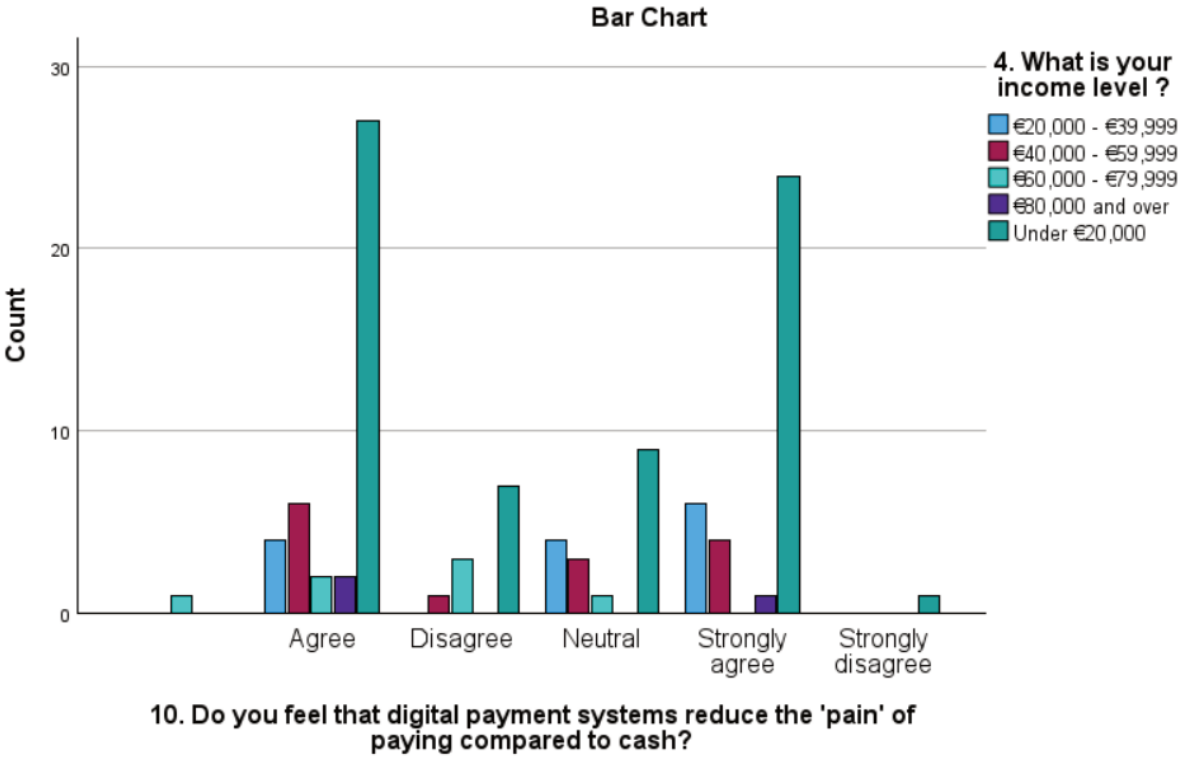
b. Using the asymptotic standard error assuming the null hypothesis.

c. Based on chi-square approximation

Symmetric Measures

		Value	Approximate Significance	Exact Significance
Nominal by Nominal	Phi	.535	.065	.[c]
	Cramer's V	.267	.065	.[c]
	Contingency Coefficient	.472	.065	.[c]
N of Valid Cases		106		

c. Cannot be computed because there is insufficient memory.



Source: Processed questionnaire data by the author

Cross-Tabulation Analysis

The majority of respondents who strongly agree that digital payments reduce the pain of paying belong to the "Under €20,000" income category (24 out of 106 respondents). However, respondents in the higher income brackets tend to be more neutral or disagree with the statement. Furthermore, most of the "Agree" responses are spread across various income categories with the highest concentration in the "Under €20,000" group (27 out of 106 respondents).

Chi-Square Test

The Chi-Square test is used here to determine if there is a significant association between two categorical variables. In this case, the variables are the pain of paying resulting from using the digital payment systems and income level based on the previous theoretical framework (See page 38).

H0: There is no statistically significant association between the pain of paying and income level

H1: There is statistically significant association between the pain of paying and income level

Assumption: Significance level 0.05

We can notice from the above table that the Pearson Chi-Square value is 30.332. However, the p-value is equal to 0.065 which is close to the typical significance level of 0.05. The p-value of 0.065 suggests a marginal relationship between income level and the perception that digital payment systems reducing the pain of paying but it is not statistically significant at the 0.05 level and the fact that it's close to significance might warrant a deeper look or additional data collection to see if this trend strengthens. On the other hand, the Likelihood Ratio test provides a similar result with a value of 23.021 and a p-value of 0.288.

Fisher's Exact Test

The Fisher-Freeman-Halton Exact Test has a p-value of 0.198 which is larger than the significance level of 0.05 so we do not reject the null hypothesis.

Measure of Association

Lambda value is equal to 0.039 and close to 0 which indicates a weak association between variables and the non-significant p-value reinforces this. On the other hand, Goodman and

Kruskal tau values ranges from 0.039 to 0.052 for the different variables indicating a weak relationship. Furthermore, the values of Phi of 0.433, Cramer's V of 0.250 and the Contingency Coefficient of 0.397 suggest a moderate association. All in all, this aligns with the earlier Chi-Square test, indicating that the association is close to significant but not quite there. We can conclude that the data suggests a potential relationship between income level and the perception that the pain of paying but this relationship is not statistically significant at the 0.05 level and the weak associations reflected in the various measures suggest that while there might be a trend, it's not strong enough to be considered significant with the current sample size.

8.3 ANOVA Test Analysis

8.3.1 ANOVA Test Analysis of Spending behaviours and Digital Payment Usage

Table 8.3.1 ANOVA Test Analysis of Spending behaviours and Digital Payment Usage

ANOVA

spendingnumeric

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	6.895	4	1.724	2.866	.027
Within Groups	60.153	100	.602		
Total	67.048	104			

ANOVA Effect Sizes[a,b]

		Point Estimate	95% Confidence Interval Lower	Upper
spendingnumeric	Eta-squared	.103	.000	.194
	Epsilon-squared	.067	-.040	.162
	Omega-squared Fixed-effect	.066	-.040	.161
	Omega-squared Random-effect	.017	-.010	.046

Source: Processed questionnaire data by the author

The table above shows the results of testing the relationship between the encoded variables of the usage digital payment systems and the change of spending behaviour. Sum of squares Between Groups (6.895) represents the variability in spending patterns that can be attributed to differences between the levels of digital payment usage. On the other hand, sum of squares Within Groups (60.153) represents the variability in spending patterns within each level of digital payment usage.

However, the significance (Sig.) of 0.027 which is smaller than 0.05 indicates that there is an association between changes in spending behaviour and digital payment usage frequency. Furthermore, an F-value of 2.866 indicates that differences between group means are larger relative to the variability within each group. However, ANOVA Effect Sizes provides different measures which indicate the strength of the relationship between the variables.

Eta-squared of 0.103 measures the proportion of the total variance in spending patterns that can be explained by digital payment usage. An eta-squared of 0.103 suggests that about 10.3% of the variance in spending patterns is explained by digital payment usage.

Epsilon-squared of 0.067 is another measure of effect size, less biased than eta-squared, especially with small sample sizes. A value of 0.067 suggests a small effect with around 6.7% of the variance in spending patterns explained by digital payment usage.

Omega-squared of 0.066 is considered a better estimate of the population effect size than Eta-squared. The fixed-effect value of 0.066 indicates that about 6.6% of the variance in spending patterns is attributable to digital payment usage. In conclusion, the ANOVA test indicates that there is a statistically significant difference in spending patterns based on digital payment usage and the effect size measures suggest that the relationship between digital payment usage and spending patterns, while statistically significant, is relatively small due to the influence of other factors.

8.3.2 ANOVA Test Analysis of Gender and Digital Payment Use

Table 8.3.2 ANOVA Test Analysis of Gender and Digital Payment Use

ANOVA

frequentuse

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	.330	3	.110	.148	.931
Within Groups	75.098	101	.744		
Total	75.429	104			

ANOVA Effect Sizes[a,b]

		Point Estimate	95% Confidence Interval Lower	Upper
frequentuse	Eta-squared	.004	.000	.021
	Epsilon-squared	-.025	-.030	-.008
	Omega-squared Fixed-effect	-.025	-.029	-.008
	Omega-squared Random-effect	-.008	-.010	-.003

Source: Processed questionnaire data by the author

The table above shows the results of testing the relationship between the encoded variables of the frequent use of digital payment systems and Gender. Sum of Squares of 0.330 and 75.098 represents the variation for both between-groups (due to differences between levels of the frequency of digital payment usage) and within-groups (random or unexplained variation). However, the Significance (Sig.) of 0.931 which is larger than 0.05 indicates that there is no impact of gender on digital payment usage frequency. Furthermore, an F-value of 0.148 is quite low and indicates that the between-group variability is much smaller than the within-group variability. In other words, there is not much difference in digital payment usage across the gender groups compared to the variation observed within each gender group so that gender does not explain the differences in digital payment use frequency.

8.3.3 ANOVA Test Analysis of the impact of Age and Income on Spending Behaviour

Table 8.3.3 ANOVA Test Analysis of the impact of Age and Income on Spending Behaviour

Between-Subjects Factors

		N
2. Age	18-24	40
	25-34	50
	35-44	13
	45-54	3
4. What is your income level ?	€20,000 - €39,999	14
	€40,000 - €59,999	14
	€60,000 - €79,999	7
	€80,000 and over	3
	Under €20,000	68

Tests of Between-Subjects Effects

Dependent Variable: spendingnumeric

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	8.921[a]	16	.558	.854	.623
Intercept	391.648	1	391.648	599.577	<.001
@2.Age	1.575	3	.525	.804	.495
@4.Whatisyourincomelevel	.412	4	.103	.158	.959
@2.Age * @4. Whatisyourincomelevel	5.817	9	.646	.990	.454
Error	58.135	89	.653		
Total	1684.000	106			
Corrected Total	67.057	105			

a. R Squared = .133 (Adjusted R Squared = -.023)

Source: Processed questionnaire data by the author

This first part of the table summarizes the distribution of the sample across the different levels of the factors (Age and Income level). For example, we can notice that there are 40 participants in the 18-24 age group and 68 participants in the "Under €20,000" category.

However, the second contains the results of the Two-Way ANOVA, where the dependent variable is spending behaviour.

First of all, the corrected model represents the total variance explained by the independent variables (Age and Income level) and their interaction. Here, the F-value is 0.854 with a significance level (p-value) of 0.623 indicating that the model does not significantly explain the variance in spending behaviour.

The main effect of Age on spending behaviour is not significant with an F-value of 0.804 and a p-value of 0.495 ($p > 0.05$). This suggests that there is no significant difference in spending behaviour across different age groups. Also, the main effect of Income Level on spending behaviour is also not significant with an F-value of 0.158 and a p-value of 0.959 ($p > 0.05$).

The interaction effect between Age and Income Level on spending behaviour is not significant as well and this implies that the effect of income on spending behaviour does not significantly vary across different age groups.

The Error term represents here the unexplained variance in the model indicating that most of the variability in spending behaviour is due to factors not included in the model.

R Squared is equal to 0.133 and indicates that the model explains only 13.3% of the variance in spending behavior and the adjusted R Squared is negative which suggests that the model does not fit the data well.

9 Conclusion

In conclusion, the empirical findings of this study provide valuable insights into the behavioral dynamics associated with the use of digital payment systems among the sampled population. The data predominantly reflects predominantly young, well-educated population with a balanced gender distribution and lower income levels. These demographic characteristics help to contextualize the findings and provide a foundation for understanding the dynamics of digital payment adoption and its impact on spending patterns.

The widespread use of digital payment systems among respondents is evident with convenience emerging as the most significant factor driving this adoption. The speed and ease of transactions further reinforce the appeal of digital payments, although other potential influences such as integration with financial planning tools, rewards programs and security concerns play a relatively minor role. This highlights a key aspect of digital payment systems that they are primarily valued for the immediate benefits they provide in the transaction process rather than for their broader financial management features.

A noteworthy finding is the perception that digital payments facilitate impulse purchases. Many respondents acknowledged that the reduced psychological burden is associated with digital payments compared to the more tangible act of paying with cash which leads to more frequent impulsive buying. Despite this, concerns about the security of digital payments remain prevalent indicating a complex relationship between the ease of spending and underlying apprehensions about financial safety. However, high levels of overall satisfaction with digital payment systems suggest that for most users the benefits outweigh the perceived risks.

Furthermore, the statistical analysis reveals while there is a perceived ease of making impulse purchases with digital payments, but this perception is not statistically associated with a higher level of trust in digital payment systems due to the trend towards increased security concerns.

The analysis also points to a potential relationship between income level and the perception of the pain of paying. The association observed in this study indicate that while trends may exist, it is not strong enough to be considered significant with the current sample size. These findings suggest that while digital payment systems are reshaping consumer behavior, the impact on spending patterns and security perceptions necessitates a larger sample to further explore these relationships.

The ANOVA test results highlight a statistically significant relationship between digital payment usage and spending patterns reinforcing the idea that digital payment systems influence

consumer behavior. However, the small effect size suggests that while digital payment usage does impact spending, it is not the sole factor. This indicates that other variables may play a more critical role in shaping spending behavior.

Thus, while digital payment usage is a relevant factor, it interacts with a broader range of influences that collectively determine consumer spending patterns. This complexity underscores the need for further investigation into the interplay between digital payments and other determinants of financial behavior to fully understand the dynamics at play.

Moreover, the ANNOVA analysis finds that there is not much difference in digital payment usage across gender groups compared to the variation observed within each gender group. This suggests that gender does not significantly explain differences in digital payment use frequency. Additionally, the analysis found no significant differences in spending behavior across different age groups or income levels which supports the conclusion that some demographic factors such as age and income may not be as pivotal in shaping digital payment spending patterns.

The respondents' comments have provided valuable qualitative insights into the broader impact of digital payment systems highlighting the need for stronger security measures since concerns about potential risks could undermine the full adoption and trust in digital payments. Continuous enhancement of security protocols is therefore crucial for maintaining user confidence.

On the other hand, there is a need for improved financial literacy and tools to help users manage and control their spending emphasizing the importance of integrating financial education with the use of digital payment systems. This integration would ensure that users have the knowledge and skills to manage their finances effectively in a digital environment by understanding the value of money and the importance of saving.

Additionally, the global reach and ease of use of digital payment systems are considered significant advantages particularly valuable in our increasingly interconnected world where cross-border transactions are becoming more common.

Lastly, we acknowledge several limitations of this study. First, the study utilizes a convenience sampling method which carries the risk of sampling bias. This approach involves selecting participants who are readily available and willing to participate rather than employing a random sampling technique that would provide a more representative sample of the broader population. Consequently, this method may lead to an overrepresentation of certain regions or segments over others. Second, the study relies on self-reported data where participants provide information about their own behaviors, perceptions and experiences. While this approach is practical

and informative, it introduces potential biases as participants may offer responses that they believe are socially acceptable or desirable rather than reflecting their true behaviors or opinions. Finally, the study's scope is limited to individuals residing in Germany which may affect the generalizability of the findings to other geographical regions. The behavior and attitudes towards digital payment systems in Germany may be influenced by specific cultural, economic, and regulatory factors unique to the country, limiting the applicability of the results to different contexts.

In summary, while this study sheds light on certain aspects of digital payment usage and its influence on spending behavior, it also underscores the complexity of these relationships in fully capturing its dynamics. Future research should aim to include a broader range of variables and larger sample sizes to better understand the factors that drive consumer behavior in the digital payment landscape as it is crucial to consider the evolving nature of digital payment technologies and their potential long-term effects on financial behavior and economic patterns.

10 References

- Adrian, T. and Mancini Griffoli, T. (2019). The Rise of Digital Money. FinTech Notes, 19(01).

- Agarwal, S., Ghosh, P., Li, J. and Ruan, T. (2019). Digital Payments Induce Over-Spending: Evidence from the 2016 Demonetization in India.

- Ahn, S.Y. and Nam, Y. (2022). Does mobile payment use lead to overspending? The moderating role of financial knowledge. Computers in Human Behaviour, 134.

- Akilesh, K.U., Hariharan, G., Karthikeyan, R., Jayasubramanian, Dr.P. and Eahambaram, Dr.C. (2023). A Study on Impact of Digital Payments on Consumer's Spending Behaviour with Special Reference to Coimbatore City. International Journal of Research and Analytical Reviews (IJRAR), 10 (1).

- Brown, M., Nacht, Y., Nellen, T. and Stix, H. (2023). Cashless payments and consumer spending. Social Science Research Network.

- Buckley, R.P., Arner, D.W., Zetzsche, D.A. and Selga, E. (2019). The Dark Side of Digital Financial Transformation: The New Risks of FinTech and the Rise of TechRisk. SSRN Electronic Journal.

- Gerlach, J.M., and Lutz, J.K.T. (2019). Evidence on Usage Behaviour and Future Adoption Intention of Fintechs and Digital Finance Solutions. The International Journal of Business and Finance Research, 13(2).

- Ghosh, G. (2021). Adoption of Digital Payment System by Consumer: A review of Literature. International Journal of Creative Research Thoughts (IJCRT), 9(2).

- Halim, E., Januardin, R. and Hebrard, M. (n.d.). The Impacts of E-Payment System and Impulsive Buying to Purchase Intention in E-commerce. International Conference on Information Management and Technology (ICIMTech).

- Halim, E., Januardin, R. and Hebrard, M. (n.d.). The Impacts of E-Payment System and Impulsive Buying to Purchase Intention in E-commerce. International Conference on Information Management and Technology (ICIMTech).

- Karmaker, S., Fardouse Oishi, Mst.E., Qasem, A. and Sharif Sami, S.B. (n.d.). Exploring the Psychological Factors of Consumer Purchase Behavior in Bangladesh on the Adoption of Digital Payment Apps. Department of Computer Science and Engineering School of Data and Sciences Brac University.

- Kuo, Dr.C.-C. (n.d.). New Innovations in Economics, Business and Management. 1st ed.
- Laksita Asastani, H., Harisno, Haris Kusumawardhana, V. and Leslie Hendric Spits Warnars, H. (2018). Factors Affecting the Usage of Mobile Commerce using Technology Acceptance Model (TAM) and Unified Theory of Acceptance and Use of Technology (UTAUT). INAPR International Conference.
- Marikyan, D. and Papagiannidis, S. (2023) Unified Theory of Acceptance and Use of Technology: A review. In S. Papagiannidis (Ed), TheoryHub Book.
- Nair, A.S. and Kannan, D.P. (2023). Digital Payment Methods: Challenges And Opportunities. Journal of Namibian Studies, 37(S1).
- Nambiar, A.P., Saranya Devi K, Anand Sriram S and Naveen Kumara R (2018). Impact Of Digital Payments on The Consumption. Journal of emerging technologies and innovative research, 5(11).
- Ozili, P.K. (2018). Impact of digital finance on financial inclusion and stability. Borsa Istanbul Review, 18(4).
- Ozturk, A. (2016). Essays on the Convergence of Consumer Spending Patterns across National Markets.
- Ozturk, A. and Cavusgil, S.T. (2019). Global convergence of consumer spending: Conceptualization and propositions. International Business Review, 28(2).
- P. Kanagaraj Dr. G. Bhoopathy (2023). The Impact of Digital Payments on Consumer Spending Habits. Tuijin Jishu/Journal of Propulsion Technology.
- Qian, R. and Palvia, P. (2022). "The Impact of Mobile Payment on Consumer Behavior: A Unified Model" (2022). AMCIS 2022 Proceedings. 18.
- Reshadi, F. and Fitzgerald, M.P. (2023). The pain of payment: A review and research agenda. he Business School, Worcester PolytechnicInstitute, Worcester, Massachusetts, USA.
- Runnemark, E., Hedman, J. and Xiao, X. (2015). Do consumers pay more using debit cards than cash? Electronic Commerce Research and Applications, 14(5).
- Sahi, A.M., Khalid, H., Abbas, A.F. and Khatib, S.F.A. (2021). The Evolving Research of Customer Adoption of Digital Payment: Learning from Content and Statistical Analysis of the Literature. Journal of Open Innovation: Technology, Market, and Complexity, 7(4).
- Statista. (n.d.). Digital Payments - Deutschland | Statista Marktprognose. [online] Available at: https://de.statista.com/outlook/dmo/fintech/digital-payments/deutschland#transaktionsvolumen [Accessed 16 Jul. 2024].

- Stroborn, K., Heitmann, A., Leibold, K. and Frank, G. (2004). Internet payments in Germany: a classificatory framework and empirical evidence. Journal of Business Research, 57(12).
- Syahadiyanti, L. and Subriadi, A.P. (2018). Diffusion of Innovation Theory Utilization Online Financial Transaction: Literature Review. International Journal of Economics and Financial Issues, 8(3).
- The pain of payment: A review and research agenda, Reshadi, F. and Fitzgerald, M.P. (2023). The pain of payment: A review and research agenda. Farnoush Reshadi, The Business School, Worcester Polytechnic Institute, Worcester, MA, USA.
- Vinitha Krishna, K. and Shanmugam, V. (2020). Determinants of Customer intention to use Digital payment system. Jour of Adv Research in Dynamical & Control Systems, 12(02).
- Vinitha Krishna, K. and Shanmugam, V. (2020). Determinants of Customer intention to use Digital payment system. Jour of Adv Research in Dynamical & Control Systems, 12(02).
- Vonkeman, C., Verhagen, T. and van Dolen, W. (2017). Role of local presence in online impulse buying. Information & Management, 54(8), p.1039.
- Wu, I.-L., Chen, K.-W. and Chiu, M.-L. (2016). Defining key drivers of online impulse purchasing: A perspective of both impulse shoppers and system users. International Journal of Information Management, 36(3).
- Xue, J. and Lin, L. (2019). Analysis of the Influence of Mobile Payment on Consumer Behavior. Advances in Social Science, Education and Humanities Research, 328.
- Yu K. Han, A. Morgan, G., Kotsiopulos, A. and Kang-Park, J. (1991). Impulse Buying Behaviorof Apparel Purchaser. 9(3).
- Zou, Z., Liu, X., Wang, M. and Yang, X. (2023). Insight into digital finance and fintech: A bibliometric and content analysis. Technology in Society, 73.

Declaration

I declare that all parts of this thesis have been written by myself and that I have only used references explicitly referred to in the text.

City, Date | Signature

Buenos Aires, 21.08.2024 | Rifaat Alsaloom