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Fund security and legal regulatory paradigm shifts for commercial prepaid cards in the digital payment era

Juping Yu¹

Universiti Teknologi Malaysia and Jiaxing Nanhu University

Siti Suraya Abd Razak²

Universiti Teknologi Malaysia

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Abstract: Research explores how changing regulations affect both security measures and customer trust and the market transition of business willingness towards accepting prepaid cards during digital payment adoption. Prepaid cards serve as crucial financial instruments for digital transactions because they address

¹ Ph.D candidate at the Azman Hashim International Business School, Universiti Teknologi Malaysia. Lecturer in Law at the School of Humanities and Arts, Jiaxing Nanhu University, China. Focus of teaching and research: Commercial Law and Procedural Law. ORCID: <https://orcid.org/0009-0005-7157-0582>. E-mail: yujuping@graduate.utm.my (corresponding author).

² Dr., senior lecturer at the Faculty of Management, Universiti Teknologi Malaysia. Ph.D in Law (Industrial Relations Law) from the International Islamic University Malaysia and a qualified Advocate and Solicitor of the High Court of Malaya. Focus of teaching and research: Industrial Relations Law, Company Law and Intellectual Property Law. ORCID: <https://orcid.org/0000-0003-1214-7854>. E-mail: sitisuraya@utm.my.

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banking service gaps in areas lacking traditional banking facilities. Security concerns arise about prepaid cards because of fraud issues together with data breaches and compliance requirements. The analysis explores the influences of Prepaid Accounts Rule and AMLD5 regulations on security protocols through their impact on fraud identification systems and encryption and identity authentication procedures. The research utilizes document analysis of regulatory documents and academic literature and industry reports to determine the essential regulatory effects on prepaid card security and business operations. Stricter regulations generate better security outcomes for consumers alongside enhanced trust and increased market development yet emerging market businesses face difficulties due to these compliance requirements. This study recommends additional international regulatory coordination because regulations have increased both safety and market expansion.

Keywords: Prepaid Cards; Regulatory Shifts; Consumer Trust; Security Features; Compliance.

1. Introduction

The prepaid card market expands worldwide because consumers choose digital payments and e-commerce grows and as financial inclusion needs increase. There are \$3.36 trillion in prepaid transactions in 2024 but the industry will reach \$12.67 trillion in 2033 based on a 15.9% compound annual growth rate (CAGR)³. The market is expanding due to three fundamental drivers that combine cashless payment technology adoption with mobile wallets and increased government programs for enhancing financial accessibility.

People who use prepaid cards benefit from an easy banking system since users can fund their accounts ahead of time to complete a variety of purchases. The primary benefit of prepaid cards is their ability to serve people who lack traditional bank access by giving them digital economic opportunities⁴. The connection between prepaid cards and digital wallets and mobile payment systems improves their overall accessibility and usability for users.

1.1. Research problem

Prepaid cards offer numerous benefits yet they face several security threats such as fraud incidents as well as data breaches and money laundering activities. The lack of identifiable user information in prepaid cards appeals to criminal elements while making it harder for regulators and financial institutions to handle these cases⁵. The 5th Anti-Money Laundering Directive of the European Union now strengthens regulations using two preventive methods that tighten prepaid card transaction restrictions.

The development of new laws and regulatory systems focused on prepaid cards fulfills the need to protect users from security vulnerabilities. US consumers benefit from the Consumer Financial Protection Bureau (CFPB) Prepaid Accounts Rule because it establishes total consumer protection through fee disclosure procedures and error prevention systems and loss/theft safety measures. Current

³ LIYANAGE, K. H. E.; HARTARSKA, V.; NADOLNYAK, D. "Prepaid cards and the unbanked in the U.S.: Financial innovations and financial inclusion", *Journal of Financial Economic Policy*, V. 16, nº 1, 2024, p. 102–119. <https://doi.org/10.1108/jfep-10-2023-0307>

⁴ DUDU, O. F.; ALAO, O. B.; ALONGE, E. O. "Advancing financial inclusion through digital payment platforms in emerging markets", *Finance & Accounting Research Journal*, V. 6, nº 11, 2024, p. 2028–2060. <https://doi.org/10.51594/farj.v6i11.1696>

⁵ CHOO, K. K. R. "Money laundering and terrorism financing risks of prepaid cards instruments?", *Asian Journal of Criminology*, V. 4, nº 1, 2008, p. 11–30. <https://doi.org/10.1007/s11417-008-9051-6>

regulations face constant challenges because of the fast-moving technological advances along with digitized payment systems operating globally.

1.2. Research objectives

An examination will be conducted about changes in legal requirements and regulatory standards impacting prepaid card security and their position within digital payment systems. Specifically, the objectives are to:

1. Analyze the evolution of legal frameworks and regulations affecting prepaid cards.
2. Examine the impact of these regulatory changes on the security features of prepaid cards.
3. Assess how these shifts influence consumer trust, business adoption, and overall market dynamics.

This paper investigates regulation and security within the prepaid card industry through three main objectives to contribute valuable insights that advance digital payment system discussions on security and inclusivity.

2. Literature review

The study investigates how regulatory and legal structures in commercial prepaid cards have evolved specifically regarding digital payment security standards and market trends during this time. The analysis examines the way that regulatory alterations have transformed security capabilities among prepaid card companies through their implementation of fraud defenses and consumer safeguarding standards. This assessment analyzes how regulatory shifts create conditions that drive both customer trust and organizational adoption of prepaid cards as well as market expansion. The literature is divided into sections that examine developmental laws and their consequences for security features along with their effects on market trends and consumer practices.

2.1. Evolution of legal frameworks and regulations affecting prepaid cards

Prepaid cards experienced initial regulations which served to fight financial crimes together with preventing systems usage for money laundering or similar illicit transactions. AML and KYC regulations played a crucial role in protecting prepaid card providers from abuse through illegal activities because they limited easy access to fraud⁶. AML and KYC frameworks functioned to confirm user identities while monitoring transactions to prevent illegal financial movements. The initial frameworks proved inadequate because they did not extend adequate protection to digital payment systems which grew quickly during that time period.

The growing popularity of prepaid cards alongside their usage as banking tools for unbanked populations caused the initial legal structures to develop. The implementation of prepaid cards marked an important advancement to extend financial service access for groups who needed it most. Initial legal guidelines promoted financial inclusion through their design to provide secure money storage and digital payment capabilities for persons cut off from banking services. The regulations established controls that supported both the inclusion of underbanked customers and protect against fraudulent activities in prepaid card systems⁷. The increasing digital financial product market faced ongoing protection challenges as well as consumer abuse issues despite regulatory advancements.

⁶ ESOIMEME, E. E. "A comparative analysis of the prepaid card laws/regulations in Nigeria, the UK, the USA and India", *Journal of Money Laundering Control*, V. 21, n° 4, 2018, p. 481–493. <https://doi.org/10.1108/jmlc-03-2017-0010>

⁷ ANONG, S. T.; ROUTH, A. "Prepaid debit cards and banking intention", *International Journal of Bank Marketing*, V. 40, n° 2, 2021, p. 321–340. <https://doi.org/10.1108/ijbm-09-2021-0401>

International regulatory policies advanced toward a thorough system for prepaid card oversight through time. The European Union established AMLD5 as a regulatory directive that imposed additional strict controls on prepaid card transactions with an emphasis on both monitored transaction values and strengthened customer identification requirements. Prepaid card regulation received substantial enhancements through these reforms that combined to reduce money laundering possibilities while enhancing payment transparency⁸. The Consumer Financial Protection Bureau (CFPB) in the United States implemented the Prepaid Accounts Rule as a protection measure which required prepaid card providers to adhere to strong security protocols and established fraud protection and disclosure requirements⁹. The creation of these regulatory frameworks established essential connections between prepaid card standards and larger financial security and consumer protection framework.

The prepaid card regulations worldwide have become stronger but multiple unresolved regulatory problems persist between international borders. International compliance frameworks lead to forming the essential structure of the global prepaid card system through Financial Action Task Force (FATF)-specified Anti-Money Laundering (AML) and Know Your Customer (KYC) standard compliance¹⁰. Various preexisting national regulations produce differing enforcement approaches that prevent businesses from abiding by the law. Multiple active issues affecting consumer safety and data security as well as fraud detection remain unresolved. The contemporary needs of prepaid cards remain restricted by regulation because law enforcement systems and adaptable policies must evolve to address new technological advancements and digital payment system security threats in anti-financial crime scenarios.

2.2. Assessment of regulatory changes on the security features of prepaid cards

Prepaid cards possessed fundamental security capabilities which included PIN protection along with cardholder verification and transaction limits when regulatory changes were minimal. Security measures implemented with prepaid cards served to prevent both unauthorized transactions and fraud occurrences. Several analysts highlighted the insufficient security elements of prepaid cards as they fell short of protecting against rising financial crime threats¹¹. The provision of PIN protection as a basic security feature lacked effectiveness because it failed to resolve issues pertaining to account hacking and data breaches¹². The low level of card issuance identity verification along with waiting for real-time monitoring systems enabled scammers to take advantage of prepaid cards' vulnerabilities which exposed users to identity theft risks.

Security features of prepaid cards benefited significantly from two main regulatory updates: The Prepaid Accounts Rule as well as AMLD5. The newly established regulations forced prepaid card providers to enhance their security

⁸ SHAH, S. "Financial inclusion and digital banking: Current trends and future directions", *Premier Journal of Business and Management*, 2024. <https://doi.org/10.70389/pjbm.100002>

⁹ DAYANANDA, K. C. "Financial inclusion, policy initiatives and implications in India", *IOSR Journal of Humanities and Social Science*, V. 19, nº 10, 2014, p. 32-35. <https://doi.org/10.9790/0837-191083235>

¹⁰ YI, H. "Anti-Money Laundering (AML) information technology strategies in cross-border payment systems", *Law and Economy*, V. 3, nº 9, 2024, p. 43-53. <https://doi.org/10.56397/le.2024.09.07>

¹¹ AL-MALIKI, O. *Analysing and improving the security of contactless payment cards*. Thesis (Doctoral in Computer Science) - School of Computing, University of Buckingham, 2020.

¹² CONSTANTIN, S. M. *The role of the FTC in the payment card industry—An examination of regulatory shortcomings and suggestions for improvement*. 2024. Available at: https://scholarship.law.unc.edu/ncbi/vol28/iss1/7?utm_source=scholarship.law.unc.edu%2Fncbi%2Fvol28%2Fiss1%2F7&utm_medium=PDF&utm_campaign=PDFCoverPages

measures by adding strong encryption methods and two-step verification systems¹³. Secure protection of cardholder data alongside reduced unauthorized transactions became possible through these advances. Consumer protection regulations requiring prepaid cardholders to be reimbursed for unauthorized transactions acted as an additional force that built security within the prepaid card market¹⁴. This security framework enabled users to receive compensation for any fraudulent transactions which increased their trust in the payment system.

Regulatory agencies developed new responses to match the changing security threats by addressing data breaches and cybercrime and identity theft risks. To combat the risks prepaid card providers implemented new compliance standards with security protocols that required real-time fraud detection systems and improved data security standards. Blockchains together with biometric security features now protect prepaid cards from fraud through strong modern security measures¹⁵. Third-party audit firms collaborate with companies to maintain rigid compliance standards which guarantee secure practices remain under continuous improvement for adapting to new regulatory requirements.

2.3. Influence of regulatory shifts on consumer trust, business adoption, and market dynamics

The implementation of the Prepaid Accounts Rule through regulatory changes has strongly impacted how consumers trust prepaid cards for digital payment activities. The regulatory changes established greater consumer safety through higher requirements for fee details and term transparency along with stronger anti-fraud systems¹⁶. Consumers developed rising trust in prepaid cards since these regulations delivered better security against unauthorized transactions and ensured secure handling of financial information. Prepaid cards gained wider use in everyday finances because mandatory liability protection features helped cardholders develop trust during free transactions.

The trustworthiness of prepaid cards significantly increased because of Consumer protection regulations which specifically address fee clarity and fraud responsibilities. Regulatory frameworks establish transparency requirements from card providers while protecting users from fraud which makes prepaid cards an improved payment option with better reliability¹⁷. Prepaid card providers now demonstrate transparency which solves worries about surprise charges and boosts safety when people use the cards to make digital payments. Consumer protection measures have facilitated the general acceptance of prepaid cards which now serve as substitute payment methods for bank-issued debit and credit cards.

¹³ CAPRARO, T. *The 5th anti-money laundering directive in the light of virtual currencies: The exploitation of the decentralized system and rising legislative challenges*. Thesis (Bachelor in Law, European Union and International Law) - School of Business and Governance, Tallinn University of Technology, 2021.

¹⁴ SCHULTE-BUSKASE, M. *Money laundering through cryptocurrencies: An analysis of the anti-money laundering framework of the European Union and the legislative process leading to the adoption of the AMLD6*. Thesis (Bachelor in Management, Society and Technology) - Faculty of Behavioural, Management and Social Sciences, University of Twente, 2022. Available at: <https://purl.utwente.nl/essays/91914>

¹⁵ SOARES, L. H. *The evolution of cyber threats and its future landscape*. Online. 2023. Available at: https://www.researchgate.net/publication/369010694_The_evolution_of_cyber_threats_and_its_future_landscape

¹⁶ KITCHING, J.; HART, M.; WILSON, N. "Burden or benefit? Regulation as a dynamic influence on small business performance", *International Small Business Journal: Researching Entrepreneurship*, V. 33, n^o 2, 2013, p. 130-47. <https://doi.org/10.1177/0266242613493454>

¹⁷ TOH, Y. L. "Prepaid cards: An inadequate solution for digital payments inclusion", *The Federal Reserve Bank of Kansas City Economic Review*, V. 106, n^o 4, 2021. <https://doi.org/10.18651/er/v106n4toh>

Businesses particularly retailers and fintech firms have modified their operational strategies by implementing prepaid cards into their payment systems because of regulatory changes. Compliance costs serve as the core reason behind the strategic changes affecting businesses. Organizations needed to spend money to fulfill regulatory needs by improving their security infrastructure through better encryption standards and developing fraud prevention technologies¹⁸. The establishment of new operational costs occurred due to audit requirements while businesses also needed to safeguard their customer data. Regulatory compliance enables businesses to enhance customer trust while establishing themselves as safe financial service providers even though these requirements require substantial investments.

Stricter regulations affected both prepaid card adoption rates alongside the development of market competitiveness. The expansion of regulatory standards elevates market entry barriers to new provider competition while demanding substantial complying investment costs from small businesses. Prepaid card businesses which already exist in the market have strengthened their market position because they possess adequate expertise to manage complex cross-border regulations and pricing approaches¹⁹. The regulatory framework stimulates prepaid card market innovation because companies create new features that pair with consumer needs and regulatory requirements. The rising need for security and compliance is driving consumers to choose prepaid cards instead of bank cards thereby boosting prepaid card market expansion particularly in developing countries with restricted access to banking facilities.

2.4. Research gap

Research remains insufficient regarding the long-term effects that prepaid card regulatory changes have on consumer patterns and market trends especially when focused on emerging market sectors. Literature shows a weak understanding of how cross-border regulatory frameworks succeed in unifying security requirements between different regional territories. Investigations about how blockchain technology together with biometric authentication systems will improve prepaid card security must be carried out because of their fast-paced technological developments. More studies are necessary to reveal how consumer trust interacts with modern regulations within the digital payment environment.

2.5. Conclusion

The Prepaid Accounts Rule together with AMLD5 brought important regulatory changes that enhanced the security features of prepaid cards by improving fraud prevention mechanisms and encryption standards and consumer safety measures. Through regulatory changes prepaid cards gained increased consumer confidence which led to both wider market adoption and especially prominent growth in emerging markets. Regulatory shifts have influenced market competition and at the same time they have spurred product development while changing market conditions. Research has not fully explained how these regulations will impact consumer behavior patterns through time especially regarding inter-border rules and blockchain advancements. The research established a foundation

¹⁸ KLEIN, A. *Is China's new payment system the future?*. Online. 2019. Available at: https://www.brookings.edu/wp-content/uploads/2019/06/ES_20190614_Klein_ChinaPayments.pdf

¹⁹ BABALOLA, F. I.; KOKOGHO, E.; ODIO, P. E.; ADEYANJU, M. O.; SIKHAKHANE-NWOKEDIEGWU, Z. "The evolution of corporate governance frameworks: Conceptual models for enhancing financial performance", *International Journal of Multidisciplinary Research and Growth Evaluation*, V. 1, nº 1, 2021, p. 589-596. <https://doi.org/10.54660/ijmrge.2021.2.1-589-596>

for conducting a document analysis method that will analyze how regulatory evolution influences prepaid card security alongside market dynamics.

3. Methodology

This research uses a qualitative approach and conducts semi-structured interviews as its main data collection method to analyze how regulatory changes have impacted both security characteristics and consumer trust levels and business acceptance and market evolution of prepaid cards during the digital payment period. The semi-structured interview approach establishes a detailed understanding of subject views through flexible questions that enable researchers to detect new research themes across multiple interviews.

3.1. Sampling and participants

The research adopted purposive sampling to gather participants who demonstrated direct expertise in prepaid card regulations as well as security implementation and business adoption. Participating professionals stem from both regulatory organizations and financial institutions' compliance offices as well as fintech executives and cybersecurity consultants. The study employed a number of 8 to 12 participants as appropriate for qualitative research to reach thematic saturation.

3.2. Interview protocol

The interview guide served as a consistency tool which allowed researchers to explore fresh insights during their interviews. Questions focused on:

1. The perceived impact of regulations (e.g., AMLD5, Prepaid Accounts Rule) on prepaid card security.
2. Experiences with implementing regulatory compliance measures.
3. Observations on how consumer trust and business practices have evolved in response to regulatory changes.
4. Regional challenges and best practices in navigating prepaid card regulations.

The interviews ran for 45 to 60 minutes and were accomplished by face-to-face meetings or video calls based on participant availability and geographical location. The participants willingly allowed their interviews to be recorded which were later transformed into transcripts for analysis purposes.

3.3. Data analysis

Thematic analysis was done by using Braun and Clarke's six-step model, where transcripts from interviews were first transcribed word-for-word, then coded and worked through in NVivo software. From this, several themes come out showing how regulations have been impacting the prepaid card market. There were big changes in security practices, mostly pushed by rules like AMLD5 and Prepaid Accounts Rule. These helped bring in things like two-factor verification and better encryption. Also, the rules seemed to help protect consumers more, especially with fee clarity and setting limits on who's responsible for fraud. That also seemed to help build more trust in digital payments. Other themes showed that while some regulations helped the market grow in new places, they also meant companies had to spend more on things like security upgrades and audits. Comparing rules across different places showed how global expansion is still hard. New tech like blockchain and biometrics helped, but threats like cybercrime still need strong checks.

3.4. Ethical considerations

All necessary ethical approval came into effect before researchers began data collection. Participants gave consent after being informed about research procedures and their names along with organizational identifiers remained anonymous. The collected data were safely retained for academic research alone.

4. Findings

The following section provides essential results obtained through professional interviews which focused on the prepaid card and digital payments industry. The analytical findings follow the study goals by grouping data into sections about regulatory transformations and security measures and consumer confidence development and company implementation of digital systems and new threats that arise. Michael Rooney and other participants share direct insight into how regulatory standards such as AMLD5 and the Prepaid Accounts Rule influence business operations while modifying industry procedures and consumer interaction in various worldwide markets.

4.1. Theme 01: regulatory shifts in prepaid card security

Effective security standards for prepaid card systems experienced significant change following both AMLD5 implementation within the EU and the US Prepaid Accounts Rule introduction²⁰. The regulations have compelled the industry to develop stricter identity verification protocols and fraud prevention standards that established a standardized global security norm.

The AMLD5 implemented operational changes at a European fintech firm through Participant 4 by advancing KYC procedures and real-time fraud detection systems for better anti-money laundering control (Participant 4):

Since the implementation of AMLD5, we've had to make substantial changes to how we issue and monitor prepaid cards... These changes have definitely strengthened our fraud prevention capabilities. (Participant 4)

The reaction demonstrates both the administrative complexity of EU regulations and their positive impact on security protection. The US regulatory system focuses on consumer protection by requiring businesses to disclose information including unauthorized transaction protections²¹. The participant (4) identified the regulatory gaps that occurred between these two regions:

In the U.S., the focus is a bit different... My colleagues there talk more about the consumer rights aspect—things like transparent fee structures and refund processes for unauthorized transactions. (Participant 4)

The adoption of modern technological solutions such as biometric authentication and blockchain systems became widespread throughout all regions including Asia to fulfill regulatory standards and battle increasingly sophisticated cyber risks. As Participant 4 stated:

Everyone's realizing that conventional security methods just aren't enough anymore in the digital age.

²⁰ ATHANASSIOU, P. L. "Regulation of payment services", In: PACCES, A. M.; MARTINO, E. D.; NABILOU, H. (eds.), *Comparative Financial Regulation*, Cheltenham: Edward Elgar Publishing, 2025, p. 255–271. <https://doi.org/10.4337/9781035306473.00026>

²¹ TOH, Y. L. *Promoting payment inclusion in the United States*. Online. 2022. Available at: <https://www.kansascityfed.org/Payments%20Systems%20Research%20Briefings/documents/9160/PaymentsSystemResearchBriefing22Toh1007.pdf>

Interview data demonstrates that the business trend towards better prepaid card security stands as a global industry-wide movement despite differing regional regulatory priorities.

4.2. Theme 02: consumer protection measures

The Prepaid Accounts Rule and AMLD5 have effectively improved consumer protection laws which specifically address unauthorized transaction incidents. The Prepaid Accounts Rule and Prepaid Accounts Rule demand that prepaid card issuers establish clear processes for reporting unauthorized charges since customers remain liable-free for 60 day tracking period²². Greater protection under Prepaid Accounts Rule and AMLD5 has raised consumer confidence thus making prepaid cards equivalent to traditional debit and credit cards²³.

According to Participant 7 who serves as a senior compliance manager at a U.S.-based prepaid card provider the protections play an essential role:

One of the biggest shifts we've seen after the Prepaid Accounts Rule is the emphasis on protecting the consumer... they feel more secure using prepaid cards, almost as they would a credit or debit card linked to a traditional bank account. (Participant 7)

Mandatory fee disclosures created another layer of consumer protection by establishing confidence between issuers and consumers²⁴. The disclosure of all fees became mandatory for prepaid card providers so consumers could make better decisions and prevent unexpected costs.

Participant 7 highlighted this change:

Another major change has been around transparency. The days of hidden maintenance or transaction fees are over. We have to clearly outline every charge at the time of card issuance. Consumers appreciate this honesty, and it has built a lot of trust. (Participant 7)

These improved consumer security measures with their fraud liability provisions have simultaneously elevated both prepaid card security levels while promoting these alternatives to traditional banking products. The digital financial industry owes its improved acceptance of prepaid cards to the regulatory developments that have occurred over time.

4.3. Theme 03: impact of regulatory measures on consumer trust

Prepaid card user confidence increased substantially after regulatory bodies enforced standard fee transparency statements and fraud protected guidelines. The U.S. Prepaid Accounts Rule together with EU AMLD5 requires prepaid card issuers to openly disclose complete information including fees and conditions at the beginning of usage²⁵. Consumer trust grows because prepaid card products now display detailed transparency about essential information and fees to consumers before use.

A Head of Risk and Compliance from a worldwide payments industry (Participant 2) confirmed this notion through observation:

²² The Paypers. *AMLD5 and prepaid cards: What has changed?*. Online. 2021. Available at: <https://thepayers.com/expert-opinion/amld5-and-prepaid-cards-what-has-changed--1251776>

²³ WANG, D.; CHEN, B.; CHEN, J. "Credit card fraud detection strategies with consumer incentives", *Omega*, V. 88, 2019, p. 179–195. <https://doi.org/10.1016/j.omega.2018.07.001>

²⁴ HOSOE, M. "Effectiveness of mandatory disclosure for consumer policy", In: HOSOE, M.; KIM, I. (eds.), *Applied Economic Analysis of Information and Risk*, Singapore: Springer, 2020, p. 35–47. https://doi.org/10.1007/978-981-15-3300-6_3

²⁵ Sampat, B.; Mogaji, E.; Nguyen, N. P. "The Dark side of fintech in financial services: A qualitative enquiry into fintech developers' perspective", *International Journal of Bank Marketing*, V. 42, n° 1, 2023, p. 38–65. <https://doi.org/10.1108/ijbm-07-2022-0328>

One of the biggest shifts we've noticed is that consumers now actively look for transparency when choosing prepaid cards... It builds an immediate level of trust because they know there are no hidden surprises. (Participant 2)

The preservation of consumer trust depends heavily on superior security protocols in addition to transparency elements. Users now demand real-time fraud detection combined with two-factor authentication (2FA) and biometric verification features during their usage of prepaid cards²⁶. Reliability standards as well as regulatory requirements can be achieved through advanced security measures which directly impact the safety perception of consumers using prepaid cards within digital transactions. Consumer trust in prepaid cards strongly depends on their availability of advanced protective features because of increasing cybersecurity threats.

Participant 2 emphasized this growing demand:

Security has also become a major trust factor... In today's environment, if a prepaid card doesn't offer these security features and clear protections against fraud, customers will simply walk away. (Participant 2)

Consumer perceptions about prepaid cards have evolved due to regulatory protections and technological enhancements. The shift in consumer perception makes prepaid cards no longer viewed as second-level financial tools but instead trusted transparent dependable alternatives for traditional banking services in digital marketplaces.

4.4. Theme 04: market penetration and growth

Prepaid card services have experienced transformation in emerging economies due to stronger regulatory measures that include both Prepaid Accounts Rule and AMLD5²⁷. These regulatory measures build trust among customers by implementing stronger security protocols and clear protective measures which stimulate higher uptake of prepaid services mainly in countries where banking services are scarce²⁸. The uninsured and underinsured populations throughout Africa Asia and Latin America rely on prepaid cards as essential financial instruments²⁹.

A Business Development Director from an emerging markets prepaid card issuer makes this observation (Participant 9):

In emerging markets like parts of Africa and Southeast Asia, prepaid cards have played a huge role in financial inclusion, especially where traditional banking services are inaccessible. Regulations that protect consumers have definitely helped drive adoption because people trust prepaid solutions more now. (Participant 9)

However, the compliance cost acts as a major barrier to market penetration. Usually, security upgrades, KYC procedures, regular audits and such, are financially

²⁶ SUBRI, N. I.; HANAFI, A. G.; POZIN, M. A. A. "Comparative analysis of eKYC and 2FA in implementing PADU database system to strengthen digital identity security", *OIC-CERT Journal of Cyber Security*, V. 5, nº 1, 2024, p. 23–34.

²⁷ ATHANASSIOU, P. L. "Regulation of payment services", In: PACCES, A. M.; MARTINO, E. D.; NABILOU, H. (eds.), *Comparative Financial Regulation*, Cheltenham: Edward Elgar Publishing, 2025, p. 255–271. <https://doi.org/10.4337/9781035306473.00026>

²⁸ LIYANAGE, K. H. E.; HARTARSKA, V.; NADOLNYAK, D. "Prepaid cards and the unbanked in the U.S.: Financial innovations and financial inclusion", *Journal of Financial Economic Policy*, V. 16, nº 1, 2024, p. 102–119. <https://doi.org/10.1108/jfep-10-2023-0307>

²⁹ AMEYAW, M. N.; IDEMUDIA, C.; IYELOLU, T. V. "Financial compliance as a pillar of corporate integrity: A thorough analysis of fraud prevention", *Finance & Accounting Research Journal*, V. 6, nº 7, 2024, p. 1157–1177. <https://doi.org/10.51594/farj.v6i7.1271>

unaffordable to smaller companies, starting from a very low level – startups in emerging economies. They can prevent scaling, inhibit competition and become too high.

Participant 9 also highlighted the regional disparity:

"In highly regulated markets like the EU, compliance is smoother because the rules are clearer and more harmonized across countries. In contrast, in emerging economies, regulatory frameworks are still developing, and the inconsistencies make market expansion harder." (Participant 9)

However, businesses which can bend to the regulatory requirements and requirements of the local market profit hugely. Prepaid cards are a vital bridge to broader financial inclusion in developing economies as demand for secure and accessible financial products is growing rapidly within the broad consumer marketplace.

4.5. Theme 05: business adoption and compliance

Due to the changing regulatory landscape around prepaid cards, businesses have had to change operations substantially to remain compliant and competitive. This came under the regulations like AMLD5 (Europe) and Prepaid Accounts Rule (US), wherein companies had to adopt robust fraud prevention systems, updated KYC protocols and high audit readiness³⁰. These measures have enhanced security and consumer protection but have also a burden on the financial and administrative aspects, especially for the smaller fintech and new entrants to the market³¹.

A FinTech COO who has recently joined a regional EU fintech startup (Participant 6) reflected on that shift:

Adapting to the Prepaid Accounts Rule and AMLD5 has required major internal restructuring... it's now essential to remain competitive and meet regulatory expectations. (Participant 6)

In many cases, businesses need to add their compliance teams, live up their IT infrastructure, and keep up with training to stay on track for regulatory standards. However, larger institutions can easily handle these costs, but for startups and regional firms it is difficult, especially in a high growth environment with a less predictable regulatory environment.

Participant 6 elaborated on the financial pressures and regional variation:

Regulatory compliance isn't just about ticking boxes—it's about embedding security into our operations... In some regions, especially where rules change frequently or lack enforcement, the uncertainty itself is a barrier to expansion. (Participant 6)

Multiple firms can separate themselves in competitive markets by integrating compliance procedures into their strategic operational approach. Succeeding in regulatory requirements reduces exposure to risk while simultaneously building brand reputation and earning consumer trust which becomes essential for achieving sustainability and market growth in developed as well as emerging markets.

³⁰ TOH, Y. L. "Prepaid cards: An inadequate solution for digital payments inclusion", *The Federal Reserve Bank of Kansas City Economic Review*, V. 106, n° 4, 2021. <https://doi.org/10.18651/er/v106n4toh>

³¹ KUMAR, S.; SHARMA, J. "Comparative analysis of prepaid payment before COVID 19 and now: A case of India", *Regular*, V. 5, n° 1, 2020, p. 7–11. <https://doi.org/10.35940/ijmh.a1116.095120>

4.6. Theme 06: technological innovations in security

Such integration of emerging technologies like blockchain and biometric authentication has completely transformed the security standards of the prepaid card industry³². As a response to growing regulatory pressure for stronger fraud prevention and identity verification, and corresponding evolving compliance obligations, many of the card issuers with these innovations are not only implementing them to protect transactions, but also to help them meet compliance obligations³³.

One of the global prepaid platform's (Participant 5) Chief Technology Officer outlined how blockchain proved to enhance security of cross border transactions:

Blockchain has been a game-changer for us... We've started using blockchain to record and verify high-risk transactions, especially across borders, and it's significantly reduced our fraud cases. (Participant 5)

As a result of its decentralized ledger, blockchain provides transactional transparency that is an ideal characteristic for audit readiness and fraud detection, particularly required under AMLD5 or PCI DSS. But it also offers a scalable platform for prepaid card platforms with multiple jurisdictions and compliance requirements.

Second, biometric authentication technologies, such as fingerprint, facial recognition and iris scanning, have risen in importance for securing user access and preventing identity theft. Participant 5 emphasized this transformation:

Biometrics have also transformed how we manage identity verification... After rolling out biometric KYC for prepaid cards, we saw a sharp decline in impersonation attempts. (Participant 5)

In addition to improving security, these technologies also facilitate document due diligence necessary to ensure firms are complying with regulatory requirements for KYC and AML. But many of the most rapid takers of digital payment systems are in areas like parts of Asia and the EU, where now regulators are expecting payment systems would be woven into financial products to meet standard compliance.

The implementation of technologies for proactive compliance fits within a global movement toward technological achievement of regulatory compliance. Modern technological innovations create strong operational security while improving consumer trust which brings success to prepaid card issuers competing within digital-first regulations.

4.7. Theme 07: Emerging Security Risks and Responses

The growing international adoption of prepaid cards creates new obstacles for security risks to evolve. The cyber threats exceed basic password breaches because they include synthetic identity fraud schemes and phishing operations and deepfake-based KYC bypass techniques³⁴. Prepaid card providers need to shift their

³² BALAGOLLA, E. M. S. W; FERNANDO, W. P. C; RATHNAYAKE, R. M. N. S; WIJESEKERA, M. J. M. R. P; SENARATHNE, A. N.; ABEYWARDHANA, K. Y. "Credit Card fraud prevention using blockchain", In: *2021 6th International Conference for Convergence in Technology (I2CT)*, Maharashtra, India, 2021, p. 1-8. <https://doi.org/10.1109/I2CT51068.2021.9418192>

³³ RAJ, A. T.; SHOBANA, J.; NASSA, V. K.; PAINULY, S.; SAVARAM, M.; SRIDEVI, M. "Enhancing security for online transactions through supervised machine learning and block chain technology in credit card fraud detection", In: *2023 7th International Conference on I-SMAC (IoT in Social, Mobile, Analytics and Cloud) (I-SMAC)*, Kirtipur, Nepal, 2023, p. 241-248. <https://doi.org/10.1109/I-SMAC58438.2023.10290462>

³⁴ WOLFORD, B. *What is GDPR, the EU's new data protection law?*. Online. 2025. Available at: <https://gdpr.eu/what-is-gdpr/>

security models from reactive to proactive defense systems since threats continue to evolve³⁵.

The Cybersecurity Director for a multinational card issuer (Participant 1) explained the increasing complexity of cyber threats (Section 3):

It's no longer just about stolen credentials—it's coordinated phishing, synthetic identities, and deepfake KYC submissions... We've had to continuously update our breach detection protocols and use AI-based anomaly detection just to stay ahead. (Participant 1)

These security risks have triggered government authorities to reinforce data protection requirements while also setting rules for businesses to build thorough breach response systems. Cole_REG_6.1.1 Framework among others in Europe and globally establish essential standards that include data breach notification procedures alongside encryption techniques and restrict access guidelines³⁶. The enforcement of cybersecurity readiness involves third-party audits and regular compliance checks as two essential tools.

Participant 1 highlighted this regulatory pressure:

The shift toward mandatory breach notifications, like under GDPR, and the increasing demand for third-party audits have raised the bar... We've been forced to adopt multi-factor authentication and biometric checks not just for compliance, but because traditional defenses are no longer sufficient. (Participant 1)

Prepaid card providers must establish complex security systems that include measures for regulatory standards together with modern technology and persistent observation protocols. Such actions enable providers to fulfill their legal duties and create systems that remain protected from emerging advanced methods used by cyber attackers. The prepaid card sector requires continuous security evolution through dynamic regulatory measures as threats in this market continue to change.

5. Discussion

The research analyzed the effects of legislative and regulatory changes on digital payment era prepaid cards as well as their market trends and adoption by businesses and consumer trust and security standards. Interviews with fintech and cybersecurity and regulatory professionals through a qualitative method provided concrete field insights about how changing laws and technology enhancements are impacting global prepaid card operations.

Prepaid card system security measures underwent significant improvements due to regulatory standards established by AMLD5 in the EU and the Prepaid Accounts Rule in the U.S³⁷. All interviewees noted encryption as well as real-time fraud detection and biometric authentication making up standard security practices following regulatory requirements³⁸. Enhanced security measures implemented by these policies both minimize fraud occurrences and make prepaid cards match security requirements of traditional banking systems.

³⁵ Fraudcom International. *KYC regulations—Preventing fraud and ensuring compliance*. Online. Available at: <https://www.fraud.com/post/kyc-regulations>. Accessed on: 24 Mar. 2025.

³⁶ YASAR, K. What is Multifactor Authentication (MFA) and how does it work?. Online. 2021. Available at: <https://www.techtarget.com/searchsecurity/definition/multifactor-authentication-MFA>

³⁷ RICHARD, M. *AMLD5 amendments in prepaid cards transaction threshold*. Online. 2019. Available at: <https://shuftipro.com/blog/amld5/>

³⁸ ADELAJA, A. O.; AYODELE, O. F.; UMEORAH, S. C.; AMOSU, O. R. "Enhancing consumer trust in financial services: The role of technological security innovations", *Finance & Accounting Research Journal*, V. 6, n° 10, 2024, p. 1746–1759. <https://doi.org/10.51594/farj.v6i10.1610>

A substantial improvement in customer trust materialized because consumers could access transparent information and receive better fraud protection. Fee disclosure requirements coupled with liability coverage and customer support systems create trust among consumers which provides a push for them to embrace prepaid cards in markets with low digital preparedness³⁹. The competitive nature of digital payments leads fintech companies to depend on transparency to build trust because it retains users according to respondents.

Several tensions emerged between companies that needed to follow regulations and their ability to expand as a business during the interview phase. Small businesses developing startups in emerging markets must pay high prices for compliance-related expenses including IT infrastructure development and audit record retention and regular safety evaluations⁴⁰. Organizations which harmonize regulatory standards with operational systems will gain greater market credibility as well as consumer trust and options for international growth.

The research uncovers another essential finding demonstrating how regulations induce organizations to develop new technology solutions. Participants understood blockchain adoption with transaction tracking along with biometric identity verification tools as security measures which simultaneously fulfilled compliance requirements and addressed threats. The interviewed executives identified these technology solutions as inclusive platforms for financial services specifically useful for regions that replace conventional banking systems with prepaid card usage.

The interview participants expressed worry regarding discrepancies in the speed and definition clarity of rules between different regions. EU harmonization standards make it easier for businesses to meet compliance requirements across borders but regulatory fragmentation obstacles to implementation and enforcement among Asia-Pacific and African companies. The observations support the research goal to examine regulatory changes' market effects since clear guidelines matter equally to robust rules when promoting industrial expansion.

The interviews validate that regulatory changes have improved prepaid card security while raising trust but ongoing growth demands an equal balance between regulatory compliance and operational feasibility and innovative practices. Public officials must establish common global standards between innovation and secure systems to create support structures for prepaid cards. Industry participants need to use proactive compliance alongside transparency and technological agility to maintain consumer trust and industry advantage in the evolving prepaid card market.

6. Conclusion

Researchers examined the effects of modern legal and regulatory changes on prepaid cards while studying their security components together with consumer trust levels and business acceptance patterns and market position development in digital payment systems. The study gathered important practical knowledge about operational effects of AMLD5 and Prepaid Accounts Rule by interviewing professionals who work in compliance and fintech with a focus on cybersecurity.

The regulatory frameworks have led to substantial improvements in security protocols which drove widespread use of fraud detection tools and two-factor authentication and data encryption and biometric verification. The innovations have

³⁹ SINGLA, S. *Regulatory costs and market power*. LawFin Working Paper No. 47, 2023. <https://doi.org/10.2139/ssrn.4368609>

⁴⁰ SOARES, L. H. *The evolution of cyber threats and its future landscape*. Online. 2023. Available at: https://www.researchgate.net/publication/369010694_The_evolution_of_cyber_threats_and_its_future_landscape

decreased user risk while customers value full disclosure of fees and protection from fraudulent actions which build their trust.

The research reveals that businesses encounter difficulties in regulatory compliance expansion due to increasing regulations but especially because emerging markets create barriers through elevated compliance costs and unpredictable enforcement systems and restricted resources. Success in compliance implementation gives organizations a superior position to earn market authenticity and seize expanding opportunities in secure financial services delivery.

The research demonstrates how technological innovation serves as both a regulatory response and an enabling mechanism for growth purposes. The implementation of blockchain and AI-supported fraud detection enables providers to achieve compliance targets even as they navigate digital financial environments with their intricate risks.

The research proves that regulatory standards have enhanced prepaid cards but it remains necessary to achieve consistent global regulatory standards. A standardized international framework would achieve uniform compliance rules and consolidate prepaid card usage as a safe and dependable financial instrument. Prepaid cards will advance digital finance through three fundamental conditions which include adequate regulatory clarity as well as proactive innovation alongside consumer-focused design systems.

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