JOURNAL OF CULTURAL ANALYSIS AND SOCIAL CHANGE

Journal of Cultural Analysis and Social Change,
2026, 11(1), 814-825
ISSN: 2589-1316

Electronic Money: Consumer Protection Versus Legal Asymmetric Information

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Citation: Maulana, R., Murwadji, T. & Litai, H. N. (2026). Electronic Money: Consumer Protection Versus Legal Asymmetric Information, *Journal of Cultural Analysis and Social Change*, 11(1), 814-825. https://doi.org/10.64753/jcasc.v11i1.3957

Published: January 04, 2026

ABSTRACT

The writing of the article is related to the problem of E-toll card consumer protection caused by the regulations governing it, namely the Bank Indonesia Regulation (PBI) dealing with asymmetric information. In Bank Indonesia Regulation Number 11/12 of 2009 concerning Electronic Money in Article 1, what is meant by: Electronic Money is a payment instrument that fulfills the following elements: a. issued on the basis of the value of money deposited in advance by the holder to the issuer; b. the value of money is stored electronically in a medium such as a server or chip; c. used as a means of payment to merchants who are not the issuer of the electronic money; and d. the value of electronic money deposited by the holder and managed by the issuer is not a deposit as referred to in the law governing banking. This article is the most crucial article in terms of consumer protection. Mechanically, the issuance of an E-toll card is the same as the issuance of a passbook. The difference is that there is no filling out of the E toll application form so that the E-toll card holder's data is not contained in the issuer's administration. This is the main problem causing the failure of consumer protection because cardholders are not legal standing, i.e. litigants in court. The placement of financial data in the server and the issuer's refusal that the deposit is not a deposit causes the issuer to be irresponsible is an unlawful act by the regulator. This is what the author calls legal asymmetric information.

Keywords: Electronic Money, Consumer Protection, Legal Asymmetric Information

INTRODUCTION

The development of information and communication technology in the digital era has driven major transformations in various sectors of life. Digitalization not only creates easy access to public services, but also encourages economic efficiency through the automation of transaction processes in the transportation, banking, and trade sectors (AFI: 2022). The Indonesian government has responded to these developments by adopting electronic payment systems as part of its strategy to modernize infrastructure and increase national productivity. One of the most massive implementations of this digital payment system is the use of electronic money for toll road services.

Within the framework of transportation infrastructure development, the government implemented a full cashless transaction policy on all toll road sections since October 31, 2017 through Minister of PUPR Regulation No. 16/PRT/M/2017 (AFTECH, 2023). This policy is driven by the need to reduce long queues at toll gates that have been caused by cash payments. The use of e-Toll card as an electronic payment instrument is considered to speed up the transaction process, improve traffic smoothness, and minimize human error in counting money (Bank of Indonesia, 2023). In addition, the implementation of e-Toll is also in line with Bank Indonesia's vision to realize a more modern, fast, safe, and efficient payment system in supporting national economic growth (Bank Indonesia, 2021).

However, behind these technical benefits, there are fundamental issues related to legal construction and consumer protection in the use of e-Toll. As open loop electronic money regulated through PBI No.

11/12/PBI/2009 and PBI No. 20/6/PBI/2018, e-Toll is issued without user registration procedures, so there is no cardholder identity in the issuer's system. This leads to *legal asymmetric information*, which is a condition where the issuer has much greater information and control than the consumer, while consumers have no legal position to demand or defend the rights to the funds they deposit (Bank Indonesia, 2022). This information imbalance is the starting point for various legal issues.

One of the direct consequences of such imbalance is the loss of *legal standing of* the cardholder when the e-Toll card is lost, damaged, or cannot be blocked. Without identity records, consumers cannot prove ownership of the card or the balance on it, so they cannot get reimbursement from the issuer even though the funds come from user deposits (Bank Indonesia, 2023). The provision that electronic money balances are not deposits as defined in the Banking Law further worsens the position of consumers, as their funds are not guaranteed and cannot be claimed as savings or deposits (Bappenas, 2023). This situation substantially weakens the principle of consumer protection and contradicts the spirit of Law No. 8/1999.

From a comparative law perspective, some international jurisdictions have implemented more comprehensive protection for electronic money users. The European Union, through PSD2, sets standards for double authentication, real-time transaction recording obligations, and dispute resolution mechanisms that must be available to all users of digital payment systems (European Banking Authority, 2021). In the United States, EFTA limits consumer liability for unauthorized transactions and requires financial institutions to prove that transactions have been properly validated (European Union, 2015). These international standards demonstrate global recognition that the use of e-money must be balanced with service provider accountability and strong consumer protection.

In Indonesia, the weakness of e-Toll regulation also has implications for the low accountability of issuing institutions. The absence of real-time transactions on chip-based cards makes transaction tracking difficult, while the absence of a clear dispute resolution scheme leaves consumers with losses without effective remediation channels (Korean Financial Services Commission, 2022). Consumer protection regulations that have been established by OJK require transparency of financial product information, system security, and clarity of complaint handling mechanisms, but its implementation of e-Toll products still does not meet adequate operational standards (Haris, A., & Wulandari, F., 2024).

By considering these various issues, it can be understood that the success of electronic payment systems is not only determined by the speed and ease of technology, but also by legal certainty, consumer protection, and transparency of fund management. Therefore, regulatory reforms are crucial to ensure that products such as e-Toll have a strong legal foundation, a clear registration system, and an accountability scheme that is in line with international best practices. This reform is a prerequisite for the digital transaction ecosystem in Indonesia to develop in a fair, sustainable, and reliable manner for all users (IMF, 2023).

LITERATUR REVIEW

Pancasila Justice Theory constitutes the foundational philosophical framework for understanding justice within the Indonesian legal system. Rooted in the nation's ideological and constitutional values, this theory emphasizes that law is not merely a technical instrument of regulation but a moral and civilizational endeavor. Romli Atmasasmita conceptualizes law as a noble human effort aimed at preserving communal life, dignity, and ethical order, asserting that legal norms inherently contain the values of civilization (the value of civilization) that must guide the exercise of power (Atmasasmita, 2018). Within this framework, justice is inseparable from morality, humanity, and social responsibility, making Pancasila Justice Theory particularly relevant for evaluating modern regulatory regimes, including those governing digital finance and electronic money.

Pancasila Justice Theory is structured around three essential elements: objectives, institutions, and methods. The institutional dimension is embodied in the Second Principle of Pancasila, Just and Civilized Humanity, which mandates that legal and financial institutions operate in a manner that respects human dignity and fairness. This principle requires that banking institutions and financial regulators uphold transparency, accountability, and ethical conduct in their policies. The methodological element derives from the Third and Fourth Principles The Unity of Indonesia and Democracy Guided by the Inner Wisdom of Deliberation and Representation which emphasize consensus, deliberation, and collective decision-making as legitimate means of achieving justice. The ultimate objective of this framework is articulated in the Fifth Principle, Social Justice for All Indonesian People, which represents the constitutional aspiration of equitable welfare and legal protection for all citizens (Hendrik & Murwadji, 2023). Together, these elements form a holistic conception of justice that integrates moral values, institutional responsibility, and participatory governance.

In the context of banking and electronic money regulation, Pancasila Justice Theory provides a critical normative lens for addressing issues of asymmetric information. Regulatory frameworks governing electronic money often position financial institutions as holders of superior information, while consumers possess limited understanding of risks, rights, and mechanisms for loss recovery. Such imbalance contradicts the humanitarian mandate of the Second Principle of Pancasila, as it exposes consumers to potential harm and undermines their dignity. From a Pancasila-based perspective, regulatory policies must therefore be reoriented to ensure transparency, fairness, and consumer protection, aligning financial innovation with ethical responsibility and social justice (Atmasasmita, 2018).

To operationalize these philosophical ideals, Integrative Legal Theory functions as a middle-range theoretical framework. Developed by Romli Atmasasmita, this theory represents a reconstruction of Development Law Theory and Sociological or Progressive Legal Theory, which he argues are insufficient when applied independently to contemporary legal challenges. Integrative Legal Theory introduces the concepts of bureaucratic reengineering and social reengineering as mechanisms for aligning legal norms, institutional practices, and social realities (Atmasasmita, 2019). Bureaucratic reengineering focuses on improving the quality, integrity, and technological competence of legal policymakers and regulators, ensuring that regulatory frameworks evolve alongside technological advancements without compromising justice or consumer protection.

Social reengineering, in contrast, targets business actors and financial institutions by fostering a legal culture of accountability, transparency, and ethical responsibility. Through this mechanism, business entities are encouraged to actively challenge unfair practices and demand institutional responsibility when banking policies harm consumers. The integrative character of this theory lies in its emphasis on harmonization: bureaucratic and social reengineering must operate coherently to avoid regulatory overlap, legal uncertainty, or conflicting policy objectives. When synchronized, these mechanisms create a balanced legal ecosystem that supports technological innovation while safeguarding consumer rights and social welfare (Atmasasmita, 2019).

At the applied level, Hermeneutic Legal Theory and Liability Theory provide analytical tools for interpreting and enforcing banking regulations and consumer protection norms. Hermeneutic theory emphasizes that legal texts must be understood contextually, taking into account their moral purposes, social implications, and underlying values. Legal interpretation, therefore, extends beyond literal readings to uncover the intent and ethical foundations of regulatory instruments. This approach is particularly relevant in interpreting Bank Indonesia regulations on electronic money, transparency, and consumer protection, where formal compliance may still result in substantive injustice if consumers remain disadvantaged by information asymmetry.

Hermeneutic interpretation enables a purposive reading of consumer protection laws, including Indonesia's Consumer Protection Act, to ensure that regulatory practices genuinely protect consumers from financial harm. In cases involving lost or damaged e-toll cards, hermeneutics supports an interpretation that prioritizes consumer rights to information, fairness, and balance recovery. Complementing this approach, Liability Theory particularly the doctrine of strict liability provides a doctrinal basis for holding service providers accountable for consumer losses resulting from system failures or unjust policies, regardless of fault. This is especially relevant in electronic payment systems, where consumers have limited control over technological risks and contractual terms.

Empirical cases reported by national media illustrate the real-world consequences of inadequate regulatory protection in electronic toll systems, including excessive fines and unrecoverable electronic balances. These incidents highlight the practical urgency of aligning regulatory interpretation and enforcement with principles of justice, humanity, and accountability (Detik, 2019; Mitra Jakarta, 2025). Collectively, the literature demonstrates that Pancasila Justice Theory, Integrative Legal Theory, and Hermeneutic and Liability Theories form a coherent and complementary framework for evaluating electronic money regulation. This integrated theoretical approach supports a normative and practical reorientation of financial regulation toward transparency, consumer protection, and social justice within Indonesia's digital financial ecosystem.

METHODS

This research adopts a normative approach supported by empirical data, which includes literature study and field interviews. The literature study is the first step in analyzing the legal regulations governing electronic money, particularly those related to E-toll cards and consumer protection. This research aims to identify the legal principles underlying the issuance of E-toll cards and how existing regulations interact with consumer rights in electronic transactions.

Interviews were conducted with relevant parties directly involved in the implementation of regulations in the field, using a structured interview method with a list of open-ended questions. This allowed the author to dig deeper into the practical experience and application of regulations related to consumer protection. In analyzing the research results, the author relies on the hermeneutic method, which focuses on the interpretation of legal texts and existing social phenomena. This approach helps to provide a deeper understanding of "*Legal Asymmetrics Information*" and how it affects consumer protection in the context of E-toll cards.

RESULT AND DISCUSSION

Characteristics of E-Toll and Legal Structural Discrepancies

E-Toll as an open loop electronic money instrument was developed to provide fast transactions at toll gates, but is legally characterized differently than other digital instruments subject to Bank Indonesia's Know Your Customer provisions (Ministry of National Development Planning/Bappenas., 2023). Instruments such as e-wallet or mobile banking use owner identification to establish a clear legal relationship, while e-Toll does not require identity, so its legal status is not attached to a particular individual.

Instruments that store monetary value without attributing it to a specific legal subject create an object-based legal relationship, rather than a fund owner-based one (Ministry of PUPR., 2023). This system causes the balance stored in the card to have no identifiable legal owner, so physical possession of the card becomes the only basis for ownership.

Ownership of the balance in e-Toll is attached to physical possession of the card. Lost cards can be directly used by anyone who finds them because the system does not have a database of user identities that can be used as a reference for verification (Ministry of Communication and Information., 2023). This condition makes the risk of loss fully transferred to consumers.

The balance on the e-Toll is a trust fund that the user economically transfers to the issuer as electronic value (Deposit Insurance Corporation, 2022). The value is subject to the process of depositing and deducting balances similar to banking mechanisms, so there is a clear economic relationship even though the legal relationship is not adequately established.

The process of replenishing and reducing the e-Toll balance reflects a savings mechanism, although it is not legally recognized as a deposit. The issuer receives funds from consumers, records the value, and then deducts it when a transaction is made (LPS, 2022). This operational structure is usually accompanied by identity recording and consumer protection.

PBI emphasizes that electronic money is not a deposit, so issuers are not required to apply the public funds protection that applies to bank accounts (Mulana, R., 2023). This exempts issuers from identity verification, balance guarantee, and compensation mechanisms for consumer losses.

The mismatch between economic practice and legal status creates a *regulatory gap* that causes the product to function like a savings account but is treated as a simple payment instrument (Mulana, R., 2023). The gap makes the consumer's position in the system vulnerable because they do not have a legal basis comparable to the economic value of the product.

Legal asymmetric information arises when the issuer controls the balance and system information, while the consumer only has limited information about the value read on the checking machine (Mulana, R., 2023). This unbalanced information structure makes it difficult for consumers to understand the risks they bear.

The imbalance of information makes it difficult for consumers to prove that a balance belongs to them. The absence of the owner's identity means that the stored balance cannot be attributed to a specific legal subject when a dispute occurs (Nasution, A., 2023). Issuers have ample room to reject claims without an objective verification process.

The e-Toll instrument does not provide transaction history related to identity, so there is no evidentiary tool commonly used in digital financial disputes (Nasution, A., 2023). This kind of system eliminates the opportunity for consumers to defend their rights to the funds they have deposited.

The issuer controls all internal data, from balance storage to transaction logs, so that it can unilaterally determine the acceptance or rejection of claims (Nasution, F., 2023). Such information dominance results in an unequal legal relationship between issuers and users.

The initial design of e-Toll did not include the principle of accountability as one of the main elements of the electronic payment system. The principle of accountability requires identification, auditability, and the ability to trace transactions (OECD, 2022). The absence of these elements weakens the position of consumers in any form of dispute.

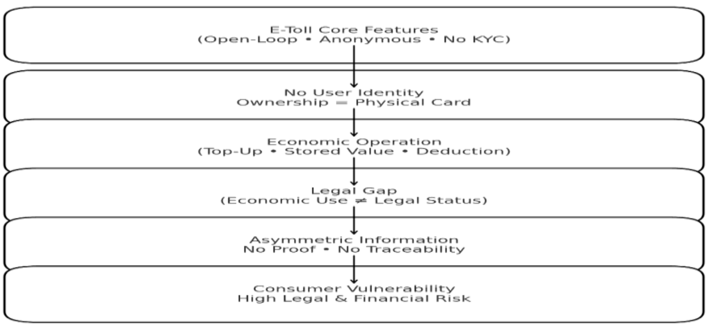

Figure 1. Characteristics of E-Toll and Legal Structural Discrepancies

The absence of a user database nullifies the rights that should be attached to the balance owner. Minimal identification is an absolute requirement to ensure the legal protection of users because a balance without an identified owner has no subject to protect (OECD, 2022). Systems that ignore identification lose the ability to establish who has rights to the economic value.

Anonymous card systems such as e-Toll are ideally used on small, low-risk transactions, not on nationwide transactions that manage large aggregate balances (OECD., 2022). Large-scale use without identity control poses much higher legal and financial risks than other digital products that have implemented identification.

The basic characteristics of e-Toll such as anonymity, non-savings status, and the absence of user identification are the root causes that trigger various legal issues. The regulatory structure that is not adjusted to the operational risk of the product makes consumer protection weak and opens up opportunities for disputes that harm users (OECD., 2022).

Loss, Damage, and Asymmetry of Protection Issues

Lost e-Toll cards emerge as one of the most dominant problems that harm consumers due to the absence of a card blocking mechanism that can protect the balance. Issuers do not have the ability to identify lost cards because the system does not record the user's identity in the first place, so any tracking efforts have no administrative basis to link the balance to the actual owner (OJK., 2022). This situation shows the fundamental weakness of the system design that relies on the card as the only proof of ownership.

Issuers claim to have no legal basis to replace lost card balances due to the absence of identity information in the system (Financial Services Authority (OJK)., 2022). This reason is used as a justification to reject compensation claims, even though the balance data is technically still recorded on the issuer's server. The absence of identification makes the balance an "ownerless value", so the issuer is not obliged to return it from the perspective of legal formalities.

Other payment instruments such as debit or credit cards have a blocking mechanism that can be triggered as soon as the user realizes the loss of the card. Such systems allow banks to freeze access, verify owners, and prevent misuse of balances. E-Toll does not offer this kind of preventive mechanism as it relies entirely on the physical presence of the card, which is the only manifestation of ownership in the system (Financial Services Authority., 2022).

The reliance on the physical card exposes the structural vulnerabilities inherent in the design of e-Toll as a mass payment product. Any lost card transfers ownership automatically without going through a verification process, so the risk of card misuse cannot be mitigated by the system. This technical design puts the user in a perpetually vulnerable position when the card is not in his/her custody.

The entire risk of loss is ultimately borne by the user as the issuer does not provide a recovery mechanism. The issuer absolves itself of the obligation to return the funds, even though the funds remain stored in their system. This risk structure makes the relationship between users and issuers unbalanced as only one party bears the operational consequences.

Damage to e-Toll cards results in problems that are as serious as loss, especially when the chip cannot be read by the balance reading device (Financial Services Authority, 2022). Chip damage. whether due to wear and tear, technical glitches, or physical defects, makes users lose access to the balance even though the funds are still technically recorded in the issuer's server.

The user cannot access the balance value when the chip fails to read, so the funds become unusable. This puts consumers at a disadvantage as access to legitimate electronic value is no longer possible. The mismatch between the existence of the balance in the system and the user's ability to utilize it is a major issue.

Issuers often reject claims of damaged card balances on the grounds that they cannot verify that the card actually belongs to a particular user (Pistor, K., 2019). Without identification linking the card to the owner, the issuer considers there is no basis to make a replacement. This argument is used despite the fact that the balance remains under the control of the issuer in the internal system.

The rejection of the claim shows that the system was not designed from the start with an identification mechanism that could serve as a basis for legal protection. The absence of identity makes all liability for damages unenforceable. A system that ignores the verification mechanism cannot guarantee the recovery of user rights.

The balance stored in the e-Toll card is basically a financial obligation of the issuer to the user (Raharjo, Y., 2023). The funds do not belong to the issuer and should be recovered if the user loses access due to damage. This obligation is blurred when there is no identification linking the balance to a specific individual, giving the issuer an excuse not to refund.

The status of damaged card balances then leads to the formation of *unclaimed funds*, which are funds that cannot be withdrawn by the owner and remain in the issuer's system indefinitely (Raharjo, Y., 2023). These funds no longer have a legal owner who can sue or claim their existence due to the absence of user identification.

The uncertainty of the balance status raises questions regarding the accounting treatment of these funds, whether they should be recognized as revenue, long-term liabilities, or other items in the financial statements (Rudiyanto, A., Prakoso, Y., & Devianti, A., 2023). The absence of firm guidance creates a risk that unclaimed funds will be treated inconsistently across issuers.

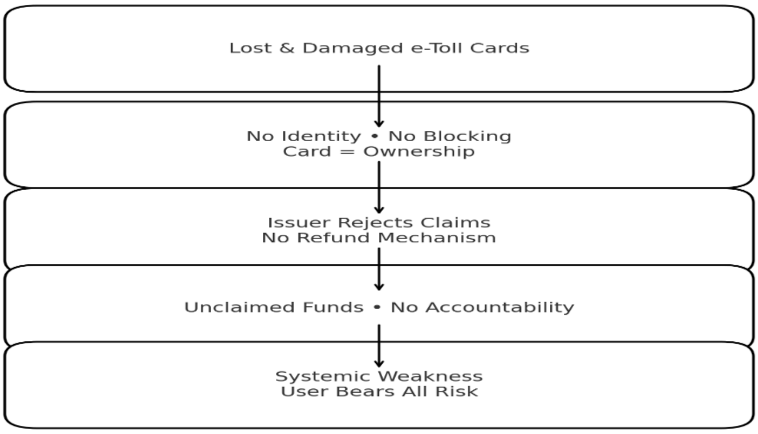

Figure 2. Loss, Damage, and Asymmetry of Protection Issues

The large-scale accumulation of unclaimed balances has the potential to raise accountability issues. The value could reach a nationally significant amount as e-Toll users number in the millions, and card damage is a common occurrence. The management of public funds without clear accountability raises the potential for abuse and non-transparency (Ryan Mulana, R., 2023).

The aspect of card loss and damage reflects a violation of the principle of fairness in consumer protection. The risk of damage is fully borne by the user, even though the funds remain under the control of the issuer. The principle of fairness requires that risks be shared in proportion to the roles and obligations of each party (Setiadi, D., & Wijaya, R., 2022).

This aspect shows that the e-Toll system has not met the security and reliability standards that should be attached to digital payment instruments. The lack of identification, absence of blocking, weak owner verification, and lack of balance refund mechanism prove that the system has not been built based on adequate consumer protection principles (Siregar, D., & Widjaja, L. 2022).

Regulatory Weaknesses, Default Clauses, and the Urgency of System Reforms

Regulations on electronic money in Indonesia have not demonstrated the capacity to ensure a balance of rights and obligations between e-Toll issuers and users, especially in the aspect of consumer protection (Siregar, D., & Widjaja, L. 2022). Regulatory emphasis is mostly directed at technical aspects, operational licenses, and system security standards, while aspects of legal relations between issuers and consumers actually have considerable empty space.

PBI regulates the technical structure of electronic money issuance without providing comprehensive guidelines on user protection in conditions of loss, damage, or system errors (Siregar, H., & Widjaja, B. 2022). The technocratic direction of the regulation means that the consumer protection dimension does not receive adequate supervision.

The absence of detailed rules opens up space for issuers to insert standardized clauses that remove responsibility for balance loss or card damage. Such clauses often appear in the terms of use printed in small print on the card or inserted in electronic documents that users never read in detail (Siregar, M., & Widjaja, T., 2022). Consumers' bargaining position is greatly weakened as they have no choice but to accept these terms.

Clauses that *exempt* issuers from liability are *exemption clauses* that are expressly prohibited by Article 18 of the Consumer Protection Law (Siregar, R., & Widjaja, M., 2022). The provision prohibits business actors from releasing responsibility for consumer losses arising from product use. The application of standard clauses in e-Toll violates the principle of balance which is the main principle of consumer contracts.

The application of such clauses continues without sanction because regulatory supervision of electronic money products has not reached an adequate level of depth. Supervisory institutions have not implemented a mechanism for assessing compliance with standard clauses in electronic money instruments as is done in the banking and multifinance industries (Tampubolon, D., 2024). This condition puts the issuer in a dominant position that is difficult to control.

The lack of enforcement of consumer protection provisions means that the bargaining power of the public is almost non-existent. Consumers cannot negotiate any terms and can only accept the product as it is. This kind of relationship structure contradicts the principle of fairness that should be the basis of modern financial transactions.

Modern electronic payment systems place consumer protection as an integral part of the product design, not just an added feature. Such protections include user identification, transaction recording, dispute resolution mechanisms, and protection of lost or inaccessible balances (Tampubolon, D., 2024). The absence of these components in e-Toll indicates a structural deficiency.

International regulations such as PSD2 in the European Union require strong authentication and give consumers the right to request correction of unauthorized transactions (Tampubolon, F., 2024). Issuers are required to provide transparent dispute resolution procedures and ensure liability limits that do not overburden consumers.

Regulation in the United States through EFTA places the burden of proving the transaction on the financial institution. The consumer does not need to prove that the transaction is unauthorized; it is the financial institution that is obliged to provide proof of authentication (Tampubolon, R., 2024). This principle is very different from the e-Toll system, which requires consumers to prove ownership of the balance without any identification data.

The comparison shows that international standards tend to put consumers in a protected position, while the e-Toll system actually puts consumers in a vulnerable position. The lack of protection makes users lose legal certainty and security in transactions (Congress of the United States of America, 1978).

Indonesia needs to adopt principles that provide a balance of rights between issuers and users to bring electronic money practices in line with international standards. User identification and transaction recording are prerequisites for creating a legally auditable accountability mechanism (United States Congress., 1978).

The first reform to be undertaken is the implementation of minimal registration or *light KYC*, which allows issuers to record the basic identity of users without losing the practical character of e-Tolls (World Bank, 2023). This minimal recording is sufficient to associate balances with individuals so that disputes can be resolved objectively.

The e-Toll technical system then needs to be upgraded to a system that supports real-time recording so that each transaction can be tracked accurately. The implementation of real-time settlement will provide the ability for the system to detect anomalies and provide transaction reports that can be an evidentiary instrument (World Bank, 2023).

Issuers also need to provide a blocking mechanism for lost cards to prevent misuse of balances. A blocking mechanism is the minimum standard for all digital payment instruments and an essential element of risk management (YLPK Indonesia, 2023).

Comprehensive regulatory reforms are needed to make the e-Toll system a safe, transparent, and fair instrument for consumers. The absence of reforms will maintain an unequal position between issuers and users, ultimately weakening public confidence in the national digital payment system. Strong consumer protection is the foundation for the development of a healthy e-payment ecosystem in the long run (YLPK Indonesia, 2023).

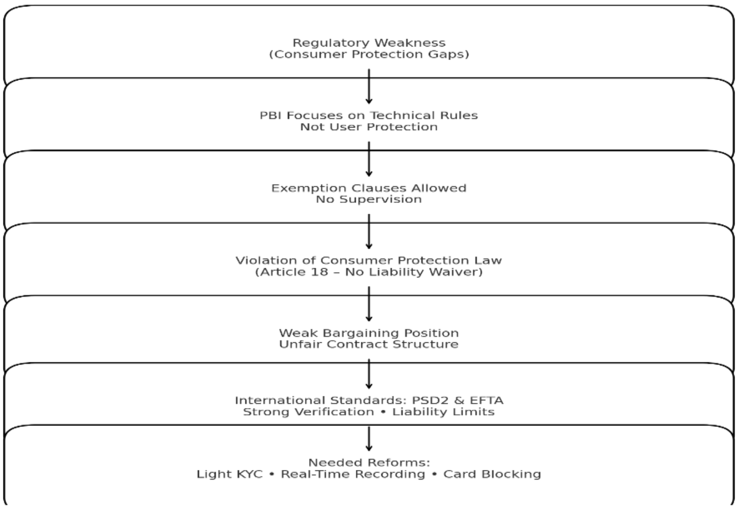

Figure 3. Regulatory Weaknesses, Default Clauses, and the Urgency of System Reforms

Systemic Implications, Economic Risks, and Challenges of e-Toll Implementation in the Digital Payment Ecosystem

The e-Toll system has broad systemic implications for the national digital payment ecosystem because the number of users reaches millions and the transaction value is very large (53). The dominant use of chip-based e-money cards in public services leads to legal and technical risks that arise not only impacting individuals, but also potentially affecting the stability of the payment system as a whole.

The use of instruments without identification magnifies the risk of systemic vulnerability as balances dispersed in the community have no traceable legal owner. When balances become unclaimed, either due to loss or damage, the value remains stored in the issuer's system without a clear basis for reconciliation (54). This condition has the potential to cause a value mismatch between the outstanding balance and the recorded balance.

Unidentified balance positions can cause distortions in the preparation of the issuer's financial statements. Accounting that does not associate balances with specific owners makes it difficult to classify liability items in the balance sheet (55). Uncertainty of classification increases the risk of manipulation or recording errors, which in the long run can affect audit accuracy.

Another economic risk arises when unclaimed funds continue to grow. The value of funds sitting without an owner is a potential hidden profit for issuers, especially when there is no obligation to report the amount of these funds on a regular basis (56). This incentive imbalance creates the possibility that issuers are not encouraged to improve user identification systems.

The absence of a blocking mechanism increases the chance of card misuse by other parties who find the card missing. The misuse of the balance can be categorized as an operational risk, but because there is no user verification system, the risk is never accurately recorded in the issuer's risk report (57). Systems that do not comprehensively record risks have the potential to create blind spots in financial institutions' risk management.

Modern payment instruments require a transaction tracking mechanism for audit and regulatory compliance purposes. An e-Toll system that does not provide identity-based recording makes the audit process difficult, as auditors cannot associate transactions with a clear legal subject (58). This weakness reduces the level of transparency and accountability in fund management.

Implementation challenges also arise within the consumer protection framework. Consumers do not have access to effective dispute resolution channels, while issuers do not provide adequate reporting or proof of balance ownership facilities (59). This inequality puts consumers at a constant disadvantage.

The weakness of the identification system complicates supervisory efforts by regulators. Authorities such as Bank Indonesia and OJK require granular data to monitor transaction behavior and potential systemic risks, but e-Toll does not provide such data (60). Regulations that are not supported by data will result in supervision that is reactive, not preventive.

National payment systems require high interoperability standards to ensure efficiency and reliability. The use of chip-based cards that do not support identity verification hinders integration with other payment platforms that have implemented user identification standards (61). This technological limitation holds back the development of a more advanced digital payment ecosystem.

The absence of user identification also creates barriers to the implementation of anti-money laundering (AML) and countering the financing of terrorism (CFT) policies. Instruments that allow anonymous use on a large scale have the potential to be misused for unauthorized transactions because there is no adequate tracking mechanism (62). This risk is a serious concern in the global payments ecosystem.

The use of chip-based offline systems leads to real-time tracking limitations. Transactions that are not recorded directly on the issuer's server make it difficult to evaluate technical errors or suspected misuse (63). Real-time disconnection opens up opportunities for data discrepancies between chips and servers that are difficult to prove accurate.

The transaction efficiency offered by e-Toll has not been matched by the reliability of the consumer protection system. An efficient but insecure system ultimately creates risks that outweigh the benefits, especially when used in national-scale public services (64). Digital payment ecosystems require a balance between speed and security.

The integration of digital payments in the transportation sector requires a strong legal framework. Instruments used by the general public must meet clear standards of legal certainty so as not to cause collective harm (65). E-Toll as a mass instrument requires adequate regulatory and technological support to ensure service reliability.

The urgency of reforming the e-Toll payment system is getting bigger as people's dependence on digital services increases. Reforms that include user identification, blocking mechanisms, real-time recording, as well as unclaimed balance accounting supervision are a must to ensure that this product meets consumer protection standards (66). Such protection will be the foundation for building a more inclusive, transparent, and reliable national payment system (67).

Social Impact, Equity of Access, and the Need for Public Policy Integration

The e-Toll system has a wide social impact considering that toll road users come from various socio-economic groups. People who do not have sufficient digital literacy face higher risks related to card loss, chip damage, or misuse that results in loss of balance (68). This suggests that the design of public payment instruments should consider diverse literacy levels.

Different levels of public understanding of electronic money systems create access gaps in national transportation services. Users with lower economic and digital capabilities suffer greater losses when balance or card problems occur, as they are not aware of the complaint procedures or the legal basis governing their rights (69). This disparity raises issues of social justice in public service provision.

The use of chip-based instruments without user identification increases the risk of exclusion of vulnerable groups. Groups such as the elderly, rural communities, and people with special needs are often unable to access digital services, making them vulnerable to barriers when using e-Toll (70). An inclusive system should provide alternative mechanisms that are easily accessible to these groups.

Payment instruments for public services should be designed with accessibility in mind. The absence of blocking or balance recovery features makes it more difficult for people with mobility or economic limitations to overcome their losses (71). Product design that does not consider the needs of weaker groups has the potential to deepen inequality.

The social impact of balance loss is not only financial, but also psychological. Users feel uncertainty and anxiety every time their card is lost or unreadable, as there is no guarantee of their funds (72). This psychological factor affects people's perception of the overall security of digital transactions.

This uncertainty affects the level of public acceptance of the national digital payment system. People who experience balance losses tend to lose trust in other electronic money products even though they are in different ecosystems (73). Public trust is the main capital in the transition to digital payment systems.

Consumer protection in public instruments such as e-Toll has a socio-political dimension. Instruments used in public services are not only subject to market logic but also to the principle of social benefit. The government has an obligation to ensure that the product is safe to use by all levels of society (74).

Public policy integration is needed so that the payment system used by the wider community does not leave certain groups behind. Such integration should include regulatory improvements, technological improvements, minimum service standards, and the provision of clear compensation mechanisms in the case of balance losses (75). These four components determine the success of inclusive digital payment system adoption.

Public policies in the transportation sector need to be aligned with payment system policies. The lack of policy synchronization makes e-Toll implementation run alone without coordination with consumer protection authorities or financial supervision institutions (76). This absence of coordination creates a gap in public protection.

Payment instruments used as public services should be under dual supervision, both payment authorities and consumer protection agencies. Dual oversight allows for a thorough evaluation of the financial and social risks that the product may pose (77). The e-Toll system is not yet under this supervisory framework.

The need for integration is even more urgent when looking at the massive scale of e-Toll usage. Supervision of mass products must consider not only technical safety aspects, but also household economic impacts, affordability, and community readiness for technological change (78). Products with millions of users require stronger standardization.

The balance between efficiency and fairness is a key principle in electronic payment-based public services. The e-Toll system has succeeded in bringing transaction efficiency, but has not provided fairness of access or legal certainty for users (79). The balance can only be achieved through social protection-based policy interventions.

The implementation of a minimum verification system, blocking mechanism, and real-time transaction recording will provide better justice for vulnerable groups. Technology should be designed not only to speed up transactions, but also to restore users' rights when losses occur (80). A fair system requires corrective features that enable recovery.

Public policy integration should also include educating the public on the use of digital payment instruments. Adequate education will help reduce losses due to ignorance, while increasing public awareness of consumer rights (81). Education programs are part of the national strategy to strengthen digital literacy.

Building an inclusive, fair, and secure e-Toll ecosystem requires regulatory collaboration between the government, issuers, and consumer protection agencies. Such collaboration should be geared towards correcting structural inequalities in e-Toll design and ensuring that the instrument is not only efficient, but also fulfills the principles of social justice (82). A system that is able to accommodate all levels of society will be a strong foundation for national digital transformation.

CONCLUSION

This research examines consumer protection issues in the use of E-toll cards as electronic payment instruments in Indonesia. Along with technological developments that encourage the shift from cash to non-cash transactions, legal challenges arise related to regulations that do not fully protect consumers. In this context, regulations governing the issuance of E-toll cards, such as Bank Indonesia Regulation No. 11/12/PBI/2009 on Electronic Money, show a mismatch between the card issuance mechanism and consumer protection principles. The main problem found in this study is the existence of "*Legal Asymmetrics Information*," which is an imbalance of information and legal responsibility between the card issuer and the consumer. This results in consumers being unable to sue for losses arising from lost cards or lost balances, because there is no data or identity recorded with the card issuer.

From the research results, it was found that although regulations have regulated the use of electronic money with the aim of increasing efficiency and financial inclusion, the consumer protection aspect is still very weak. The unclear legal status of E-toll cards and the absence of a clear mechanism to claim losses have created legal loopholes that harm consumers. Interviews with relevant parties indicate that card issuers have no clear liability in terms of responsibility for lost balances or damaged cards, as E-toll cards are not registered with the holder's identity. Thus, existing regulations need to be reformed to align consumer protection with technological developments and ensure better accountability of card issuing institutions. This research recommends mandatory registration of every E-toll card and *real-time* transaction alignment in order to increase transparency and protect consumer rights more effectively.

Funding Source

Indonesian Education Scholarship, the Center for Higher Education Funding and Assessment, and the Indonesian Endowment Fund for Education.

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