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Insurance Services as a Distinct Financial Product: Information Asymmetry, Trust and Digital Transformation in Market Management

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Abstract: Insurance services differ fundamentally from conventional goods and from many other financial products because their economic value is associated with protection against uncertain future losses rather than immediate consumption. This article develops a conceptual interpretation of insurance as a complex financial, legal and information-based product and examines the managerial implications of information asymmetry, actuarial pricing, trust, institutional regulation and digital transformation. The study applies theoretical synthesis, comparative analysis and structural-functional analysis to classical insurance economics and contemporary digital-insurance governance literature. The results identify seven defining characteristics of the insurance service: intangibility, probabilistic outcome, delayed realization of utility, actuarial pricing, information asymmetry, dependence on trust, and institutional embeddedness. The article further demonstrates that adverse selection and moral hazard are not peripheral market imperfections but core management problems that shape underwriting, pricing, monitoring and claims management. A comparative analysis shows that insurance products differ from banking and investment products in their economic purpose, time of benefit realization, pricing logic and dominant source of trust. Building on these findings, an Integrated Insurance Product Management Framework is proposed, linking risk assessment, information governance, trust and solvency, digital personalization, customer protection and regulatory coordination. The framework clarifies how insurers can use data-intensive technologies to improve segmentation and risk assessment without weakening transparency, privacy and financial inclusion. The findings contribute to a more comprehensive understanding of insurance-market management under conditions of increasing uncertainty and digitalization.

Keywords: Insurance services; insurance product; information asymmetry; adverse selection; moral hazard; actuarial pricing; trust; digital insurance; market management; artificial intelligence.

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1. Introduction

Insurance occupies a special position in the financial system because it converts uncertain and potentially large future losses into contractually defined current payments. Unlike an ordinary commodity, an insurance policy does not primarily deliver a tangible object or an immediately observable service. Its economic value lies in the transfer and collective management of the financial consequences of risk. The policyholder pays a premium today in exchange for a conditional promise of protection whose practical benefit may be realized only if a specified event occurs in the future. This temporal and probabilistic structure makes insurance a distinctive financial product and creates specific requirements for market management.

The managerial complexity of insurance arises from several interconnected features. First, the parties to an insurance contract rarely possess equal information about the insured risk. The policyholder often knows more about health conditions, property quality, driving behavior, business practices or other risk determinants, whereas the insurer must make pricing and acceptance decisions on the basis of incomplete information. Second, the quality of the product cannot normally be assessed at the moment of purchase. It becomes visible through the insurer's ability to settle legitimate claims, maintain solvency and provide reliable service over time. Consequently, trust, reputation, transparency and regulatory oversight become integral components of the product itself rather than external attributes of the market.

Third, the digitalization of insurance is changing how these traditional problems are managed. Big Data, artificial intelligence (AI), telematics, cloud infrastructure and automated decision systems enable more granular risk assessment and more personalized products. At the same time, they intensify concerns about data protection, algorithmic opacity, unfair discrimination, cyber security and financial exclusion. OECD [1] emphasizes that Big Data and AI can improve underwriting, pricing and claims management, but they also introduce new governance risks. Similarly, EIOPA [2] notes that the benefits of AI in insurance depend on appropriate governance principles, including fairness, transparency, explainability, data management and human oversight.

Against this background, the purpose of this article is to develop a systematic interpretation of insurance services as a distinct financial product and to identify the management mechanisms required to address its specific characteristics. The study has four objectives: (1) to synthesize the theoretical foundations of information asymmetry in insurance; (2) to identify the structural characteristics that distinguish insurance from banking and investment products; (3) to examine how trust, regulation and digital technologies interact in the provision of insurance services; and (4) to propose an integrated framework for insurance-product management in a digital environment.

Insurance, risk and uncertainty

The theoretical distinction between risk and uncertainty provides a fundamental starting point for understanding insurance. Knight [3] separated measurable risk, for which probabilities can be estimated, from fundamental uncertainty, for which probabilities cannot be reliably assigned. Insurance operates primarily in the domain of measurable risk. By pooling a sufficiently large number of exposures, insurers can transform individual uncertainty into statistically manageable portfolio risk. This transformation underlies actuarial pricing, reserving and solvency management.

Arrow [4] demonstrated the economic importance of risk-sharing mechanisms under uncertainty, while Borch [5] formalized conditions for efficient risk exchange in insurance markets. These contributions shifted the interpretation of insurance away from a narrow compensation mechanism toward a broader system of risk allocation. From this perspective, insurance does not eliminate risk; rather, it redistributes its financial consequences across time, policyholders, insurers, reinsurers and capital markets. This risk-transformation function is central to the economic role of insurance and explains why the sector contributes to business continuity, household resilience and financial stability. [6].

Information asymmetry, adverse selection and moral hazard

Information asymmetry is one of the defining characteristics of insurance transactions. Rothschild and Stiglitz [7] showed that competitive insurance markets are highly sensitive to differences in information between insurers and insureds. When individuals know more about their own risk type than the insurer, uniform pricing can attract a disproportionate share of high-risk customers. This process, known as adverse selection, can distort the composition of the insured pool, increase expected claims and undermine the sustainability of standard contracts.

Moral hazard arises after coverage has been obtained. Because the financial consequences of a loss are partly transferred to the insurer, the policyholder may have weaker incentives to avoid risky behavior or to minimize the size of a loss [8]. Moral hazard can take several forms, including reduced precaution, exaggerated claims or changes in behavior that are difficult to observe contractually. The managerial response therefore requires a combination of deductibles, co-payments, limits, exclusions, risk-based pricing, loss-prevention requirements, monitoring and claims verification [9]. These instruments are not merely contractual details; they are mechanisms for aligning incentives and protecting the collective insurance pool.

Akerlof's [10] broader analysis of markets with asymmetric information also helps explain why insurance quality and trust are difficult to evaluate *ex ante*. Where buyers cannot easily distinguish financially strong and service-oriented insurers from weak or opportunistic providers, market confidence may deteriorate. Regulation, disclosure requirements and reputational mechanisms help reduce this quality uncertainty and create minimum standards for market participation.

Trust, solvency and institutional embeddedness

Trust is especially important in insurance because the product is a promise contingent on a future event. The policyholder may pay premiums for years without receiving a claim payment, yet still derives value from the existence of credible protection [11]. The ability of the insurer to fulfill its obligations depends on adequate capital, technical provisions, asset-liability management, reinsurance, governance and operational capability [12]. For this reason, the quality of an insurance product cannot be separated from the financial condition of the institution that issues it.

This feature explains the institutional embeddedness of insurance [13]. Capital requirements, solvency supervision, reserve rules, conduct-of-business standards and disclosure obligations are designed not only to constrain firms but also to support confidence in the contractual promise [14]. Market management therefore requires coordination between company-level risk management and system-level regulation. Strong institutions reduce the probability that information failures or financial weakness at individual firms will undermine confidence in the wider market [15].

2. Research Methodology

The study uses a qualitative conceptual research design. Its analytical basis combines theoretical synthesis, comparative analysis and structural-functional analysis. Theoretical synthesis is used to integrate the economics of risk, asymmetric information and insurance-market institutions. Comparative analysis is applied to distinguish insurance products from banking and investment products according to economic purpose, timing of value realization, outcome characteristics, pricing mechanism and source of trust. Structural-functional analysis is used to identify the management functions that follow from the specific nature of insurance services.

The research procedure consists of four stages. First, the core characteristics of insurance services are derived from the economic logic of the insurance contract and from established insurance-economics literature. Second, the consequences of these characteristics for underwriting, pricing, customer behavior, claims management and solvency are analyzed. Third, the impact of digital technologies is evaluated with reference to contemporary international work on Big Data, AI and digital insurance governance. Fourth, the results are synthesized into an Integrated Insurance Product Management Framework. The framework is conceptual rather than econometric; its purpose is to organize causal and managerial relationships that can later be operationalized and tested empirically in national insurance markets.

3. Results and Discussion

Defining characteristics of insurance as a financial product

The analysis identifies seven characteristics that distinguish insurance services from conventional goods and shape the design of insurance-market management. These characteristics are summarized in Table 1. Their significance lies in the fact that each characteristic generates a specific management problem. Intangibility increases the importance of communication and reputation; probabilistic outcomes require pooling and actuarial methods; delayed utility increases the need for long-term financial credibility; information asymmetry requires underwriting and incentive design; and institutional dependence makes solvency and regulation part of the effective product quality.

Table 1. Defining characteristics of insurance services and their management implications

Characteristic	Economic meaning	Primary management implication
Intangibility	The customer purchases a right to financial protection rather than a physical good.	Communicate coverage clearly; strengthen service quality, brand reputation and disclosure.
Probabilistic outcome	Insurer performance depends on whether a covered event occurs and on the size of the loss.	Use risk pooling, actuarial models, reserves and scenario analysis.
Delayed realization of utility	The benefit may materialize long after the premium is paid, or may never take the form of a claim.	Maintain long-term solvency, service continuity and policyholder confidence.
Actuarial pricing	Price is based on expected loss, risk characteristics, expenses, capital costs and uncertainty margins.	Improve data quality, segmentation and pricing governance.
Information asymmetry	The parties possess different information about risk type and behavior.	Apply underwriting, deductibles, monitoring, fraud controls and incentive-compatible contracts.
Dependence on trust	Product quality is fully observable only when the insurer is required to perform.	Ensure claims fairness, transparency, reputation and credible financial strength.
Institutional embeddedness	Product reliability depends on regulation, solvency rules and market infrastructure.	Coordinate corporate governance with regulatory compliance and consumer protection.

The first four characteristics explain why insurance pricing cannot be managed like the pricing of ordinary services. Premiums must incorporate expected claims, uncertainty, operating costs, capital requirements and, where relevant, reinsurance costs. Pricing too low can threaten solvency, while pricing too high can reduce accessibility and encourage low-risk customers to leave the pool. The insurer therefore faces a simultaneous technical and market-management problem: prices must be actuarially adequate but also commercially understandable and acceptable.

The final three characteristics explain why insurance competition depends on more than price. A low premium has limited value if policy wording is opaque, claims are delayed or the insurer lacks financial capacity. Trust, complaint handling, claims settlement and transparency therefore influence demand. In this sense, insurance management combines risk analytics with relationship management and institutional credibility.

Comparative position of insurance among financial products

Insurance, banking and investment products all operate within the financial system, but they perform different economic functions. Table 2 highlights the main distinctions. The comparison shows that insurance is unique because its primary economic purpose is the management of adverse financial consequences rather than the temporal reallocation of money or the pursuit of investment return.

Table 2. Comparative characteristics of insurance, banking and investment products

Criterion	Insurance product	Banking product	Investment product
Primary purpose	Manage financial consequences of risk	Transfer funds across time and provide liquidity/credit	Generate return through capital allocation
Timing of benefit	When a covered event occurs; protection exists continuously	After funds are deposited, borrowed or repaid according to contract	Depends on asset performance and holding period
Nature of outcome	Probabilistic and contingent	Relatively predetermined by contract	Market-dependent and uncertain
Pricing basis	Actuarial estimate of risk plus expenses and capital cost	Cost of funds, credit risk, liquidity and margins	Expected return, market risk and asset characteristics
Main trust factor	Insurer solvency and claims performance	Institutional reliability and repayment capacity	Quality of asset management and market infrastructure

The comparison has direct implications for product management. In banking, the contractual exchange often concerns access to or the use of money, while investment products are evaluated primarily through risk-adjusted return. Insurance customers, by contrast, evaluate a product through a combination of coverage relevance, premium affordability, service convenience, claims confidence and the financial strength of the insurer. Consequently, insurance-product design must integrate legal wording, actuarial logic, customer communication and service processes.

The probabilistic character of insurance also means that customer satisfaction cannot be assessed only through claims experience. Many policyholders will not claim during a policy period. Their perception of value depends on whether the protection is understood and trusted, whether digital and human service channels are accessible, and whether the insurer provides useful risk-prevention information. Modern insurance management therefore increasingly includes prevention, advisory services and continuous engagement rather than limiting the relationship to premium collection and claims payment.

Digital transformation of the insurance product

Digital technologies expand the insurer's capacity to collect and process risk-relevant information. Telematics can provide behavioral information in motor insurance; wearable devices can support health-related risk management; remote sensing and Internet-of-Things technologies can improve property monitoring; and AI can support underwriting, fraud detection and claims triage. OECD (2020) identifies significant potential for Big Data and AI to enhance risk assessment and operational efficiency across the insurance value chain.

The digital environment, however, changes the form of information asymmetry rather than eliminating it. Insurers may gain far more information about customers, but customers may simultaneously lose the ability to understand how automated models

classify them or determine prices. This creates a new asymmetry: the insurer knows the model, data sources and decision architecture, whereas the customer observes only the final price or decision. If unmanaged, such opacity can weaken trust even when predictive accuracy improves.

This tension explains the growing importance of algorithmic governance. EIOPA (2021) emphasizes proportionality, fairness and non-discrimination, transparency and explainability, human oversight, data governance, and robustness and performance as important principles for trustworthy AI in insurance. These principles are consistent with the economic nature of insurance because a product based on a long-term promise requires not only accurate prediction but also legitimate and understandable decision processes.

Digitalization also enables movement from broad risk categories toward individualized pricing. This may improve actuarial precision and reduce cross-subsidization, yet extreme personalization can weaken the pooling function of insurance. If every risk is priced almost individually, high-risk consumers may face unaffordable premiums or exclusion. Therefore, the managerial objective should not be maximum segmentation at any cost; it should be an economically and socially sustainable balance between risk sensitivity, pool stability, fairness, accessibility and regulatory expectations.

Integrated Insurance Product Management Framework

On the basis of the preceding analysis, this study proposes an Integrated Insurance Product Management Framework (IIPMF). The framework treats the insurance product as the outcome of six interconnected management blocks rather than as a policy document alone. The blocks are shown in Table 3. Their integration is essential because improvements in one area can create new risks in another. For example, more detailed data can improve pricing but can also increase privacy and discrimination risks; faster automated claims processing can improve efficiency but may create contestability problems if customers cannot understand or challenge decisions.

Table 3. Integrated Insurance Product Management Framework (IIPMF)

Management block	Core instruments	Expected contribution
1. Risk and actuarial management	Risk classification, actuarial models, portfolio analysis, reserves, reinsurance	Adequate pricing and financial sustainability
2. Information-asymmetry management	Underwriting, deductibles, limits, monitoring, fraud analytics, incentive design	Reduction of adverse selection and moral hazard
3. Trust and solvency management	Capital adequacy, claims standards, disclosure, reputation, service quality	Credibility of the insurer's future promise
4. Digital and data governance	AI/ML controls, data quality, privacy, cyber security, explainability, human oversight	Efficient personalization with controlled technological risk
5. Customer-value management	Needs analysis, clear wording, prevention services, omnichannel support, complaint resolution	Higher perceived value, retention and informed choice
6. Institutional and regulatory coordination	Compliance, consumer protection, supervisory reporting, market standards	System stability, transparency and sustainable market development

The first block ensures that the premium and coverage structure are consistent with the underlying risk and the insurer's financial capacity. The second block addresses the

contractual consequences of private information and changing behavior. The third block recognizes that solvency and claims performance are part of product quality. The fourth block extends conventional risk management to data and algorithmic systems. The fifth block treats the policyholder as a user of an ongoing risk-management service rather than a passive purchaser of a contract. The sixth block connects company-level management with the institutional architecture that supports confidence in the market.

The main conceptual contribution of the framework is the recognition that insurance-product management cannot be optimized by maximizing a single variable such as predictive accuracy, premium growth or claims automation. Effective management requires simultaneous control of technical adequacy, behavioral incentives, customer trust, technological risk and institutional legitimacy. This multi-dimensional approach is particularly relevant in emerging insurance markets, where financial literacy, institutional trust and digital infrastructure may develop at different speeds.

Functional architecture of the modern insurance market

The product-level characteristics analyzed above can be extended to the market level. A modern insurance market performs a broader set of functions than the traditional compensation function alone. Six interrelated functions can be distinguished: risk transformation, compensatory-reproductive support, investment-distributive intermediation, stabilization, information-analytical processing, and institutional-regulatory coordination. These functions show that insurance operates simultaneously as a contractual service, a risk-management mechanism and a financial institution.

Table 4. Functional architecture of the modern insurance market

Market function	Content	Management significance
Risk-transforming	Converts individual uncertainty into collectively managed and statistically assessable risk.	Requires portfolio diversification, underwriting discipline and adequate risk classification.
Compensatory-reproductive	Restores disrupted household and business processes after insured events.	Links claims performance to economic continuity and customer confidence.
Investment-distributive	Accumulates technical reserves and channels temporarily free funds into financial assets.	Connects asset-liability management with long-term financial stability.
Stabilizing	Distributes the financial consequences of shocks across policyholders, insurers and reinsurers.	Supports resilience and limits transmission of localized losses.
Information-analytical	Collects, processes and interprets information about hazards, behavior and claims.	Creates a data foundation for pricing, prevention, fraud control and strategic planning.
Institutional-regulatory	Establishes rules, standards and confidence among market participants.	Aligns insurer governance, consumer protection and supervisory objectives.

The risk-transforming function is the foundation of the system. Through pooling, classification and diversification, isolated financial threats become portfolio obligations that can be estimated and financed. This function makes it possible for households and firms to replace potentially severe losses with a predictable premium. From a management perspective, the quality of this transformation depends on the size and diversity of the risk pool, the adequacy of actuarial assumptions and the insurer's ability to respond to emerging or correlated risks.

The compensatory-reproductive function emphasizes what happens after a covered event. Claim payments help households restore property and consumption capacity and

allow firms to repair assets, replace inventories and continue operations. Efficient claims settlement therefore supports economic reproduction, not merely contractual compliance. The investment-distributive function emerges because premiums are received before many claims are paid. Technical reserves can be invested subject to prudential constraints, making insurers institutional investors and linking insurance management to capital-market development.

The stabilizing function becomes particularly important when shocks are large or widespread. Reinsurance and risk transfer mechanisms distribute losses beyond the balance sheet of a single insurer and can reduce the probability that severe events become sources of broader financial distress. The information-analytical function has expanded rapidly with digitalization. Insurers increasingly act as processors of risk information, combining historical claims data with external and real-time data to improve prediction, prevention and portfolio steering. The IAIS (2018) notes that machine learning and AI can support real-time prediction, risk pricing, fraud prevention, automated underwriting, claims handling and preventive counselling, while also creating consumer-outcome considerations.

Finally, the institutional-regulatory function provides the rules that make long-term promises credible. Supervision, disclosure, solvency requirements, market conduct rules and consumer-protection mechanisms reduce the consequences of information asymmetry at the institutional level. Taken together, the six functions demonstrate that the insurance market should be managed as a complex socio-economic system. Performance indicators should therefore extend beyond premium volume and profitability to include claims reliability, solvency, risk reduction, customer trust, data governance and the capacity to support economic resilience.

Managerial and Policy Implications

For insurers, the findings imply that underwriting and pricing should be designed as part of an integrated governance system. Data-driven segmentation can improve risk differentiation, but model governance should include validation, documentation, fairness testing and review of outcomes across customer groups. Human oversight remains important in complex or high-impact decisions, especially when automated systems affect access to essential protection or when customers contest a decision.

Claims management should be viewed as the decisive moment in which the intangible promise becomes observable service quality. Speed alone is insufficient. A high-quality claims system should combine efficient verification, consistent interpretation of coverage, clear communication and accessible appeal mechanisms. Because policyholders often assess an insurer through claims experiences shared by other customers, claims governance has a direct reputational effect that can influence market demand beyond the individual case.

Product design should also incorporate risk-prevention services where economically justified. Digital alerts, telematics feedback, property monitoring and advisory services can reduce losses while making the insurance relationship more continuous. This shifts the business model from passive compensation toward active risk management. However, customers should understand what data are collected, how they are used and whether participation affects pricing or coverage.

For regulators, the analysis suggests that digital innovation should be evaluated in relation to the underlying economic functions of insurance. Innovation that improves risk assessment and service efficiency can strengthen the market, but weak data governance, opaque algorithms or exclusionary pricing can undermine trust and accessibility. Proportionate regulation should therefore protect solvency and consumers while allowing insurers to experiment with new data sources and delivery channels under appropriate governance safeguards.

At the market level, the development of insurance should not be measured solely through premium growth. A more informative assessment should also consider claim-payment quality, solvency, market concentration, customer complaints, insurance penetration, product accessibility, digital security and the effectiveness of consumer protection. Such a broader management perspective better reflects the role of insurance in transforming uncertainty into manageable financial obligations and supporting economic resilience.

Limitations and directions for further research

The study is conceptual and therefore does not estimate the quantitative effect of the proposed management blocks on profitability, loss ratios, customer retention or insurance penetration. This limitation is deliberate because the objective is to establish a coherent analytical structure before empirical testing. Future research can convert the framework into measurable constructs. Risk and actuarial management can be represented by loss-ratio stability, reserve adequacy and reinsurance dependence; information-asymmetry management by underwriting accuracy, fraud indicators and the use of deductibles; trust and solvency management by complaint rates, claims-settlement time, capital adequacy and customer confidence; and digital governance by data-quality controls, model validation, cyber incidents and explainability procedures.

Empirical testing can be conducted at three levels. At the firm level, panel data can be used to examine whether stronger integration of actuarial, digital and customer-governance practices is associated with more stable underwriting results. At the customer level, surveys and structural equation modeling can test how transparency, perceived fairness, digital convenience and trust affect purchase intention and renewal behavior. At the market level, comparative analysis can investigate whether institutional quality and digital maturity strengthen the relationship between insurance development and economic resilience. Such research would be particularly valuable in emerging economies, where insurers may adopt advanced technologies faster than consumer-protection institutions and insurance culture develop. Longitudinal designs would also help distinguish short-term efficiency gains from sustainable improvements in market trust and inclusion.

4. Conclusion

This article has shown that an insurance service is a distinctive financial product whose value lies primarily in future protection against uncertain financial consequences. Its specific nature is determined by intangibility, probabilistic outcomes, delayed realization of utility, actuarial pricing, information asymmetry, dependence on trust and institutional embeddedness. These characteristics explain why insurance-market management cannot be reduced to conventional sales management or financial intermediation.

Information asymmetry is a central management problem because it influences both the composition of the insurance pool and policyholder behavior after contract formation. Adverse selection and moral hazard therefore require a coordinated set of underwriting, pricing, monitoring and incentive mechanisms. At the same time, the insurer's solvency, reputation and claims behavior are integral components of product quality because customers purchase a future promise whose credibility cannot be fully verified in advance.

Digital technologies expand the capacity of insurers to assess risk, personalize coverage and automate operations, but they also introduce new asymmetries related to data access, algorithmic complexity and explainability. The proposed Integrated Insurance Product Management Framework responds to this challenge by connecting six management blocks: risk and actuarial management, information-asymmetry management, trust and solvency management, digital and data governance, customer-value management, and institutional-regulatory coordination. The framework provides a

basis for future empirical research on the relationship between digitalization, trust, pricing accuracy and insurance-market development.

Future studies can operationalize the proposed framework using insurer-level or market-level indicators and test its dimensions through structural equation modeling, panel-data analysis or comparative case studies. Particular attention should be given to emerging insurance markets, where rapid digital adoption may coexist with limited insurance penetration, uneven financial literacy and evolving regulatory institutions. In such environments, the long-term development of insurance will depend not only on technological capacity but also on the ability of market participants to preserve the fundamental social and economic function of insurance: credible collective protection against uncertainty.

REFERENCES

- [1] OECD, *The Impact of Big Data and Artificial Intelligence (AI) in the Insurance Sector*. Paris, France: OECD Publishing, 2020. doi: 10.1787/c822ee53-en.
- [2] EIOPA, *Artificial Intelligence Governance Principles: Towards Ethical and Trustworthy Artificial Intelligence in the European Insurance Sector*. Frankfurt am Main, Germany: European Insurance and Occupational Pensions Authority, 2021.
- [3] F. H. Knight, *Risk, Uncertainty and Profit*. Boston, MA, USA: Houghton Mifflin, 1921.
- [4] K. J. Arrow, "Uncertainty and the welfare economics of medical care," *American Economic Review*, vol. 53, no. 5, pp. 941–973, Dec. 1963.
- [5] K. Borch, "Equilibrium in a reinsurance market," *Econometrica*, vol. 30, no. 3, pp. 424–444, Jul. 1962.
- [6] M. Skidmore, "Risk, natural disasters, and household savings in a life cycle model," *Japan and the World Economy*, vol. 13, no. 1, pp. 15–34, Jan. 2001.
- [7] M. Rothschild and J. E. Stiglitz, "Equilibrium in competitive insurance markets: An essay on the economics of imperfect information," *Quarterly Journal of Economics*, vol. 90, no. 4, pp. 629–649, Nov. 1976. doi: 10.2307/1885326.
- [8] S. E. Harrington and G. R. Niehaus, *Risk Management and Insurance*, 2nd ed. New York, NY, USA: McGraw-Hill/Irwin, 2004.
- [9] E. J. Vaughan and T. M. Vaughan, *Fundamentals of Risk and Insurance*, 11th ed. Hoboken, NJ, USA: Wiley, 2014.
- [10] G. A. Akerlof, "The market for 'lemons': Quality uncertainty and the market mechanism," *Quarterly Journal of Economics*, vol. 84, no. 3, pp. 488–500, Aug. 1970.
- [11] J. F. Outreville, *Theory and Practice of Insurance*. Boston, MA, USA: Kluwer Academic Publishers, 1998.
- [12] H. H. Panjer, *Operational Risk: Modeling and Analysis*. Hoboken, NJ, USA: Wiley-Interscience, 2006.
- [13] D. M. Raynes, *A History of British Insurance*. London, U.K.: Pitman & Sons, 1948.
- [14] European Commission, "Directive 2009/138/EC of the European Parliament and of the Council of 25 November 2009 on the taking-up and pursuit of the business of Insurance and Reinsurance (Solvency II)," *Official Journal of the European Union*, L 335, pp. 1–155, Dec. 2009.
- [15] International Association of Insurance Supervisors (IAIS), *Issues Paper on Increasing Digitalisation in Insurance and Its Potential Impact on Consumer Outcomes*. Basel, Switzerland: IAIS, 2018.