

Artificial Intelligence in Insurance: Industry Transformation, Customer Benefits, and Emerging Risks

Sigortacılıkta Yapay Zekâ: Sektörün Dönüşümü, Müşteri Faydaları ve Ortaya Çıkan Riskler

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Araştırma Makalesi Süreci	Research Article History
Geliş Tarihi: 22.06.2026 Kabul Tarihi: 24.09.2026 Yayın Tarihi: 30.09.2026	Received: 22.06.2026 Accepted: 24.09.2026 Published: 30.09.2026
Benzerlik	Similarity Check
Bu makale, en az iki hakem tarafından incelenmiş ve intihal yazılımı ile taranmıştır.	This article has been reviewed by at least two reviewers and screened using plagiarism detection software.
Değerlendirme	Review Process
Ön İnceleme: İç hakem (editörler). İçerik İnceleme: İki dış hakem/Çift taraflı körleme.	Preliminary Review: Internal reviewers (editors). Content Review: Two external reviewers; double-blind peer review.
Telif Hakkı & Lisans	Copyright & License
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Yapay Zekâ Kullanımı	Use of Artificial Intelligence
Bu çalışmanın hazırlanma sürecinde yapay zekâ tabanlı herhangi bir araç veya uygulama kullanılmamıştır. Çalışmanın tüm içeriği, yazar(lar) tarafından bilimsel araştırma yöntemleri ve akademik etik ilkelere uygun şekilde üretilmiştir. Goncha Muradli	No AI-based tools or applications were used in preparing this study. All content was produced by the author(s) in accordance with scientific research methods and the principles of academic ethics. Goncha Muradli
Etik Bildirim	Ethics Disclosure
turkisharr@gmail.com	turkisharr@gmail.com
Çıkar Çatışması	Conflict of Interest
Çıkar çatışması beyan edilmemiştir.	No conflict of interest has been declared.
Finansman	Funding
Yazarlar, bu araştırmayı desteklemek amacıyla herhangi bir dış fon kullanılmadığını beyan ederler.	The authors declare that no external funding was received for this research.
Yayıncı	Publisher
Published by Mehmet ŞAHİN Since 2016- Akdeniz University, Faculty of Theology, Antalya, 07058 Türkiye	Published by Mehmet ŞAHİN Since 2016- Akdeniz University, Faculty of Theology, Antalya, 07058 Türkiye
Atıf	Cite as
Muradli, G. (2026). Sigortacılıkta yapay zekâ: sektörün dönüşümü, müşteri faydaları ve ortaya çıkan riskler. <i>Turkish Academic Research Review</i> , 11(3), 709-720. https://doi.org/10.30622/tarr.1976749	Muradli, G. (2026). Artificial iantelligence in insurance: industry transformation, customer benefits, and emerging risks. <i>Turkish Academic Research Review</i> , 11(3), 709-720. https://doi.org/10.30622/tarr.1976749

Öz

Yapay zekâ (YZ) ve özellikle üretken yapay zekâ, müşterilerin dijital kanallara yönelip daha fazla kişiselleştirme talep ettiği bir dönemde sigorta sektöründe hızla benimsenmektedir. Bu derlemenin amacı, yapay zekânın sigortacılığı nasıl dönüştürdüğünü, müşterilere neden fayda sağlayabileceğini ve aynı zamanda sigortacıları nasıl daha kötü bir konuma getirebileceğini incelemektir. Yöntem açısından çalışma, ampirik bir araştırma değil yapılandırılmış bir anlatı derlemesidir: ağırlıklı olarak 2022-2026 yılları arasında yayımlanan hakemli akademik araştırmalar ile sektör, düzenleyici ve piyasa kaynakları; güncellik, ilgililik ve otorite ölçütlerine göre amaçlı olarak seçilmiş ve sigorta değer zinciri ile yapay zekânın fırsat-risk ikiliği çerçevesinde bir araya getirilmiştir. Derlemenin bulgularına göre yapay zekânın benimsenmesi artık sigortacılar arasında neredeyse evrenseldir; ancak yalnızca küçük bir azınlık bunu pilot uygulamaların ötesine taşıyabilmiştir. Yapay zekâ; daha hızlı hizmet, daha geniş erişim ve dijital, kişiye özel deneyimlere yönelik belgelenmiş taleple örtüşen kişiselleştirilmiş fiyatlandırma ve ürünler gibi somut müşteri faydaları sunmakta; ortaya çıkan ajansal (agentic) yapay zekâyâ geçiş ise dağıtım kanalını yeniden biçimlendirmeye, insan acenteleri güçlendirirken aynı zamanda onları devre dışı bırakma tehdidi oluşturmaya başlamaktadır. Ancak aynı yetenekler karşıt riskler de doğurmaktadır: üretken araçlar derin sahtecilik (deepfake) ve sentetik hasar taleplerini mümkün kılarak dolandırıcılık savunmasını hem güçlendirmekte hem zayıflatmakta; veri gizliliği gerilimlerini artırmakta; şeffaf olmayan modeller ise önyargı, adalet ve güven konusunda artık düzenlemelerle kayıt altına alınan endişeler doğurmaktadır. Çalışma, yapay zekânın sigortacılar üzerindeki net etkisinin önceden belirlenmiş olmaktan çok koşullu olduğu; yönetişime, şeffaflığa ve kişiselleştirme ile gizlilik arasındaki içsel gerilimin yönetimine bağlı olduğu sonucuna varmaktadır.

Anahtar Kelimeler

sigortacılık, yapay zekâ, üretken yapay zekâ, sigorta dolandırıcılığı, veri gizliliği

Öne Çıkanlar

- Bu derleme, yapay zekânın sigortacılıkta iki ucu keskin bir güç olduğu ve sigortacılar üzerindeki net etkisinin önceden belirlenmiş olmaktan çok yönetişime bağlı olduğu temel tezini öne sürmektedir.
- Yapay zekânın benimsenmesi sigortacılar arasında artık neredeyse evrenseldir; ancak yalnızca küçük bir azınlık bunu pilot uygulamaların ötesine taşıyabilmiştir.
- Yapay zekâ; daha hızlı hizmet, daha geniş erişim ve dijital deneyimlere yönelik belgelenmiş eğilimle örtüşen kişiselleştirme yoluyla müşterilere fayda sağlar.
- Dolandırıcılık tespitini güçlendiren üretken araçlar aynı zamanda derin sahte ve sentetik hasar dolandırıcılığını mümkün kılar ve gizlilik ile güven endişelerini artırır.
- Ajansal yapay zekâ; karmaşık danışmanlıkta insan acenteleri güçlendirirken basit ürünlerde onları devre dışı bırakma tehdidiyle dağıtımını yeniden biçimlendirmeye başlamaktadır.

Abstract

Artificial intelligence (AI), and generative AI in particular, is being adopted across the insurance industry at the same time that customers are migrating to digital channels and demanding greater personalization. The purpose of this review is to examine how AI is reshaping insurance, why it can benefit customers, and how it can simultaneously leave insurers worse off. Methodologically, the study is a structured narrative review rather than an empirical study: peer-reviewed research and authoritative industry, regulatory, and market sources published primarily between 2022 and 2026 were purposively selected for relevance, recency, and authority, and were synthesized around the insurance value chain and the opportunity-risk duality of AI. The review finds that adoption of AI is now near-universal among insurers, yet only a small minority have scaled it beyond pilots. AI delivers tangible customer benefits- faster service, broader access, and personalized pricing and products aligned with documented demand for digital, tailored experiences and the emerging shift to agentic AI is beginning to reshape distribution, augmenting human agents while threatening to disintermediate them. The same capabilities, however, generate countervailing risks: generative tools both strengthen and undermine fraud defenses by enabling deepfake and synthetic claims; they intensify data-privacy tensions; and opaque models raise concerns about bias, fairness, and trust that are now being codified in regulation. The study concludes that AI's net effect on insurers is conditional rather than predetermined, depending on governance, transparency, and the management of an inherent tension between personalization and privacy. The review contributes an integrative synthesis that links AI's benefits to their countervailing risks and identifies directions for future research.

Keywords

insurance, artificial intelligence, generative AI, insurance fraud, data privacy

Highlights

- This review advances the central thesis that artificial intelligence is a double-edged force in insurance whose net effect on insurers is not predetermined but conditional on governance.
- AI adoption is now near-universal among insurers, yet only a small minority have scaled it beyond pilots.
- AI benefits customers through faster service, broader access, and personalization that match a documented shift toward digital experiences.
- The same generative tools that strengthen fraud detection also enable deepfake and synthetic-claim fraud and intensify privacy and trust concerns.
- Agentic AI is beginning to reshape distribution, augmenting human agents for complex advice while threatening to disintermediate them for simple products.

Introduction

Insurance is, at its core, an information business: insurers compete on their ability to assess risk, price it, and settle claims accurately and efficiently. It is therefore unsurprising that artificial intelligence (AI) and, since 2023, generative AI in particular, has been embraced by the sector as a potentially transformative technology. The industry possesses precisely the conditions AI rewards: deep, longitudinal data reserves and a long tradition of data-driven decision-making (Boston Consulting Group, 2025). At the same time, customer expectations are shifting. Insurance buyers increasingly research, purchase, and manage policies through digital channels and expect the same tailored, on-demand experiences they receive from technology and retail platforms, with personalization moving from a differentiator to a baseline expectation (Accenture, 2023; Capgemini, 2026).

These two forces- a supply-side rush to deploy AI and a demand-side pull toward digital, personalized service are reshaping insurance simultaneously. The prevailing narrative frames this as a clear win: AI promises faster claims, sharper underwriting, lower costs, and more individualized products. Yet the same technologies that benefit customers can also leave insurers worse off. Generative AI that helps detect fraud also enables it; data-hungry personalization collides with rising privacy sensitivity; and opaque models that price risk more precisely raise questions of bias, fairness, and trust that regulators are now beginning to answer (Mahajan et al., 2025). The result is a technology that is genuinely double-edged.

A further, still-emerging shift, from generative to agentic AI, in which autonomous systems act across workflows with limited human oversight extends these dynamics into the distribution channel itself, with direct consequences for the traditional insurance agent.

This article reviews the state of AI in insurance along three questions. First, how is AI, together with the broader digital shift, reshaping the industry? Second, why can it benefit customers? Third, how can it simultaneously make insurers worse off, specifically through fraud, privacy, and trust? The contribution is an integrative synthesis that places the widely discussed benefits of AI alongside their countervailing risks, and argues that AI's net effect is conditional on governance rather than predetermined. The remainder of the paper sets out the review method, the digital and AI turn in insurance, AI's reshaping of the value chain, the rise of agentic AI and its effect on distribution, its benefits to customers, and its downside risks, before discussing implications and concluding.

Materials and Methods

This is a structured narrative review rather than an empirical study; no new data were generated. Sources were selected for relevance to the three guiding questions, for recency (with emphasis on material published between 2022 and 2026), and for authority, drawing on peer-reviewed journals, primary regulatory texts, and research from established consultancies, reinsurers, and industry bodies. Peer-reviewed literature was used to anchor conceptual claims about the insurance value chain, insurability, algorithmic bias, and fairness; industry and market research was used to characterize current adoption, investment, consumer demand, and the emerging fraud landscape, for which peer-reviewed evidence necessarily lags. Findings are organized around the insurance value chain and the opportunity-risk duality of AI. Two limitations follow: several quantitative figures derive from industry surveys that use differing samples and definitions and are periodically revised, and the fast-moving

nature of generative AI means any synthesis is a snapshot. Where estimates vary across providers, this is noted in the text.

The Digital and AI Turn in Insurance

Customers Are Choosing Digital and Demanding Personalization

The clearest signal driving insurers toward AI is customer behavior. Across large multi-market consumer studies, demand for digital, tailored insurance experiences is rising: surveys report that a large majority of customers are more likely to purchase from insurers offering personalized advice, and that most are willing to share personal and smart-device data in exchange for lower premiums and better service (Accenture, 2023). Personalization has shifted from a competitive differentiator toward a baseline expectation set by experiences in retail and streaming (Capgemini, 2026). Crucially, this willingness is conditional on trust: customers are markedly more prepared to share data with insurers they trust, a point that becomes central to the risks discussed later (Accenture, 2023). The same research also reveals a countervailing trend- growing reluctance to surrender personal data producing what Accenture describes as a consumer in conflict, simultaneously wanting personalization and guarding privacy (Accenture, 2021).

Carriers Are Investing Heavily in AI and Digital Capability

On the supply side, insurers have moved quickly. A 2024 cross-industry benchmark found the insurance sector outpacing nearly all others in AI adoption, second only to technology and telecommunications, with some firms investing as much as one billion U.S. dollars in growth and technology with a particular emphasis on AI (Boston Consulting Group, 2025). Industry surveys indicate that around 90% of insurers are evaluating generative AI and a majority have moved into early or full deployment (AllAboutAI, 2025), while roughly four in five insurers commit at least five million dollars per year to AI initiatives (CIO Dive, 2026). The strategic intent is concentrated: analysis of patent filings shows that three U.S. property-and-casualty insurers, State Farm, USAA, and Allstate, account for 77% of insurer AI patents, and that generative AI has surged from 4% to 31% of insurer AI filings since 2023 (Insurance Business, 2025). Digital transformation now ranks as the single top strategic priority for 74% of insurers based on a survey result conducted among 43 leading insurance C-level executives (FinTech Global, 2025).

Adoption, however, is not the same as transformation. A survey of 160 global insurers found that while 78% of property-and-casualty carriers had adopted generative AI, only about 4% had scaled it meaningfully across claims operations (Risk and Insurance, 2025). Boston Consulting Group similarly estimates that only 7% of insurers have brought AI to enterprise-wide scale, a gap widely described in the industry as pilot purgatory (AllAboutAI, 2025; Boston Consulting Group, 2025). Figure 1 illustrates this funnel from near-universal experimentation to narrow, scaled deployment. The implication is that the customer benefits attributed to AI remain, for most insurers, prospective rather than realized, consistent with evidence that AI payback typically takes two to four years, with only about 6% of organizations reporting returns within a year (Deloitte, 2025).

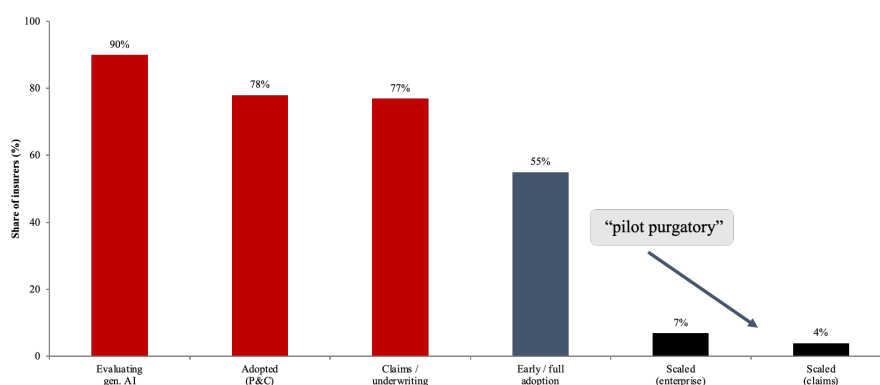


Figure 1. AI adoption among insurers is near-universal, but meaningful scaling lags. Shares are drawn from differently scoped industry surveys and are indicative rather than strictly comparable.

How Artificial Intelligence Is Reshaping the Insurance Value Chain

AI's reach extends across the entire value chain. In their influential review, Eling et al. (2022) argue that AI shifts the insurance business model from loss compensation toward loss prediction and prevention, with applications spanning distribution, underwriting, pricing, claims, and asset management. A 2025 systematic review reaches a complementary conclusion, mapping AI use cases across automotive, health, and property lines while stressing the need to balance efficiency against ethical and regulatory constraints (Bhattacharya et al., 2025). In distribution and marketing, AI enables personalized targeting and product recommendation; in underwriting and pricing, it supports data-intensive risk selection and behavior-based, dynamic pricing; in claims, it automates triage, document processing, and damage assessment; and in customer service, it powers chatbots and virtual assistants available around the clock (Eling et al., 2022; Vonage, 2025).

The operational gains reported are substantial. Insurers that redesign claims end-to-end around AI rather than bolting it onto existing processes have achieved a 35% productivity boost and cut homeowners' claims processing times in half (Risk and Insurance, 2025). Survey evidence points to a strategic migration of generative AI from back-office tasks toward front-office, customer-facing functions, with 55% of insurers anticipating cost savings of 11% to 20% (EY, 2025). McKinsey analysis cited across the industry associates AI-led operating models with 10% to 15% premium growth and up to 40% lower onboarding costs (AllAboutAI, 2025). These figures should be read as indicative; they derive from vendor and consultancy research with varying methodologies but the direction is consistent: AI compresses cycle times and cost across the chain.

Agentic AI and the Future of the Distribution Channel

A further shift is now underway, from generative AI, which assists with discrete tasks, toward agentic AI: autonomous systems that can plan and execute multi-step processes across systems with minimal human intervention (ScienceSoft, 2026). Where a generative model drafts a document, an agentic system can gather customer data, navigate carrier rating engines, generate and compare quotes, and manage follow-up end-to-end. Agentic AI was the most actively pursued form of AI in insurance entering 2026 (ScienceSoft, 2026), and adoption is expected to climb steeply: only about 16% of property-and-casualty insurers currently use AI to augment human underwriting, but roughly 60% plan to by 2028 (insuretechtrends, 2026), and around one in five insurers expect an agentic solution in production by the end of 2026 (insuretechtrends, 2026). Figure 2 sketches this trajectory.

Early evidence links advanced-analytics adoption to performance, with sophisticated adopters reporting lower combined ratios and higher premium growth than slower movers (insuretechtrends, 2026).

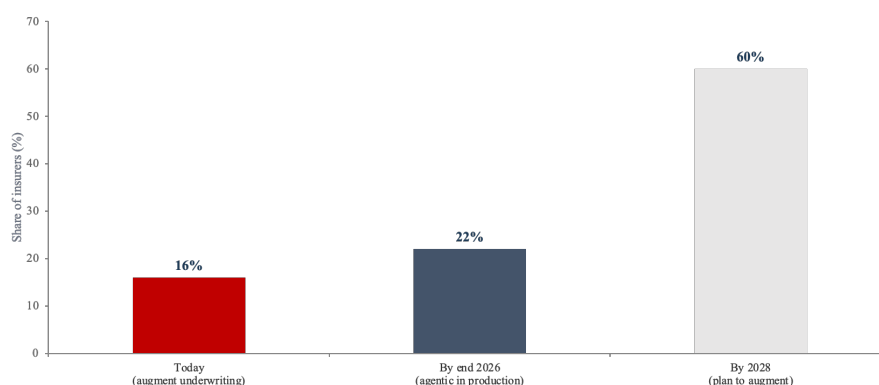


Figure 2. The expected ramp in agentic and AI-augmented capability among insurers. The three bars draw on related but distinct metrics and indicate the direction of adoption rather than strictly comparable shares.

For the traditional agent channel, agentic AI cuts both ways. On the augmentation side, AI agents can relieve human producers of the administrative burden that consumes much of their day—data gathering, quoting, follow-up, and routine servicing, freeing them for the relationship work customers value most. Carriers deploying agents report that underwriters can redirect recovered time toward complex risk assessment and relationship building, repositioning them as portfolio strategists rather than processors (insuretechtrends, 2026). Capgemini similarly finds that data-driven distribution tools are insurers’ top priority for improving agent effectiveness, with AI-equipped agents better able to deliver personalized recommendations and close business (Capgemini, 2026). In this framing, AI amplifies the agent rather than replacing them.

On the disintermediation side, however, agentic AI threatens to bypass the human agent for simpler products. Analysts at J.P. Morgan have outlined a scenario in which AI agents embedded in consumer platforms such as ChatGPT manage the entire personal-lines journey—researching, comparing, and purchasing on the customer’s behalf, raising price transparency, churn, and competitive intensity (Genasys, 2026). The early signs are visible: insurance-sales applications have begun to appear inside large-language-model ecosystems, and the prospect of “agentic commerce,” in which a customer’s personal AI queries dozens of carriers and shortlists policies autonomously, is being taken seriously enough to move broker share prices (AI Risk, 2025; ScienceSoft, 2026). The risk for incumbents is that fragmented legacy systems may leave them unable to connect to these new agent-mediated channels, ceding the customer interface to whoever controls the consumer’s agent (Insurance Thought Leadership, 2026).

The probable outcome is bifurcation rather than wholesale replacement. As AI commoditizes the transactional, low-complexity end of the market, the human agent’s value migrates upward toward genuine advice, complex and commercial risk, and advocacy at the point of claim—a shift from transactional salesperson to trusted adviser (Genasys, 2026). Industry leaders frame the near-term path as augmentation with humans retained “in the loop,” particularly for higher-stakes decisions where fully autonomous determination is neither trusted nor, yet, permitted (Insurance Business, 2026; InsuranceNewsNet, 2025). This repositioning connects directly to the trust theme of this review: precisely because agentic systems can transact without a human, the relationships and advocacy that human agents provide become the differentiator algorithmic channels struggle to replicate, provided insurers preserve and invest in them. A related concern is that automating entry-level tasks may erode the

traditional training ground through which the next generation of underwriters and agents develops expertise (InsuranceNewsNet, 2025).

Why Artificial Intelligence Benefits Customers

For customers, the most immediate benefit is speed and convenience. AI automates the manual steps of quoting, underwriting, and claims, reducing interactions that once took days to minutes and enabling the self service, digital-first journeys that consumers increasingly prefer (Accenture, 2023; Vonage, 2025). A second benefit is personalization: by analyzing richer behavioral and contextual data, insurers can tailor coverage and price to the individual rather than the pool, and can proactively recommend protection at relevant life events, precisely the tailored experience customers report wanting (Capgemini, 2026). A third is access and inclusion: more granular, data-driven underwriting can extend coverage to risks that rules-based systems handled poorly, and lower operating costs can support more affordable or usage-based products.

A fourth benefit is service quality. Intelligent assistants provide continuous, multichannel support, while AI routing can hand complex cases to human agents, combining efficiency with empathy (Vonage, 2025). Underlying all of these is a potential price benefit: to the extent that AI lowers loss and expense ratios, through better risk selection and fraud detection, some of that saving can be passed to customers in a competitive market (Earnix, 2025). It is important, however, not to overstate the win-win. These benefits are realized unevenly given the scaling gap documented above, and several of them, behavior-based pricing in particular, depend on data collection that introduces the privacy and fairness risks examined next. The customer benefit, in other words, is real but conditional.

The Downside: How Artificial Intelligence Can Leave Insurers Worse Off

Fraud: Artificial Intelligence as Both Shield and Sword

Fraud is the clearest example of AI's double edge. As a shield, AI materially strengthens fraud defense: anomaly-detection models are reported to outperform legacy systems by 40% to 60% (Deloitte, 2025), AI has been associated with a 22% reduction in fraudulent-claim incidents (insuretechtrends, 2026), and 35% of insurance executives now rank fraud detection among their top priorities for generative AI investment (Guidewire, 2026). Against a backdrop in which insurance fraud is estimated to cost the United States on the order of 308 billion dollars per year (Coalition Against Insurance Fraud, 2022), these gains matter.

As a sword, however, the same generative tools have armed fraudsters. Anyone with a smartphone can now fabricate convincing "deepfake" photos and videos of damage, or make subtler "shallowfake" edits to genuine images, and submit them through the very digital, low-touch channels that AI has made efficient (Guidewire, 2026; Verisk, 2025). The signals are striking: one voice-security firm observed a 475% increase in synthetic-voice fraud attacks at insurers in 2024 (TruthScan, 2025). UK insurers reported a roughly 300% rise in manipulated claim images in a single year, prompting an explicit warning from Allianz UK (TruthScan, 2025). Swiss Re's risk-foresight analysis concludes that deepfakes and AI-enabled disinformation will raise insurers' detection costs and can erode trust in the industry itself (Swiss Re, 2025). The push toward "touchless" claims amplifies the exposure, because AI-manipulated evidence may be accepted automatically unless forensic checks are embedded from the first inspection (Verisk, 2025). Figure 3 summarizes this duality.

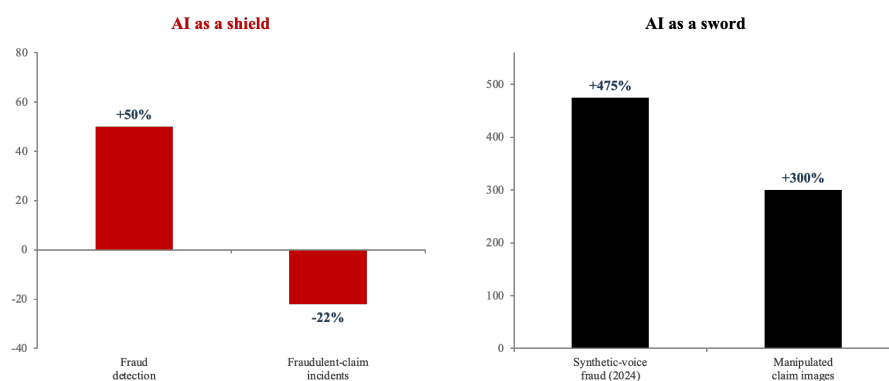


Figure 3. Artificial intelligence acts as both shield and sword in insurance fraud. Figures are drawn from different studies and metrics and are indicative of direction and magnitude rather than directly comparable.

Privacy and the Personalization Paradox

The personalization that customers value is fueled by data, and the appetite for that data sits in tension with rising privacy sensitivity. While many customers will share data for better prices and service, reluctance is growing: Accenture reports the share of consumers who consider sharing personal data too intrusive rising over time, describing a consumer simultaneously wanting personalization and guarding privacy (Accenture, 2021, 2023). Willingness is conditional on trust; customers share far more readily with insurers they trust (Capgemini, 2026) so any erosion of trust directly constrains the data on which AI-driven personalization depends. Behavior-based products that monitor driving, health, or location intensify the issue, raising questions of surveillance, consent, and data security that, if mishandled through breaches or perceived overreach, convert a source of advantage into a source of liability and regulatory exposure.

Bias, the Black Box, and Trust

Finally, the opacity of advanced AI raises concerns about bias, fairness, and trust. Insurers increasingly rely on models whose decisions are difficult to explain, even as regulators and customers demand explainability to ensure fairness and maintain public confidence (Bhattacharya et al., 2025). The concern is not hypothetical: modeling under the European Union's AI Act which classifies insurance underwriting AI as "high-risk" (European Union, 2024, Annex III, point 5(c)) estimates that, absent mitigation, premiums for the lowest-income quintile can exceed fair benchmarks by 5.8% in life and 7.2% in health lines, and that compliance shifts cost and capital onto insurers (Mahajan et al., 2025). Finer segmentation also collides with social norms and anti-discrimination law, so that what is statistically optimal may be legally or ethically impermissible (Mahajan et al., 2025). Trust is the binding constraint: it is the basis on which customers share data and accept algorithmic decisions, yet it is fragile and, as Swiss Re notes, vulnerable to AI-enabled disinformation (Swiss Re, 2025). An insurer that scales AI faster than its governance risks the very trust on which the customer benefits depend.

Discussion

Read together, these strands describe a technology whose effect on insurers is conditional rather than uniformly positive. The benefits to customers- speed, access, personalization, and potentially price are real and align with documented demand, but they are realized unevenly given the persistent gap between adoption and scaling, and they rest on data collection and algorithmic decision-making that generate the very risks of fraud, privacy erosion, and mistrust examined here. The defining feature is duality: the generative models that detect

fraud also manufacture it; the data that personalizes also exposes; and the precision that prices risk fairly for most can price it unfairly for some. None of these tensions resolves itself. Each is governed by the quality of an insurer's data and model governance, the transparency of its algorithms, the robustness of its fraud forensics, and the care with which it handles consent and privacy.

Two implications follow. For insurers, capability and control must advance together: scaling AI ahead of governance exposes the firm precisely on the fraud, privacy, and fairness dimensions that regulators and customers are watching most closely, and the near-term cost of compliance may precede the efficiency gains (Deloitte, 2025; Mahajan et al., 2025). For regulators and the broader market, the same duality argues for frameworks, such as the EU AI Act and the model guidance emerging from U.S. supervisors that make algorithmic decisions auditable without foreclosing the genuine benefits AI offers customers (European Union, 2024; Geneva Association, 2023). The central message for both is that the question is not whether AI helps or harms, but under what governance conditions its benefits exceed its costs.

Conclusions and Future Directions

Artificial intelligence is reshaping insurance along the whole value chain, and it offers customers tangible benefits in speed, access, and personalization that match a clear shift in their preferences toward digital, tailored service. Those same capabilities, however, can adversely affect insurers: generative AI strengthens and simultaneously undermines fraud defenses, deepens the tension between personalization and privacy, and through opaque models threatens fairness and the trust on which the entire system rests. AI in insurance is therefore best understood not as an unambiguous good but as a powerful, double-edged tool whose net value is decided by governance.

Several directions for future research follow. First, the net customer-welfare effect of AI-driven personalization, weighing lower prices and better service against privacy loss and the risk of exclusion, deserves rigorous empirical measurement. Second, explainable-AI methods for underwriting and pricing, and their acceptance by customers and regulators, merit further study. Third, the arms race between AI-enabled fraud and AI-based detection, including deepfake-resilient claims verification, is an urgent applied problem. Fourth, the impact of agentic AI on distribution and the future role of the human insurance agent, balancing augmentation against disintermediation, warrants close study. Fifth, longitudinal work on how AI adoption affects consumer trust would help clarify the binding constraint identified here. Finally, comparative study across mature and emerging markets would test how far the patterns documented in advanced economies generalize. Across all of these, the unifying question is the governance under which AI's benefits to customers can be secured without leaving insurers and the insured worse off.

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