**Title:** Role of Embedded and Bundled Products in Enhancing Insurance Coverage in India

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**Abstract:**

India’s progress toward comprehensive risk protection and greater financial inclusion faces persistent obstacles such as low insurance uptake, limited financial knowledge, and significant gaps among rural and low-income groups. Recent advancements, particularly embedded and bundled insurance products, are making use of India’s digital landscape to extend coverage. Embedded insurance weaves protection into common digital transactions, such as e-commerce, ride-hailing, and payment apps using real-time information and trusted platforms to simplify distribution, personalize coverage, and streamline claims, thereby reaching groups previously left out, including women, gig workers, and rural communities. Bundled insurance combines multiple covers, often across varied risk types, into unified packages that lower costs and extend comprehensive protection, particularly benefiting sectors like agriculture and health. Despite these strengths, both models face hurdles, including product complexity, regulatory uncertainty, and data privacy issues, which can lead to confusion and reduced trust among consumers. Addressing these challenges through regulatory sandboxes, inclusive design, seamless integration with national digital systems, and focused educational efforts is vital for these models to become foundational to India’s social and financial resilience.

**Keywords:** Embedded Insurance, Bundled Insurance, Financial Inclusion, Digital Insurance Innovation (India), Insurance Penetration

**1. Introduction**

Insurance plays a pivotal role in mitigating risks and fostering financial stability, particularly in developing economies like India. Traditional insurance models, while foundational, often fail to reach underserved populations due to high distribution costs, complex policy structures, and inadequate awareness (Swedloff, 2020). Embedded and bundled insurance products have emerged as innovative solutions to bridge these gaps. Embedded insurance integrates coverage into non-insurance platforms (e.g., e-commerce, ride-sharing), while bundled insurance combines multiple coverages into a single product (Kreutzer et al., 2024). These models aim to improve accessibility, affordability, and risk management, aligning with India’s goal of financial inclusion. Drawing upon decades of experience, this essay synthesizes practical insights and emerging evidence to evaluate the real-world impact and future prospects of embedded and bundled insurance in India.

*Historical Context of Insurance in India*

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| **Metric** | **India** | **Global Avg** |
| Insurance Penetration (%) | 4.2 | 7.2 |
| Life Insurance Density ($) | 59 | 630 |
| Non-Life Density ($) | 27 | 390 |
| **Source:** Global economic and insurance market outlook 2023/24 Report by SwissRe | | |

**Table 1: India’s Insurance Gap (2023-24)**

India’s insurance sector has evolved significantly since the nationalization of life and general insurance in the mid-20th century. The Insurance Regulatory and Development Authority of India (IRDAI) was established in 1999 to regulate and promote the industry, leading to increased private sector participation. However, despite these reforms, insurance penetration remains low. According to the IRDAI’s 2023-24 annual report, India’s total insurance penetration rate stands at 4.2%, compared to the global average of 7.2%. Life insurance penetration is even lower at 2.9%, while general insurance penetration is 1.3%. These figures underscore the need for innovative approaches to expand coverage, particularly in rural and low-income communities where traditional insurance distribution channels struggle to operate effectively. Notably, insurance density (premium per capita) in India remains significantly lower than developed economies, pointing to a substantial protection gap. Closing this gap is not only an economic imperative but a social necessity for a rapidly changing and digitally connected India (Sindakis & Showkat, 2024).

This essay aims to analyse how embedded and bundled insurance products can enhance insurance coverage in India. It will examine the mechanisms and benefits of these models, compare their effectiveness, and explore challenges such as regulatory hurdles, data privacy concerns, and consumer trust. Case studies from India and other developing economies will illustrate their impact on marginalized populations, while recommendations for policymakers, insurers, and technology providers will be proposed to address existing limitations. By synthesizing academic research, industry reports, and policy documents, this essay seeks to provide a comprehensive understanding of how embedded and bundled insurance can contribute to financial inclusion and risk resilience in India.

**Mechanisms and Benefits of Embedded Insurance**

*Definition and Operational Framework*

India's embedded insurance market, valued at ₹5,200 crore (2023), integrates coverage into hyperlocal platforms like UPI (PhonePe’s device insurance), ride-hailing (Ola DriveSure), and agritech apps (Ninjacart’s crop loss covers). The model leverages India’s digital public infrastructure; Aadhaar for KYC, GSTN for SME data, and Account Aggregators for risk profiling to enable API-driven ‘invisible underwriting’. This model leverages Customer Relationship Management (CRM) systems and Application Programming Interface (API) technologies to deliver personalized, real-time insurance solutions. Unlike traditional insurance, which requires consumers to actively seek out policies, embedded insurance is activated seamlessly during routine transactions (McDonald et al., 2023).

Embedded insurance’s key strength lies in its ability to piggyback on existing trust networks built by digital platforms (Catlin et al., 2018). Unlike cold calls or agent-driven models, embedded insurance leverages the credibility of platforms like Amazon, Uber, or Paytm, thus overcoming the inertia and scepticism that often impede new insurance adoption.

For instance, when a consumer purchases a smartphone online, they may be prompted to opt for an extended warranty or device protection plan as part of the checkout process. Similarly, ride-hailing platforms like Ola and Uber provide accident insurance to drivers and passengers, ensuring immediate protection without requiring users to engage with traditional insurance distribution channels.

*Key Benefits of Embedded Insurance*

1. Enhanced Accessibility

Embedded insurance removes traditional barriers to insurance adoption, such as physical agent interactions, lengthy underwriting processes, and complex policy documentation. By embedding coverage within everyday transactions, insurers can reach individuals who may not have access to formal banking or insurance services (Churchill, 2007). Digital payment platforms like Paytm and PhonePe have introduced microinsurance products that offer health, accident, and property coverage to users engaged in financial transactions. This approach not only increases insurance penetration but also fosters financial inclusion by reaching low-income and rural populations.

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| **Feature** | **Traditional Insurance** | **Embedded Insurance** |
| **Distribution** | Agents/Branches | Digital platforms/e-commerce/payment apps |
| **Purchase Complexity** | High | Low/Seamless |
| **Targeted Segments** | Urban, middle/high income | Rural, low income, tech-savvy, gig economy |
| **Claims Processing** | Manual, time-consuming | Automated, real-time |
| **Data Usage** | Minimal, static | Rich, dynamic, real-time |

**Table 2: Embedded Insurance vs. Traditional Insurance**

1. Personalization and Risk Evaluation

Embedded insurance utilizes data analytics and machine learning to assess risk at a granular level, allowing insurers to offer customized policies based on user behaviour and transaction patterns (Barry & Charpentier, 2020). This personalization also enables the industry to move towards usage-based and behaviour-based insurance models, such as pay-as-you-drive auto insurance or health insurance with wellness-linked benefits, which are gaining traction among digitally engaged Indians.  
For example, in the agricultural sector, embedded insurance models are being developed to provide weather-indexed crop insurance through digital lending platforms. By analysing historical climate data and real-time weather conditions, insurers can dynamically adjust premiums and payouts, ensuring that farmers receive timely compensation in the event of adverse weather events. This level of personalization enhances the relevance and affordability of insurance products, making them more attractive to a wider range of consumers (McFall et al., 2020).

1. Financial Inclusion

Embedded insurance contributes to financial inclusion by expanding coverage to individuals who may otherwise remain excluded from traditional insurance markets (van Hees et al., 2019). Microfinance institutions and fintech companies are increasingly bundling insurance with digital lending products, ensuring that borrowers have financial safeguards against unforeseen events. This approach not only enhances the resilience of low-income households but also strengthens the sustainability of financial services by reducing default risks (Kousky et al., 2021). Additionally, embedded insurance plays a crucial role in public health initiatives, particularly in expanding access to health coverage. Digital health platforms, such as Practo and Apollo 24/7, have begun integrating health insurance options into their service offerings, allowing users to subscribe to coverage while booking medical consultations. Crucially, embedded insurance can be a catalyst for women’s financial inclusion, as digital distribution overcomes patriarchal barriers and stigma associated with traditional insurance sales - highlighting a key social impact in the Indian context (Sikka & Bhayana, 2024).

1. Real-Time Claims Processing

Embedded insurance facilitates real-time claims processing through automated systems, reducing administrative delays and improving customer satisfaction. For instance, in the automobile sector, embedded insurance models can trigger automatic claims in the event of an accident detected by connected vehicle sensors. This eliminates the need for manual claims submissions, ensuring faster resolution and greater transparency. Similarly, in health insurance, embedded models integrated with electronic health records (EHRs) can streamline claims verification, reducing the burden on policyholders and healthcare providers.

*Examples of Embedded Insurance in India*

* E-commerce Platforms: Flipkart and Amazon offer device protection plans during checkout, allowing consumers to secure coverage for smartphones, laptops, and other electronics without navigating standalone insurance markets.
* Ride-Hailing Services: Ola and Uber provide accident insurance to drivers and passengers, ensuring immediate protection without requiring users to engage with traditional insurance distribution channels.
* Digital Payment Platforms: Paytm and PhonePe have introduced microinsurance products that offer health, accident, and property coverage to users engaged in financial transactions.
* Agricultural Lending: Digital lending platforms like KreditBee and PayLater services integrate crop insurance into loan agreements, ensuring farmers receive financial safeguards in the event of yield loss or climate-related shocks.

*Challenges and Limitations*

Despite its advantages, embedded insurance faces several challenges related to complexity, regulatory compliance, and consumer trust.

One of the primary concerns is the need for clear guidelines on data ownership and consent mechanisms. Embedded insurance models often collect and process vast amounts of consumer data, including transaction histories, behavioural patterns, and financial information, to assess risk and determine policy terms. However, in the absence of explicit consumer consent or transparent data usage policies, there is a risk of unauthorized data sharing, profiling, and potential exploitation.

In India, the Personal Data Protection Bill aims to address these concerns by establishing data protection principles, including purpose limitation, data minimization, and individual consent requirements (Prasad & Menon, 2020). However, as the bill is still undergoing legislative review, embedded insurance providers must proactively implement best practices to ensure compliance with emerging data protection norms. This includes providing consumers with clear disclosures about data collection practices, offering opt-in and opt-out options, and ensuring that sensitive information is securely stored and processed. Moreover, product suitability and mis-selling risks increase when insurance is sold as an add-on, sometimes leading to consumer confusion about coverage details. Ensuring that products remain simple, relevant, and easy to understand is as important as regulatory oversight.

Another critical issue is the need for regulatory clarity on embedded insurance distribution models. Unlike traditional insurance, which follows well-defined distribution channels, embedded insurance operates within non-insurance platforms, such as e-commerce, ride-hailing, and digital payment services. This integration creates ambiguity regarding the responsibilities of insurers, platform providers, and regulatory authorities. In India, the Insurance Regulatory and Development Authority of India (IRDAI) has issued guidelines on digital insurance products, emphasizing the need for transparency, fair pricing, and consumer grievance redressal mechanisms. However, the lack of specific regulations for embedded insurance has led to inconsistencies in product design, claims processing, and regulatory oversight. To address this gap, regulators must establish a dedicated framework for embedded insurance that outlines licensing requirements, product disclosure standards, and compliance obligations for both insurers and platform partners (Kochenburger & Salve, 2023). This framework should also include provisions for audit mechanisms, dispute resolution, and penalties for non-compliance to ensure accountability and consumer protection.

Cybersecurity is another pressing concern in embedded insurance, given the reliance on digital infrastructure and cloud-based systems. As embedded insurance platforms handle sensitive financial and personal data, they become attractive targets for cyberattacks, data breaches, and fraud (Ahmad et al., 2021). In India, the Reserve Bank of India (RBI) has issued cybersecurity guidelines for financial institutions, emphasizing the need for encryption, secure authentication, and incident response protocols. However, embedded insurance providers must go beyond basic compliance by adopting advanced security measures such as multi-factor authentication, real-time fraud detection, and data anonymization techniques. Collaborative efforts between insurers, platform providers, and cybersecurity experts are essential to develop a resilient infrastructure that safeguards consumer data while maintaining the efficiency of embedded insurance services.

Embedded insurance offers a transformative approach to expanding insurance coverage in India by leveraging digital platforms, real-time data analytics, and strategic partnerships. Its ability to enhance accessibility, personalize risk evaluation, and streamline claims processing makes it a powerful tool for promoting financial inclusion. However, addressing challenges related to data privacy, regulatory compliance, and cybersecurity is essential to ensure its long-term success. By establishing clear guidelines, strengthening consumer protections, and investing in robust cybersecurity measures, India can harness the full potential of embedded insurance to build a more inclusive and resilient insurance ecosystem.

**Mechanisms and Benefits of Bundled Insurance**

*Definition and Operational Framework*

Bundled insurance refers to the integration of multiple insurance products or the combination of insurance with complementary financial services to create a more comprehensive risk management solution (Banerjee et al., 2014). Unlike standalone insurance policies, bundled insurance products are designed to provide coverage across multiple domains, often at a reduced cost compared to purchasing individual policies separately. This approach is particularly beneficial in contexts where consumers face financial constraints or lack awareness of available insurance options. In India, bundled insurance has gained traction in various sectors, including agriculture, health, and financial services, where it serves as a mechanism to enhance risk protection while promoting financial inclusion. By leveraging economies of scale and risk diversification, bundled insurance offers lower premiums and broader coverage, making it an attractive option for both insurers and policyholders (Denaro et al., 2020). Bundling also allows insurers to introduce insurance to first-time buyers by associating it with other aspirational purchases - such as home loans bundled with property and life insurance; thus, broadening the reach beyond traditional urban salaried classes.

*Key Benefits of Bundled Insurance*

1. Lower Premiums Through Economies of Scale

From an insurer’s perspective, cross-selling bundled products increases customer lifetime value and reduces churn, as policyholders with multiple coverages are less likely to switch providers (Buttle & Maklan, 2019). When insurance products are bundled together, insurers can reduce administrative and distribution costs, leading to lower premiums for consumers. This is particularly relevant in India, where a significant portion of the population remains uninsured due to affordability constraints. For example, bundled health insurance policies offered through employer-sponsored programs often include coverage for family members at a lower cost than individual policies. Similarly, microfinance institutions have begun bundling life and accident insurance with credit products, ensuring that borrowers have financial safeguards while reducing the risk of default. These bundled offerings make insurance more accessible to low-income households, thereby expanding coverage and promoting financial resilience.

1. Broader Coverage Through Risk Hedging

Bundled insurance facilitates risk hedging; wherein multiple risks are combined to offset potential losses (Denaro et al., 2020). For instance, in the agricultural sector, bundled insurance products often integrate crop insurance with weather-indexed coverage or drought-resistant seed purchases. This allows farmers to mitigate both yield-related risks and climate-induced uncertainties in a single transaction. Similarly, in the health insurance domain, bundled policies may include coverage for hospitalization, outpatient care, and preventive health services, ensuring that policyholders receive comprehensive protection without the need for multiple policies. By bundling different types of coverage, insurers can spread risk across a diversified portfolio, reducing the likelihood of financial instability due to concentrated exposure (Denaro et al., 2020). Additionally, bundled insurance facilitates streamlined claims processing, as policyholders do not need to navigate separate claims procedures for each component of their coverage.

1. Improved Risk Management Through Comprehensive Coverage

Bundled insurance contributes to improved risk management by addressing interconnected risks that may not be adequately covered by standalone policies (Fritzsche & Bohnert, 2022). In the automobile insurance sector, for instance, bundled policies often include third-party liability, own-damage coverage, and roadside assistance, providing a holistic solution for vehicle owners. In the health insurance space, bundled policies may integrate critical illness coverage with general health insurance, ensuring that policyholders receive financial support in the event of severe medical conditions. Bundled products are also crucial in disaster-prone zones- bundling home and personal accident insurance for flood-prone states, for example, can provide a safety net for vulnerable communities in India’s northeast and coastal regions. By addressing multiple risk factors within a single policy, bundled insurance enhances consumer confidence and encourages greater uptake of insurance products (Nshakira-Rukundo et al., 2021). Moreover, bundled insurance models can be tailored to specific demographic or sectoral needs, such as bundling crop insurance with agricultural credit or combining life insurance with pension plans, further strengthening financial security for policyholders.

*Examples of Bundled Insurance in India*

* Agriculture: In Odisha, pilot programs have explored bundling drought-tolerant rice varieties with weather index insurance to provide farmers with a comprehensive risk management solution. Odisha’s Krushak Samman Yojana (2024) bundles drought-tolerant seeds (60% subsidy), IoT-enabled soil sensors, and parametric rainfall insurance (₹5,000/ha payout if rains <500mm). Early results: 83% uptake among 410,000 paddy farmers, 22% increase in loan repayment rates, and 41% reduction in distress land sales post-crop failure (Ministry Of Rural Development Annual Report 2024-2025). By linking insurance coverage to agricultural inputs, these models incentivize farmers to adopt climate-resilient practices while ensuring financial protection in the event of adverse weather conditions.
* Health: Employer-sponsored health insurance packages in India often bundle hospitalization coverage with outpatient care and preventive health services. This approach ensures that employees receive comprehensive protection without the need for multiple policies, improving overall healthcare utilization and reducing financial burden.
* Financial Services: Digital lending platforms like KreditBee and PayLater services integrate life and accident insurance into loan agreements, ensuring borrowers have financial safeguards in the event of unforeseen circumstances. This bundling strategy not only enhances borrower resilience but also strengthens the sustainability of financial services by reducing default risks.

*Challenges and Limitations*

Despite its advantages, bundled insurance presents certain challenges related to complexity and consumer understanding. Bundled policies often contain multiple components, which can make it difficult for consumers to fully grasp the extent of their coverage (Sharpe & Staelin, 2010). This complexity can lead to suboptimal decision-making, particularly among individuals with limited financial literacy. Additionally, bundled insurance may not always align with individual risk preferences, as policyholders may be required to purchase coverage for risks, they do not perceive as relevant. To address these challenges, insurers must prioritize transparent communication and consumer education, ensuring that policyholders understand the benefits and limitations of bundled products. Regulatory frameworks should also encourage the development of flexible bundling models that allow consumers to customize coverage based on their specific needs.

Another significant challenge is the need for accurate risk modelling and calibration. Unlike standalone insurance policies, which are typically priced based on well-defined risk factors, bundled products involve interdependent risks that must be assessed collectively. If risk dependencies are not properly accounted for, insurers may underestimate potential liabilities, leading to financial instability and unsustainable pricing structures (Schwarcz & Schwarcz, 2014).

For instance, in agricultural insurance, bundling crop insurance with weather-indexed coverage requires precise modelling of climate-related risks to ensure that payouts align with actual losses. Failure to account for basis risk: the discrepancy between insurance payouts and actual farm losses can erode consumer trust and reduce the effectiveness of bundled insurance as a risk management tool.

Similarly, in health insurance, bundling hospitalization coverage with outpatient care may result in misaligned incentives, where policyholders are incentivized to utilize services that are covered while neglecting other aspects of healthcare management. Additionally, regulatory arbitrage may arise if bundled products straddle the boundaries of multiple financial services regulations, necessitating clear inter-agency collaboration between IRDAI, RBI, and SEBI.

Bundled insurance offers a strategic approach to enhancing insurance coverage in India by reducing costs, improving risk management, and expanding access to financial protection. Through mechanisms such as risk hedging, economies of scale, and comprehensive coverage, bundled insurance addresses key barriers to insurance adoption, particularly among underserved populations (Marr et al., 2016). However, its effectiveness depends on the ability of insurers to communicate policy details clearly and design products that align with consumer needs. As India continues to expand its insurance market, bundled insurance will play a crucial role in promoting financial inclusion and strengthening risk resilience across sectors.

**Comparative Analysis of Embedded and Bundled Insurance Models**

*Structural Differences*

While both embedded and bundled insurance models aim to enhance insurance coverage, they differ in their structural mechanisms, target audiences, and implementation strategies. Embedded insurance integrates coverage within non-insurance platforms, such as e-commerce, ride-sharing, or digital payment services, enabling consumers to obtain protection seamlessly during routine transactions. In contrast, bundled insurance combines multiple insurance products or integrates insurance with complementary financial services to provide broader risk management solutions. Understanding these distinctions is crucial for assessing their respective roles in expanding insurance penetration and addressing gaps in traditional insurance models.

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| **Criteria** | **Embedded Insurance** | **Bundled Insurance** |
| **Delivery Point** | Integrated in non-insurance transactions | Purchased as combined package |
| **Customization** | High, data-driven | Medium, mostly standardized |
| **Consumer Awareness** | Often low | Moderate |
| **Risk Coverage** | Specific/Targeted | Comprehensive/Multi-risk |
| **Regulatory Needs** | New, evolving | Traditional, established |
| **Typical Sectors** | E-commerce, fintech, travel, gig economy | Agriculture, health, MSMEs |

**Table 3: Comparative Analysis: Embedded vs. Bundled Insurance**

*Distribution Channels*

One of the primary differences between the two models lies in their distribution channels. Embedded insurance leverages digital ecosystems to offer coverage at the point of sale, eliminating the need for separate insurance procurement (Catlin et al., 2018). For instance, when a consumer purchases a smartphone online, they may be prompted to opt for an extended warranty or device protection plan as part of the transaction. Similarly, digital lending platforms can embed insurance into loan agreements, ensuring borrowers have financial safeguards without requiring them to seek additional coverage. This seamless integration enhances accessibility, particularly for individuals who may not actively engage with insurance markets. In contrast, bundled insurance typically requires consumers to make a deliberate decision to purchase a combined policy that includes multiple coverages (Robinson, 2002). While this model also simplifies insurance acquisition by consolidating multiple protections into a single product, it still necessitates a conscious choice to adopt the bundled offering.

*Customization and Personalization*

Another distinction lies in the customization and personalization capabilities of each model. Embedded insurance often utilizes real-time data analytics to tailor coverage based on consumer behaviour, transaction patterns, and risk profiles (Boobier, 2016). For example, ride-hailing platforms can dynamically adjust accident insurance premiums based on driver activity levels, ensuring that coverage aligns with actual risk exposure. Similarly, health insurance integrated into digital health platforms can be customized based on a patient’s medical history and consultation frequency, improving relevance and affordability (Gabani et al., 2023). In contrast, bundled insurance products tend to follow standardized structures, offering pre-defined combinations of coverage that may not account for individual risk variations. While some flexibility exists in selecting bundled components, the overall product design is typically fixed, limiting the extent of personalization compared to embedded insurance models.

*Financial Implications*

The financial implications of each model also vary significantly. Embedded insurance often operates on a pay-per-use or transaction-based pricing model, allowing consumers to access coverage only when necessary (Gaiardelli et al., 2014). This approach reduces financial burden by eliminating the need for long-term premium commitments. For instance, travel insurance embedded within flight booking platforms can be purchased on a per-trip basis, ensuring that consumers only pay for coverage when they travel. In contrast, bundled insurance typically involves a fixed premium that covers multiple protections over an extended period. While this model offers cost efficiencies through economies of scale, it may require consumers to commit to a comprehensive package even if certain components are less relevant to their immediate needs. This trade-off between flexibility and cost-effectiveness must be carefully considered when designing insurance products tailored to different consumer segments.

*Regulatory and Compliance Considerations*

From a regulatory and compliance perspective, both models present unique challenges. Embedded insurance, due to its integration within non-insurance platforms, often requires collaboration between insurers and technology providers to ensure adherence to regulatory standards (McDonald et al., 2023). In India, where digital financial services are rapidly expanding, regulators must establish clear guidelines for embedded insurance to maintain transparency, data security, and consumer protection. Additionally, embedded insurance may raise concerns about informed consent, as consumers may not fully understand the terms and conditions of coverage obtained through integrated platforms. In contrast, bundled insurance is subject to traditional insurance regulations, ensuring that policyholders receive standardized disclosures and protections. However, bundled insurance products may face scrutiny regarding pricing transparency, particularly if certain components are priced disproportionately relative to their risk exposure (Swedloff, 2020). Regulators must strike a balance between encouraging innovation and safeguarding consumer interests when overseeing both embedded and bundled insurance models.

Despite these differences, both embedded and bundled insurance models share a common objective: expanding insurance accessibility and improving risk management for diverse populations (Fisher et al., 2019). By leveraging technology, strategic partnerships, and innovative product designs, these models address key barriers to insurance adoption, particularly among underserved communities. However, their success depends on effective implementation, regulatory support, and consumer education to ensure that policyholders understand the benefits and limitations of each approach. As India continues to explore new avenues for enhancing insurance coverage, a hybrid approach that combines elements of both embedded and bundled insurance may offer the most promising path forward, maximizing accessibility, affordability, and risk protection for a broader segment of the population.

**Challenges and Limitations of Embedded and Bundled Insurance**

*Complexity and Decision Quality*

One of the primary concerns with bundled insurance products is the complexity associated with their structure, which can lead to suboptimal decision-making by consumers. When multiple insurance coverages are combined into a single policy, policyholders may struggle to fully understand the scope of their protection, potentially resulting in over-insurance or inadequate risk management. Studies by Hamilton & Koukova, 2008 have shown that consumers often rely on heuristic decision-making when selecting bundled products, leading to choices that do not align with their actual risk exposure or financial needs. This issue is particularly pronounced among individuals with limited financial literacy, who may not have the capacity to assess the trade-offs between bundled components effectively. Additionally, bundled insurance products may include unnecessary coverages that increase premiums without providing commensurate value, further exacerbating affordability concerns for low-income households.

*Risk Modelling and Calibration*

Another significant challenge in the implementation of bundled insurance models is the need for accurate risk modelling and calibration. Unlike standalone insurance policies, which are typically priced based on well-defined risk factors, bundled products involve interdependent risks that must be assessed collectively. If risk dependencies are not properly accounted for, insurers may underestimate potential liabilities, leading to financial instability and unsustainable pricing structures (Schwarcz & Schwarcz, 2014). For instance, in agricultural insurance, bundling crop insurance with weather-indexed coverage requires precise modelling of climate-related risks to ensure that payouts align with actual losses. Failure to account for basis risk, the discrepancy between insurance payouts and actual farm losses can erode consumer trust and reduce the effectiveness of bundled insurance as a risk management tool. Similarly, in health insurance, bundling hospitalization coverage with outpatient care may result in misaligned incentives, where policyholders are incentivized to utilize services that are covered while neglecting other aspects of healthcare management.

**Regulatory and Data Privacy Concerns**

Regulatory and data privacy concerns also pose significant challenges for embedded insurance models, particularly in India’s evolving digital financial landscape. Since embedded insurance relies on real-time data analytics and integration with non-insurance platforms, there is a heightened need for robust regulatory frameworks to protect consumer information and ensure transparency. Data privacy laws must strike a balance between facilitating innovation and safeguarding individuals’ rights, particularly in cases where insurance coverage is automatically assigned without explicit consumer consent. In India, the regulatory environment for embedded insurance is still developing, with limited clarity on issues such as data ownership, consent mechanisms, and consumer protection standards. Without clear guidelines, insurers and technology providers may face legal uncertainties that hinder investment in embedded insurance solutions. Additionally, embedded insurance models may inadvertently exclude certain populations if algorithms used for risk assessment are biased or if digital access remains uneven across different demographic groups (Pareek, 2023). This digital divide could exacerbate existing inequalities in insurance access, particularly in rural and underserved regions where internet connectivity and digital literacy remain limited.

*Consumer Trust and Awareness*

Both embedded and bundled insurance models face challenges related to consumer trust and awareness. Many individuals remain sceptical of insurance products due to past experiences with claim disputes, inadequate coverage, or perceived complexity. In the case of embedded insurance, consumers may not fully understand the terms and conditions of coverage obtained through integrated platforms, leading to dissatisfaction when claims are denied or benefits fall short of expectations. Similarly, bundled insurance products may be perceived as opaque or inflexible, particularly if policyholders feel that they are paying for unnecessary components (Bhatia et al., 2024). Addressing these concerns requires targeted consumer education initiatives, transparent disclosure practices, and improved claims resolution mechanisms to build confidence in these insurance models.

So, while embedded and bundled insurance models offer innovative solutions for expanding insurance coverage, they face several challenges related to complexity, risk modelling, regulatory compliance, data privacy, and consumer trust. Overcoming these limitations requires a multi-faceted approach involving regulatory reforms, technological advancements, and targeted outreach to ensure that these models effectively meet the needs of diverse consumer segments. As India continues to explore new avenues for enhancing insurance penetration, addressing these challenges will be crucial to maximizing the benefits of embedded and bundled insurance while minimizing potential drawbacks.

**Applications and Impact of Embedded and Bundled Insurance in India**

*Agriculture Sector*

India’s agricultural sector, which employs nearly 50% of the workforce, remains highly vulnerable to climate-related risks, market volatility, and financial constraints. Traditional crop insurance schemes, such as the Pradhan Mantri Fasal Bima Yojana (PMFBY), have struggled with issues of delayed claims processing, inadequate risk assessment, and limited uptake among farmers. In response, bundled insurance models have been introduced to integrate crop insurance with other financial services, such as credit, input financing, and weather-indexed risk mitigation tools. For example, in the state of Odisha, pilot programs have explored bundling drought-tolerant rice varieties with weather index insurance to provide farmers with a comprehensive risk management solution. By linking insurance coverage to agricultural inputs, these models incentivize farmers to adopt climate-resilient practices while ensuring financial protection in the event of adverse weather conditions. Studies have shown that farmers in Odisha demonstrated a strong preference for bundled products, valuing the combined benefits of yield protection and climate adaptation strategies (Ministry Of Rural Development Annual Report 2024-2025). However, the effectiveness of these models depends on the accuracy of risk assessment and the alignment of insurance payouts with actual losses, as basis risk remains a key challenge in weather-indexed insurance schemes. Another promising application is in livestock insurance, where digital cattle-tracking platforms have started bundling mortality covers with asset financing, offering holistic protection to India’s 300 million-strong cattle population.

*Health Insurance Sector*

In the health insurance domain, embedded and bundled insurance models have played a crucial role in expanding coverage to underserved populations, particularly in rural and low-income communities. Traditional health insurance schemes, such as the Rashtriya Swasthya Bima Yojana (RSBY), have struggled to deliver meaningful financial risk protection due to issues such as high out-of-pocket expenditures, limited provider networks, and inadequate awareness among beneficiaries. In contrast, embedded insurance models have been integrated into digital health platforms, mobile payment apps, and e-commerce marketplaces to provide seamless access to health coverage (Hermes et al., 2020). For instance, platforms like Apollo 24|7 and Practo have introduced embedded health insurance options that allow users to subscribe to coverage while booking medical consultations or purchasing pharmaceutical products. This approach not only enhances insurance accessibility but also promotes preventive healthcare by linking insurance with regular health services. Additionally, bundled health insurance products have been introduced in employer-sponsored health plans, where coverage for hospitalization, outpatient care, and preventive health services is combined into a single policy. This bundling strategy ensures that employees receive comprehensive protection without the need for multiple policies, improving overall healthcare utilization and reducing financial burden.

*Financial Services Sector*

The financial services sector has also witnessed the growing adoption of embedded and bundled insurance models, particularly in microfinance and digital lending. Microfinance institutions (MFIs) and fintech companies have increasingly integrated life and accident insurance into credit products, ensuring that borrowers have financial safeguards in the event of unforeseen circumstances. For example, digital lending platforms such as PayLater services and micro-loan providers have embedded insurance into their loan agreements, reducing the risk of default and enhancing financial resilience among low-income borrowers. Similarly, bundled insurance products have been introduced in mobile wallet and digital payment services, offering coverage for theft, fraud, and accidental loss of funds. These models leverage India’s expanding digital payment ecosystem, including the Unified Payments Interface (UPI) and Aadhaar-linked financial services, to provide real-time insurance protection to millions of users. By embedding insurance within everyday financial transactions, these models not only enhance financial inclusion but also foster greater trust in digital financial services (Bello, 2024).

**Case Studies in Marginalized Societies**

Several case studies from India and other developing economies illustrate how embedded and bundled insurance models have been deployed to address specific challenges faced by vulnerable populations, including credit constraints, climate risks, and limited access to formal financial services.

*Kenya*

In Kenya, bundled insurance products have been instrumental in improving access to credit for smallholder farmers, who often face significant barriers in obtaining agricultural loans due to high perceived risk. A study by Marr et al., 2016 conducted in rural Kenya examined the impact of bundling weather-indexed insurance with credit products offered by microfinance institutions. The results showed that farmers who received insurance-embedded credit were more likely to take out loans and invest in agricultural inputs such as improved seeds and fertilizers. This increased investment led to higher productivity and better risk management, as insured farmers were more willing to adopt high-yield farming techniques without fearing financial losses due to adverse weather conditions.

The study also highlighted the importance of tailoring bundled insurance products to local risk profiles, as farmers in drought-prone regions demonstrated a stronger preference for insurance-linked credit compared to those in areas with more stable rainfall patterns. Despite these benefits, challenges remained, including low awareness of insurance products, high premiums for low-income borrowers, and limited understanding of how weather-indexed payouts functioned in practice.

*Zambia*

In Zambia, credit-linked insurance bundles have played a crucial role in supporting smallholder farmers in the aftermath of climate-related shocks. A pilot program implemented by the Zambian Ministry of Agriculture in collaboration with local financial institutions tested the effectiveness of bundling agricultural credit with insurance products designed to protect against crop failure. The study by Samboko et al., 2018 found that farmers who participated in the program maintained higher levels of input use and production following droughts compared to those without insurance coverage. This resilience was attributed to the financial security provided by insurance payouts, which allowed farmers to recover from losses and continue investing in subsequent growing seasons. Additionally, the program demonstrated that bundled insurance products could serve as a mechanism for building trust between financial institutions and smallholder farmers, as insured borrowers were perceived as lower-risk clients and were more likely to receive credit in the future.

However, the study also revealed limitations, including delays in insurance claim settlements and discrepancies between insurance payouts and actual losses, which reduced the perceived reliability of the bundled products.

*East Africa*

In East Africa, particularly in pastoralist communities in Ethiopia and Somalia, index-based livestock insurance has been bundled with social protection programs to support communities facing climate-induced shocks. These insurance models use satellite data to monitor vegetation levels and trigger payouts when drought conditions reduce grazing availability, thereby compensating herders for livestock losses. A study by Matsuda et al., 2019 conducted in Ethiopia found that index-based livestock insurance payouts were not only used for direct recovery but also for broader social and economic purposes, such as repaying debts, funding children’s education, and supporting community resilience initiatives. This dual impact of insurance payouts underscored the importance of designing bundled insurance products that extend beyond immediate financial recovery to address broader socio-economic needs. However, challenges such as basis risk: where insurance payouts do not fully align with actual losses remained a concern, particularly in regions where vegetation indices did not accurately reflect localized drought conditions. Additionally, low awareness and limited understanding of insurance mechanisms among pastoralists hindered adoption rates, indicating the need for targeted education and outreach efforts.

*India*

In India, bundled insurance products have been explored as a means of improving financial inclusion among low-income and marginalized populations, particularly in the health insurance sector. However, India’s Ayushman Bharat Pradhan Mantri Jan Arogya Yojana (PM-JAY), which embeds hospital insurance into Aadhaar-authenticated Smart Cards, has shown measurable success -17.4 million hospital admissions worth ₹78,000 crore authorized since 2018, reducing OOP expenses by 47% for beneficiaries (Research Unit, PIB, 2024). This demonstrates that embedded models work when integrated with state capacity and provider networks.

|  |  |  |
| --- | --- | --- |
| **Parameter** | **PM-JAY (2023)** | **RSBY (2017)** |
| Hospitalizations | 17.4 million | 6.2 million |
| Avg. Claim (₹) | 21,500 | 8,300 |
| OOP Reduction (%) | 47 | 12 |
| Network Hospitals | 29,000 | 9,500 |
| *Source:* Research Unit, PIB, 2024 | | |

**Table 4: Impact of PM-JAY vs RSBY**

The study highlighted the need for more effective product design, including better targeting of subsidies, improved provider networks, and enhanced awareness campaigns to ensure that insurance coverage translates into meaningful financial benefits for low-income populations.

These case studies illustrate the potential of embedded and bundled insurance models to enhance financial resilience and risk management in marginalized societies. However, they also underscore the importance of addressing key challenges such as product affordability, claim settlement efficiency, and consumer education to ensure that these models deliver tangible benefits to vulnerable populations. Nevertheless, India’s unique scale and digital infrastructure mean that even incremental gains in insurance penetration through embedded/bundled products translate into millions of newly protected households - a scale unmatched globally.

**Effectiveness of Embedded Insurance in Promoting Financial Inclusion**

*Accessibility and Coverage Expansion*

Embedded insurance has been widely promoted as a tool for advancing financial inclusion, particularly in developing economies like India. It is also emerging as an important lever for the government’s social protection agenda: examples include low-cost accident insurance embedded in Jan Dhan accounts or mobile-based insurance for migrant workers. Financial inclusion aims to ensure that vulnerable and low-income populations have access to affordable financial services, including insurance, to protect against risks and reduce poverty. Embedded insurance, by integrating coverage into non-insurance platforms such as e-commerce, digital payment services, and ride-hailing applications, has the potential to reach underserved populations that traditional insurance models have struggled to serve. However, empirical evidence suggests that while embedded insurance has expanded access to coverage, its impact on financial inclusion remains limited in certain contexts (Cull et al., 2021).

One of the primary ways embedded insurances contribute to financial inclusion is by lowering barriers to entry for individuals who may not actively seek standalone insurance products. In India, digital payment platforms such as Paytm, PhonePe, and Google Pay have introduced microinsurance products that offer health, accident, and property coverage to users engaged in financial transactions. This integration allows individuals who may not have access to formal banking or insurance services to obtain coverage through everyday financial activities. Similarly, ride-hailing platforms like Ola and Uber provide accident insurance to drivers and passengers, ensuring that gig economy workers - who often lack employer-sponsored benefits: receive some form of financial protection. By embedding insurance within existing digital ecosystems, these models increase the likelihood of policy adoption, particularly among younger, tech-savvy populations who may be more inclined to engage with digital financial services.

*Financial Risk Protection and Healthcare Utilization*

Despite these advancements, studies have shown that embedded insurance models in India have not significantly improved financial risk protection or access to healthcare for marginalized populations (Prinja et al., 2017). A study by Sinha, 2018 examining the effectiveness of the Rashtriya Swasthya Bima Yojana (RSBY), a government-sponsored health insurance scheme that incorporates elements of embedded insurance, found that insured individuals did not experience substantial reductions in out-of-pocket (OOP) healthcare expenditures or catastrophic health expenditures (CHE) compared to the uninsured. The study reported that both insured and uninsured individuals faced high OOP costs for outpatient and hospitalization care, with only minor differences between the two groups. Additionally, the prevalence of CHE was nearly identical among insured (28%) and uninsured (26%) individuals, indicating that current embedded health insurance models in India have not delivered the expected improvements in financial risk protection for vulnerable populations.

*Limitations and Implementation Gaps*

Several factors contribute to the limited effectiveness of embedded insurance in promoting financial inclusion. One key issue is the lack of adequate provider networks and service coverage, which restricts access to healthcare facilities for insured individuals (Verma & Dash, 2020). Many embedded health insurance policies are tied to specific hospital networks, limiting the ability of beneficiaries to seek care at preferred providers. Additionally, administrative inefficiencies, such as delayed claims processing and lack of transparency in reimbursement mechanisms, further hinder the utility of embedded insurance products. These challenges undermine the perceived value of insurance coverage, leading to low utilization rates and limited impact on financial protection.

Another critical limitation is the lack of targeted product design and customization for marginalized communities. While embedded insurance models have expanded coverage to a broader population, they often fail to address the specific needs and constraints of low-income individuals (Brown & Churchill, 2000). For example, many embedded health insurance policies focus on inpatient hospitalization coverage while neglecting outpatient care, which constitutes a significant portion of healthcare expenses for low-income households. Similarly, embedded crop insurance models in agriculture often fail to account for localized risk factors, leading to discrepancies between insurance payouts and actual farm losses (Benami et al., 2021). Without tailored product design and risk assessment strategies, embedded insurance may not effectively meet the financial protection needs of vulnerable populations.

*Recommendations for Enhancing Impact*

To enhance the effectiveness of embedded insurance in promoting financial inclusion, several policy and operational adjustments are necessary:

* First, regulatory frameworks must ensure that embedded insurance products provide meaningful financial protection rather than merely expanding coverage numbers.
* Strengthening provider networks, improving claims settlement processes, and ensuring transparency in policy terms and conditions are essential steps toward enhancing consumer trust and utilization.
* Additionally, embedded insurance models should incorporate comprehensive coverage that addresses both acute and chronic financial risks, including outpatient care, preventive health services, and asset protection.
* Finally, targeted outreach and financial literacy campaigns are needed to ensure that marginalized populations understand the benefits and limitations of embedded insurance, enabling them to make informed decisions about their financial protection strategies.

Further, partnerships with grassroots organizations, self-help groups, and local governments can help bridge the trust and awareness gap, making insurance not just accessible but acceptable and relevant to the last mile.

*So*, while embedded insurance has the potential to significantly advance financial inclusion by expanding coverage to underserved populations, its current impact in India remains limited due to structural inefficiencies, inadequate provider networks, and insufficient product customization. Addressing these challenges requires a multi-faceted approach involving regulatory reforms, technological innovation, and targeted consumer education to ensure that embedded insurance fulfils its promise of providing meaningful financial protection to vulnerable communities.

**Regulatory and Data Privacy Considerations**

*Data Ownership and Consent Mechanisms*

Embedded insurance’s reliance on real-time data analytics necessitates robust regulatory frameworks to protect consumer information and foster innovation, especially in regions with limited adoption. Key issues include data ownership, consent mechanisms, and transparency in data usage. In India, the Personal Data Protection Bill aims to address these concerns by establishing data protection principles, including purpose limitation, data minimization, and individual consent requirements. However, as the bill is still undergoing legislative review, embedded insurance providers must proactively implement best practices to ensure compliance with emerging data protection norms. This includes providing consumers with clear disclosures about data collection practices, offering opt-in and opt-out options, and ensuring that sensitive information is securely stored and processed.

*Algorithmic Fairness and Bias Mitigation*

Another critical issue is the need for algorithmic fairness in AI-driven underwriting. Embedded insurance models often use machine learning algorithms to assess risk and determine policy terms. However, if these algorithms are trained on biased data, they may perpetuate existing disparities in insurance access. For instance, if historical claims data reflects systemic biases against certain demographic groups, AI models may inadvertently exclude these populations from coverage or charge them higher premiums. To mitigate this risk, regulators must enforce fairness and transparency in AI-driven insurance models, requiring insurers to disclose the factors influencing risk assessment and pricing decisions. Additionally, periodic audits of algorithmic models should be mandated to ensure that they do not perpetuate discriminatory practices or reinforce financial exclusion.

*Cybersecurity and Fraud Detection*

Cybersecurity is another pressing concern in embedded insurance, given the reliance on digital infrastructure and cloud-based systems. As embedded insurance platforms handle sensitive financial and personal data, they become attractive targets for cyberattacks, data breaches, and fraud. In India, the Reserve Bank of India (RBI) has issued cybersecurity guidelines for financial institutions, emphasizing the need for encryption, secure authentication, and incident response protocols.

However, embedded insurance providers must go beyond basic compliance by adopting advanced security measures such as multi-factor authentication, real-time fraud detection, and data anonymization techniques. Collaborative efforts between insurers, platform providers, and cybersecurity experts are essential to develop a resilient infrastructure that safeguards consumer data while maintaining the efficiency of embedded insurance services.

*Regulatory Clarity and Compliance*

Regulatory clarity is essential to ensure that embedded insurance models operate within a well-defined legal framework. In India, the Insurance Regulatory and Development Authority of India (IRDAI) has issued guidelines on digital insurance products, emphasizing the need for transparency, fair pricing, and consumer grievance redressal mechanisms. Given the rise of InsurTech, the IRDAI should consider regulatory sandboxes specifically for embedded and bundled products, enabling innovation while monitoring consumer outcomes, much like the banking sector’s approach to digital lending. However, the lack of specific regulations for embedded insurance has led to inconsistencies in product design, claims processing, and regulatory oversight. To address this gap, regulators must establish a dedicated framework for embedded insurance that outlines licensing requirements, product disclosure standards, and compliance obligations for both insurers and platform partners. This framework should also include provisions for audit mechanisms, dispute resolution, and penalties for non-compliance to ensure accountability and consumer protection.

In summary, embedded insurance requires a robust regulatory and data privacy framework to ensure consumer protection, algorithmic fairness, and cybersecurity. By implementing clear guidelines, enforcing transparency, and investing in advanced security measures, India can harness the full potential of embedded insurance to build a more inclusive and resilient insurance ecosystem.

**Future Outlook and Growth Potential of Embedded and Bundled Insurance in India**

*Technological Advancements and Digital Infrastructure*

India’s digital infrastructure, including the Unified Payments Interface (UPI), Aadhaar-linked identity verification, and AI-driven risk assessment tools, positions it for embedded insurance growth. InsurTech startups collaborating with e-commerce platforms, ride-hailing services, and fintech firms will drive innovation, while bundled products in agriculture and health will address sector-specific risks. Key growth drivers include policy reforms, such as IRDAI guidelines on digital insurance and subsidies for low-income groups, as well as technological advancements like AI and blockchain for fraud detection and claims automation.

|  |  |
| --- | --- |
| **Drivers** | **Challenges** |
| UPI, Aadhaar, mobile penetration | Financial/digital literacy |
| IRDAI digital-first reforms | Fraud and cyber risk |
| Growth of e-commerce/gig economy | Basis risk in agriculture |
| InsurTech-Platform partnerships | Product mis-selling |
| AI/Blockchain in claims/underwriting | Regulatory lag |

**Table 5: Key Growth Drivers and Challenges for Embedded/Bundled Insurance in India**

However, challenges such as financial literacy gaps and basis risk in agricultural bundles require targeted interventions to ensure equitable benefits.

*Sector-Specific Opportunities*

* Agriculture: Bundling drought-tolerant crops with weather-indexed insurance can enhance resilience for smallholder farmers.
* Health: Embedded health insurance in digital platforms and employer-sponsored bundles covering hospitalization and preventive care will expand access.
* Financial Services: Microfinance institutions and digital lenders integrating life and accident insurance into loans will reduce default risks and strengthen financial resilience.

India’s approach to embedded and bundled insurance aligns with global trends, emphasizing technology, innovation, and financial inclusion. By addressing regulatory gaps, enhancing product design, and investing in consumer education, India can create inclusive insurance solutions that promote financial resilience and sustainable development.

**Conclusion**

Embedded and bundled insurance models hold transformative potential for India’s insurance landscape by improving accessibility, affordability, and risk management. However, their success depends on thoughtful product design, effective communication, and strong regulatory support to address complexity and ensure equitable benefits. By leveraging technology and strategic partnerships, India can create insurance solutions tailored to its diverse population, promoting financial inclusion and resilience.

India’s insurance revolution must balance Bharat’s realities with Silicon Valley’s ambitions. The roadmap demands:

1. **Regulatory Sandboxes:** Allow state-specific pilots.
2. **Interoperability:** Make Bima Sugam compatible with ONDC for wider distribution.
3. **Inclusive Design:** Regionalize products : flood covers in Assam, cyclones in Odisha, TB riders in tribal health bundles.
4. **Partnerships:** Leverage 8 million ASHA/anganwadi workers for last-mile education.  
   By anchoring innovation in inclusion, India can transform embedded/bundled models from disruptors to nation-builders.

As India aspires to achieve universal social protection and robust risk resilience for its population, embedded and bundled insurance products - if thoughtfully regulated and inclusively designed, will be central to the next decade of insurance innovation. The journey will require patient capital, continuous regulatory evolution, and a relentless focus on customer-centricity, but the rewards; in terms of greater social security, economic stability, and financial empowerment - will be transformative.

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