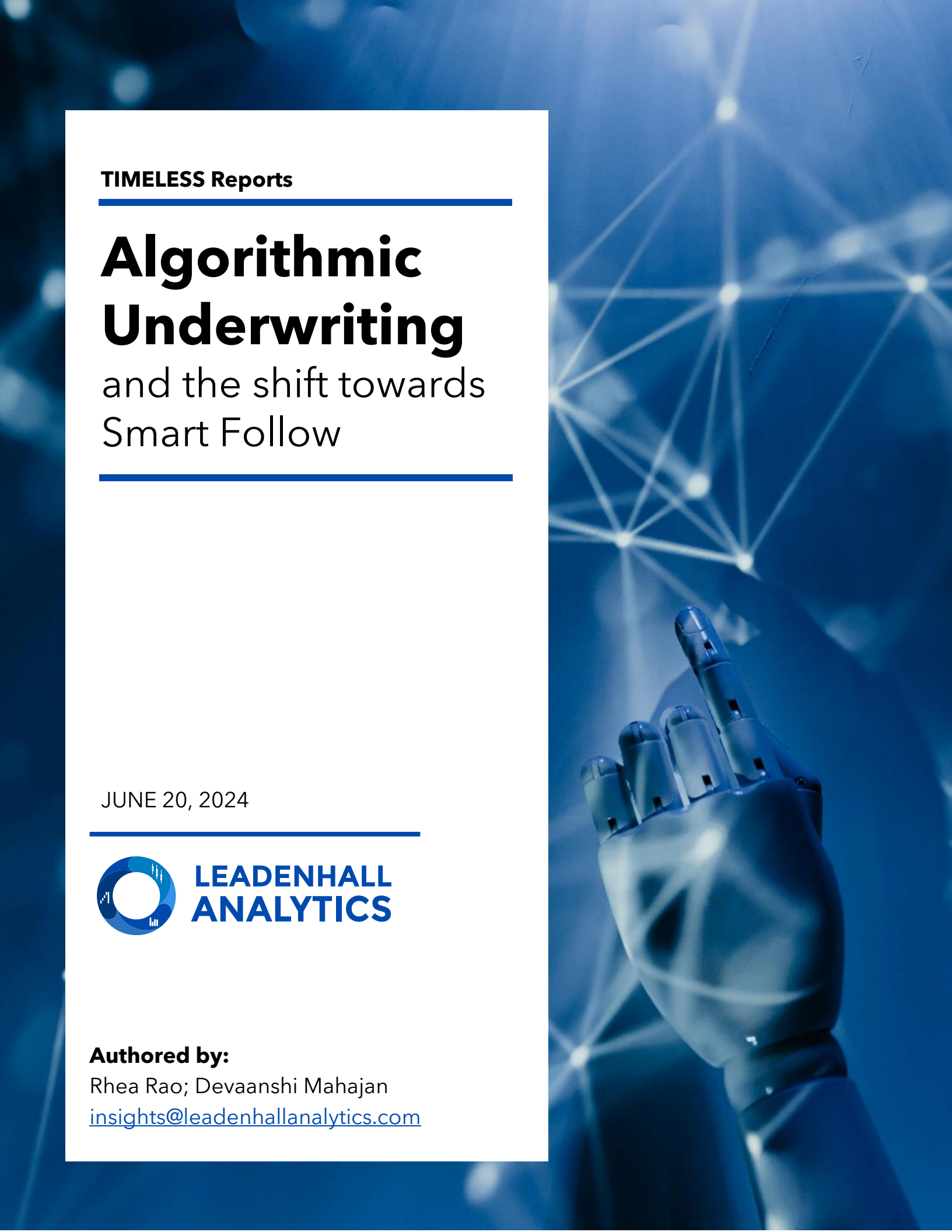

TIMELESS Reports

Algorithmic Underwriting

and the shift towards Smart Follow

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LEADENHALL ANALYTICS

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Executive Summary

The exploration of algorithmic underwriting in the insurance industry highlights significant advancements, opportunities, and challenges associated with this technology. The integration of AI and machine learning into underwriting processes has revolutionized the industry by enhancing efficiency, accuracy, and scalability. This transformation allows insurers to process more submissions rapidly, manage risks more effectively, and provide better service to brokers and clients.

While algorithmic underwriting presents numerous benefits like lower operational costs, higher efficiency as there is reduction in human error, enhanced risk assessment and overall service improvement, it also poses significant challenges like data quality and integration, algorithm bias and fairness, complexity in integration, that require careful management.

Insurers must balance technological innovation with regulatory compliance and ethical considerations to ensure a sustainable and equitable adoption of this transformative technology.

As the first fully digital and algorithmically driven Lloyd's of London syndicate, ***Ki Insurance*** *has set a new benchmark for innovation and in many respects, started the trend. Their collaboration with Brit, Google Cloud, and University College London exemplified forward-thinking and technological excellence, enabling a seamless, data-driven underwriting process.*

Strategic collaborations between insurers and tech firms, such as Hiscox and Google Cloud, highlight AI's potential to enhance underwriting processes. These partnerships are crucial for integrating advanced technologies and maintaining competitiveness.

Initiatives like Apollo's collaboration with Artificial Labs show how technological innovation can streamline underwriting and improve service delivery. These innovations set new industry standards and drive the adoption of algorithmic underwriting, enabling MGAs to offer more accurate pricing and faster service.

Future Outlook

The future of algorithmic underwriting is promising, with continuous advancements expected in AI and data analytics. Insurers must remain vigilant about regulatory compliance and ethical considerations to harness the full potential of this technology. The industry will likely see more sophisticated models, enhanced data integration, and broader adoption of algorithmic underwriting.

Introduction

Traditional Underwriting

Traditional underwriting evaluates risks to issue insurance policies, helping insurers manage risk portfolios and maintain financial stability. The process begins with the policyholder's application, providing detailed information. Underwriters use this data, along with public records and industry databases, to assess risk and potential claims. Following guidelines based on statistical models and historical data, they decide whether to accept or reject the application and set coverage terms. For complex cases, negotiations may occur. Once approved, policy documents are prepared and delivered. Insurers monitor risks throughout the policy term and reassess at renewal for ongoing manageability.

Challenges in Traditional Underwriting:

- Labor-intensive and time-consuming process requiring extensive manual data collection and analysis
- Heavily relies on the underwriter’s judgment, introducing subjectivity and inconsistency
- Underutilises vast amounts of available data, leading to less accurate risk evaluations and pricing
- Slows down the underwriting process, affecting precision and fairness of insurance policies

Algorithmic underwriting

Algorithmic underwriting refers to the use of automated systems and algorithms to evaluate and approve insurance policies or loans. This process leverages advanced data analytics, machine learning, and AI to assess risk and determine whether to approve or deny applications.

Relevance of Algorithmic Underwriting

Technological Advancements: AI and ML advancements allow insurers to automate underwriting, using sophisticated algorithms for accurate and consistent risk evaluation. These algorithms are customizable to business models, enhance decision accuracy and let underwriters focus on complex cases, automating simple decisions and flagging ambiguous ones for review.

Efficiency and Cost Reduction: Algorithmic underwriting significantly reduces human error and the time and resources required to underwrite policies. By automating repetitive, data-intensive tasks, insurers can lower operational costs and increase throughput, a crucial advantage in a competitive market where speed and accuracy are key differentiators.

Scalability: Algorithmic underwriting enables insurers to process more submissions without increasing their workforce, allowing for rapid scaling as more data becomes available. This scalability makes it easier to manage multiple products with minimal additional resources, facilitating efficient decision-making in the short term and enabling rapid expansion without needing extra staff.

Enhanced Risk Management: Algorithms analyse vast amounts of data to identify patterns and trends that may not be apparent to human underwriters. This capability enhances risk assessment and management, allowing insurers to price policies more accurately and set appropriate reserves, leading to better financial stability and profitability.

Market Competitiveness: In the current market, insurers must provide quick and reliable service to brokers and clients. Smart follow underwriting, which provides automatic capacity when specific criteria are met, makes lead underwriters more attractive to brokers, reducing the need for additional coverage and streamlining the placement process.

Futureproofing: Digitizing and storing initial submission data creates a digital library that supports detailed future analysis. As models improve, this data can be re-evaluated to extract new insights, allowing insurers to adapt to changing conditions, such as incorporating pandemic clauses.

Enhanced Customer Satisfaction: Faster turnaround times improve broker experiences, leading to more productive and satisfied clients. This efficiency ultimately benefits the insured, enhancing overall service quality

Process of Algorithmic Underwriting

1	**Application Submission**	The process begins when a potential policyholder submits an insurance application online or through other digital channels. The application typically includes detailed information such as personal data (for life and health insurance) or property/business details (for property and casualty insurance)
2	**Data Collection**	Upon submission, the algorithmic underwriting system automatically collects relevant data from the application form. Additionally, it may gather information from various sources such as public records, industry databases, and third-party data providers. For health insurance, this may include medical records and history, while for property insurance, it may involve details about the property's location, construction, and use.
3	**Data Processing and Analysis**	The collected data is processed and analysed by sophisticated algorithms and machine learning models. These algorithms assess the risk associated with the applicant by evaluating various factors such as age, health status, occupation, lifestyle habits, and property characteristics. The analysis may also consider historical claims data, actuarial studies, and industry trends to predict the likelihood and severity of future insurance claims.
4	**Risk Assessment**	Based on the analysis, the algorithmic underwriting system assigns a risk score or rating to the applicant. This risk score indicates the probability of the applicant filing a claim and the potential financial impact of such a claim. The system categorizes applicants into different risk groups, ranging from low risk to high-risk, to determine their insurability and premium rates.
5	**Decision Making**	Using predefined rules and thresholds, the algorithmic underwriting system decides whether to accept or reject the application. If accepted, the system may also determine the terms of coverage, including the premium amount, deductible, coverage limits, and any exclusions or endorsements. In some cases, the system may refer borderline cases or complex scenarios to human underwriters for manual review and decision-making.
6	**Policy Issuance**	Once a decision is made, the system generates the policy documents electronically. These documents outline the coverage details, terms, conditions, and premium amounts agreed upon. The policy documents are then sent to the applicant electronically or via traditional mail.

Drawbacks of Algorithmic Underwriting

Data Quality and Availability:

- Algorithmic underwriting relies heavily on large datasets. In the MGA space, data may be incomplete or outdated, leading to inaccurate risk assessments.
- Data might be scattered across various systems and not integrated, making it difficult to have a unified and comprehensive dataset for underwriting.

Algorithm Bias:

- Algorithms are trained on historical data, which might contain inherent biases. If not addressed, these biases can lead to unfair pricing and discrimination against certain groups.
- Lack of sufficient data on certain demographics can result in poor underwriting decisions for these groups, leading to potential disparities in coverage.

Complexity of Risks:

- Some risks require a nuanced understanding that algorithms may not capture. Human underwriters can use their judgment and experience to assess complex risks more accurately.
- Algorithms might struggle to account for unforeseen events or unique situations that do not fit historical patterns.
- Heavy reliance on algorithms can lead to a decline in the development and retention of human underwriting expertise.
- Algorithms may lack the flexibility to adapt to rapidly changing market conditions or new types of risks without significant reprogramming.

Technological Challenges:

- Integrating algorithmic underwriting systems with existing MGA platforms and workflows can be challenging and costly.
- Dependence on technology means that system failures or bugs can disrupt the underwriting process, leading to potential delays and inaccuracies.

Customer Trust and Acceptance:

- Customers and brokers may be sceptical of algorithmic decisions, preferring the assurance of human judgment.
- Explaining algorithmic decisions to customers can be challenging, leading to dissatisfaction or mistrust

Smart Follow Underwriting

Smart Follow underwriting and its associated algorithmic technology are revolutionizing the insurance industry by improving pricing accuracy and reducing costs for large and complex risks. This innovative approach streamlines the underwriting process, significantly reducing the effort required by brokers.

Smart Follow Operations

Traditional Syndicated Underwriting Process

In the traditional London market, underwriting involves three main steps:

1. The client engages a broker to place the risk.
2. The broker finds a lead underwriter willing to price the risk and determine the cover terms, usually taking 15% to 20% of the risk.
3. The broker manually finds additional underwriters to cover the remaining risk capacity, which is a time-consuming process.

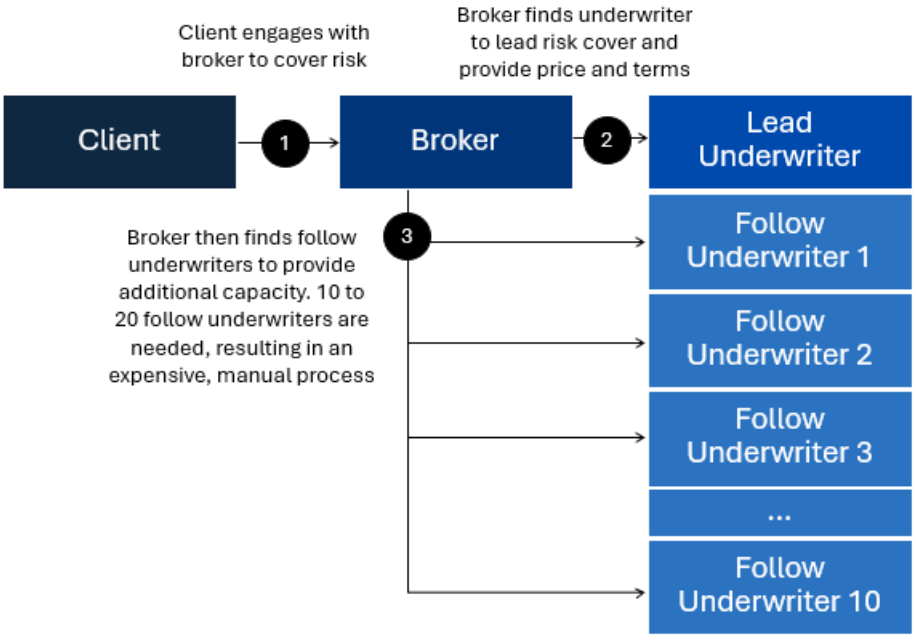

Figure 1: Traditional Underwriting; Is the Future Of Lloyd's Algorithmic?

Smart Follow Underwriting Process

Smart Follow underwriting simplifies this process by using algorithms to automate the allocation of risk capacity:

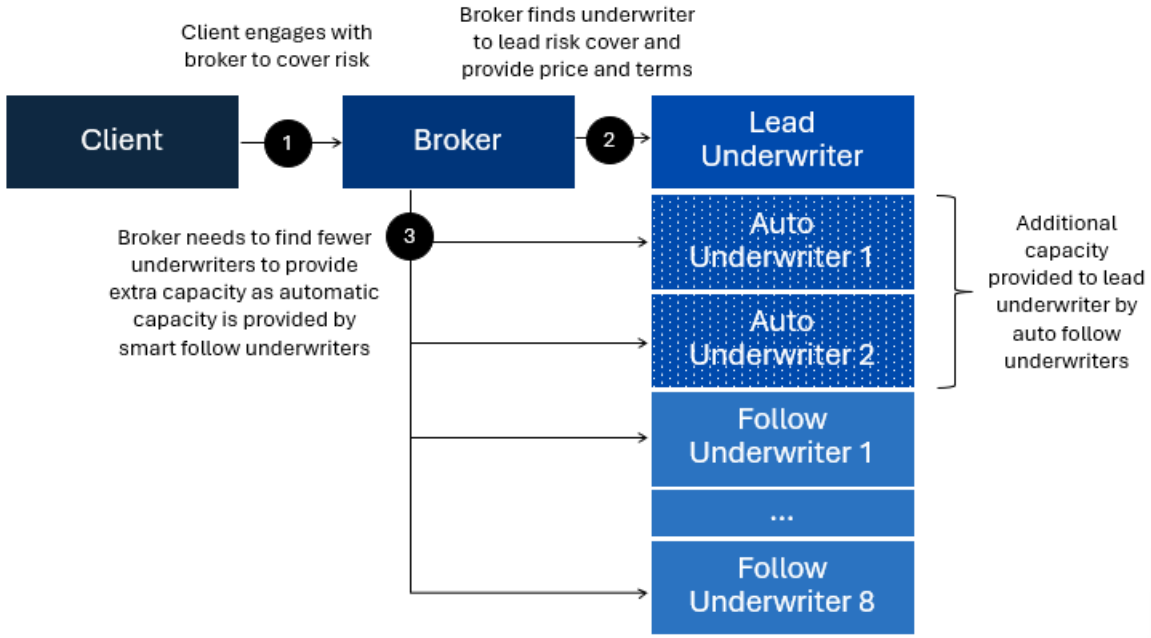

Figure 2: Traditional Underwriting; [Is the Future Of Lloyd's Algorithmic?]

1. The lead underwriter's capacity is automatically enhanced by follow underwriters based on pre-set criteria, reducing the manual effort required from brokers.
2. The process leverages algorithms to assess risk and provide near-instant capacity, making the lead underwriter more attractive to brokers and increasing business efficiency.

Mechanism of Algorithmic Underwriting

1. Insurers agree to provide a percentage of cover for risks quoted by a lead underwriter if specific criteria are met. These criteria are defined by the algorithmic underwriting function.
2. Risks are selected based on historical profitability and underwriter expertise. Complex criteria, such as excluding catastrophe-prone risks, can also be applied.
3. Advanced systems like AI and machine learning are used to track and evaluate risks, enhancing the underwriting process.

Benefits of Smart Follow Underwriting

For Insurers: Smart Follow underwriting provides significant benefits for insurers, including increased business volume by enabling access to high-volume quotes at a lower cost. This approach also optimizes capital requirements through improved portfolio risk management, thereby reducing overall capital needs. Furthermore, it enhances risk knowledge by utilizing expert underwriters, allowing insurers to expand their understanding and expertise into new areas. By combining these advantages, Smart Follow underwriting not only boosts operational efficiency but also strengthens the insurer's market position and adaptability.

For Lead Underwriters: Smart Follow underwriting expands capacity for lead underwriters, making them more attractive to brokers due to the additional capacity provided automatically by follow underwriters. This approach reduces the brokers' workload in finding supplementary coverage, streamlining the entire process. Moreover, it enhances the credibility of lead underwriters by selecting those with proven experience and capabilities, thereby boosting their reputation in the market. This dual advantage of increased capacity and enhanced market standing positions lead underwriters more favourably, attracting more business and fostering growth within the insurance sector.

For Brokers: Smart Follow leads to a reduction in the need for multiple follow underwriters speeds up risk binding and lowers costs.

Outlook and Market Impact

Smart Follow underwriting is expected to become a market standard, driven by the benefits it offers and the push to digitize Lloyd’s market. The model is attracting significant interest from capital providers, and successful implementation by syndicates like Smart Tracker has demonstrated its profitability. As more syndicates adopt this approach, there will be a natural selection process favouring lead underwriters with superior pricing and risk assessment capabilities. This trend will likely lead to significant growth in smart follow syndicates and increased market competitiveness.

Players in Smart Follow

I. KI Insurance | Follow-Only Syndicate

Overview

Ki Insurance is an innovative and fully digital Lloyd's of London syndicate that focuses on algorithmic underwriting. Launched in late 2020 in collaboration with Brit, Google Cloud, and University College London, Ki aims to streamline the insurance process by using advanced data-driven technologies. Received signoff from Lloyd's to underwrite $1.2bn for 2023

- **Development:** Developed in collaboration with Brit, Google Cloud, and University College London's Computer Science department. Ki operates independently and underwrites 'follow-only' business, supporting risks once a lead underwriter has committed the initial capacity.
- **First Quarter Performance:** Ki has outperformed initial expectations, underwriting over $200m across 1,500 risks, halfway to its 2021 goal of $400m in gross written premium.
    - Support from twelve broker partners has been significant

Key Priorities

- **Expense Ratio:** Ki's model targets a lower expense ratio than the market average, and first-quarter results indicate progress toward this goal.
- **Streamlining for Brokers:** Ki simplifies the process for brokers seeking following capacity, eliminating the need for physical presence and multiple interactions in the Underwriting Room.
    - Brokers can now get quotes via Ki's online platform in under a minute, compared to the traditional timeframe of several days to weeks.
    - Brokers can interact with Ki's platform anytime and anywhere, enhancing convenience and efficiency in obtaining insurance coverage
    - The platform is accessible 24/7 on various devices, enhancing convenience.

Collaborations and Partnerships

Ki has formed strategic partnerships with several major insurance carriers like Travelers and Aspen to augment its capacity. This collaborative approach helps in creating a more comprehensive and flexible insurance offering for clients

- Ki announces partnership with Travelers and Aspen to expand digital follow capacity
- Aspen partners with Ki Insurance
- Partnership with Beazley for additional follow capacity

Ki and Brokers:

Broker Feedback: The platform has over 1,200 active users with positive feedback, demonstrating ease and efficiency. Plans for future integration directly with brokers' electronic platforms are in progress to further streamline operations.

Elimination of Bias: Ki removes human bias from underwriting decisions as there is no human interaction in the quoting process. Brokers appreciate consistency and fairness, as the algorithm provides clear, data-driven decisions without negotiation. With no human interaction from Ki's side in the quoting process, human bias, whether conscious or unconscious, is removed as a risk from making underwriting decisions

Impact on Brokers: Despite occasional discrepancies in the capacity offered, clarity and absence of negotiation are valued by brokers.

Achievements

- Underwrote over **US$400m in Gross Written Premium** in the first year. More than doubled Gross Written Premium to US$834m in 2022.
- Since its launch in 2020, Ki has offered **coverage for more than thirty classes**.
- **$500m Investor Capital Commitment:** Secured from Blackstone and Fairfax, marking Ki as the largest Lloyd's of London startup.

Financial Performance for 2023:

Source: Lloyd's Website

Syndicate Performance:

- A profitable year with **gross written premiums of $877m** and a **combined ratio of 89.7%**, a 7.1 percentage point improvement from 2022, indicating strong underwriting profit and validating the digital approach.
- Reduced total **expense ratio to 30.8%** from 31.8% in 2022, while increasing headcount to improve operational models and service quality.
- Positive investment return of 35.9m in 2023, recovering from a negative return of 35.9m in 2023, recovering from a negative return of ($7.9m) in 2022.
- Member's Balance: The member's balance on 31 December 2023 is $95.7m (2022: deficit of $5.1m). The increase was due to a profit in the year of $100.8m (2022: $10.8m).

Financial Investments:

- The investment portfolio consists of cash and cash equivalents ($85.9m; 11.7% of assets under management)
- Fixed income securities ($649.1m; 88.3%); (2022: $94.7m cash, 22.4%, fixed income securities $327.7m, 77.6%).
- Fixed income securities in the portfolio comprise government debt ($414.2m; 63.8%), corporate debt ($155.4m; 23.9%) and securitised debt ($79.4m; 12.2%).

Claims and Loss Management:

- Managed major losses from the Hawaiian wildfires and Hurricane Ida, totalling $20m.
- Prior Year Reserves increased due to Winter Storm Elliott, adding 2.7% to the claims ratio.

ESG

- Ki emphasizes the importance of responsible business operations and acknowledges the significant impact of climate change on stakeholders. Ki Syndicate 1618 has engaged an external data provider for ESG data to monitor their underwriting portfolio and is part of ClimateWise, participating in ESG initiatives within Lloyd's market.
- The company also funds global tree planting initiatives through Ecologi, demonstrating its dedication to environmental sustainability.
    - Raised £290,000 for Action Medical Research by cycling from London to Brussels via Amsterdam.
    - Planted ten trees for every policy written, growing their forest to 184,350 trees.
- Workforce and Community Engagement:
    - Expanded to over 220 employees, with ninety-four new hires in 2023, including five interns from the Code First Girls initiative.

II. Beazley, Syndicate 5623 | Smart Tracker

Overview

Beazley Smart Tracker Syndicate 5623 is a follow-only capacity strategy in the London market, supported mainly by third-party capital. The syndicate has consistently returned a profit for all closed underwriting years, thanks to its low expense model and selective underwriting approach.

Offerings

- **Classes of Business:** Focuses on Property, Marine and Energy, Casualty, Cyber, and Specialty.
- **Distribution Routes:**
    - Broker Facilities (multi-line and mono-line)
    - Consortia (top quartile, with market-leading expertise)
    - MGAs (specialist niches or non-London traded business)
    - Digital Exchange platforms.

Capabilities

- **Class Consideration:** Open to any class of business within Beazley Group, except treaty reinsurance and life.
- **Risk Preference:** Prefers short and medium tail, less volatile classes.
- **Capacity:**
    - Up to USD 10M per risk (USD 5M for critical catastrophe)
    - Generally, 10% of order
- **Deployment Strategy:** Balanced consideration of territories, exposure types, and catastrophe risks.
- **Independence:** Capacity is offered independently from Beazley core syndicates.
- **Long-Term Partnerships:** Committed to building long-term relationships.

Financials | Syndicate 5623

- **Gross Premiums:** The gross premiums written in 2023 were $390.1m, a significant increase from $249.3m in 2022.
- **Profit:** The syndicate reported a profit of $40.6m for the year 2023, up from $24.5m in 2022.
- **Claims Ratio:** The claims ratio for 2023 was 57%, slightly down from 58% in 2022.

- **Expense Ratio:** The expense ratio increased to 33% in 2023 from 27% in 2022, indicating higher costs relative to net earned premiums.

Figure 3: Syndicate Reports; page 4; Lloyds.com

ESG Policy of Syndicate 5623

- **ESG Scoring Criteria**: From 2024, Syndicate 5623 will begin writing lines of business that adhere to ESG scoring criteria developed with support from specialist, independent rating agencies.
- **ESG Lines of Business:** These new ESG lines were previously written through syndicate 4321 and will provide additional capacity for large corporate clients who meet the eligibility standards of the ESG criteria.
- **ESG Principles and Ambitions:** The syndicate embeds ESG principles and focuses on reducing its carbon footprint, contributing appropriately to its social environment, and enhancements to governance.
- **Responsible Business Strategy:** Launched in March 2021, this strategy sets goals and targets across a range of ESG issues, including climate change, and is updated alongside the Beazley plc annual report and accounts.

III. Apollo Syndicate Management Limited ("ASML") | Smart Follow

Overview

Collaboration of Apollo and Artificial Labs (Aug 23, 2023): Apollo, an independent specialist insurer and reinsurer, has partnered with Artificial Labs, an Insurtech specializing in algorithmic underwriting, to launch a new smart follow collaboration aimed at providing London market brokers with fast, consistent, and reliable capacity.
The collaboration follows a successful proof of concept conducted in early 2023, which applied Artificial's technology to the **marine hull class**. The partnership leverages Apollo's underwriting expertise and Artificial's technology to offer a unique service that increases productivity and efficiency while maintaining high customer service standards.

Financials | ASML

- Smart Follow is part of the Apollo Syndicate 1969
- For Syndicate 1969:
    - The **gross premium written** increased by 20% to $724.7m in 2023.
    - **Profits** for the financial year rose significantly by 84% to $72.2m.
    - The **combined ratio** stood at 91%

ESG Policy of Syndicate 1969

In 2022, ASML introduced its ESG strategy, aligning with its vision of a resilient and sustainable world.

- ASML is aiming for carbon neutrality for Scope 1 and 2 emissions and supporting clients in transitioning to a low-carbon economy.
- ASML fosters a diverse and inclusive workplace with zero tolerance for discrimination
- Offers DEI training and mental health support.
- The company tracks ESG metrics like carbon emissions, diversity, and employee satisfaction to continually improve its ESG initiatives.

In 2024, ASML plans to further develop its ESG strategy with external specialist support.

IV. Other Syndicates / MGAs involved in Follow-Only

1. Amwins launches a follow form facility backed by Beazley smart tracker: Jun 2023
    a. Amwins Global Risks, part of the global specialty insurance broker Amwins, announced the launch of Amwins Amplify, an automated follow-form facility.
    b. **Lead Syndicate**: The facility is led by Beazley's Smart Tracker Syndicate 5623.
    c. **Initial Coverage**: Initially covering Property, with plans to expand to cross-class diversification.
    d. **Capacity**: Up to 15% capacity for policies written on a subscription basis, following terms set by a select panel of underwriters.

2. Atrium as D&F Leader on InsurX Digital Platform: Jan 2024
    a. **Platform Advantages**: InsurX benefits both brokers and insurers by providing a streamlined platform for syndicating risks, enhancing efficiency and collaboration.
    b. **Lead Position:** Atrium D&F Property has established a leading role in a new digital capacity exchange platform through InsurX.
    c. **Independent Digital Exchange:** InsurX is an independent digital platform designed to offer algorithmic follow capacity behind Atrium's lead property Direct and Facultative (D&F) lines.
    d. **Algorithmic Follow Capacity:** The platform enables brokers to access follow capacity quickly and efficiently, leveraging Atrium's lead line.
    e. **Syndicates Involved**: Beazley Smart Tracker and MS Amlin are among the syndicates providing follow capacity on the InsurX Exchange. These syndicates participate according to their regularly updated underwriting preferences.
    f. **Initial Brokers**: The initial launch includes brokers such as BMS, Cogent, Concilium, Gallagher, and Miller, with expectations for more brokers to join.

3. Hampden Risk Partners, Syndicate 2689 | Follow-Only Syndicate
    a. HRP Syndicate 2689 is a dynamic, Lloyd's focused, follow-only syndicate.
    b. Concentrates on cross-class consortia to provide targeted capacity to top-performing lead underwriters, especially where traditional capital support is lacking.
    c. Previously called *Verto Syndicate 2689* and managed by **Asta MGA**, they joined a reinsurance consortium underwriting arrangement for the 2020 year of account, underwritten by Chord Re.

4. Vuw.ai | Follow-Only MGA | Nov 2023
    Specialist MGA facility in the London market, writing a follow-only book.

Algorithmic Writing in MGA Sphere

I. Hiscox and Google Cloud

Overview

- Hiscox, a specialist global insurer, has partnered with Google Cloud to develop an AI enhanced lead underwriting model for the London Market insurance industry.
- Underwrites internationally traded, bigger ticket business, and reinsurance through Hiscox London Market and Hiscox Re & ILS.

This collaboration combines Hiscox's technology platform, Hiscox AI Laboratories (Hailo), with Google Cloud's GenAI technology to automate the underwriting process from submission to quote. This is anticipated to decrease the quote turnaround time for certain lines of business from three days to only three minutes for underwriting teams. Announced on 12th December 2023 in London, UK, it is the first AI-enhanced lead underwriting model in the London Market insurance industry.

Platforms Used

- Hiscox AI Laboratories (Hailo): Hiscox's proprietary AI tool developed in 2021.
- Google Cloud's Generative AI Technology: Used to automate the lead algorithmic underwriting process.
- Google Cloud's BigQuery and Vertex AI Platform: These tools were utilised to extract key data and insights from email submissions, a traditionally manual process.

Impact on Underwriting Process

- Efficiency Improvement: The collaboration aims to reduce the time required for generating lead open-market quotes from three days to just three minutes.
- Automation Scope: The integration of AI automates specific elements of the underwriting process, including the extraction and analysis of data from email submissions.

Usage and Implementation

- The proof of concept was conducted in the Sabotage and Terrorism line of business due to its heavy reliance on manual data extraction and analysis.
- Hailo enables real-time monitoring and calibration of underwriting models, utilizing machine learning and statistical techniques to enhance risk assessment and pricing accuracy.
- The principles and benefits of this AI integration are expected to extend to other lines of business within and beyond big-ticket insurance.

II. Aurora MGA

Overview

Pro Global Holdings Ltd. (Pro), a global re/insurance advisor, announced its support for UK-based Aurora, a specialist commercial insurance provider for the SME market, through its MGA incubator subsidiary, Pro MGA Global Solutions. Aurora touts a rapidly growing portfolio of insurance products, supported by its algorithmic underwriting approach.

The company already provides real-time coverage for over seven hundred trade types at the SME level through its dynamic online platform. Aurora highlighted that 80% of companies experiencing operational disruptions close within 18 months due to their inability to absorb losses, unlike larger corporates that can retain more risk on their balance sheets. Despite significant progress in the SME sector, **larger SMEs remain underserved**, with **80% still underinsured and half considering their premiums too expensive.**

Upcoming Insurance Products

- Soft launch on 31st October 2022: accident and health insurance
- Early 2023: property and business interruption insurance
- Future products: cyber insurance, construction insurance, professional indemnity, directors', and officers' liability insurance

Capacity Providers and Partnerships

- Collaborates with major reinsurers and insurers: AXIS, AIG, Munich Re
- Partnerships with Swiss Re and Mastercard for enhanced risk assessment and efficient claims processing

Distribution Strategy

- Omni-channel distribution emphasizing interoperability
- Collaborates with brokers (e.g., WTW) and offers direct-to-customer approach
- Provides tailored products, data-driven insights, and risk management education
- Works with associations and platforms to reach diverse SME customers

Algorithmic Underwriting Process

1. **Advanced Algorithmic Framework**:
    a. Automates insurers' appetite, underwriting rules, and pricing
    b. Prioritizes portfolio management decisions over individual risk assessments
    c. Increases underwriting efficiency as
2. **Consistent Feedback Loop:**
    a. Live performance monitoring
    b. Granular risk assessment allows near-instant adjustments to underwriting and pricing
    c. Enhances overall insurance portfolio management

III. Vave MGA

Overview

Vave's underwriting is powered by its proprietary technology designed to provide near-instant insurance quotes. It can integrate with any insurance distributor's application via an API. This allows seamless communication and data transfer between brokers' applications and the Vave system. On 7th June 2021, Canopius Group, a prominent global specialty reinsurer, announced the launch of its algorithmic underwriting platform, Vave, as an MGA. The management has highlighted Vave's centralized underwriting model and stressed on their alignment with Lloyd's Blueprint Two, focusing on cost reduction and data accuracy. Having begun trading in May 2019, Vave has quoted over 1.2m risks, $2.2bn in premium; forecasted to exceed $100m in premium by year-end.

Product Portfolio and Expansion

- **Current Offerings:** US homeowners' property and monoline flood insurance.
- **Plans:** Launching a US commercial property product later in the year.
- **Integration:** API integration with major brokers in the U.S. surplus lines wholesale market for automated quoting and binding.

Vave Functioning

1. **Quoting and Binding Process:**
    a. Brokers can submit property information through their app to the Vave system for obtaining quotes, binding requests, or endorsements.
    b. Vave accesses more than eight hundred data fields to assess the risk and provide an accurate insurance quote in near real-time.
2. **Premium Calculation and Response:**
    a. Vave's algorithmic pricing engine calculates the premium based on the assessed risk.
    b. Vave's underwriting is informed by detailed historic property exposure and claims data amounting to $3.6 trillion.
3. **Portfolio Management:**
    a. Vave adjusts its pricing dynamically to control exposures and maximize diversification within its portfolios.
    b. Vave's approach leverages advanced technology and extensive data to streamline the underwriting process.

Vave's Unique Approach in Commercial Property Insurance

- **Differentiation in the Insurance Space:**
    - Advanced pricing algorithm and data-driven risk assessment
    - Focus on individual risk characteristics rather than just achieving higher rates.
- **Data-Driven Risk Selection:** Vave's algorithm leverages a multitude of data points to identify better, more profitable risks.
    - Utilises overflight imagery and AI for damage assessment.
    - Evaluates 20-25 rating factors compared to traditional underwriting's 5-9 factors.
    - Stores over nine hundred data points for continuous improvement

Key Advantages

- Vave's proprietary technology provides near-instant insurance quotes via an API, enabling seamless integration with insurance distributors' applications.
- The algorithm assesses risk using over eight hundred data fields, provides real-time quotes, and automatically validates quotes against underwriting criteria. The pricing engine calculates premiums and feeds back insights to enhance future models.
- Every quote and binding decision are stored to inform future pricing and manage exposure in near real-time. This data-driven approach helps optimize Vave's portfolios for diversification and controlled exposures.

Regulatory Challenges

I. Financial Conduct Authority (FCA) Regulations

The FCA is responsible for regulating the conduct of financial services firms to ensure they operate with integrity, transparency, and fairness.

Fairness and Bias

- Algorithms trained on historical data can inadvertently perpetuate biases present in that data, leading to discriminatory practices.
- Algorithms must not perpetuate biases and must be regularly audited for fairness, requiring specialized knowledge and resources.

Transparency

- Insurers must be able to explain their underwriting decisions to customers and the FCA. Given the complexity of algorithms, providing clear and understandable explanations can be difficult.
- Insurers must explain underwriting decisions clearly to customers and the FCA, maintaining trust and compliance.

Accountability

- Under the FCA's Senior Managers and Certification Regime (SM&CR), senior managers are personally accountable for the actions of their firms.
- Senior managers are personally accountable for compliance under the SM&CR, necessitating robust governance frameworks.

II. Competition and Markets Authority (CMA) Guidance

The Competition and Markets Authority (CMA) is an independent non-ministerial department in the UK responsible for ensuring that markets work well for consumers, businesses, and the economy. The CMA promotes competition and tackles practices that harm competition.

Market Fairness:

- The CMA may scrutinize algorithmic practices to ensure they do not lead to anti-competitive behaviours.
    - This includes practices like price-fixing, collusion, or creating barriers to market entry.
    - Algorithms that adjust pricing dynamically could unintentionally engage in anti-competitive behaviour if they rely on similar data sources or react similarly to market changes as competitors.
- Ensuring compliance requires rigorous testing and possibly redesigning algorithms to avoid these risks.

Transparency and Accountability

- Insurers must ensure their algorithmic underwriting processes are transparent and can be explained to the CMA if required.
- Insurers must document decision-making processes and ensure they do not unfairly disadvantage consumers or market participants.

Consumer Protection

- Algorithms that inadvertently discriminate against certain consumer groups or fail to provide clear explanations for pricing decisions can fall afoul of CMA regulations.
- Ensuring that algorithmic underwriting models are fair and do not exploit consumers requires ongoing monitoring and adjustments.

III. General Data Protection Regulation (GDPR)

GDPR, incorporated into UK law as the Data Protection Act 2018, provides a framework for protecting personal data. It sets strict guidelines on how personal data should be collected, processed, stored, and shared.

Data Collection and Consent:

- Under GDPR, insurers must obtain explicit consent from individuals to process their data. This includes collecting data for algorithmic underwriting, which can involve vast amounts of personal information.
- Insurers must obtain explicit consent from individuals to process data for algorithmic underwriting, which can be logistically challenging and may deter potential customers.
- Only data necessary for underwriting should be collected, potentially conflicting with the need for large datasets

Transparency and Explanation

- GDPR provides individuals the right to understand how their data is being used, particularly in automated decision-making. This "right to explanation" means that insurers must be able to explain how their algorithms work and how decisions are made.
- Insurers must explain how their algorithms work and how decisions are made, which is challenging due to the complexity of machine learning models.
- Comprehensive documentation and demonstration of compliance to regulators are required, adding to the administrative burden.

Data Security:

Robust measures to protect personal data are mandatory, which can be costly and complex.

IV. Digital Operational Resilience Act (DORA)

The Digital Operational Resilience Act (DORA) is an EU regulation aimed at enhancing the digital resilience of financial entities, including insurance companies, insurtech firms, brokerages, credit institutions, investment managers, crowdfunding providers, crypto entities, and critical third-party ICT service providers. Its goal is to ensure these entities can withstand and recover from ICT-related disruptions, maintaining stability and security within the financial sector.

Though an EU regulation, DORA's implications could extend to the UK insurance industry, especially for UK firms operating in or with the EU. Here's how DORA might affect the UK insurance industry, particularly regarding algorithmic underwriting:

- **Enhanced ICT Risk Management:** Implement comprehensive ICT risk management frameworks, including continuous risk assessments, documenting system interdependencies, and developing robust cybersecurity policies.
- **Incident Reporting:** Establish systems for classifying and reporting ICT-related incidents, including initial notifications, progress updates, and final reports with thorough documentation and root cause analysis.
- **Operational Resilience Testing:** Conduct regular ICT system testing, including annual vulnerability assessments and threat-led penetration testing (TLPT) every three years for larger firms.
- **Third-Party Risk Management:** Manage risks associated with third-party ICT service providers through thorough assessments and maintaining a register of all contracts to ensure compliance with DORA's standards.

Impact on Insurtech Firms

- **Compliance with High Standards:** Demonstrate adherence to DORA's stringent requirements, which can provide a competitive edge by showcasing commitment to advanced ICT risk management and robust incident response capabilities.
- **Opportunities for Innovation:** DORA creates opportunities for insurtech firms to develop solutions that assist traditional insurers in meeting regulatory requirements. This includes creating technologies for risk management, incident reporting, and resilience testing.
- **Information Sharing:** Encourage information sharing about cyber threats among financial entities to foster collaboration and enhance collective cybersecurity defences.
- **Regulatory Oversight:** Insurtech providing critical ICT services, will be subject to direct oversight by designated regulators, with potential penalties for non-compliance.

V. Equality Act 2010

The Equality Act 2010 ensures equal treatment in employment, education, and access to goods and services.

Algorithmic Discrimination:

- If the training data used for algorithms includes biases, these biases can be perpetuated in the underwriting process, leading to discriminatory outcomes.
    - For example, if historical data shows higher claims from a particular demographic due to socio-economic factors, the algorithm might unfairly price insurance higher for that group.
- Even if an algorithm does not explicitly use protected characteristics (e.g., race, gender) in its decision-making, it might still result in indirect discrimination if proxies for these characteristics (e.g., postcode data) are used.

Ensuring Compliance:

Insurers must implement measures to identify and mitigate biases in their algorithms.
This involves continuous monitoring and adjustment of the algorithms and a high level of transparency and accountability in their processes, which can be technically demanding and resource intensive.