

Emerging risks and opportunities in insurance: Technology and innovation

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As innovation continues to transform the transparency, availability and consumer-friendliness of insurance products, slow reactions can leave traditional companies trailing behind.

Developing new solutions to manage complex risks has underpinned the culture of the insurance market for centuries. Constant innovation to suit the changing needs of its customers has always been particularly evident in the London insurance market.

The explosion of funding for insurtech companies in recent years demonstrates that the insurance industry will continue to evolve. Insurance provides a natural platform for technology. Companies seeking new opportunities to take advantage of AI, big data and autonomy may do very well while others will be left behind. Although risk management will need to adapt existing risks and controls for the changes that innovation brings, emerging risks should not be ignored. This paper investigates innovation in the global insurance market driven by insurtech, and considers the emerging risks faced by insurance companies.

Insurtech

Insurtech is a term used to group innovative, technology-driven solutions in the insurance sector. It can cover a wide range of functions from front-to-end operations within start-up tech-minded insurance companies or it can be restricted to one or more components of the insurance value chain. For example:

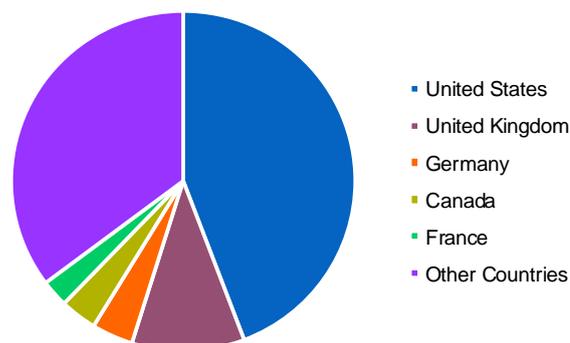
- **Brolly** is an AI-driven app providing insurance advice for personal lines products in the UK. It was founded in 2016, raising £1m of capital in the first year. The company focusses on one specific area of the insurance value chain: distribution. Fast purchasing and management of insurance products is its key aim. Insurance partners include Ageas, AXA, and LV=.
- **Lemonade** offers home insurance in New York and several other US states. The business model aims to achieve social good by donating reserve surplus to non-profit organisations selected by policyholders. The company has attracted over \$180m from investors such as Softbank and Allianz. Lemonade maintains its customer relationships via an app, downloaded over 50,000 times each month.

WHERE IS IT HAPPENING?

Insurtech start-ups have sprung up worldwide, with companies headquartered in 50 different countries. The largest insurtech hub is the United States, with over 800 insurtech companies.

Then follows the United Kingdom, with over 190 insurtech companies, three-quarters of which are found in London. The geographical distribution of insurtech companies can be seen in Figure 1 below.

FIGURE 1 PROPORTION OF INSURTECHS BY HEADQUARTERS COUNTRY



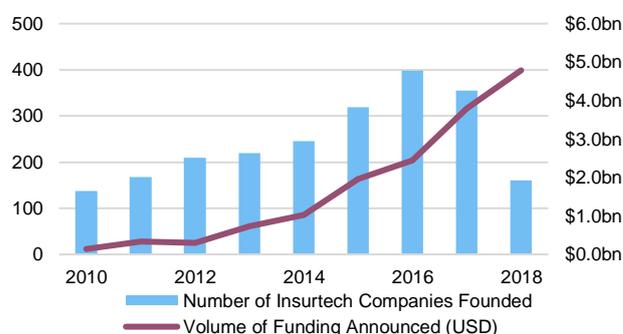
Source: Crunchbase

THE SCALE OF INSURTECH

Over the course of the last decade, the number of insurtech companies being founded has increased from fewer than 10 per year, to almost 100 in each of 2015 and 2016. The level of funding continues to escalate. From 2010 to 2012, global publicised funding averaged approximately \$250m p.a. This reached in excess of \$3.5bn in 2017 and \$4.5bn in 2018.

Figure 2 below shows the trend in funding.

FIGURE 2 NUMBER OF INSURTECH COMPANIES FOUNDED AND VOLUME OF FUNDING PUBLICLY ANNOUNCED BY YEAR (IN CONVERTED USD)



Source: Crunchbase

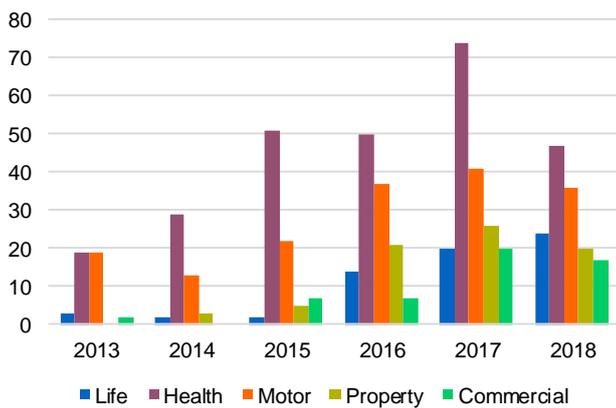
There has been a downturn in the number of newly founded companies during 2018 and the early months of 2019 but funding for 2018 exceeded \$4.5bn and 2019 is on track to exceed \$5.0bn, suggesting that the insurtech industry has established strong foundations within the insurance world and is maturing.

WHICH AREAS OF INSURANCE?

Investment in insurtech companies is greatest within health insurance. Life insurance appears to be dragging behind on insurtech activity, although the prospect for many exciting innovations remains positive. Within general insurance, personal lines insurance companies have received large investments.

Figure 3 below shows the number of funding rounds for insurtech companies operating in different sectors of insurance:

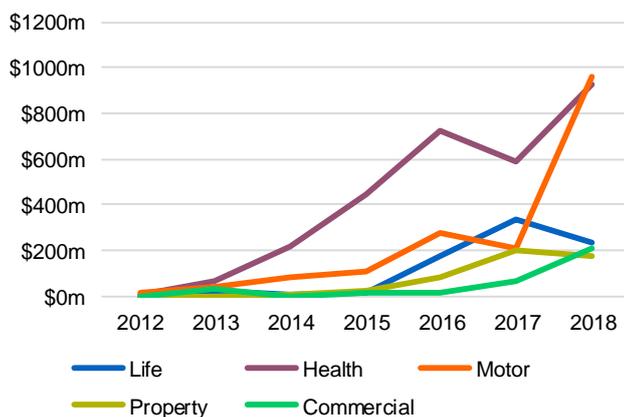
FIGURE 3 NUMBER OF INSURTECH FUNDING ROUNDS BY INSURANCE SECTOR AND YEAR



Source: Crunchbase

Figure 4 below shows the announced volume of funding rounds for insurtech companies operating in different sectors:

FIGURE 4 VOLUME OF PUBLICLY ANNOUNCED INSURTECH FUNDING BY INSURANCE SECTOR AND YEAR (IN CONVERTED USD)



Source: Crunchbase

Figure 4 shows only disclosed information. The details of many funding rounds, particularly seed rounds, are often not public.

Figure 4 also shows a dramatic uptick in the funding of insurtech companies in the Motor Insurance sector during 2018 driven by a \$500m investment in Cambridge Mobile Telematics, a leading analytics and mobile telematics provider, from the Softbank vision fund.

CASE STUDY: DINGHY

Dinghy was founded in 2017 by three entrepreneurs in London. They had identified a gap in the market for flexible, on-demand professional indemnity insurance for contractors and other fixed term workers in technology. Within a year, they had raised £1m in seed funding.

Dinghy’s strengths lie in flexibility, interacting with policyholders using their mobile phones and offering an on/off switch for cover which enables a pay-as-you-use insurance arrangement. Such pay-as-you-go arrangements are seen by many industry professionals as an inevitable next step for many personal lines insurance products.

HOW IS THE INDUSTRY REACTING?

Innovation is not limited to start-up companies and new product types. Incumbent insurance companies are creating innovative products which capture data in new ways. Health insurance companies in the UK can now provide more focussed health benefits to their customers using data collected from smart devices provided to the policyholder at discounted costs. Traditional insurance classes such as marine are also using Blockchain technology to improve the sharing of data between the insurer and the insured so that risks can be covered more quickly, with more transparent pricing, and with a quicker claims management process than ever before.

We discuss below some of the other ways in which insurance incumbents are reacting to innovation.

Venture Capital Subsidiaries

Large companies are reacting to insurtech by forming venture capital subsidiaries and investing in start-up companies. For example:

- AXA’s subsidiary, AXA Venture Partners, has made 46 investments in companies innovating in insurtech (Limelight Health), Blockchain technology (Blockstream), cyber security (Contrast Security), digital authentication (Futurae), data-driven recruitment (Zenjob) and many other areas.
- XL innovate, another member of the AXA XL group, has invested in companies including Windward, a marine analytics company, and Slice Labs, which offers an on-demand insurance platform to support the on-demand economy.
- Allianz X, a subsidiary of Allianz, has invested in a number of start-up companies including the aforementioned Lemonade. They have also invested in companies innovating in virtual reality (Drone Racing League), cyber security (Argus Cyber Security), wealth management (Moneyfarm) and an on-demand app covering ride-hailing, food delivery and payments & financial services (Gojek).
- Aviva Ventures, the venture capital arm of Aviva, has invested in companies building solutions for autonomous vehicles (AppyParking), home security (Cocoon) and medical diagnostics (Owlstone medical).

It is clear from these examples that incumbent companies are investing in up-and-coming technologically focussed businesses within and on the periphery of the insurance space. These wider technology companies are developing solutions that could be integrated into the insurer's products or used to reduce operating costs.

Sponsoring Insurtech Competitions

This approach is to create internal platforms for insurtech companies to pitch their ideas and compete for capital. For example:

- Lloyd's of London has created the Lloyd's Lab, providing an environment where technology-driven concepts, ideas and products can be tested and, if successful, introduced to the insurance world to meet the demands of a rapidly changing and unique insurance market. The support and active involvement of the world's specialist insurance marketplace makes it appealing to innovators.
- Over the course of 2018 and 2019, Zurich ran the Zurich Innovation World championship. Innovative start-ups from 49 different countries entered for an opportunity to revolutionise Zurich's business. The winners of the competition were Chisel AI, a company which use Natural Language Processing and Artificial Intelligence to read unstructured text and extract value.

Acquisitions

A further method the insurance industry is using to promote innovative start-ups is through acquisitions. Dinghy was acquired by Knightsbridge Contractor Insurance, another professional indemnity company insurer.

Risks and Opportunities

Innovation can bring flexibility and transparency to the policyholder, and security and efficiency to insurance companies. However, the resulting emerging risks cannot be ignored. We discuss some of these below:

DATA

As innovation increases so will the complexity of processes and products that can exist in the insurance market. The complexity of models and their data requirements are expected to increase materially. The risks related to data will escalate, with tighter controls necessary.

Data Governance:

- Many insurers are now collecting larger volumes of policy data than ever before. The severity of any personal identifiable data breach events could increase acutely, introducing new compliance, reputational and operational risks with respect to the cyber security.
- GDPR regulation exposes insurers to punitive fines if they do not comply with regulations.

Complexity of Models and Systems:

- Insurers are using increasingly complex models and automated processes, making best use of machine learning algorithms for pricing and underwriting. Automation of underwriting, claims handling and policy servicing will continue to improve
- The additional complexity of systems leads to risks arising from a lack of transparency; future business decisions based on a large array of underlying factors could become impossible to understand. This is similar to the search algorithms used by Google and YouTube, which are based on machine learning to the extent that the justification for any individual decision is impossible to fully explain from the ground up.
- Unconstrained increases in model complexity can also lead to algorithmic bias, where algorithms used to train models can lead to selection risk or bias against protected characteristics. This risk is difficult to predict and is likely to fluctuate over time based on social trends.

Data Management:

- As insurers collect more data, it is vital that they are able to utilise this information to the greatest possible extent so as to gain the competitive advantage they strive for.
- Unstructured data collected from telematics devices for example can offer a level of detail that makes it impossible to make full use of.
- Insurers must maintain the integrity of their data through thorough and regular validation, as errors or leaks in data can lead to issues within modelling, particularly models using highly complex algorithms.
- The exponential growth of data, in-house historical underwriting and claims historical data, combined with a host of other data sources, to manage insurance operations will increase data risks and provide new opportunities
- The ability to build up detailed risk profiles based on a range of data sources will be essential in the long term. Insurers will have to take advantage of the value of this data in order to not fall behind.

CUSTOMER BEHAVIOUR

Trends in customer behaviour over recent years have had huge effects on many industries, including retail, banking, hospitality and transportation. The effects of changing customer behaviour on the insurance market have not yet revolutionised the way insurance is transacted, but it is inevitable that the tech-savvy generations of the future will look for insurance products which suit their buying habits.

Trends expected to permeate the insurance industry include:

- Products that are available on demand, without a long underwriting and approval process.
- Products that are flexible to the specific needs of the customer.
- Interaction via digital interfaces, rather than human contact, revolutionising underwriting and claims management.

- Building relationships with customers based on their individual preferences and future needs.

Insurance companies which do not adapt to these trends will find themselves at risk of losing market share.

Customers naturally expect to be treated fairly. It is possible that increased automation could lead to unfair treatment of customers if not properly managed. As automation increases, it is important to link this into the management of the company's conduct risk, which in turn will need to be increasingly tightly defined and managed.

PEOPLE

Companies seeking to be innovative need the right staff in order to achieve their aims. Insurers may do well to provide training opportunities to staff to develop their skills and broaden their knowledge on technology. Many roles of the future will require a far greater extent of computer science and programming skills than is currently present in the market.

Furthermore, it cannot be ignored that many traditional roles will become less relevant over time as automation becomes increasingly commonplace.

COMPETITION

When discussing innovation, the concept of disruption is usually quick to come to mind. Disruption relates to the ability of an innovative company taking root initially in simple applications at the bottom of a market and then relentlessly moving up market, eventually displacing established competitors. Such companies can begin by focusing only on specific areas of the insurance value chain, such as product development, underwriting or claims management, and place significant pressure on incumbents to improve, or become uncompetitive.

Other areas of potential competition for insurance companies are from 'big tech' companies such as Google or Amazon. These companies have the data and business models to revolutionise the insurance world. For example, personal property insurance using technology to detect damage could see the immediate shipment of replacement products following an insured incident.

Herding behaviour is not uncommon in insurance markets, with innovative ideas copied across companies until the competitive advantage has been all but eliminated. One risk present here is that companies could be chasing similar types of innovative solutions, preventing innovation in itself.

How Milliman Can Help You

Through servicing clients, Milliman's consultants have gained considerable experience in developing risk management frameworks. We are well-placed to benchmark your risk management approach against the rest of the industry, and provide insight and advice tailored to your individual circumstances and needs.

Our operational risk modelling tools can be used to understand the causes and impact the risks highlighted in this paper can have on your business as well as how these risks interact with others. We would engage key stakeholders around the business through workshops to ensure a broad appreciation of risk management. Our industry-leading cyber risk tools and understanding can help you to reflect on the consequences that these risks can have on your business and how best to manage them.

As your business continues to make better use of technology to identify and manage risks, Milliman's in-depth knowledge of innovation in the market can help you find the ideal solution. For example, we have recently assisted our clients to improve their understanding of trends and emerging risks inherent in their business using data from social media.

[EIOPA issued a paper](#) in March 2019, highlighting the potential risks and benefits of insurtech. [Milliman has since released a briefing note](#), summarising EIOPA's findings.

If you would like to discuss the contents of this paper, or any other aspects of risk management practices and framework, please contact either of the consultants below.

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