Deloitte.

Turbulence ahead

The future of general insurance

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Introduction

Dear Colleagues,

Insurance institutions aren't known for chasing trends. And maybe you wouldn't want them to be. For an industry where customers are best served by the sober assessment of risk, there's something reaffirming about the industry's steady bearing in FinTech's choppy wake.

But transformative forces are there—at the edges, under the surface, looking for a way in. They're in the technology that's taking the human element out of risk. They're showing up along the value chain, bringing price transparency and brand-new products. They're in adjacent sectors, where pay-per-click threatens commissions and customers must insure assets they use but don't own. And they're in the data, where the future can be told.

None of these trends is isolated. Mostly, they overlap. For example, both social data and the Internet of Things (IoT) are yielding insights via predictive analytics. Both the sharing economy and peer-to-peer insurers are changing the way insurance is being consumed and structured.

In 2015, Deloitte and the World Economic Forum (The Forum) released a report entitled The future of financial services: How disruptive innovations are reshaping the way financial services are structured, provisioned and consumed. It looked at the effects of disruptive innovations on financial services. In the following pages, we build on The Forum's findings as they relate to general insurance. First, we consider the implications that transformative forces have to incumbents in the industry. Combining these implications we then draw a few possible scenarios for the future. While the main focus will be to explore implications and future scenarios, an examination of the innovations influencing these transformations can be referenced at the end of this paper. We hope these ideas, together with those in the sister publication from the Deloitte US Center for Financial Services, *Insurers on the brink*, help you as you develop your strategies for addressing the changing insurance environment.

Sincerely,

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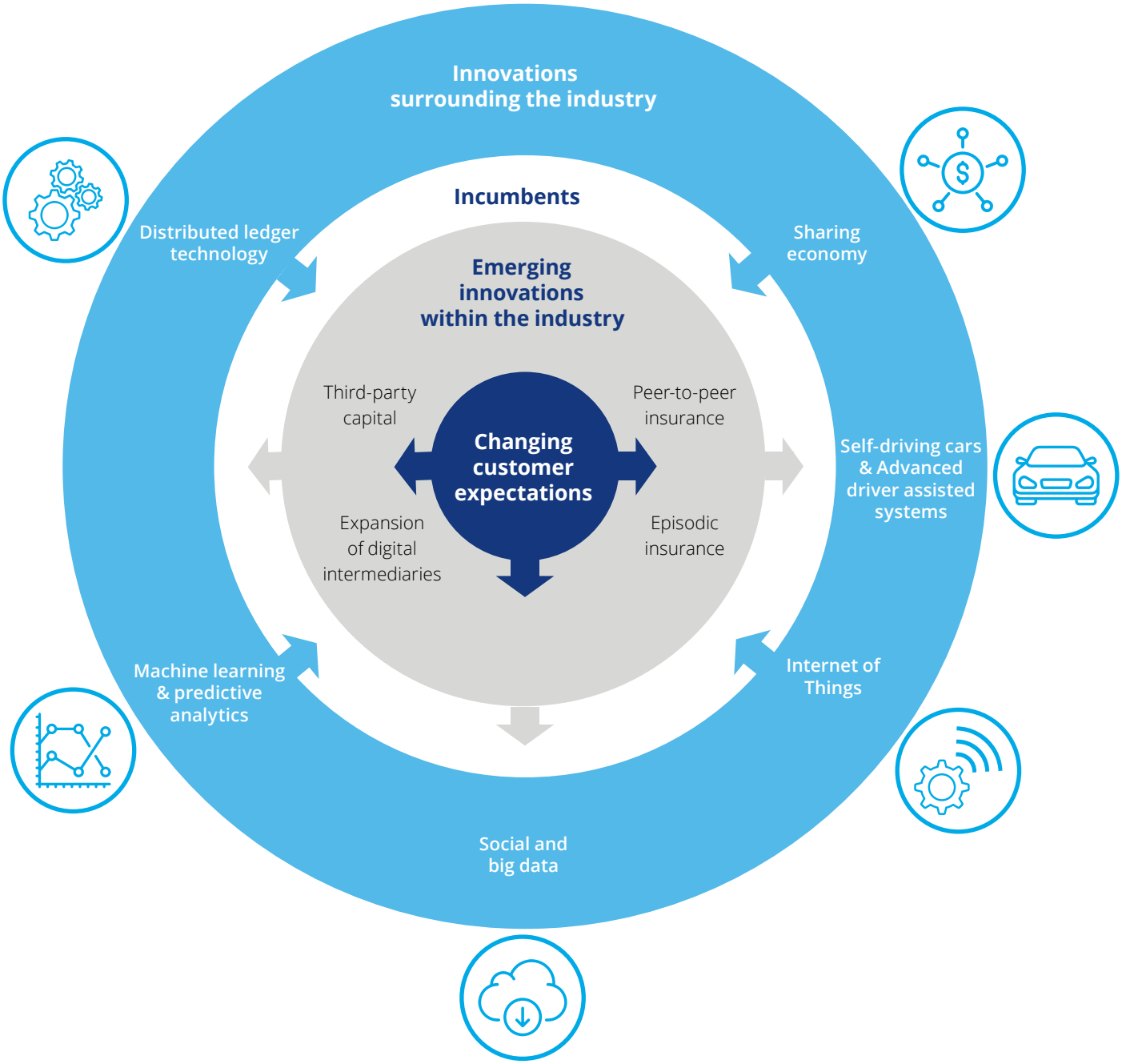
Figure 1.


Innovations surrounding the industry
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Part one
Forces transforming the insurance industry

General insurance, it will surprise no one to hear, is a risk-averse business. The resulting lag in innovation has led to a growing gap between customer expectations and insurers' ability to fulfill them. The industry is now ripe for disruption.

In the report Deloitte developed with The Forum, we made a bold prediction about insurance:

- While retail banking will experience the most imminent effect of disruption, the greatest impact of disruption is likely to be felt in the insurance sector.

Compared with other financial services, the future for general insurance is more uncertain because it's being shaped by forces inside and outside the industry.

Within insurance, 2016 is shaping up as the inflection point for "InsurTech." Many new entrants have emerged, from next-generation distribution intermediaries to peer-to-peer insurers to reinsurance platforms. Each exploits severe friction points among customers. Global insurers and brokerages have launched innovation programs and become one of InsurTech's most active investors.

Outside the industry, transformative forces like self-driving cars and the sharing economy have made shocking progress in the past year. They will change the way property is owned and used. And then there are enabling innovations such as big data, machine learning, and distributed ledger technologies, which offer new ways for insurers to transcend their operations. All are poised to change how insurance is structured, consumed, and provisioned in the future.

In this paper, we explore how these emerging transformative forces inside and outside of the insurance industry may transform the future market landscape. In the first section "Implications of transformative forces," we discuss six potential implications of these forces on the insurance industry, some of which are complimentary while others are contradictory to one another. Then in the following section "Scenarios for the future," we will examine how these implications may converge to create four plausible versions of the future and outline potential strategies that may prevail in those scenarios.

If you are not as familiar with the transformative forces outlined in Figure 1 and would like to take a closer look, please refer to the detailed section on "Forces transforming the insurance industry" on Page 23.

Implications of transformative forces

What are incumbent firms to make of these emerging forces? Several, often competing, outcomes seem likely.

Commercial entities might assume or represent risks that are traditionally personal lines coverages. Insured risks might be broken down by configuration and duration. Personalized risk pricing could lead to unpooling of risk across customers. Meanwhile, safer cars and properties could reduce and homogenize risks, making insurance a commodity. On the other hand, the separation of origination and underwriting could bring consumers more innovative, specialized, and competitive insurance offerings.

Some of these implications may be complimentary to one another, while others may be contradictory depending on how incumbents and innovative new entrants respond to the emerging transformative forces.

Commercial ownership of policies

In the future, commercial entities may represent a substantial share of liabilities associated with personal assets. (Figure 2)

Many sharing economy platforms already aggregate and represent individual customers' insurance demand, so that premiums are included in the per-usage fees customers pay. Where users do not own specific properties, as with ZipCar or Car2Go, it can be difficult to attach insurance policies to specific users. As a result, these companies tend to use commercial fleet insurance, or self-insure and reinsure the risks, and include the cost of insurance in per-usage fees. On the other hand, sharing economy platforms where users offer their own assets to other users, such as Uber and Airbnb, also tend to purchase coverages to support such unique commercial activities, to provide ease of use.

In addition, peer-to-peer insurance providers aggregate a number of individual risks and represent them to traditional insurers. Because they create a pool for only part of the insurance premiums, such as deductibles, peer-to-peer insurers work with traditional insurers to assume the remainder of risks.

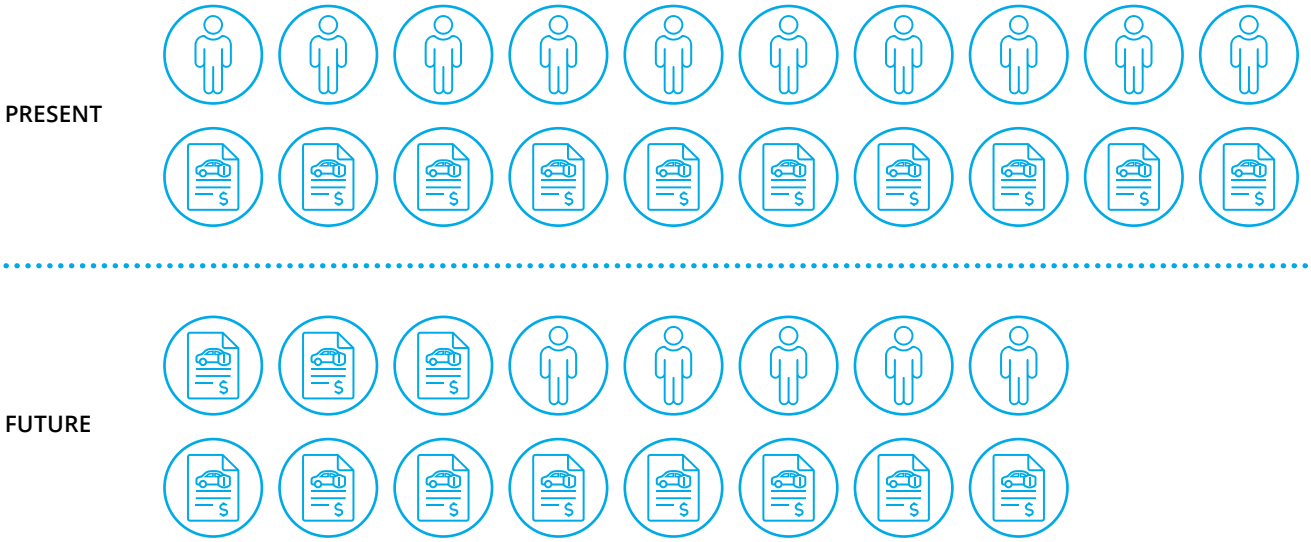
Finally and most profoundly, self-driving cars and advanced driver assisted systems (ADAS) could change who owns insurance policies. Most of the liability associated with self-driving cars will stem from manufacturers rather than drivers. Furthermore, this next generation of vehicles will create new types of risks, such as cyber, that were not associated with auto policies traditionally. As a result, those risks may naturally be represented by auto manufacturers, reducing the amount of risks insurable replacing the demand from individual customers. Meanwhile, because the risks associated with manufacturing algorithms are more complex, they will require insurers with more bespoke, specialized underwriting capabilities.

Volvo announces 100 percent assumption of liability

In 2015, Volvo announced a plan to fully assume the liability associated with accidents caused by its self-driving cars. The technology is imminent, noted Volvo president and CEO Hakan Samuelsson, even though the regulatory framework isn't yet in place.[2] Google and Mercedes are expected to follow suit.[3]
Several accidents reportedly occurred among self-driving vehicles during road tests in 2016. Such incidents may prompt more manufacturers to assume liability for the algorithms behind the vehicles.[4]

The sharing economy could boost this shift toward commercial ownership of insurance policies as ridesharing platforms adopt fleets of commercially-owned self-driving vehicles. As a step toward this goal, in 2016 General Motors announced strategic investments in Lyft. [1]

Figure 2. The future could hold market erosion combined with a shift to commercial policy ownership



IMPACT TO INCUMBENTS	NECESSARY CONDITIONS
Portfolio shift from personal to commercial policies, requiring sophisticated underwriting capabilities	**Widespread adoption** of self-driving technologies and sharing economy models
Market erosion in the insurance industry as non-insurers develop the capacity to estimate and insure their own risks	**Regulatory acceptance** of policies being owned by parties other than the asset owner
Expansion of reinsurers' role as commercial owners directly partner with reinsurers to assume risk for individuals	**Sufficient and fair coverage** provided by commercial institutions and the resolution of potential conflicts of interest
Moral hazard of drivers due to mismatch between policy ownership and property usage	

Shorter policy periods

Although underwriters account for a great many factors in calculating a premium, much still depends on statistical rather than situational or behavioral data. As a result, most policies renew only annually or biannually, because it's too expensive to gather statistical data and calculate premiums more frequently. This is changing.

From the customer's perspective, it's always been costly to buy annual coverage for part-time activity. For example, the driver who works from home most days might not necessarily pay less than someone with a daily commute, all other things being equal. But the rise of the sharing economy, along with online ordering apps, are leading customers to question why they can't get coverage based on their property use. It seems wasteful to buy a year's worth of auto body protection for a vehicle sitting in a garage, or 12 months of flood insurance when some months are dry.

Soon it won't be necessary. Mobile applications enable people to buy micro-coverage on the spot with a few swipes on their phones. Telematics sensors transmit activity so that underwriters can adjust premiums based on the customer's specific habits or situation. Underlying it all are powerful analytics that can extract insights and trends from massive data volumes.

In short, market demand, not actuaries, are beginning to dictate product development. As a result, we're beginning to see modular products that are specific to the time and use of an asset or a customer's behavior. People might turn coverage on or off at will—opting for insurance when their property is in use or when they deem their risks are greater. Billing will change in turn, as premiums become variable and irregular rather than fixed, and billed on an annual or semi-annual basis.

Trov offers insurance on demand

US-based Trov provides a mobile app that lets users maintain an inventory of their belongings. The company recently partnered with Australia's Suncorp to offer on-demand coverage of everyday items such as electronics, musical instruments, and sports equipment. Customers can use the same inventory app to activate and deactivate insurance for particular items, as well as to pay premiums.[5]

That said, shorter policy periods are likely to have a higher base unit premium. If people buy insurance only when their risks are higher, they lose the cross-subsidization of premiums across inactive and active periods during the policy term. As a result, customers might save less than they expect.

IMPACT TO INCUMBENTS	NECESSARY CONDITIONS
Reduced ability to pool risks across customer lifecycles as customers frequently turn policies on and off	**Insurer capabilities** to understand and monitor asset usage
More unpredictable cash flow from annual premiums, potentially leading to new ways of calculating risk capital	**Mobile, user-friendly channels** for customers to buy insurance on demand
Gaming from customers who purchase coverage immediately after an incident, then claim it happened during the coverage period	**Educated customers** who know how much coverage to buy and when
Virtual insurance distribution as customers consume policies just in time	**Minimal overlap** between episodic and full-time coverage
Reduced customer loyalty as relationships exit the insurance transaction	**Sufficient economic incentive** to purchase episodic coverage over time, based on frequency of use

Unbundling of perils

Although general insurance is typically sold as an all-risk, comprehensive policy today, it's really a bundle of perils (specific risks or causes of loss). For instance, an auto policy could have liability for bodily injury, property damage, auto collision, and more. Insurers can cover these perils under one policy so long as the owner is the primary user.

But between the sharing economy and self-driving vehicles, we could see fewer all-risk policies. Instead, it might become more common to consume insurance in smaller units that address single perils.

For example, suppose a car has many part-time drivers. In that case, property liability might belong to the users, while other perils—such as protection against theft while the car is idle—remains with the owner. Similarly, an Uber driver might hold accident liability, but passengers might want to purchase bodily injury protection in case of a no-fault accident. Finally, auto manufacturers might retain liability associated with self-driving algorithms or accident prevention technologies, while auto owners secure protection against theft, fire, and non-driving damage.

IMPACT TO INCUMBENTS	NECESSARY CONDITIONS
Diversified distribution channels to serve individual and commercial customers as comprehensive policies unbundle **More connectivity and sophisticated underwriting capabilities** to understand and track the causes of risk **Less customer turnover** as insurance connects multiple parties with specific properties	**Regulations** to close the gaps between traditional policies and new property consumption models **Sufficient demand** for coverage against specific perils

Metromile and Uber provide a convertible policy

Metromile, a US-based managing general agent specializing in usage-based auto insurance, has partnered with Uber to provide a policy that switches between personal and commercial coverage. The switch takes place via an in-car dongle plus integration with the Uber app. This way, part-time Uber drivers needn't pay for passenger protection or other commercial perils unless they have a paying customer matched or onboard. [6]

Commoditization of risk

Digital intermediaries are making it easier for customers to compare prices across carriers, which has led to products looking increasingly alike in markets like the United Kingdom.

This trend is likely to continue as sharing economy platforms and peer-to-peer insurers homogenize the customer base and their risks. In other words, more of the market may look like the one for rental car insurance where carriers, unable to differentiate across drivers, charge a uniform rate.

Self-driving cars, ADAS, and the IoT will have a commoditizing effect as well. According to Volvo, self-driving technology will eliminate 80 percent of car crashes by 2035.[7] Meanwhile, the rise of remote monitoring and incident prevention will likely reduce what property risks remain in both personal and commercial insurance. As risk levels decline, so may variability among customer risk profiles, further reducing insurers' ability to differentiate based on pricing sophistication.

IMPACT TO INCUMBENTS	NECESSARY CONDITIONS
Reduced ability to differentiate as underlying products and their pricing become commoditized	**Mass adoption of preventative technologies** to effectively remove the human factor
Margin pressure as price-based competition proliferates, increasing the importance of scale and efficiency	**Little perceived differentiation** among carriers and their brands
Erosion of premiums as risks decline	**Limited ability** of insurers to track individual risk profiles on sharing economy and peer-to-peer platforms

Driver error accounts for most car crashes

According to a study by the US National Highway Traffic Safety Administration, 94 percent of crashes are due to driver error.[8] If self-driving cars can significantly reduce human error, other insurable risks may become marginal, with smaller variances among non-human factors. As a result, general insurance policies may become a pure commodity.

Unpooling of risk

Since its inception, the general insurance industry has pooled risks from large groups of customers to help cover losses. However, insurers have begun to explore the IoT, social data, and big data for more behavioral and contextual detail about their customers' risk. Meanwhile, customers are gaining more insight about their own risk, thanks to increased transparency from digital distribution and connected devices such as wearables and cars.

The upshot is that insurers are getting better at measuring and pricing individual risks, while customers are getting better at understanding their own risk levels. This means the old risk pools may go away—and, along with them, insurers' ability to subsidize high risk customers with premiums from low risk customers.

In the end, customers may provide their own cross-subsidies by "borrowing" from their past and future premiums to cover losses. For insurers, long-term customer retention will become a key driver of profitability. Unpooling of risks may also motivate customers to self-insure via monthly savings and a line of credit, especially if they know the exact likelihood and magnitude of expected losses.

IMPACT TO INCUMBENTS	NECESSARY CONDITIONS
Erosion of prediction premium as more accurate risk profiles and individual pricing become a competitive necessity	**Regulatory allowance** of individual pricing based on behavioral data instead of demographic factors, including resolution of privacy issues
Replacement of analytical investments with business intelligence as digital channels allow for price transparency	**Market consensus** on the right price for an individual customer's risk profile
Growing importance of expense ratios to combat compression on loss ratios, making scale and efficiency critical	**Universal data availability** for a sufficient number of insurers to price risks accurately; otherwise, insurers with exclusive access to data will dominate the market by securing profitable customers
Long-term customer retention as the key to profitability as risks are pooled only across the customer lifecycle; value-add and service levels gain emphasis	
Potential increase in average risk levels as customers who identify themselves as low risk choose to self-insure	

Startups help customers understand their individual auto risks

Startups like Zubie, Dash, and Mojio are connecting personal vehicles to the internet to allow people to get insight into their driving habits, vehicle maintenance, and fuel efficiency. This appeals to drivers who would rather not get this information through an insurance company. Given a new level of awareness about their risk levels, it's likely that drivers will begin to expect premiums that reflect this individualization. And, with customers willing to pay only for their exact level of risk, it may become harder for insurers to pool risks across customers.

Separation of origination from underwriting

Traditionally, general insurance companies have owned most of the insurance value chain, except for distribution (mostly owned by brokers) and a small portion of risk capital (ceded to reinsurers). Over the past decade, large scale brokers and managing general agents have been assuming a greater role in underwriting policies that are originated by insurers. In the future, two trends may accelerate this shift and reconfigure how the insurance value chain is structured.

The first is the emergence of digital intermediaries that offer services beyond mere distribution, such as risk analysis and innovative product packaging. These players rely on their partner carriers to assume the risks associated with the policies themselves but, like managing general agents, fully own the underwriting authority—from pricing to binding.

The second trend is in the market for risk capital. Thanks to new analysis platforms, reinsurers can select the policies they assume from insurers faster and with more accuracy and sophistication. Meanwhile, alternative capital such as hedge funds securitize insurance risks, with end customers directly funding some portion. Their widening participation may further separate underwriting from origination or funding. As these models develop and technologies like blockchain automate claims adjudication, we may see a new insurance marketplace for retail and institutional investors, similar to lending platforms like Zopa and Prosper.

Over time, the separation of underwriting and origination activities will proliferate the entry of new, innovative players with alternative value propositions in the general insurance industry, while changing the market dynamics between traditional insurers.

IMPACT TO INCUMBENTS	NECESSARY CONDITIONS
New value propositions as intermediaries and underwriters gain freedom to experiment without putting the entire book at risk	**Trust and transparency** offered by underwriting parties to originating parties
Competitive shakeup due to greater access to capital and tumbling barriers to entry	**Regulatory acceptance** of increased complexity to the industry structure
Downward pressure on rates as the supply of capital increases	**Continued appetite of alternative capital sources to invest** in insurance, even in a high rate environment
More commercial insurers and reinsurers in the personal insurance market via innovative partnerships	

Global reinsurers support Lemonade

Lemonade, a New York-based startup aiming to launch a full peer-to-peer insurance network, has announced partnerships with global reinsurers such as Berkshire Hathaway's National Indemnity, XL Catlin, and Munich Re.[9] While Lemonade will operate as a carrier—unlike other peer-to-peer insurance platforms that are structured as brokers—its alliances with global reinsurers will allow Lemonade to focus on underwriting capabilities, while relying on reinsurers and individual investors to provide risk capital for policy origination.

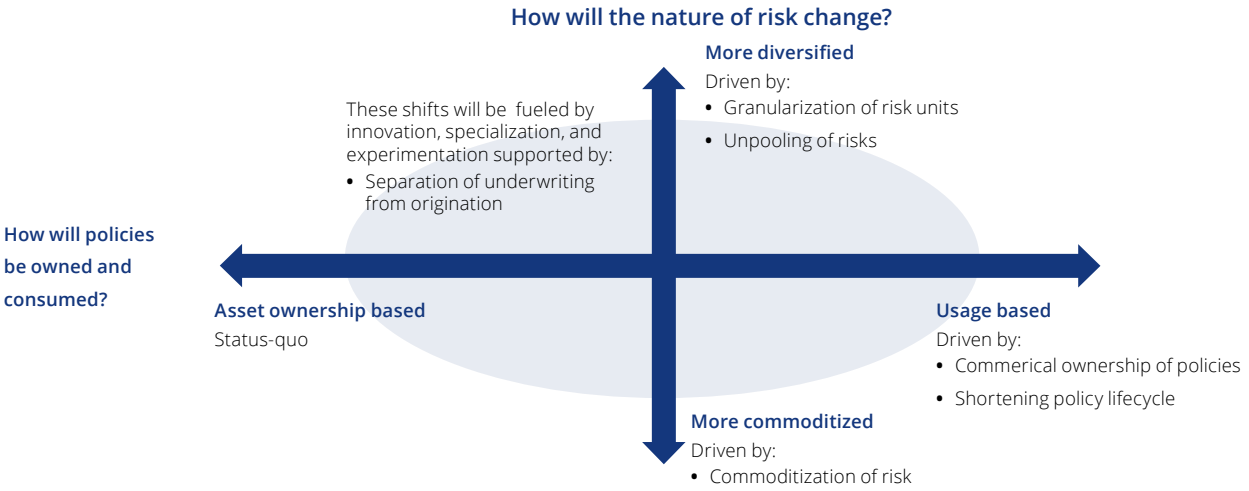
Alternative capital continues to grow

As of 31 December 2015, alternative capital sources such as hedge funds comprise US$72 billion of the US$565 billion global reinsurance capital market, showing 12 percent annual growth. Projections indicate that this market will grow to US$120-150 billion by 2018.[10] An influx of alternative capital into the reinsurance market may separate funding from underwriting activities.

Scenarios for the future

How will these implications come together to influence the general insurance industry? Figure 3 shows some plausible alternatives.

Figure 3. The future of general insurance offers four likely scenarios

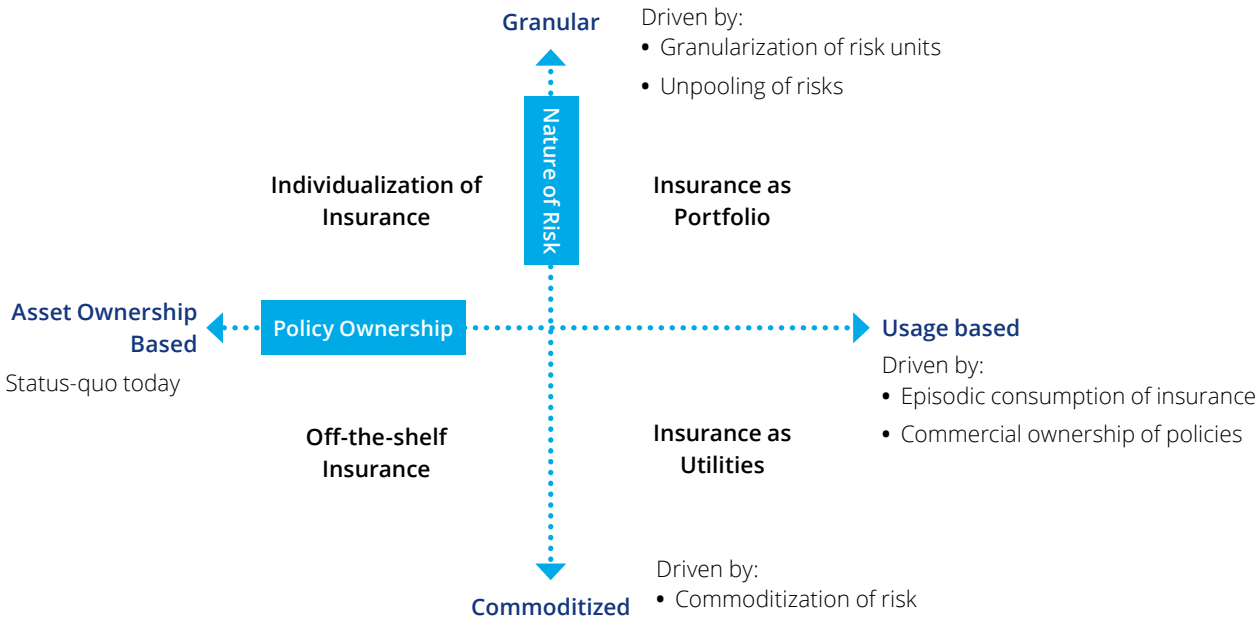


Some of these implications affect policy ownership and consumption. These could stay with asset owners (the status quo). Then again, they could shift to asset usage (as insurance policies become more episodic) or liability source (as commercial entities increase their role within personal insurance).

Similarly, some implications affect the kind of risk that is being insured. At one end lies further commoditization and erosion. At the other end, higher granularity and personalized pricing may end up diversifying risk.

With the separation of underwriting from origination, experimental players will enter the general insurance industry and accelerate the shift along these two axes. Figure 4 shows what these implications mean for incumbent institutions and their ability to win in the future. While these four scenarios are contrasting, they may all co-exist to some degree. Insurers must make their core strategic decisions based on which direction they believe their market will move.

Figure 4. Developments in general insurance depend on policy ownership and the nature of risk



Scenario 1: Individualization of insurance

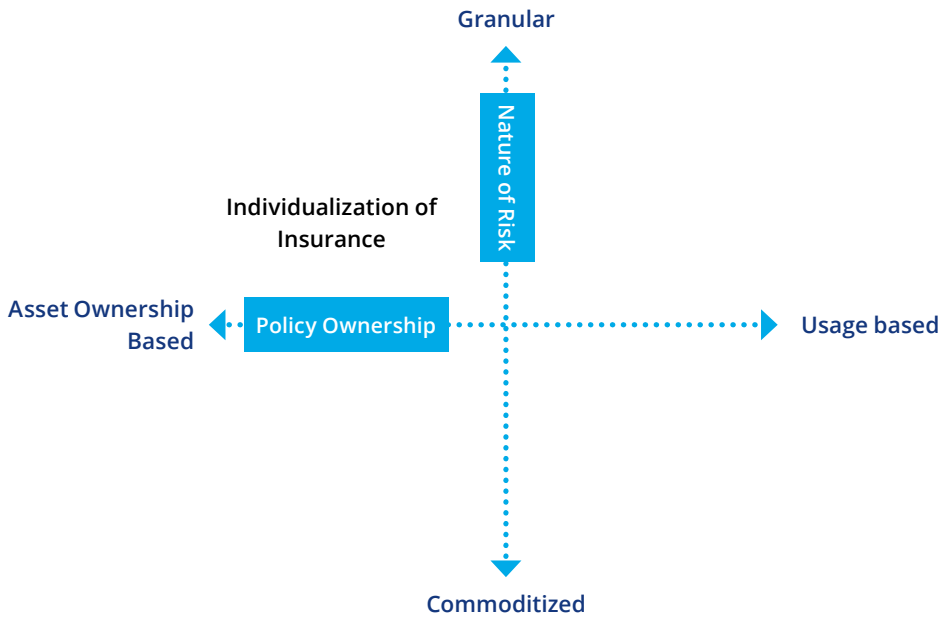
You sit in your car, and before you've even pulled out of your driveway the amount of risk you face on your drive to work has been calculated; considering your driving habits, the time of day, the current weather, real-time traffic, and the condition of the tires and breaks. A message pops up on your dashboard from your insurance provider to alert you that your usual route is not the safest option during this rainstorm. An alternate route is suggested, and you select it knowing that doing so will not only increase your personal safety, but will also help to reduce your monthly insurance premium.

Suppose that for the most part customers continue to buy insurance as asset owners. It could be that increased connectivity of assets and behavior offers insurers and customers alike better insight into the empirical factors that directly affect risk levels. Firms end up competing to provide more accurate predictions. The result? Increasingly personalized pricing and coverage (Figure 5).

But as prediction accuracy improves and overpricing declines across the industry, an individual insurer's profitability will likely be neutralized. (After all, you can't get more right than right.) Profitability after that will depend more on insurers' ability to proactively manage customers' risks and, therefore, losses.

MUST HAVES	POTENTIAL PLAYS
Advanced predictive analytics capabilities to support price sophistication and risk management Access to **behavioral, situational and contextual data** **Real-time digital channels** to connect with customers in the right moments to provide proactive advice	**Proactive, pre-emptive management of customers' risks,** providing insightful, real-time advice and incentives **Specialization in specific customer segments** with unique risk profiles, evolving the affinity distribution model

Figure 5. Individual asset-based policies plus differentiated risk equals more personalized pricing and coverage



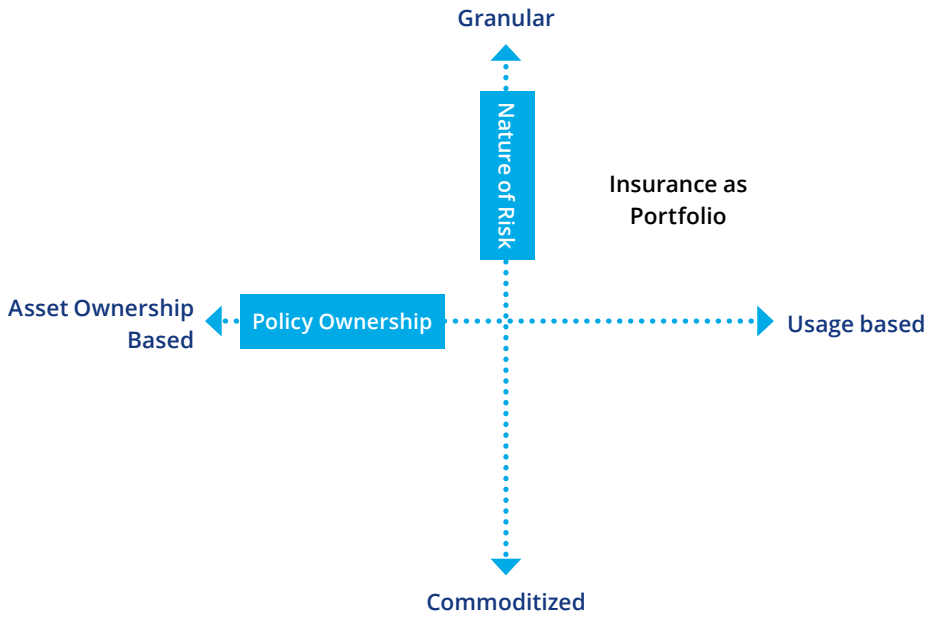
Scenario 2: Insurance as a portfolio

Instead of insuring your assets with preset products, you insure your life and whatever you choose to do, whenever you choose to do it. On a Friday morning instead of driving to work you take the day off and drive with your family to the countryside. Your digital broker recognizes the changed pattern and instantly swaps your urban coverage to a more suitable lower priced policy with another carrier just for the afternoon. Later in the evening, you take an Uber with your partner for a dinner date. Your digital broker automatically provides you with protection coverages from a specialized insurer. On the weekend, you rent a truck to help your daughter move into a college dorm. Instead of paying a high insurance premium included in rental car pricing, your digital broker pairs you up with a carrier to receive a "right price" recognizing your superb driving skills. Like an electricity grid, depending on your usage of assets your broker or agent can swap coverages in and out to insure you always have the most suitable coverage at the best price.

In this scenario, risks are still measured and managed at a granular level. However, customers acquire coverage only for the limited time an asset is in use or when they undertake a risky activity. The traditional policy then gives way to a portfolio of small, diverse, dynamic policies or modules. Another way of looking at it is that each consumer has a custom insurance product that they assemble, either by themselves or with the help of a broker (Figure 6).

MUST HAVES	POTENTIAL PLAYS
Ability to break policies down into granular units to enable **episodic consumption** **Seamless connectivity** to enable ongoing purchase, consumption and management of micro-policies Access to **behavioral and situational data** to determine customers' insurance needs in a timely manner	**End-to-end, seamless fulfillment** of customer needs through partnerships with various digital platforms (e.g., sharing economy platforms, and vehicle operating systems) **Subscription based insurance model** allowing customers to turn coverages on and off as they need them

Figure 6. Usage-based policies plus differentiated risk equals dynamic, one-of-a-kind products



Scenario 3: Off-the-shelf insurance

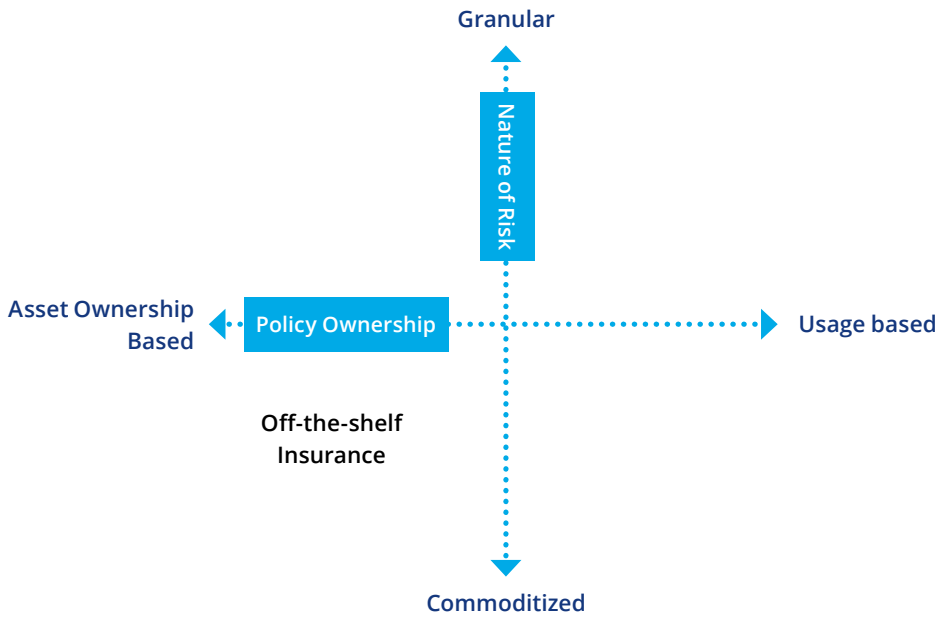
You choose your insurance policy when you bought your car at the car dealership. There were no questions or quotes, just a selection based on price among a few companies as their products are virtually undifferentiated. Next year, while you are window-shopping at a local hardware store, you find a cheaper insurance offer for your car in a gift card section. You simply pick up the voucher, pay for it at the counter, and activate it using your phone.

Another possibility is that personal asset-based policies become standardized to the point that people can buy them "off the shelf." This happens when risks become homogenous, due to increased automation and asset sharing. In other words, personal insurance all carries the same risk premium because risks are virtually the same. Therefore analytics are less of a competitive factor, and risk pricing becomes commoditized (Figure 7).

Once risks are low or homogenized enough, products will sell on some mix of price and consumer experience. To some extent this model is already here: We see it to differing extents in the travel and pet insurance segments, and in the UK private motor insurance market.

MUST HAVES	POTENTIAL PLAYS
Operational efficiency to ensure price competitiveness	**Scale play** to drive efficiencies and compete on the basis of price **Being a multi-line player** may be necessary in markets where the threshold of scale cannot be achieved due to regulatory restrictions **Investment in brand building** to create perceived differentiation in customers' minds **Providing differentiated value-add offerings** to customers to compete above and beyond commoditized core products **Partnerships** with retailers/institutions surrounding the underlying property to enable seamless purchase experience (e.g., car dealerships, loan providers, real estate agents)

Figure 7. Individual asset-based policies plus commoditized risk equals off-the-shelf insurance products



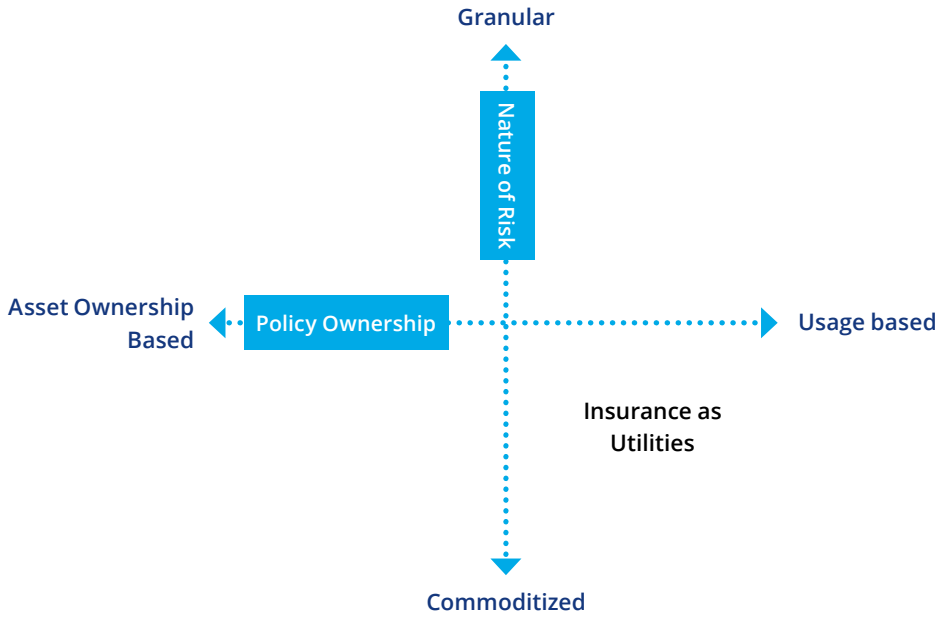
Scenario 4: Insurance as a utility

Imagine a world where … You don't own a vehicle but instead use a self-driving rideshare for all of your transportation needs. You know that you're protected in case of an accident because the rideshare company takes care of all of the insurance in the background. Even for those who purchase private cars, their car manufacturers include the cost of insurance in their monthly leasing or financing invoice as you are only responsible for 10 percent of risks associated with the car anyways. Insurance becomes a levy on your usage, just like sales taxes. You use assets as you need them but no longer need to purchase insurance, at least not consciously.

The final scenario is one in which insurance becomes super-commoditized but is no longer attached to asset ownership. Whether it is because the sharing economy proliferates or customers only own a small fraction of risk, insurance purchases are tied to the consumption of assets. In this scenario, customers don't have to select a provider for each consumption since they know the prices and products are similar and they can rely on intermediating commercial institutions to present their needs to insurers. Therefore, commercial institutions own the risk, and individual consumers have less visibility into pricing or even the carriers who provide the insurance products (Figure 8).

MUST HAVES	POTENTIAL PLAYS
Business-to-business partnerships with commercial entities that will assume or represent a majority of risks in the future	**Specialization** in specific types of insurance product variations (e.g., self-driving cars, the sharing economy) **Development of usage-based billing** models to enable intermediating commercial entities efficiently distribute costs to end users **Creation of alliances** with specific intermediating commercial entities to create standards for consumption of insurance as utilities

Figure 8. Usage-based policies plus commoditized risk equals commercial policy ownership



Conclusion

Change has been slow to affect general insurance. It's been that way for some time. It might not be that way much longer.

Inside or outside of the industry, transformative forces may create a market that looks substantially different from today. Insurers need to think about how those forces could affect them and what they must do to win in this landscape. In other words, emerging innovations call for insurers to rethink what their long-term strategies will be.

However things turn out, insurers have a few safe bets:

- Seamless digital channels to deliver valuable insights or distribute insurance policies when customers need them
- Access to data that helps price risks and generates new insights
- Partnership strategies for the next generation of digital intermediaries or commercial entities representing customer demand
- Scale and operational efficiency to counteract lost prediction premium or create new value

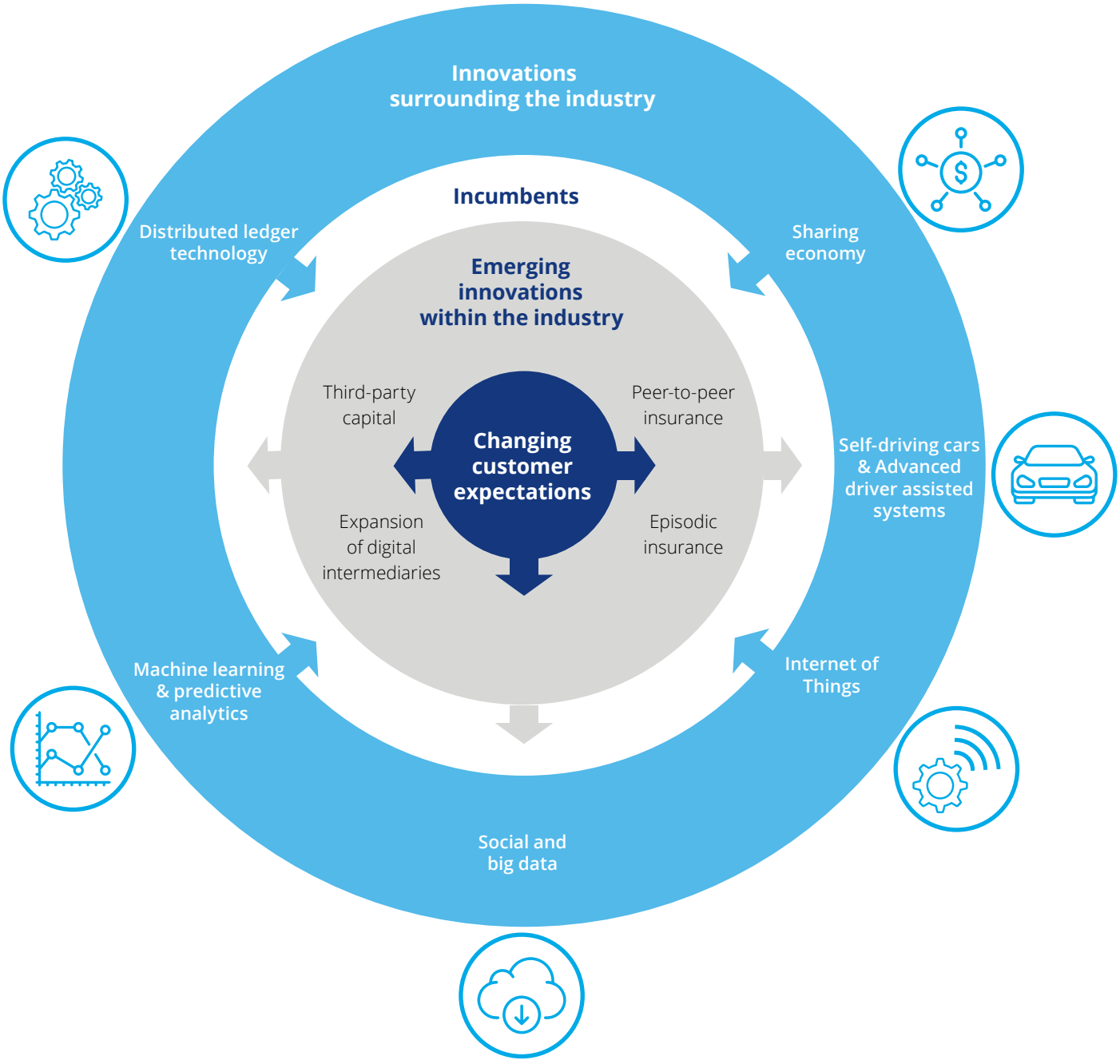
As for emerging innovators, insurers have a decision to make. Investing in innovative products is important, but no insurer can go it alone. They need a strong relationship with the innovation ecosystem to sense changes, lock in key alliances, and place winning bets against the market evolution.

We've developed in-depth examinations of a number of potential areas of disruption, with particular attention to rallying an effective response. We welcome the opportunity to discuss any of these ideas further with you.

Part two
Innovations surrounding the insurance industry

In this section we take a deeper look at each of the innovations transforming the insurance landscape, both from within insurance, and from surrounding industries. These transformational forces, as seen in Figure 1 and 9, are the basis for the implications and future scenarios discussed throughout the paper and serve as reference to those wanting to take a closer look at each.

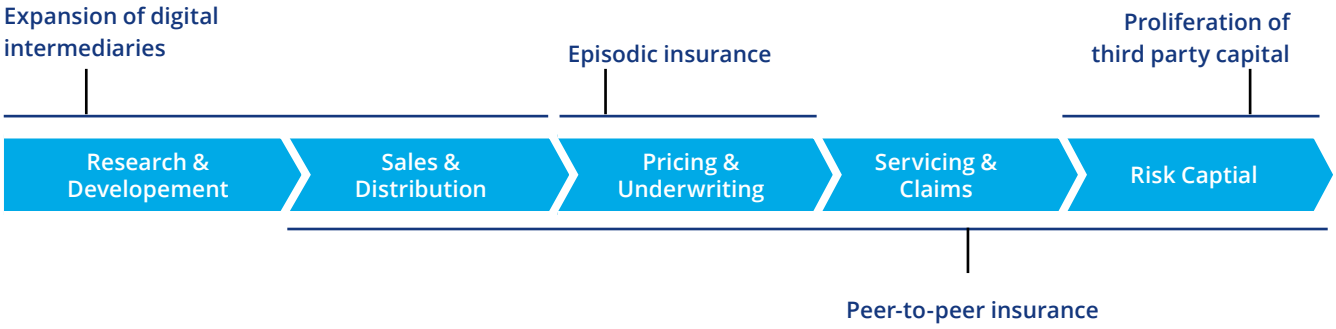
Figure 9.



Innovations within insurance

Within general insurance, innovation looks very different from the way it did just a few years ago. Back then, most innovation came from incumbent institutions aiming to enhance product features or customer interaction. Today, we're seeing a large influx of new entrants test the boundaries of insurance (Figure 10). Global insurers, having learned from the disruption taking place in other financial services segments, are embracing these new entrants and providing them access to products, data, and capital.

Figure 10. New entrants are testing the boundaries of general insurance



Expansion of digital intermediaries

For general insurance, digital distribution isn't a new story. Many leading carriers now offer digital direct-to-consumer channels, while online aggregators (price comparison websites) such as Insurify, Goji, and TopCheck continue to gain influence. In the United Kingdom, for example, a Deloitte/YouGov survey shows that 58 percent of general insurance customers use online aggregators before buying a policy.

But new types of digital intermediaries are entering the mix as well. Online aggregators like Embroker, Next, and Insureon tackle commercial insurance, a market where customers' digital needs have been underserved. Brolly, Knip, and Coverwallet analyze customers' insurance needs, portfolios, and options similar to a traditional in-person broker.

Then there are digital intermediaries that offer value-added products and services, like FIGO's pet community or Schutzklick's discounted offers on tech gadgets. Bought by Many also participates in risk selection and customer segmentation, activities that carriers ordinarily assume.

Finally, we're seeing business model innovators—think episodic and peer-to-peer insurance—registered as brokers in order to bypass traditional barriers of entry. These players typically partner with only a select number of carriers, or they "hold the pen," essentially acting as the next generation of managing general agents.

This evolution of digital intermediaries can create important implications for traditional carriers. First, they can improve customers' ability to discover the right prices for their risk levels and create a standardized view of insurance products, driving commoditization of insurance policies. They can act as external research and development arms for traditional carriers to try out innovative business models, without putting their entire business operations at risk, but in doing so, also increasing the importance of first-mover advantages for insurers in securing partnerships with them.

Episodic insurance

Today's digital customers expect products and services on demand. Apps like Uber and Foodora have conditioned them to just-in-time fulfillment. At the same time, the sharing economy has made pay-as-you-go consumption the norm in certain demographics.

In response, a new generation of insurers are enabling customers to purchase coverage only for as long as they need it. Metromile, OKCheXian, and Octo offer usage-based insurance where premiums are based on driving distance and duration. Cuuva lets customers buy auto coverage by the hour when they borrow their friends' vehicles. For personal belongings, Trov plans to offer on-demand insurance coverage by the item for whatever duration the customers define.

These innovators are sweeping away traditional policies and replacing them with on-demand, micro-duration coverage, changing not only the way insurance is consumed but also the way risks are distributed.

Proliferation of third-party capital

Hedge funds and other capital management firms are providing more of the funding for reinsurance. They do this by issuing insurance-linked securities such as catastrophe bonds and setting up reinsurance companies. As a result, insurers have reduced their dependency on the traditional reinsurance market.

By 2015, alternative capital composed US$68 billion of global reinsurance capital, compared with traditional capital's US$497 billion. That 12 percent market share is expected to double by 2018.[11]

Besides providing a different funding option for insurers, alternative capital is less expensive than capital from traditional providers. This means access to risk capital may be less of a barrier than it once was for firms trying to enter the insurance industry. It could also lead to greater commoditization of risks as more players join the insurance market. In reinsurance, the main impact is an increasing supply of risk capital, depressing prices and profitability.

But reinsurers are fighting back with real time and predictive analytics, which help them select underwriting risks and track them against quoted business, underwriting guidelines, and capital allocation.

Although the underlying analytics technology has been available for some time, its cost has declined significantly in recent years. At the same time, new commercial cloud-based applications are making solutions easier to buy and use. One example is QuanTemplate, which offers business analytics capabilities specifically for reinsurers. In September 2015, QuanTemplate raised nearly US$8 million in its fourth round of funding.[12]

If they can model risk scenarios from large data volumes, reinsurers will end up with more sophisticated risk selection, pricing, and reserving, potentially allowing them to counteract the increasing power of reinsurance buyers today. For instance, a reinsurer might use analytics on social media data to identify a health risk (such as breast implant problems in France) and then, ahead of a class action lawsuit, adjust its reserves.

Peer-to-peer insurance

Peer-to-peer insurance networks, most of which are new entrants, are collecting customers with similar insurance needs into groups that share in the benefits and costs of general insurance coverage. Group members benefit from lower premiums by promoting risk-sensitive behavior, such as absorbing small claims or driving more safely.

It all looks much like the mutual aid societies of the past, but with a modern, digital twist. Social network platforms enable customers to connect with one another and pool their premiums online. Lemonade, a startup that aims to combine technology with behavioral economics, raised US$13 million in its initial round of funding.[13] Friendsurance, which has more than 10,000 customers[14] and raised US$15.3 million,[15] groups similar policyholders and collects a portion of the groups' premiums in a pool. The pool is then used to cover small claims made by any of the groups' members, or is repaid to the members if claims are less than premiums.[16]

By offering the possibility of lower costs and greater transparency, peer-to-peer networks may be able to draw certain segments of customers—those most willing to engage in online insurance networks, often the young and tech-savvy—away from traditional insurers.

Innovations outside of insurance

Compared with other financial segments, general insurance is especially susceptible to innovations from the industry's periphery. For example, self-driving cars—a staple of science fiction—are about to become a reality. Some of these innovations will disrupt the way products are created and used. Others will bring a new level of sophistication to how insurers run their businesses.

The sharing economy

Online and mobile platforms are making it easier to commercialize personal property. The idea is to help people make use of excess capacity, such as an extra seat, empty bed, or idle tool. For a given asset, the user base may now extend beyond its owner and his or her personal acquaintances to include a broad range of community members.

Uber and Airbnb are two famous examples of "sharing economy" platforms. They're part of an industry that is projected to reach US$335 billion by 2025.[17]However, insurance gaps may emerge in these new models of production and consumption. For example, Uber drivers may need varying degrees of coverages when their vehicles are being used for personal uses, commercially without passengers, or with on-fare passengers. Similarly, an Airbnb host may need an additional level of insurance coverage to protect against damages and liabilities that are incurred by users. But traditional products tend not to provide the degree of flexibility required to meet those varying needs effectively.

Incumbent insurers are working to close the gap. For instance, several now offer ridesharing policies.[18] In the meantime, however, they may face competition from new entrants that aim to appeal to the specific insurance needs of sharing economy participants.

Self-driving cars and ADAS

Automotive and technology companies are developing cars that can navigate roads without humans. Some 10 million self-driving cars are expected to be in use around the world by 2020.[19]

As self-driving cars replace the old-fashioned kind, the nature of risk will shift from human error while driving to new risks that stem from manufacturing defects, such as mechanical failures, programming errors, and hacking. If self-driving cars are safer than human drivers, as tests suggest, the motor insurance market will shrink as the frequency and severity of losses decline and the ability to accurately predict and price individual drivers will lose its marketplace advantage. Instead, incumbents will need to adapt their underwriting techniques for product and environmental factors, and soon—or face new entrants who beat them to it. Underwriters will be more effective when they understand the differences between performances of car manufacturers and operating systems that enable self-driving cars, as this will be far more important to developing unique risk profiles than customer information.

The proliferation of self-driving vehicles will also change insurers' customer bases and products. The shift toward self-driving cars will put more responsibility on vehicle manufacturers and operating system providers, and may necessitate a new coverage that insures them from vehicle malfunctions and cyber attacks, although vehicle owners will still be responsible for insuring against non-driving damages. Coverages may therefore unbundle from today's comprehensive policies as manufacturers and operating system providers become vehicle stakeholders, and potentially owners of insurance policies in the future.

To some extent, the ramifications of increased safety and shifted liability in self-driving vehicles are already being felt with ADAS. ADAS are sensors that help drivers know what they can't see. Some sensor devices, such as backup cameras, blind spot alerts, and adaptive cruise control, are readily available. Others, such as automatic parking, are emerging. Eventually, ADAS will communicate with one another, significantly improving their accuracy and reliability.

And before long they will all be standard to most vehicles, in no small part due to automotive regulation. The global ADAS market is expected to reach US$60 billion by 2020.[20]

ADAS and self-driving cars alike are a general insurance game-changer. As they save lives and property, they could lead to much smaller premiums. Safer vehicles will reduce claims frequencies and severity in the long-term, although claims may be higher initially due to increased complexity and cost of self-driving vehicle parts. In addition, they may blur the line between human risk and manufacturers' liability in assessing the risks associated with driving.

The IoT

Physical objects are being embedded with wireless technology that allows them to connect to other objects via the cloud. In this way, everyday items can form a network where they communicate with one another—such as your car telling your house two blocks over to open the garage door. This is the IoT.

The IoT will create unique opportunities for insurers to embed themselves into the emerging ecosystem surrounding underlying properties to deliver additional value to customers.

As more things become connected, insurers will be able to tap them for data, greatly improving the accuracy of risk assessment and pricing. The IoT also will create a new channel to interact with auto and property insurance customers, helping to mitigate specific risks or offer coverage at the point of need. For example, a sensor could shut off the water supply when it detects a drop in pressure caused by a leak.

But not every IoT company is a startup. Large, established companies are piling in too, including Cisco, Bosch, GE, and Texas Instruments.[21] By 2020, US$1.7 trillion will have been spent on IoT-enabled devices.[22]

These devices and the opportunities they present to insurers will not exist in a silo–the IoT and the web of connections it encompasses will support the development of ecosystems within which many companies will interact to form a streamlined experience for customers. By adopting devices that can connect with components delivered by other industries or companies, insurers will be able to embed themselves in the end-to-end experience of customers who are, for instance, purchasing a vehicle or a home.

And in this emerging field, the advantage could go to those with lower costs to install IoT technology. They may end up being the ones who master real-time analysis of data streams through the network, enabling them to reward safe behavior and intervene in hazardous situations.

Social and big data

Yesterday's data mining has evolved into today's big data analytics. New graphical interfaces help actuaries and other business users tease patterns, trends, and correlations from massive sets of data. Behind the scenes, cheap memory and high-speed algorithms make short work of the sort of computational analysis that took weeks to complete not so long ago.

People post more than 1 billion items—statuses, links, photos, etc.—to Facebook every day. Companies like them are exploring ways to quantify and analyze human activity. A system developed by Facebook scans 10,000 posts every second in 20 languages aimed at improving user experience and linking to relevant content.[23] Data scans are also being used to see how well ads are doing across different segments of the audience.[24]

Similar lifestyle and behavioral information shared through social media could change the way incumbents predict customer risk. Using powerful analytics tools, insurers might reveal unmet coverage needs, nuanced correlations between behavior and risk, and profitable customer segments they had previously overlooked. Startups are also exploiting the opportunities of social media data. For example, Bought by Many uses social media and online search to identify profitable customer niches.

Machine learning and predictive analytics

Machine learning and predictive analytics are making their presence known in financial services. The industry is no stranger to the actuarial modeling and claims fraud detection that these advanced capabilities support. But big and social data, combined with the falling costs of computing power, help insurers create the next generation of pricing and claims models. They offer more sophistication and accuracy, reveal new indicators and precursors, and create ways to personalize insurance policies and pricing.

Machine learning helps insurers by creating a feedback loop with empirical data. Platforms like Google Deep Mind, Ayasdi, and SigOpt provide sophisticated machine learning capabilities at competitive prices. Traditional insurers are already one of the most avid users of these technologies, judging by how many insurers sponsor crowdsourced analytics platforms like Kaggle.

These technologies are also at the core of robotics and process automation (RPA), which is fundamental to the advancement of many of the innovations outlined here. Insurers will only experience the impacts of increased data availability due to the IoT and decreased variability in risk as a result of self-driving cars if RPA continues to advance.

Blockchain technology

The financial services industry has led the effort to apply blockchain technology beyond virtual currency. By distributing ledgers across more computers, blockchain provides a fast, cost effective, and highly reliable alternative to traditional databases and rails of value transfer. Blockchains can also be broken down into infinite number of smaller units–blockchain-based systems can easily break policies down into minutes and seconds to enable episodic insurance distribution. It also enables smart contracts that can be automatically and immutably executed based on measurable conditions.

Blockchain applications show early promise for both insurers and customers. It may reduce the cost of premiums and claims given the ease and speed with which blockchain would manage very complex cases, which would reduce the cost of managing these claims to insurers and allow them to pass savings on to the customer. Combined with the IoT, blockchain systems can make parametric insurance in home and auto insurance possible, so that claims can be automatically paid based on predetermined conditions. Blockchain also could facilitate automated premium payments, complex claims assessment, and claims payments.

Implications

Each of these forces will have different effects on the insurance business model, as illustrated in Figure 11. Insurers will need to consider their unique business to determine how they want to try and innovate in order to succeed.

Figure 11. How do transformative forces map to potential implications?

		Within insurance				Outside of insurance					
		Digital Intermediaries	Episodic insurance	Alternative capital	Peer-to-peer insurance	Sharing economy	Self-driving cars & ADAS	IoT	Social and big data	Machine learning & predictive analytics	Distributed ledger technologies
Distribution	Commercial ownership of policies				•	•	•				
Product	Shorter policy periods	•	•			•		•			•
	Unbundling of perils		•				•	•			
Pricing	Commoditization of risk				•	•	•			•	
	Unpooling of risk	•						•	•	•	
Structure	Separation of origination from underwriting	•		•	•						

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