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CRE READING PROGRAM QUESTIONS

All quizzes **MUST** be taken online

“ERM: What Insurance Regulators Need to Know About Key Performance Indicators and Key Risk Indicators”

Multiple Choice Questions — Submit Answers Online

1. Question: What is missing from risk registers that makes them inadequate for monitoring ERM programs?
 - a. Mitigation plans for addressing the risk.
 - b. Priority ranking of the risks.
 - c. Risk owners.
 - d. All of the above
2. Question: What form should effective key performance indicators (KPIs) take?
 - a. They must be quantitative.
 - b. They must be qualitative.
 - c. To be most effective, KPIs need to be clear, meaningful and measurable.
 - d. They must be strategic.
3. Question: How can you develop effective key risk indicators (KRI)?
 - a. Use reverse stress tests.
 - b. Use a KPI trend line to signal a potential risk, KRI.
 - c. Use employee exit interviews to reveal potential risks, KRIs.
 - d. None of the above.
4. Question: How might insurers use KPIs and KRIs?
 - a. Ensure financial and non-financial plans are met.
 - b. Keep track of risk developments.
 - c. Enable early intervention and mitigation.
 - d. All of the above.
5. Question: What is an example of a KPI or KRI for insurance carriers?
 - a. New underwriting criteria are KPIs.
 - b. Adding to claims staff is a KRI.
 - c. Renewal price monitor is a KPI.
 - d. Investment portfolio mix guidelines are KRIs.



CRE READING PROGRAM QUESTIONS

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“PwC NAIC Newsletter”

True or False Questions — Submit Answers Online

1. The Cyber Security Working Group’s efforts led to a successful meeting of its goal to complete an Insurance Data Security Model Law by the end of 2016.
2. The Statutory Accounting Principles Working Group was able to finalize guidance that accounting for bond exchange-traded funds will remain classified within SSAP 26R, Bonds.
3. Earthquake and catastrophe risk charges will be implemented in the RBC calculation starting with 2018 reporting.
4. Principles Based Reserving is set for mandatory implementation as of January 1, 2020.
5. With regard to SSAP 41, the Statutory Accounting Principles Working Group exposed for comment proposed revisions that provide guidance on surplus notes issued at a discount or a premium or with a zero coupon.

“IAIS Report on FinTech Development in Insurance Industry”

True or False Questions — Submit Answers Online

1. Core themes for regulatory considerations that need to be addressed as technology in insurance evolves include interconnectedness, ability for regulatory oversight, business model viability, and data ownership.
2. One item in insurance that will never change with technological innovations as new business models evolve is the relationship between insurers and their policyholders.
3. The most impacted area in the insurance value chain from technology innovation is in fraud detection and claims handling processes.
4. If specialist technology firms are established so customers are interfacing with those firms through sophisticated data analytics, for property insurance as an example, monitors could be attached to pipes to assess the risk of freeze and thereby marginalize the insurance product by reflecting the reducing level of risk.
5. With regard to pricing and underwriting, sensor technologies in the car, home and on the body may lay a foundation for tailored insurance plans and a claims model focused on prevention.



CRE READING PROGRAM QUESTIONS

All quizzes MUST be taken online

“Captive Insurance for the Middle Market”

True or False Questions — Submit Answers Online

1. A group captive is usually used to insure risks that are uninsurable or difficult to obtain in the commercial market.
2. A small captive is exempt from income tax up to \$2.5 million starting in 2017.
3. A group captive is designed to enhance the Company’s primary layer of casualty insurance.
4. A small captive is defined by the amount of premiums that the captive writes annually.
5. Small captives were on the IRS “Dirty Dozen” list for 2016.



Captive Insurance for the Middle Market

By Kimberly S. Bunting and Phyllis Ingram

Business, by nature, is risky. Even with proper research and planning, business owners know to expect the unexpected. Nonetheless, part of proper planning may include business owners managing their own risks—such as certain casualty, property, and enterprise risks—by forming captive insurance companies to gain greater flexibility and potential cost savings.

This article will help CPAs better understand the purpose and benefits of captives—as well as the options available, particularly for a middle-market business owner. Additionally, it explains how provisions of the Protecting Americans From Tax Hikes (PATH) Act of 2015 (Division Q of the Consolidated Appropriations Act, 2016, P.L. 114-113) offer new, favorable tax opportunities to owners of captive insurance companies.

A captive insurance company is an insurance company formed by a business or a business owner to insure the risks of the business and related or affiliated businesses. A captive also may be formed by multiple businesses or business owners from different companies, which is generally referred to as a group captive. The benefits of owning a captive include flexibility in insurance coverage arrangements and the potential to retain underwriting profits. Captives may issue property and/or casualty insurance coverage against a wide variety of possible liabilities and may be used to insure life and health risks as well. In addition, captives provide an opportunity to insure against liabilities that may be generally uninsurable or that are difficult to insure because coverage is unavailable in the commercial market or is excessively priced.

When a company purchases commercial insurance, it pays a third-party company to take on a certain amount of its risks. The insurance company calculates the costs that the risks might present and charges a premium accordingly. If the risks/losses ultimately are less than the premiums charged, the insurance company makes an underwriting profit. The same concept applies to a captive. A captive evaluates the risks it undertakes and charges premiums sufficient to cover them. If the costs associated with those risks are less than the premiums charged, the captive makes an underwriting profit. The premiums received by the captive are invested, just as a commercial insurance company invests its premiums and earns an investment return. The key difference between using a captive and purchasing commercial insurance is that the owner of the captive has the role of both the insured and the insurer.

The key benefits of operating a captive include: (1) The premium payments are tax-deductible as a business expense under Regs. Sec. 1.162-1(a), and (2) the premium income to the captive either is reduced by loss reserves or may be nontaxable under Sec. 831(b), depending on the amount of premium income. If the captive is operated successfully, it will generate profit that belongs to the captive owner, not a commercial insurance company, while



Captive Insurance for the Middle Market

(continued)

also providing significant tax benefits.

For income tax purposes, captives are often referred to as large or small. A large captive does not have a stated limitation on premiums received; however, a small captive taking advantage of a Sec. 831(b) election must limit premiums received to \$1.2 million or less. Starting in 2017, the premium limitations will increase to \$2.2 million per year under the PATH Act. Both types of captives must be taxed as C corporations (see Sec. 1361).

The distinction between the two is important in operating a profitable insurance company. A large captive can shield premium income only through loss reserves, which must be determined by actuarial analysis based on past loss experience, just as any other insurance company operates. A small captive makes an election to be treated as such under Sec. 831(b). The primary advantage of making the Sec. 831(b) election is that the small captive is then exempt from income tax on up to \$1.2 million (\$2.2 million in 2017) of premiums received without having to actuarially establish reserves to offset premium income.

Companies with uninsured or underinsured risks are prime candidates for captives, as they can provide otherwise unavailable or difficult-to-procure insurance. Also, companies with a history of low losses may consider using a captive to insure matters that are covered in their commercial insurance programs, given the profit opportunity, tax benefits, and investment opportunities. Captives also provide benefits such as claims management flexibility and the opportunity for improved risk management procedures. Captives are generally designed to complement, not replace, a company's commercial insurance program by addressing certain types of risk more efficiently and by filling holes and gaps in a company's risk management program.

Middle-market companies usually do not have sufficient loss experience for a stand-alone large captive to be cost-effective, given the costs to set up and operate one. Small captives or group captives (described below) are the best captive opportunities for middle-market companies.

Group Captives

A group captive is a large captive involving a number of participants. Some specialize in specific industries and are referred to as homogeneous group captives. Others, including companies from a variety of industries, are referred to as heterogeneous group captives. Selecting a type of group captive should take into account the particular benefits each affords, including loss control services and the opportunity to learn lessons from the other participants. A group captive is designed to replace primary



Captive Insurance for the Middle Market

(continued)

layer casualty insurance, including general liability, automobile liability, and workers' compensation. A number of insured companies are involved, and significant premiums are paid into the captive; thus, a group captive is typically a large captive.

The group captive, depending on its design, may cover up to the first \$1 million in exposure for each of the above areas through a combination of primary and excess coverage for each of its insureds, plus reinsurance or "stop-loss" coverage. The primary layer is insured by several mechanisms. An example is a group captive with an A layer and a B layer. The A layer is directly funded and paid by the individual insured, with necessary funding determined by past loss experience. Once the A layer is exhausted, losses are paid by the B layer. The B layer is funded and paid by the entire group of companies that are members or insureds. All the losses incurred in the B layer are shared by all the participants in the group captive. Normally, there is also a reinsurance layer above the B layer that essentially operates as a stop-loss mechanism if the shared-risk layer incurs significant or excessive losses.

In a group captive, the participants are paying not only for their losses but also for other participants' losses. The funding for the excess layer is equivalent to the premiums and costs needed to buy commercial reinsurance. Participants either are owners of the group captive or are insureds that do not have an ownership interest in the group captive. This is an important distinction because significant liabilities may be associated with ownership that do not exist for a participant that is only an insured. The risks to a participant must be carefully examined, including past loss experience of the B-layer risks, as well as the move away from traditional or "guaranteed cost" insurance. A move from traditional insurance to a group captive and back from a group captive to traditional insurance is not easy due to the collateral requirements of each type of program and therefore must be undertaken with care and study.

Many group captives are operated in offshore domiciles for ease of administration and to reduce operating costs. Some group captives operate wholly offshore as non-U.S. entities and do not subject themselves to U.S. tax treatment. Others that operate offshore elect to be subject to U.S. tax treatment under Sec. 953(d). There are inherent risks in operating offshore, particularly if a group captive chooses not to be subject to U.S. tax yet conducts significant business in the United States. This issue should be examined carefully by a company considering participation in a group captive.

Group captives are a valuable tool for the middle-market business under the right circumstances, but they are not without inherent risks, and they must be evaluated carefully with the assistance of experts before participation.



Captive Insurance for the Middle Market

(continued)

Small Captives

A small captive is defined by the number of premiums that the captive writes annually. To receive the special tax treatment afforded by Sec. 831(b), a company must elect to receive this tax treatment, and the net premiums written by the captive may not exceed \$1.2 million per year (\$2.2 million per year in 2017 and after). The captive must also be operated as a separate and regulated insurance company to obtain the special tax treatment afforded by Sec. 831(b) (premium income in a small captive is not taxable income to the captive). An analysis of the company risks and exposures is conducted, the insurable risks identified, loss history for those risks reviewed, and premiums determined by a licensed actuary, taking into account commercial insurance rating factors and the risks presented by the particular company.

The small captive is licensed and operates as an insurance company subject to compliance with applicable domicile laws and regulations. Assuming the risks that are underwritten do not result in excessive losses, an underwriting profit will be generated, resulting in a new profit center for the owner of the captive. Small captives are used to insure the difficult-to-insure risks of a company that generally do not generate a significant number of claims, i.e., "low frequency," and deductibles associated with commercial insurance. This allows the captive to accumulate underwriting profits over time as a "rainy day" fund for losses. Due to the benefits afforded by Sec. 831(b), the funds accrue on a tax-advantaged basis.

Small captives are powerful risk management tools if operated correctly. To qualify for the valuable tax benefits associated with a Sec. 831(b) election, the captive must be set up as and meet the requisite formalities of an insurance company from a regulatory standpoint, as well as meet the definition of a valid insurance company operation from the IRS and/or Tax Court perspective.

IRS Historical Challenges and Guidance

The IRS's view of captives has evolved, and the Service has challenged certain aspects of captive insurance companies over the years. First, the IRS made significant attempts to disallow the special tax treatment for a number of captives, primarily large captives. The primary arguments for those challenges were (1) that the captive was not writing "insurance" in the required sense due to a lack of risk shifting and risk distribution (and particularly the IRS's definition of such), and (2) that excessive premiums were being paid for the risks underwritten. After years of litigation regarding captives, beginning in 2002 the IRS issued a series of revenue rulings providing safe harbors for the concepts of risk distribution and risk shifting that provide some guidance in structuring a captive from the IRS's perspective. Without exception, each revenue ruling provided a significantly more conservative requirement than the case law on each point.



Captive Insurance for the Middle Market

(continued)

Risk Distribution

Risk distribution generally refers to the sharing of insurance risks and is a required element of insurance. Rev. Rul. 2002-91 provides that the distribution of risk allows the insurer to reduce the possibility that a single claim will exceed premiums received. The ruling indicates that a pooling of premiums is necessary to reduce the potential that the insured is, in essence, paying for its own risks while obtaining a tax deduction. Accordingly, the elements of risk distribution are driven by the number of "exposure units" and the pooling of premiums from which to pay losses. The combination of a sufficient number of exposure units and pooling of premiums makes losses more predictable so that they more closely match premiums received.

Fortuity

In addition to risk shifting and risk distribution, according to the IRS, the insurance policy issued by the captive must be insurance in a typical sense. Thus, there must be fortuity or uncertainty as to the risk underwritten. A common objection by the IRS is that the insured risk is a mere business or investment risk rather than a traditional insurance risk. For instance, the IRS found premiums paid to create reserves for inevitable nuclear-decommissioning costs did not constitute the purchase of insurance since there was no uncertainty as to whether the costs would occur (see Chief Counsel Advice 200703007). It also found that premiums paid to create reserves for product warranty claims did not constitute the purchase of insurance when the company manufactures or sells the products that the warranty agrees to replace (see Technical Advice Memorandum 200827006).

Unrelated Business

Under Rev. Rul. 2002-89, if more than 50% of premiums earned by a subsidiary captive are premiums from unrelated entities, this is sufficient for risk shifting and risk distribution. The IRS also stated that where 10% of the total premiums earned come from unrelated businesses, that is not enough for risk shifting or distribution.

Internal risk distribution

In Rev. Rul. 2002-90, the IRS ruled that where 12 subsidiaries paid premiums to an affiliated captive, with each subsidiary having no more than 15% and no less than 5% of the total risk insured, there was enough risk distribution and risk shifting.



Captive Insurance for the Middle Market

(continued)

CAPTIVE RECENT DEVELOPMENTS

Unfortunately, a number of companies have been marketing captive management services to middle-market companies for small captives that have little or no insurance industry experience, and these advisers have set up many small captives for tax savings instead of risk management and insurance purposes. This practice has attracted the negative attention of the IRS and has shifted the focus of tax litigation issues to small captives as well as large captives. The IRS recently included in its 2016 annual "dirty dozen" list a discussion of small captives under "abusive tax structures." This year is the second that improperly formed and operated captive insurance companies have appeared on the list. (It is worth noting that trusts, limited liability companies (LLCs), and limited liability partnerships are also listed as tools used in abusive tax structures.)

States, through their departments of insurance, regulate the types of policies and their premium pricing. A careful review by onshore regulators will generally prevent the problems that draw IRS scrutiny to the entire industry. As the small captive business evolves, more often, small captives are set up and operated by insurance experts and then regulated by sophisticated onshore state departments of insurance, reducing the number of captives set up for tax, not insurance, purposes. A captive program and commercial insurance program should be designed to complement and optimize the cost/benefit of all coverages for a company, some of which are more appropriate for a commercial insurance policy and some more appropriate for a captive to insure.

RECENT TAX COURT DECISIONS

Rent-A-Center

Rent-A-Center, 142 T.C. 1 (2014), involved a Bermuda captive, Legacy, that elected to be taxed as a U.S. taxpayer and insured the business risks of Rent-A-Center. The IRS disallowed Rent-A-Center's deductions for premium payments to Legacy, claiming Legacy was a sham entity created for tax purposes. Among other things, the IRS challenged a financial guarantee by Rent-A-Center to Legacy for its losses. The IRS viewed this as a circular transaction, which was evidence that Legacy was a sham. The Tax Court found that the parental guarantee, under the facts and circumstances of the case, was acceptable. This case illustrates that the Tax Court will assess the business purpose behind an arrangement that may at first glance appear to be a circular transaction or a tax-driven strategy. If a legitimate business purpose is the primary focus of a strategy, including regulatory-driven requirements, then the arrangement will be classified as acceptable.



Captive Insurance for the Middle Market

(continued)

Securitas Holdings

In *Securitas Holdings*, T.C. Memo. 2014-225, the Tax Court held that payments made by subsidiaries of a parent corporation to another subsidiary of the parent, which was a captive insurance company in a brother-sister arrangement, were properly deductible. The court found that based on the arrangement's economic consequences, the requisite risk shifting was present for the arrangement to be insurance. With respect to risk distribution, the Tax Court focused on the number of underlying risks rather than the number of insureds in reaching its decision and ignored the IRS revenue rulings requiring a certain number of insured entities. The opinion confirms in this case that risk shifting and risk distribution can be achieved even with a small number of insureds, as long as the risks insured are numerous enough for the law of large numbers to apply.

RECENT LEGISLATIVE CHANGES

The PATH Act was part of a large budget and tax deal. Altogether, the Joint Committee on Taxation estimated that the bill included \$622 billion in tax breaks.

Section 333 of the PATH Act modifies several provisions of the Internal Revenue Code related to Sec. 831(b) captives. The most significant changes, which go into effect in 2017, are the increase mentioned above in the limitation on premiums from \$1.2 million to \$2.2 million per year (with the new limit indexed to increase with inflation) and new diversification requirements targeted at the use of captives as estate planning tools. Under the diversification requirements, ownership in the insured operating businesses must be aligned with ownership of the captive if a spouse or lineal descendant (child or grandchild) of an individual who owns an interest in the operating company/insured has ownership in the captive. This ownership may be either directly or through a trust, estate, partnership, or corporation. The company may qualify under either of two ownership diversification tests: (1) The ownership by the spouse or lineal descendant must be the same as his or her ownership of the operating company (with some de minimis exceptions), or (2) no more than 20% of the net written premium of the captive can be attributable to any one policyholder. For purposes of this rule, all policyholders that are related (within the meaning of Sec. 267(b) or 707(b)) or are members of the same controlled group are treated as one policyholder.

The increase in the premium limit to \$2.2 million annually creates an opportunity for current captive owners to evaluate their programs to see whether additional risks can be insured. The increase will also make captives more appealing to larger companies that might not have found enough economic benefit with the \$1.2 million premium limit.

The changes regarding ownership will require many of the captives that



Captive Insurance for the Middle Market

(continued)

include estate planning to modify either their ownership structure or their insurance and reinsurance programs to fit within the new requirements.

THE PATH TO A SUCCESSFUL CAPTIVE

Congress has reaffirmed the validity and usefulness of small captives and their role in protecting companies by including favorable provisions in the new PATH Act.

Nevertheless, the IRS will continue to examine and challenge captives by pulling apart and examining each element of a large or small captive to determine whether it is formed onshore or offshore; it is capitalized adequately; there is risk shifting and risk distribution under the IRS criteria; premiums are reasonable, given the risks covered; and the company is operated in an arm's-length manner, i.e., there are no loan-backs and no guarantees by the parent company or business owner. These challenges can be addressed and minimized by working with an experienced captive manager with insurance and risk management skills (not just tax skills). The path to a successful captive operation includes the proper business motivation; insurance skills; and knowledge, appropriate structure, underwriting, and management.

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What Insurance Regulators Need to Know About Key Performance Indicators and Key Risk Indicators

By Kristina Narvaez, Donna Galer and Max Rudolph Senior Advisors at Hannover Stone Solutions, LLC

Enterprise risk management (ERM) has attracted additional attention in the last several years due to the events that took place during the Global Financial Crisis and common responses from financial services firms. Today's insurance carriers face many types of complex and interrelated risks while executing their strategic plans. Developing an accurate and deep understanding of the opportunities and threats of various risk-taking activities, while consolidating risks across the company and using the most effective risk controls, can lead to a competitive advantage for an insurance carrier.

The competitive advantages for an insurer to implement an ERM program can be manifested in these potential results: a) increased efficiencies, b) reduced earnings volatility, c) stronger capital position, and d) higher profitability. The success of an ERM program is dependent on how well it integrates with the risk culture of the organization. The ERM process can improve practices such as Asset Liability Management (ALM), underwriting practices, investment risks, operational risks, and strategic planning. All departments within an insurance company, including sales, finance, investment, strategic, etc. are critical in the implementation of ERM. An effective risk process must connect across all departments of the organization and become common practice for all types of decision-making.

Company size, complexity, current resources and capabilities are among the key determinants of ERM adoption. Larger companies, facing multiple risks, are more likely to develop a holistic risk management framework. Insurers who are active in a number of markets offering complex products have a need for ERM to deal with interactions between these types of risks. External pressures from credit rating agencies and the regulatory community have also supported the trend for insurance carriers to implement ERM programs.

Challenges with Monitoring ERM Programs

Many ERM programs start off strong, quickly ramping up the identification and assessment of risks. Departments review the various types of risks (e.g., strategic, operational, investment, insurance) and create a risk register to prioritize and monitor their risks. The risk register documents the process to identify risks, create mitigation strategies, identify the risk owner, and assess the probability (or likelihood/frequency) and severity of the risk.

Some of the challenges with a risk register include a limited description of the action steps needed to mitigate a risk. Risk registers rarely provide action steps on how to exploit an opportunity because they tend to focus on the downside of risk. In addition, the risk register does not have the capability to provide alerts to the risk owner of the changes in the performance of the risk response or with new and emerging risks. Additional drill down capabilities can go into more details on these topics.



What Insurance Regulators Need to Know About Key Performance Indicators and Key Risk Indicators

(continued)

The goal of an ERM program is to develop a process for the senior management team and the board of directors to evaluate risk information about events that could impact strategic performance. Organizations traditionally use Key Performance Indicators (KPIs) to measure business and operational performance. Performance measurement provides information about gaps between actual and targeted performance. KPIs can be used to determine organizational effectiveness and operational efficiency. Measuring and monitoring risk effectiveness is no different from measuring other performances. Metrics are identified, expected targets or thresholds are established, and a baseline is set.

A better set of risk metrics needs to be developed that identify future shifts in risk conditions, capturing new and emerging risks. Doing so allows the senior management team and board of directors to consider responses to future events in advance. Currently, KPIs struggle to identify risk conditions of new and emerging risks due to lack of experience. Most KPIs have been created based on historical data, which does not take into consideration risk events that have not yet happened.

KPIs can be used with risk registers to monitor the effectiveness of risk responses. A risk register could have an additional column where risk responses are aligned to defined KPIs to ensure that risk controls are being evaluated for their effectiveness. For example, staff turnover or inadequate training may be an underlying problem where the Customer Services team may have to work together with the Human Resources team to define what KPIs need to be in place to better control staff turnover.

The root cause of staff turnover may be defined by a lack of staff training and/or a hostile work environment. KPIs could be created to measure what needs to be included or to have adequate staff training or a work environment that is not hostile. Of course, it is never possible to manage all identified risks the same way, so you will need to prioritize and focus on the most critical risks to offer KPIs to risk responses. You may also need to do some form of cost-benefit analysis to make sure you get a positive return on the investment with the most critical risks you assign KPIs to.



What Insurance Regulators Need to Know About Key Performance Indicators and Key Risk Indicators

(continued)

	Owner	Strategic	Operational	Insurance	Equity	Interest Rate	Credit	Pre Mitigation		
								Frequency	Severity	Velocity
CORPORATE										
Financial										
Accessibility to capital			X							
Capital Adequacy			X	X	X	X	X	X		
Cash Flow Mismatch (Disintermediation)			X	X	X	X				
Emerging Risks			X	X	X	X	X	X		
Employee Benefits Funding			X		X	X	X			
Expenses - Level, Overhead, Inflation			X							
Financial Reporting			X	X				3	4	5
Institutional Tax Law Changes			X	X	X					
Investment Process Oversight			X			X	X	X		
Legal Risk			X	X						
Liability Insurance			X	X						
Liquidity			X	X	X					
Model Risk			X	X						
Nontraditional Ventures (e.g., M&A)			X							
Policyholder/Product Regulatory Changes			X							
Vendor Risk			X							
Workforce										
Accountability			X							
Associate Engagement			X							
Business Continuity			X							
Coping With Change			X	X						
Emerging Technology			X							
Ethics & Employee Behavior			X	X						
Facilities			X							
Information Technology - Data Integrity			X							
Information Technology - Security			X							
Information Technology - System Availability			X					2	5	4

The preceding chart shows a partial risk register, highlighting a listing of the risk and risk owner, along with several metrics designed to prioritize mitigation efforts. Each row would correspond to a drill-down of specific opportunities and threats to that risk and plans for management actions. Frequency, severity, and velocity (how quickly a risk can become material) in this example are ranked on a 1-10 scale. Other scales used include low/medium/high or green/yellow/red.

It is important to distinguish the difference between a key performance indicator and a key risk indicator. Key Risk Indicators (KRIs) are metrics used by organizations to provide early warning signals of increasing risk exposures. They can be key ratios that management tracks as indicators of evolving threats or potential opportunities. Other KRIs may be more elaborate and involve the aggregation of several individual risk indicators into a multi-dimensional score about emerging events that may lead to new threats or opportunities.

Key Performance Indicators Can Take Many Forms:

- *Qualitative and quantitative indicators.*

Qualitative measures are based on subjective characteristics or qualities rather than on a quantity or measured value. Quantitative measures are based on objective, quantifiable data, like percentages, counts, and ratios. The difference between qualitative and quantitative measures can be confusing, but both can be equally useful and a combination of



What Insurance Regulators Need to Know About Key Performance Indicators and Key Risk Indicators

(continued)

qualitative and quantitative measures can provide a more holistic picture of performance.

- *Leading and lagging indicators.*

Leading indicators are predictive in nature, like early warning signals. They can highlight that an overall change in performance level is expected based on specific triggers that are monitored. They allow changes to be made earlier in the decision-making process. Lagging indicators provide insights into the success or failure of an activity after it is complete.

- *Input, process, and output indicators.*

These indicators are useful in evaluating an end-to-end process. Input indicators measure resources used in executing an activity. Process indicators measure efficiency or productivity. Output indicators measure the result of the process or activity.

In measuring risk management effectiveness, a combination of indicator types is often used. The biggest challenge in measuring performance is knowing what exactly should be measured. Selecting performance measures that are hard to gather and track on an ongoing basis or selecting performance measures that are too complex for business leaders to understand their relevance will not provide value. To be most effective, key performance indicators need to be defined so that they are clear, meaningful, and measurable.

When defining KPIs for ERM, ensuring that the following four characteristics are incorporated can be helpful:

- *Tangible.*

Tangible performance measures, aligned with formal definitions of risk exposure levels the company deems acceptable, provide true measures of risk management effectiveness, not just milestones in a risk management plan.

- *Flexible*

Flexible performance measures that can be adjusted to changes in the organization and risk landscape.

- *Standardized*

Common performance measures used enterprise-wide provide a consistent view of how each business line's performance contributes to the aggregate risk exposure at the enterprise level.



What Insurance Regulators Need to Know About Key Performance Indicators and Key Risk Indicators

(continued)

- *Outcome or objective focused*

Performance measures that are aligned to a specific objective or desired outcome.

Developing Effective Key Risk Indicators

An effective set of KRIs identifies relevant metrics that provide useful insight into risks that might have an impact on the organization's ability to reach their strategic objectives. The starting point begins with the organization reviewing its strategic goals and constraints and then identifying their related risks. Linkage to risks and core strategies helps define the most relevant information to serve as effective Key Risk Indicators.

One way to develop KRIs begins with a reverse stress test, working backward to pinpoint the root cause of the event. What might have caused the event to occur? Were there changes in the risk landscape due to things such as a) external economic factors, b) internal changes in strategy, c) new regulations, d) a new competitor, or, e) changes in customer's taste for a given product or service?

Senior management can use that analysis to identify the root cause of the risk event and evaluate what strategies could be in place to either mitigate a threat or exploit an opportunity. The KRI identification process benefits from subject matter experts within the organization. Their input helps ensure that key risks are not overlooked and that KRIs are designed to be effective in communicating an early indication of necessary action.

Another important factor when designing effective KRIs involves the assurance that all parties involved in collecting and aggregating KRI data are clear on what data needs to be collected. Without the agreement to the risk data being collected, aggregated risk information will lack the confidence of the organization. For example, in underwriting a potential policyholder if it's important to evaluate a policyholder's financial condition it should be determined if all policyholders are weighted equally? How much analysis can occur before a policyholder is deemed too difficult? Does the policyholder's loss history correlate with their financial instability?

How Insurers Can Use KPIs and KRIs

Insurance companies monitor their performance using key performance indicators. These are metrics related to significant business activities and outcomes. They can be tracked daily, monthly, quarterly, or annually. They can be comprehensive, such as combined ratio, actual to expected ratio, and expense ratio, or more discreet and specific such as claims closing ratio, renewal pricing by line of business and lapse rates. They are produced to manage the business and have been in use for decades. However, when the metric shows a problem, variance to plan or deleterious trend line, it can be



What Insurance Regulators Need to Know About Key Performance Indicators and Key Risk Indicators

(continued)

a signal that the company is facing a risk of not achieving plan or sustaining a loss. The KPI at that point becomes a key risk indicator. The KPI is used to identify a risk which may necessitate a risk mitigation plan.

All significant risks, regardless of how they are identified, require a mitigation plan, i.e., steps that will be taken to address the risk. The performance against the plan will need to be monitored and are, in essence, KPIs. Many companies use a simple color code to show whether the risk mitigation steps are proceeding per plan = green, somewhat on plan = yellow, or not on plan = red.

Key risk indicators, therefore, can emanate from KPIs, from evolving market conditions, or from changes in the natural world. It is up to the CRO to ensure that meaningful key risk indicators are being monitored throughout the company so that emerging and existing risks are identified and handled.

Examples of KPIs and KRIs for Insurance Carriers

Here are a few examples:

KPI - Claims aging ratio

KRI - Increase in claims aging ratio indicates risk of average cost of claims paid going up and that annual profit target will not be met

KPI - Number policies with schedule credits

KRI - Increase in policies with schedule credits indicates risk of underpricing and risk that profit target will not be met

KPI - Renewal pricing from price monitoring reports

KRI - Negative mismatch between renewal pricing goals and renewal pricing indicates risk profit target will not be met

KPI - Number monthly new business applications

KRI - Decrease in monthly new business applications indicates risk that annual planned gross written premium (GWP) will not be met

KPI - Expense vs Budget report

KRI - Mismatch between actual expense and budget expense indicates risk that profit target will not be met or risk that actions/projects will not be accomplished as planned

KPI - Actual to Expected mortality or morbidity

KRI - Trend of risk class for issued policies (increased mortality indicates risk of trending toward selection of worse performing risk classes)



What Insurance Regulators Need to Know About Key Performance Indicators and Key Risk Indicators

(continued)

KPI – Number policies issued for new product

KRI – Number of agents recruited to sell the new product (low number of new agents recruited reduces likelihood of meeting sales goals – leading indicator)

KPI – Defaults on bonds

KRI – Trend of ratings for bonds purchased (lower average rating increases likelihood of excess capital losses – leading indicator)

Other KRIs not linked to a KPIs (some of these are emerging risks and rely on government metrics to track):

KRI - Emerging changes in macroeconomic conditions could indicate a risk that investments will not perform as planned and may negatively affect profitability

KRI - Emerging changes in legislative or regulatory environment could indicate a risk that new requirements (e.g. process for rate increase approval) or old protections (e.g., TRIA/TRIPRA) will negatively impact operations

KRI - Climate forecasts which predict more dangerous weather phenomena indicate a risk that losses due to natural catastrophes will escalate and that profit targets will not be met

KRI - Increased M&A activity could indicate a risk for an uptick in D&O claims (but also an opportunity to sell transaction insurance products)

Conclusion

In today's uncertain world, insurers and regulators need to coordinate as many tools as possible to manage risks. KPIs and KRIs provide metrics that deliver consistency between risks and lines of business to ensure senior management has the information they need to make decisions. Emerging risks and marketplace scanning is important, as is encouraging contrarian thoughts. Companies should look at both risk mitigation, when risk exposures are high, and risk exploitation when exposures are low and expertise is present. The insurers who combine qualitative and quantitative metrics to manage risk are less likely to miss a coming risk event, creating a competitive advantage.



What Insurance Regulators Need to Know About Key Performance Indicators and Key Risk Indicators

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An enterprise risk management advisory firm that works with insurance companies to start, complete and vet existing programs for insurance companies, as conducting training programs for state regulators on the principles of ERM to better enable the review of ORSAs.

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The National Association of Insurance Commissioners held its Spring National Meeting in Denver April 8-11. This newsletter contains information on activities that occurred in some of the committees, task forces and working groups that met there, and also includes summaries of interim conference calls through April 25. For questions or comments concerning any of the items reported, please feel free to contact us at the address given on the last page.

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Executive Summary

- A high priority Innovation and Technology Task Force has been established and is charged with overseeing such advancements in the insurance sector.
- The Cybersecurity Task Force exposed its third draft of the Insurance Data Security Model Law with a revised goal of completing the model by year-end 2017.
- The Statutory Accounting Principles Working Group adopted a proposal to discount the assessment liability and premium tax credit asset for long-term care guaranty fund assessments, and approved significant revisions to bond accounting in SSAP 26.
- Significant RBC proposals were adopted; catastrophe risk will be implemented in the P/C RBC formula in 2017 after nearly 12 years of development, and the capital add-on approach for basic operational risk was adopted for 2017 (but the specific risk factor still needs to be approved). The Investment RBC Working Group announced a revised goal of implementing in 2018 revisions to the bond structure and factors for all three RBC formulas.
- The chair of the Valuation of Securities Task Force directed SVO staff to resume credit assessments of affiliated debt and private fund transactions.
- The Reinsurance Task Force discussed concerns related to the covered agreement negotiated by the U.S. Treasury Department and the Office of the U.S. Trade Representative with the European Union.
- The Variable Annuities Issues Working Group finalized the details of its second Quantitative Impact Study with a goal to complete recommendations by the end of 2017.
- The NAIC approved formation of a new Joint Committee on Long-Term Care Insurance which will be coordinating all aspects of their work including financial solvency analysis, financial reporting, actuarial standards and rate increase reviews.



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Innovation and Technology Task Force

The NAIC's Executive Committee formed a new high-level leadership group, the Innovation and Technology Task Force, which charge is to "provide a forum for discussion of innovation and technology developments in the insurance sector, including the collection and use of data by insurers and regulators and new products, services and distribution platforms, in order to educate state insurance regulators on how these developments impact consumer protection, insurer and producer oversight, marketplace dynamics, and the state insurance regulatory framework."

The Cybersecurity Working Group and Big Data Working Group will now report directly to this new task force, which also plans to study insurance issues related to autonomous vehicles and microinsurance.

Cybersecurity model law

Despite significant effort, the Cybersecurity Working Group was not able to meet its goal of completing an Insurance Data Security Model Law by end of 2016. The task force's drafting group met four times since the Fall National Meeting to continue its work which resulted in a third exposure draft exposed February 27. The chair of the task force expressed some frustration at the Spring National Meeting stating "frankly, there is no more consensus on this draft than the other two," with respect to the controversial notification to consumer requirements. Significant revisions from previous drafts were made to the sections on personally identifiable information, investigation of a data breach and notification requirements of a data breach. New sections were added on "nonpublic personal information" and notice regarding data breaches to reinsurers. The task force extended the comment period for the third draft until April 17 and a conference call to review comments is scheduled for May 9.

A task force member noted that there does seem to be more consensus regarding the risk-based security requirements of the draft model such as the requirement for an Information Security Program but less so regarding requirements in the event of a data breach.

The task force also heard a presentation from Maria Vullo, Superintendent of the New York Department of Financial Services. Her opening statement was that "cybersecurity is what keeps me up at night and there is no greater risk to financial markets than cyber risks." Ms. Vullo reviewed New York's recently adopted Cybersecurity Requirements for Financial Services Companies Regulation (23 NYCRR § 500.00-23, effective March 1, 2017), noting differences between New York's requirement and the NAIC's current draft including differences in the time to notify the regulator,

data encryption and notification to consumers. The chair noted that one of the primary issues for the NAIC is notification of a breach to consumers, which is not required under the NY regulation. The chair noted that the task force and drafting group will continue to hold calls until consensus is reached, with a goal of completing its work by the end of 2017.

The Cybersecurity Working Group is also developing a joint NAIC/Stanford University cybersecurity program to be held in the fall. The program will host a panel of insurance industry representatives to discuss the type/scope of cyber insurance coverages and various cyber event scenarios. The results of this program will be a joint paper to be used by state insurance regulators and other policymakers.

Big data

The mission of the Big Data Working Group is to "gather information to assist state insurance regulators in obtaining a clear understanding of what data is collected, how it is collected, and how it is used by insurers and third parties in the context of marketing, rating, underwriting, and claims." Industry and consumer groups seem to be far apart on their views of the use of big data by insurers.

During the Spring National Meeting, the working group heard a presentation on the benefits of big data for consumers and industry by Lawrence Powell, University of Alabama. The presentation highlighted the use of data in accurate and fair pricing, as well as mitigating costs, which ultimately affect consumers by minimizing fraudulent claims. Mr. Powell also emphasized that both state regulators' ability to reject rates that do not meet regulatory standards, as well as the lack of consumer dissatisfaction, were evidence for fair rate practices.

Birny Birnbaum, Center for Economic Justice, countered each of the points presented in favor of industry's use of big data. He stressed the limitations in consumers' understanding of pricing, and the need for insurance regulators to ensure that pricing is not discriminatory. He also noted that currently, insurance regulators are often relying on insurer's representations on pricing.

The working group's vice chair Superintendent Dwyer stated her view that insurers are not providing appropriate explanations to consumers regarding how their rates are determined; the Missouri representative noted that its department does not have authority to disapprove P/C rate filings.

2017 work plan

Working group members suggested various edits to the draft language of the work plan, and there was an overall consensus to prioritize actions and create a timeline.

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The chair noted it is unlikely that the working group will complete its work in 2017. After hearing comments from both industry and consumer representatives on the draft wording, specifically the need to balance open discussion with confidential details of insurers' rating models, the chair noted that a revised work plan will be circulated later this spring.

Group capital calculation

The Group Capital Calculation Working Group continues its long term project to construct a U.S. group capital calculation using an RBC aggregation methodology.

Use of scalars

This spring, the working group continued discussion of the possible use of scalars to address comparability of capital requirements between jurisdictions. Non-U.S. insurers are subject to capital requirements in their home jurisdiction, but it can be difficult to compare foreign capital requirements to those in the U.S., primarily due to differences in accounting systems and regulatory environments. Two possible approaches to developing a scalar for non-U.S. insurers in a group capital calculation have been discussed: the relative ratio approach and the distance-to-intervention approach. The relative ratio approach would be based on a jurisdiction's aggregate industry-wide total available capital to its industry-wide regulatory intervention level capital. The second approach is the distance to intervention approach, which uses current RBC treatment and applies a scalar factor based on the foreign insurer's relative distance to regulatory intervention in its home jurisdiction.

During discussions, the use of scalars and a relative ratio approach was supported by some, with two technical corrections, which were to replace the authorized control level RBC with company action level RBC and normalize the required capital to the regulatory intervention level before applying the scalar. Other interested parties supported a non-scaled approach and raised concerns that the scalar should be an objective measure using a numerical method and not an attempt to judge another jurisdiction's approach to capital requirements. Based on the comments received and concerns raised, the working group will revise the exposure to reflect consensus and adjustments. During its April 28 conference call, the working group is expected to discuss additional comment letters received from interested parties supporting a pure relative ratio approach, which is based solely on reported solvency ratios.

Non-regulated/not subject to RBC entities

The working group heard a presentation from the ACLI regarding a proposed group capital calculation for non-regulated entities. The proposed treatment for non-insurance entities would not rely on a flat charge to equity (such as the 22.5% factor that had been previously exposed for comment), has a degree of sensitivity to underlying risk drivers and does not penalize well capitalized entities. The ACLI is proposing 3 approaches for regulatory review, which are based on upon three principles: 1) should focus on capturing the capital requirements of all material financial entities and those non-financial entities with "demonstrable recourse" to the group; 2) should exclude most immaterial financial entities and non-financial services entities as long as they have no demonstrable recourse to the group; and 3) should exclude assets and liabilities of excluded entities. The chair asked NAIC staff to work with the ACLI to create examples to better see how these approaches might work in practice. In response to a question from a trade association, the ACLI representative noted that scalars were not contemplated in this version of the proposal but would be considered in "round 2." The ACLI would like the working group to approve field testing for one or more of the three proposals.

The working group also discussed approaches for U.S. insurers that are not subject to risk-based capital requirements such as mortgage and financial guaranty companies and title insurers, and insurers with significant permitted practices such as captives. The three suggestions summarized in the proposal included: 1) require non-RBC insurers to use a standard minimum capital; for example all mortgage guaranty insurers would use the capital requirements from the NAIC's Mortgage Guaranty Insurance Model Act; 2) require captives to use RBC as well as including adjustments for policyholder liabilities, letters of credit and other specified adjustments; and 3) accumulate prescribed and permitted practices and require an on-top adjustment to the group capital calculation of available capital. The working group exposed the proposal for comment until May 23.

Statutory Accounting Principles Working Group

The working group met three times in 2017; significant actions include the following below. (Appendix A to this Newsletter summarizes all actions taken by the working group related to statutory accounting and reporting since the 2016 Fall National Meeting.)

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- Effective January 1, 2017, the working group adopted revisions to SSAP 3R, Guaranty Fund and Other Assessments, to require discounting of the long-term care guaranty fund assessment liability and related premium tax credit assets for insurers which wrote long-term care contracts. (#2017-01). The guidance requires use of the maximum valuation interest rate for whole life policies, updated annually; the rate for 2017 is 3.5%. The financial statements will include detailed disclosures including the undiscounted and discounted amounts, discount rate, range of years to discount the asset and liability and other requirements. The new guidance is applicable only to long-term care guaranty fund liabilities and assets. As noted by NAIC staff, the current estimate of the Penn Treaty insolvency of \$4.2 million is reduced to \$2.1 billion using the 3.5% discount rate and assuming a 20 year pay-out.
- After almost three years with often intense discussions, the working group finalized guidance on accounting for bond exchange-traded funds; these instruments will remain classified within SSAP 26R, Bonds, but with separate accounting provided, now designated as “SVO-identified instruments.” Companies must make an irrevocable election (per investment) at December 31, 2017 (and at subsequent acquisitions) to use the systematic value measurement method, which will be effective January 1, 2018. (Book adjusted/carrying value will be used for year-end 2017 financial statements.) The systematic value method is considered an “aggregated cash flow” method in which the cash flow streams from the individual bond holdings are aggregated into a single cash flow stream. The book yield is recalculated at least quarterly in order to adjust the investor’s book yield to reflect current cash flow projections of the current bond holdings within the ETF. The required calculation of the systematic value is included in Appendix B to SSAP 26R. Specific impairment guidance was also adopted for these investments. Companies not electing to use this method will account for the investment at fair value with changes in fair value recorded in surplus.

As another part of this investment classification project (#2013-36), the working group also adopted a revised definition of a security, which is now consistent with the U.S. GAAP definition. New or revised securities also included in the definition of a bond are bank loans acquired through a participation, syndication or assignment, certain hybrid securities and debt instruments in a certified capital company. At the request of interested parties, the working group has agreed to consider bank loans directly issued by insurers as a separate agenda item (#2017-10), which was exposed for comment at the

Spring National Meeting. Insurers consider these loans to be very similar to private placement debt and classify them as Schedule D investments.

- The working group has been considering loss development and other disclosures required by ASU 2015-09 Disclosures about Short Duration Contracts since 2015 (issue #2015-37) and has now rejected the majority of these disclosures for the annual and audited statutory financial statements. Effective April 8, 2017 insurers issuing short duration contracts will be required to disclose information related to significant changes in methodologies and assumptions used in calculating the liability for unpaid claims and claim adjustment expenses, including reasons for the change and the effects on the financial statements, along with new disclosures related to interest accretion on discounted reserves. All other disclosures were rejected.

In connection with this issue, the Audit Issues Task Force of the AICPA’s Auditing Standards Board recently concluded that U.S. GAAP disclosure requirements that have been rejected by the NAIC, in whole or in part, would no longer need to be evaluated by the auditor in order to determine whether the annual audited statutory financial statements achieve fair presentation in accordance with the insurance statutory basis of accounting. However, if the NAIC has not finalized action on GAAP disclosure requirements, an auditor would still need to assess whether informative disclosures in the annual audited statement financial statements would be needed to achieve fair presentation. This assessment would occur when the entity is required to adopt the new standard for GAAP. This is a significant change in practice since the implementation of the NAIC Codification and applies to all GAAP guidance rejected by the NAIC, i.e. not just the ASU 2015-09 guidance.

- The working group voted not to adopt proposed changes to the definition of loan-backed and structured securities (issue #2016-40). Industry raised significant concerns about unintended consequences of significantly revising the definition beyond what had been proposed by the VOS Task Force and the “punitive” restrictions to prohibit use of structured finance securities as a means to engage in related party transactions. The working group may consider a revised proposal as a new agenda item later in 2017.
- The working group continued work on its high priority project to develop guidance for certain limited derivative contracts; see the summary of the variable annuities framework for that discussion.

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- The working group re-exposed revisions to SSAP 37, Mortgage Loans, which clarify that a reporting entity that provides a mortgage loan as a “participant in a mortgage loan agreement” would consider the mortgage loan in the scope of SSAP 37. After reviewing detailed comments from interested parties, the working group proposed adding the following: “in addition to mortgage loans directly originated, a mortgage loan also includes mortgages acquired through assignment, syndication or participation.” Investments that reflect “participating mortgages,” “mortgage loan fund,” or the “securitization of assets” are not considered mortgage loans within scope of SSAP 37. The revisions also include footnotes that describe common scenarios as examples of what investments are meant to be captured by SSAP 37.

Risk-based capital

The regulators made the following significant progress on RBC projects in 2017. (Appendix B summarizes other actions taken by the various RBC Working Groups since the 2016 Fall National Meeting.)

Investment RBC

The Investment RBC Working Group continued its debate of many of the same issues it has been deliberating for years: finalizing the bond factors, revisions to the portfolio adjustment and whether the bond RBC structure should be consistent across all formulas. With respect to the bond factors, the AAA has been working with the ACLI on issues raised by them in 2016 and has revised the representative bond portfolio to include all investment grade bonds, which lowers the risk factor on investment grade bonds, and has little effect on below investment grade bonds. The AAA had wanted to update the bond recovery assumptions, but has not been able to obtain the necessary data to do so. The AAA expects to have a final updated factors by June 1. With respect to the portfolio adjustment, the working group has concluded they will update the factors but stay with the current methodology using number of issuers, and will not consider amount invested in each issuer.

The working group is moving forward with its plan to implement the bond granularity 20 rating classes proposal for P/C and Heath RBC filers and exposed for comment until May 29 proposed blanks and RBC formula changes to implement those changes. Trade associations for these insurers stated they don't necessarily object to the increased granularity, but the bond factors will be an important consideration. The AAA is willing to adjust the final Life bond factors for taxes and the risk premium offset, which are two of the major differences between the Life and other formulas. Some commenters object to the 10-year time horizon

embedded in the proposed Life factors as being too long for non-life companies. The working group's consistent response to this has been that 10 years represents the full economic cycle for bond investments which does not need to be adjusted for other RBC formulas.

The working group also exposed for comment until July 14 a revised ACLI real estate proposal for Life RBC, which is similar to the ACLI's prior recommendation of a 10 % charge for real estate, but with the addition of a market value adjustment to reflect that the market value of real estate can be significantly greater than the depreciated cost carrying value. The ACLI is proposing that the applied base RBC factor of 10% be adjusted by two-thirds of the percentage difference between the market and book value, but not resulting in an RBC lower than the bond factor for a Baa equivalent (currently 1.30%). In situations where market value is less than carrying value, the RBC factor would be increased up to the factor for common stock (which can be as high as 45% after the beta adjustment). The proposal recommends the same treatment for Schedule A and Schedule BA real estate.

The revised goal of the working group is to implement the new bonds factors and 20 rating classes for all three formulas for 2018 RBC filings and the real estate for 2018 Life RBC filings.

Life RBC

Longevity risk – On behalf of the Longevity Risk Subgroup, the AAA's Longevity Risk Task Force is assessing an approach for longevity risk, initially focusing on annuity products. The task force is evaluating an appropriate definition of a tail stress event and a potential RBC charge expressed as a factor applied to statutory reserves. The current assumption is that the RBC charge should reflect the impact of longevity stress, primarily mortality improvement, on all future cash flows. Statutory reserves are generally held at the 85th percentage level and RBC factors cover risks in excess of reserves up to a 95th percentile event. The RBC charge would be based on the difference between reported statutory reserves and statutory reserves using stressed mortality.

The Longevity Risk Subgroup has concluded that the RBC charge should not include estimated improvements in mortality as a result of future medical breakthroughs. The subgroup has a goal of 2018 RBC to include longevity risk in the Life RBC formula, but it is too soon to tell whether that is feasible.

FHLB collateral RBC - The Life RBC Working Group continued its discussion of a proposal from the ACLI related to the RBC treatment of Federal Home Loan Bank collateral. Unlike other restricted assets, FHLB collateral receives RBC charges on three (vs two) levels:

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C-0 (restricted asset charge), C-1 (asset charge) and C-3 (Asset/Liability Cash Flow Synchronization Testing related to FHLB borrowings classified as funding agreements). The ACLI is proposing to retain the C-1 and C-3 charges but modify the C-0 component to zero (from 1.3%) for the collateral equal to the amount advanced, and a factor based on the NAIC rating of the FHLB for any excess collateral.

One working group member believes that eliminating the C-0 charge encourages insurers to “aggressively leverage those advances and increase their spread banking non-insurance activity” and that the working group should fully understand the risks before adopting the ACLI proposal. The ACLI plans to submit a revised proposal to address this concern; the trade association is still hoping to get the revisions adopted for 2017 RBC.

Health RBC

Medicare Part D Factor (2016-16-CA) - The regulators adopted a previously exposed AAA proposal for Medicare Part D factors that revises the Supplemental Benefits factor within the stand-alone Medicare Part D coverage to 50% of net claims incurred from the current 35% factor on premiums. The proposal is effective for 2017 all RBC filings.

Stop loss factors (2016-17-CA) - The Health RBC Working Group adopted a previously exposed AAA proposal that recommends a tiered factor approach to stop-loss premiums on the basis that companies writing a smaller block of stop-loss business are at greater risk than companies writing a larger block. The proposal applies a 35% factor to the first \$25 million in stop-loss premium and a 25% factor to the remaining premium in excess of \$25 million. One comment letter from a trade organization expressed concern that the proposed factors are not appropriately calibrated. In response, the working group stated their support for the AAA's factors which were derived from 146 plan years of data from 17 companies. The proposal is effective in 2017 RBC filings.

Catastrophe risk

Rcat implementation (2016-07-CR) - The NAIC gave final approval to implement the earthquake and hurricane catastrophe risk charges in the RBC calculation for 2017 reporting. This marks a significant achievement, as noted by the chair of the Catastrophe Risk Subgroup, which took “eleven and a half years” to develop and implement.

Use of other models (2016-12-CR) - The Catastrophe Risk Subgroup continues to discuss a proposal to allow companies to use approved company-internal catastrophe models as the basis for the catastrophe risk charge, instead of one or more of the five approved commercially available external models. The use of the internal catastrophe model would be subject to

regulatory approval and oversight. The proposal was not finalized at the Spring National Meeting and the subgroup believes it needs additional refinement.

Operational risk (2016-13-O)

After months of deliberation, the Operational Risk Subgroup adopted a capital add-on approach (instead of the proxy-based approach) for basic operational risk, which broadly covers operational risk across an insurance entity. The Capital Adequacy Task Force also approved for 2017 RBC filings this add-on approach, which methodology uses the insurer's RBC as the insurer's exposure to operational risks. It therefore determines the basic operational risk charge by applying a factor to an insurer's total after-covariance RBC.

In addition, the subgroup exposed the current informational factor of 3% as the “live” factor to be implemented in 2017. The following points were considered in the selection of the 3% factor:

- Add-on factors as high as 6% were tested and did not result in material adverse impacts, but did provide an earlier warning for some companies near the margin of action level.
- A review of standard methodologies used in other jurisdictions which have implemented an operational risk charge indicates that the 3% post diversification (covariance) add-on is at the low end of the range for the ratio of operational risk to total capital requirement. Other jurisdictional factors for operational risk appear heavily reliant on regulatory judgement and there is limited clear rationale for a higher (or lower) RBC add-on factor at this time.

The exposure period ends May 4; the final factor must be adopted June 30 to be effective for 2017 RBC filings.

Valuation of Securities Task Force

Private letter ratings

The task force had exposed for comment until April 8 comprehensive amendments to the P&P Manual to implement recommendations of the Reporting Exceptions Working Group related to verification of private letter ratings to be filed directly by NRSROs by July 1, 2017. Industry comment letters raised a significant concern that the proposed revisions give the SVO authority to reject a NRSRO rating based on a private ratings letter. The task force will work with the SVO to review the issues submitted by interested parties and identify possible changes to the SVO proposed amendments.

At the Executive Committee meeting in Denver, the regulators adopted a funding request to enhance NAIC systems to accommodate the filing and collection of

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private letter ratings in order to receive these ratings directly from NRSROs.

SVO assessment of affiliated transactions

After decades of assigning NAIC designations to affiliated debt and private fund transactions, the SVO has raised concerns that there is no specific methodology for a credit assessment that recognizes the unique risks of related party investment/debt transactions. (There is no requirement for affiliated investments to be rated but life insurers can obtain a rating for RBC purposes.) The SVO further believes that some transactions are so unique that they cannot assign a designation. After spirited discussion among the task force, SVO staff and interested parties, the chair of the task force directed the SVO to continue assigning designations for new private funds and affiliated transactions while the task force studies the issue and until a new methodology is developed. The SVO's memo, Request for Guidance on the Role of the Securities Valuation Office in Assessment of Affiliated Transactions, was exposed for comment until May 9.

Through-the-cycle macroeconomic methodology

The Structured Securities Group is continuing its study of a proposed methodology adjustment to the financial modeling of securities in response to industry concerns that the "procyclicality" of the financial modeling process makes it difficult for life insurers to predict capital needs. The staff is proposing a through-the-cycle model that 1) will be based on historical and publicly available data; 2) generates several forecast "paths" that can statistically represent various percentile paths; 3) quantitatively mimics historical extremes when extreme scenarios are used; and 4) is "memoryless," which focuses only on the present state, not the events that preceded it. At the Spring National Meeting, the SSG presented a technical report on model development for macroeconomic scenarios for RMBS which was exposed for comment until June 8. The SSG will proceed with the CMBS portion of the study after comments are received. No timeline for implementation of the methodology was discussed in Denver.

BlackRock's CMBS credit model

The task force discussed that BlackRock is revising its CMBS credit model, which could result in potential changes to the RBC factors for CMBS investments. The preliminary results indicate that the enhanced model is more conservative than the model currently used. As the enhanced model better captures individual property risk, losses are expected to be somewhat higher across vintages, with larger differences in the peak years (2006 and 2007) and more recent issuances since the financial crisis. The implementation of the CMBS model enhancements is expected for the year-end 2017 analysis.

Modified Filing Exemption

The task force heard a report from the SSG regarding the use of Modified Filing Exempt (MFE) reporting by insurers. MFE only applies to SSAP 43R securities not subject to modeling. The process was implemented in 2010 as a response to the financial crisis; the chair questioned whether the process introduces distortions to the current understanding of credit risk. The SSG reported that 19% of structured securities went through the MFE process, which are designated with an "AM symbol" in Schedule D. The chair stated that he believes the MFE process has "potential pitfalls," and the task force should consider whether it is still relevant. However, no proposal was exposed for comment.

Blanks Working Group

In addition to adopting six other Blanks proposals, the working group approved the comprehensive revisions to Schedule F (2016-35BWG) for 2018 reporting. The goal of the changes is to reduce filing errors, improve transparency, and promote consistency; eliminate duplicate information reported on multiple pages; automate the provision for reinsurance and credit risk calculation; and eliminate crosscheck errors. The working group also exposed 16 new items for public comment. Adopted and exposed items can be viewed at the Blanks Working Group [webpage](#).

Reinsurance Task Force

Covered agreement

After the announcement January 13 that the U.S. Treasury Department and the Office of the U.S. Trade Representative had completed negotiations for a covered agreement with the European Union, NAIC President, Ted Nickel of Wisconsin, testified before Congress in opposition to the negotiated agreement. In March, the NAIC wrote a [letter to the Treasury](#) again expressing its concerns, noting that "it has become clear that there is significant confusion among current and former government officials, insurance regulators and the industry regarding the nature of the obligations to be undertaken, the purported benefits that were gained, and the concessions that were made." The NAIC is requesting formal clarification and confirmation of the terms of the agreement "through the exchange of formal side letters with the EU" or formally reopening negotiations.

At the Spring National Meeting, the chair of the Reinsurance Task Force reviewed issues related to the covered agreement from the state regulatory point of view including the central concern that states could make significant changes to their insurance laws and regulations that would benefit the EU and its insurance sector without the U.S. receiving certainty surrounding their business activities in the EU. The chair noted it

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would be premature and inefficient for the Reinsurance Task Force to discuss possible responses to the covered agreement until it is known whether the agreement is being finalized. A trade association representative noted that the EU Commission is currently moving forward with authorization.

Perhaps in response to the NAIC's concerns, 24 members of Congress, including U.S. House of Representatives Housing and Insurance Subcommittee Chair Sean Duffy and Vice-Chair Dennis Ross, wrote to the Treasury Secretary and the USTR on April 7 to request that the covered agreement not be signed without formal clarifications to points in the agreement they consider to be ambiguous. They urged a formal exchange of letters, which they described as a common practice in international agreements. Three other members of Congress also sent a letter April 7 strongly supporting the covered agreement.

Effect of solvency II on U.S. companies

The Qualified Jurisdiction Working Group has been considering possible recommendations in response to issues encountered by U.S. companies doing business in the EU as a result of Solvency II and had asked for input from various stakeholders. One extreme possibility suggested at the Fall National Meeting was to consider revoking Qualified Jurisdiction status of countries introducing barriers to U.S. companies. At the Spring National Meeting the working group reported that it is still working on recommendations but they are very hesitant to move too quickly due to the uncertainty of the implementation of the covered agreement. The chair of the working group noted that they have received comment letters from the four EU qualified jurisdictions but those letters are not being distributed publically.

Legal entity vs group ratings

In response to prior discussions of whether insurance financial strength group ratings could be used in the approval process for Certified Reinsurers, the task force exposed for comment proposed changes to the Uniform Application Checklist for Certified Reinsurers. The proposed guidance would allow the use of either a stand-alone or group rating. If a group rating is used, the applicant must provide a rationale. The proposal is exposed until May 9.

ORSA and enterprise risk (Form F) filings

The Group Solvency Issues Working Group adopted proposed changes to the Accreditation Review Team Guidelines that recommend the following: "an analysis of the ORSA Summary Report should be completed by the Lead State and shared with other states that have domestic insurers in the group. Such analysis should address all three sections of the ORSA Summary Report, consistent with guidance outlined in the NAIC *Financial*

Analysis Handbook." One goal of this guidance is to restrict distribution of confidential ORSA detail filings made to the domiciliary regulator.

As a result of significant objections from industry to the draft Form F Implementation Guide, which goal is to assist companies in preparing the annual Enterprise Risk Report filings, the Group Solvency Issues Working Group re-exposed the document after an interim call February 23. The working group received a joint comment letter from seven trade associations reiterating their concerns that the draft guide "prescribes new requirements beyond the requirements and intent of the Form F." At its meeting in Denver, the working group received a report and heard comments from the NAIC's legal division which seemed to support industry's view. The report concluded that some of the language currently included "does appear to expand the scope of the Form F" and may conflict with the holding model law and regulation. The working group and interested parties had an extensive discussion of what the next steps should be with little agreement. The working group decided to form a drafting group to study the issues further.

Principles-based Reserving

The NAIC continued work on its various PBR projects; the voluntary three year adoption period of principles-based reserving began January 1, 2017 with implementation mandatory as of January 1, 2020. Significant developments in 2017 include the following.

AG 48

The Life and Actuarial Task Force adopted clarifying revisions to Actuarial Guideline 38 *The Application of the Valuation of Life Insurance Policies Model* to align effective dates and applicability with corresponding references in the *Valuation Manual*. This revisions were also adopted by the Life and Annuities Committee in Denver.

Valuation Manual amendment proposals

LATF exposed for comment until May 2 substantive amendments to the Valuation Manual to address simplifications and approximations in the calculation of the net premium reserve, clarify references to policies subject to minimum reserves, include provision for immediate payment of claims in the net premium reserve or additional reserve, and stipulate that periodic updates to certain designated tables which have an established process for updates will not require exposure or adoption by LATF or the Health Actuarial Task Force. The task force also exposed for comment proposed revisions to the PBR Companywide Exemption that would eliminate the 450% RBC requirement for companies with ordinary life premium below \$50 million, and that allow commissioners discretion to

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continue the exemption for one year if this requirement is met in the prior year.

VM-20 spread tables

In December, LATF exposed for comment an ACLI proposal recommending a 1-month lag in data be used to develop the spreads, so that spreads applicable for the current valuation period are available before the end of the quarter. Subsequently NAIC staff requested that this proposal be withdrawn, based on a comment letter noting that the corresponding default costs depend in part on the spread factors, but under the proposal the resulting spreads would not be synchronized with the default costs, thereby creating a timing mismatch. NAIC staff will meet with the Academy Life Reserve Work Group, the ACLI and a group of regulators to determine how to develop spreads on a timelier basis for greater applicability for the current quarter.

VM-22 fixed annuity PBR

The VM-22 Subgroup presented an updated proposal to modernize the maximum valuation interest rate for income annuities, including guaranteed living benefits once the base policy funds are exhausted. The proposed methodology is designed to be more responsive to the economic environment than the current interest determination method. The current proposal incorporates comments received during re-exposure following the Fall National Meeting, including an increase in the expense margin to address regulator concerns that the proposal was too aggressive. At the Spring National Meeting, the task force adopted the proposal, recommending that it become effective January 1, 2018. Under the new methodology, valuation rates will be adjusted quarterly or daily depending on contract size, will be based on treasury rates plus a spread less default costs and expenses, and will be established based on the expected duration of the payout period.

PBR standard portfolio

The Valuation Analysis Working Group, which is assisting in interpreting the Valuation Manual and other PBR issues during implementation, has completed development of the standard portfolio model. Sensitivity testing of model assumptions is now being done to understand how much reserves change as a result of changes in a modeling assumptions.

2016 PBR pilot results

NAIC staff summarized the final results of the PBR pilot project. One overall observation is that the level of detail in the PBR report varies significantly and the regulators would like even more detail; LATF may be asked to formalize the report format even more to minimize variations.

Technical results of the pilot include the following:

1) deterministic reserves could be negative for term insurers, but most likely only when there are aggressive or unrealistic company experience (e.g., mortality) assumptions; 2) post-reinsurance reserves could be greater than the pre-reinsurance reserve; reinsurance accounting guidance needs to be reviewed to determine whether changes are necessary; and 3) regulators need to provide more guidance on how to apply credibility when determining a company's own mortality assumption.

Consistent with earlier estimates, approximately 16 companies are expected to adopt PBR in 2017 for at least one product. NAIC staff reported that some companies don't plan to implement PBR until it is known what tax-qualified reserves will be.

Variable Annuity Framework

The NAIC continued its projects to consider proposed changes to the statutory framework designed to reduce the level and volatility of the non-economic aspect of current reserve, statutory accounting and RBC requirements.

Quantitative Impact Study (QIS II)

In early 2017, the Variable Annuities Issues Working Group finalized the parameters, structure and timeline of the second Quantitative Impact Study, the goal of which to review the financial effect of the recommendations made following QIS I. The 15 participating companies in QIS II represent approximately 50% of industry variable annuity assets.

The timeline for QIS II incorporates three consecutive cycles, beginning February 21 and ending on September 15, 2017 allowing several months to develop recommendations on proposed reserving and RBC changes and to present them by the end of 2017. The key decision points to be examined in the first cycle cover both the stochastic and standard scenario elements of VACARVM and C3 Phase II. For the stochastic calculation, the decision points include the equity return calibration criteria, the high CTE level governing the C-3 charge, the scalar used to adjust the high CTE level to a C-3 risk charge, and the extent to which revenue sharing can be recognized. For the standard scenario calculation, the decision points include the standard scenario paths, the diversification benefit adjustment, the reflection of clearly-defined hedging strategies, and policyholder behavior assumption governance. The scope of cycles 2 and 3 will be greatly influenced by the results of the first cycle.

There will be three voluntary working groups in place to allow focused discussion on specific sub-topics within the first test cycle. The subtopic groupings comprise policyholder behavior assumptions, economic scenario

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generation and reinsurance issues. More working groups may be added for subsequent test cycles. A working group call is planned for May 11 to provide interested parties with a status update on cycle 1.

Proposed VA derivative accounting

The SAP Working Group continued its high priority project to develop guidance for certain limited derivative contracts (e.g. interest rate hedges with counterintuitive effects) that otherwise do not meet hedge effectiveness requirements of SSAP 86. The working group asked industry through the ACLI to provide feedback on specific technical questions and based on that input released a new exposure draft, Issue Paper 15X, on April 11. Significant revisions since the last exposure draft and open issues for further discussions are highlighted below:

- The working group agree to remove the requirement for all non-domiciliary states in which an insurer is licensed to approve the use of the special hedging and accounting guidance.
- The requirement of an actuarial certification of the hedging strategy has been combined with the AG 43 actuarial certification requirement.
- Fair value changes in highly effective derivatives would be recognized in realized gain/loss, instead of the current treatment of unrealized gain/loss, so that the change in the AG 43 reserve and the derivative balance are both recorded in the statement of operations.
- The proposed guidance would allow recognition of deferred asset and liabilities related to the portion of the fair value fluctuation in the hedging instruments that is attributed to the hedged risk and does not immediately offset changes in the hedged item. The amortization period was first proposed to be five years, and has been increased to 10 years. The ACLI has stated that 20 years is the shortest maximum length that would result in removing most of the non-economic accounting volatility from the statutory financial statements. NAIC staff are doing research to determine if consistent timeframes have been approved by regulators; one state has allowed ten years as a permitted practice.
- Industry opposes the proposed guidance to discontinue amortization (and therefore recognize gains and losses) when a non-expired derivative instrument no longer qualifies for the specialized accounting, or is no longer an effective hedge. During the exposure period, staff will be doing additional work on this issue and has asked the Variable Annuity Issues Working Group to provide

feedback on the effect of these prior effective hedges on the remaining/future AG 43 liabilities.

- Industry has been asked to provide an illustrative Schedule DB to recommend how these transactions can be transparently reported.

A proposed effective date was not discussed at the Spring National Meeting. However, the intent of the working group is consider the recommendations of the Variable Annuities Issues Working Group when finalized so it seems unlikely that the new derivatives guidance would be effective for year-end 2017.

Life Actuarial Task Force

In addition to progress on PBR initiatives, the task force continued work on the following projects since the Fall National Meeting.

Valuation mortality tables

Guaranteed issue mortality – The task force received an update from the AAA/SOA Joint Committee on the development of Guaranteed Issue mortality tables and voted to expose until June 10 the 2017 Guaranteed Issue Mortality Tables Report and accompanying mortality tables. One question for which LATF seeks comment is whether GI Term business should be subject to PBR, or whether this business should revert to VM-A/VM-C for reserve valuation purposes. LATF seeks to adopt the tables by mid-2017 with an effective date of January 1, 2019.

Accelerated underwriting mortality - The Joint Committee also provided an update on Simplified Issue and Accelerated Underwriting (AUW) work, noting that working definitions of SI and AUW are in progress and the quickly changing landscape of underwriting practices creates challenges and continues to blur lines between underwriting approaches. Considerations include the ability to collect data appropriate for study so that “like” experience can be compared, and how the resulting mortality tables and corresponding margins can be appropriately applied to AUW business for valuation purposes.

The VM-20 Reserving Subgroup walked through application of VM-20 and VM-31 to AUW business and concluded that the necessary changes to VM-20 are unlikely to be finalized in time to be effective before 1/1/2019 (i.e. adopted by LATF prior to July 1, 2017, to allow companies 12-18 months lead time to implement). The subgroup recommends that in the short term LATF should develop guidance for PBR valuation prior to 1/1/2019, and the subgroup would continue to study the issues and recommend changes by early 2018.

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LATF members discussed the possible form of such interim guidance, including guidance notes in the Valuation Manual, an evolving Practice Note, LATF interpretations, or prescribing specific mortality tables and/or margins. The LATF chair noted that companies have an obligation to document their approach if the guidance is not clear, so there should be some basis for regulators to evaluate what companies are doing. Discussion of this matter will continue on future conference calls.

Long-Term Care Issues

Joint Long-Term Care Insurance Task Force

The NAIC approved the formation of this new joint task force of the Health Insurance and Financial Condition Committees, which is “coordinating all aspects” of the NAIC’s work regarding the long-term care insurance (LTCI) market. The task force’s specific charges are the following:

- more rigorously assess the financial solvency of LTCI writers;
- evaluate the sufficiency of current financial reporting and actuarial valuation standards;
- assess regulatory considerations related to rate increase requests and identify common elements for achieving greater transparency and predictability;
- coordinate state actions aimed at revising state guaranty fund laws;
- monitor the development of regulatory policy regarding short duration LTCI policies; and
- consider product innovations and the development of potential state and federal solutions for stabilizing the LTCI market.

Model law development

Executive Committee also approved the model law development request of the Health Insurance and Managed Care Committee to develop a new NAIC model law to address long-term care products of short duration, typically less than one year, that are excluded from the Long-Term Care Insurance Model Act (#640) and the Long-Term Care Insurance Model Regulation (#641), but do not quite fit into policies included in the Accident and Sickness Insurance Minimum Standards Model Act (#170) and the Accident and Sickness Insurance Minimum Standards Model Regulation (#171).

Reserving and rate reviews

The LTC Pricing Subgroup of the Long-term Care Actuarial Working Group has been developing considerations in forming a recommendation for a uniform rate review process. The discussion at Fall National Meeting focused on companies’ use of the Milliman Claim Cost Guidelines for re-pricing, and what information companies should provide to support use of the Milliman results for their business. Milliman noted

that data is tailored to specific companies, and will provide a public document about how their Guidelines are intended to be applied by companies, which is targeted for release by May 26., The subgroup will also hold open conference calls to continue discussion of questions where no clear consensus is emerging.

The LTC Valuation Subgroup continued its work on the proposed Actuarial Guideline for *The Application of the Health Insurance Reserves Model Regulation for Testing the Adequacy of Long-Term Care Insurance Reserves*. At the Spring National Meeting an amended draft was exposed for comment until May 11 after a lengthy discussion, which included passionate debate of the proposal to require documentation of assumed future rate increases by state jurisdiction. This requirement was opposed by industry; ACLI and AHIP representatives expressed concern that such information would be used by regulators to inform decisions on subsequent rate increase filings. One regulator stated that he already asks for this information from companies requesting rate increases. The absence of uniformity in regulators’ evaluation of rate increase assumptions necessitates that documentation of the basis for the rate increase be provided; however such disclosure could create political turmoil over the potential for cross-subsidization due to variation in regulators’ approval practices. The requirement remained in the current exposed draft but could be removed or revised in the future.

Actuarial Opinions

The Casualty Actuarial Statistical Task Force’s Actuarial Opinion Working Group exposed for comment a proposal from an interested party (and former regulator) regarding qualifications of the appointed actuary. The proposal adds a requirement for the Board of Directors to initially assess that the actuary meets the definition of a qualified actuary and document such review in its minutes. In order to do so, the Board will require the actuary to explain how all of the applicable requirements in the “Qualification Standards for Actuaries Issuing Statements of Actuarial Opinion in the United States” are met. After the initial appointment, the appointed actuary will include in the actuarial report documentation that demonstrates he/she continues to meet the qualification standards. It is expected that similar proposals will be submitted to the Life Actuarial Task Force and Health Actuarial Task Force, and if adopted, would be effective for 2018.

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Financial Regulation Standards and Accreditation Committee

Revisions to Life and Health Insurance Guaranty Association Model

At the Spring National Meeting, the committee adopted revisions to the Life and Health Insurance Guaranty Association Model Act (Model #520) for life companies. The amendments clarified that guaranty association coverage is intended to protect structured settlement annuity benefits to the original annuitant and not to annuity benefits sold to a third-party by the original annuitant. The basis for this revision is that buyers have considered such risk in the price offered to the original annuitant. These revisions are not required to be adopted for a state to maintain its accreditation status.

Revisions to the Standard Valuation Law

At the Spring National Meeting adopted as an accreditation standard the 2009 revisions to the Standard Valuation Law (#820), which adopts principle-based reserving for life, annuity, and accident and health contracts and also requires states to apply the Valuation Manual to fraternal benefit societies. The new requirements are effective January 1, 2020 which is consistent with the date that PBR becomes applicable to all companies after a voluntary three-year phase-in.

New accreditation exposures

At the Spring National Meeting, the committee exposed for comment until May 8 a recommendation to adopt the Term and Universal Life Insurance Reserve Financing Model Regulation (#787) and the 2016 revisions to the Credit for Reinsurance Model Law (#785) as new accreditation standards. Model #787 and revised Model #785 would replace AG 48 and establish requirements regarding the reinsurance of XXX/AXXX policies. The committee is also recommending waiving the normal timeline for adoption of these models as an accreditation standard which would require adoption by January 1, 2020.

International Insurance Relations Committee

The committee continues to monitor the activities of the International Association of Insurance Supervisors to consider the potential effects on U.S. state-based insurance regulation. The committee heard updates on the following key areas.

Standard setting activities

The revised IAIS Insurance Core Principles (ICPs) and the draft ComFrame material were released for comment until June 1. The NAIC has begun its internal process to review and draft initial comments on the consultation material, and a conference call to discuss comments has been scheduled for May 30. The committee also discussed that the International Capital Standard version

1.0 is scheduled to be adopted by the IAIS in June to be used for extended field testing and Version 2.0 is scheduled for adoption in the latter part of 2019, with implementation by jurisdictions in 2020.

An application paper on cyber risk is being developed by the IAIS Financial Crime Task Force as well as an issue paper on the increased use of technology by consumers by the IAIS Market Conduct Working Group.

Financial stability

The IAIS released its assessment of globally systemically important insurers (G-SIIs) with responses due back from the relevant firms by the first week of May. The IAIS formed the Systemic Risk Assessment Task Force to develop a holistic framework on systemic risk assessment and measurement, including looking into the development of an activities-based approach to systemic risk assessment.

Implementation

The Emerging Markets Small Group was formed to work on three deliverables: 1) a revised coordinated implementation framework; 2) a proposal on how to enhance the IAIS implementation assessment program; and 3) proposals on how a third chair of the IAIS Executive Committee could support greater focus on emerging markets. The group will meet in May to finalize its proposals to be presented to the Implementation Committee for further discussion to send to the Executive Committee in June.

The IAIS Multilateral Memorandum of Understanding, currently has signatories representing nearly 71% of worldwide premium volume, with 16 U.S. state signatories with a few more states that have expressed interested in applying.

The next National Meeting of the NAIC will be held in Philadelphia on August 6-9. We welcome your comments regarding issues raised in this newsletter. Please provide your comments or email address changes to your PricewaterhouseCoopers LLP engagement team, or directly to the NAIC Meeting Notes editor Jean Connolly at jean.connolly@pwc.com.

Disclaimer

Since a variety of viewpoints and issues are discussed at task force and committee meetings taking place at the NAIC meetings, and because not all task forces and committees provide copies of agenda material to industry observers at the meetings, it is often difficult to characterize all of the conclusions reached. The items included in this Newsletter may differ from the formal task force or committee meeting minutes.

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This table summarizes actions taken by the SAP Working Group since the [PwC NAIC Fall Meeting Newsletter](#) dated January 16, 2017. Items exposed for comment have a May 19 comment deadline. For full proposals exposed and other documents see the SAP Working Group [webpage](#).

Issue/ Reference #	Status	Action Taken/Discussion	Proposed Effective Date
SSAP 26 – Investment Classification Review (#2013-36)	Adopted	Revisions remove exchange-traded funds from the definition of a bond and provide separate accounting guidance for these instruments in SSAP 26. The revisions also incorporate the definition of a “security” within the definition of a bond, and incorporate definitions for non-bond, fixed-income instruments. SAPWG also adopted the related Issue Paper 156 (#2013-36).	December 31, 2017
SSAP 26 and SSAP 43R-Measurement Method for NAIC 5 Designations (#2015-17)	Deferred*	For several meetings, SAPWG has deferred revisions that would require investments held by an AVR filer designated as an NAIC 5 to be reported at the lower of amortized cost or fair value; issue is lower priority (C) item.	TBD
Quarterly Reporting of Investment Schedules (#2015-27)	Referred	SAPWG sent a referral to the APP Task Force in February 2017 to consider a policy change that facilitates collection of a new electronic-only submission of Schedule D investment data, with information detailing CUSIP, par value, book/adjusted carrying value and fair value each June 30. Industry continues to object to this proposal with the rationale that the need for such a filing has not been demonstrated. A call of the APP Task Force is scheduled for May 2.	TBD
Aging and Revenue Recognition of Multi-Peril Crop Policies (#2015-33)	Further analysis necessary*	NAIC staff is to work with interested parties, regulators and key stakeholders to develop recommendations for updating SSAP 78, Multiple Peril Crop Insurance, regarding (1) the use of the billing date for application of the 90-day rule, (2) defining “processing date” or updating the term, (3) providing more specificity on the period of risk for purposes of earning revenue and (4) developing a glossary.	TBD
ASU 2015-09: Financial Services – Insurance, Disclosures about Short-Duration Contracts (#2015-37)	Adopted	The proposal was exposed February 23, 2017 to reject the majority of these U.S. GAAP disclosures for short-duration insurance contracts which was adopted at the Spring National Meeting. Two new disclosures were adopted related to loss reserve discounting and changes to loss reserve methodologies.	April 8, 2017
Principle-Based Reserving (#2015-47)	Exposed*	Issue Paper 154 has been exposed to document the substantive revisions to SSAP 51, <i>Life Contracts</i> , related to PBR. Note that the revisions to SSAP 51 necessary to implement PBR were adopted in 2016, effective January 1, 2017.	N/A

Appendix A

SSAP 26 – AVR and IMR (#2016-41)	Directed staff to draft revisions for future exposure	SAPWG had exposed a request to regulators and industry for information on the current practices of allocating gains and losses between AVR and IMR. At the Spring National Meeting, the working group agreed to clarify that all non-SSAP 43R credit-related losses would be recognized through AVR and all interest-related losses would be recognized through IMR; no OTTI would be recognized if a security is sold in the same period.	TBD
Appendix C Introduction (#2016-42)	Deferred	The working group had previously exposed revisions to Appendix C – Actuarial Guidelines in the AP&P Manual to promote consistent application of the Actuarial Guidelines which highlights that insurers which depart from actuarial guidelines should disclose those differences. In comments from interested parties, they suggest that disclosure not be required when insurers hold reserves of the required minimums. The working group asked NAIC staff to work with interested parties to refine the wording of the proposed guidance.	TBD
INT 01-25 Inflation-Indexed Securities (#2016-43)	Adopted	The working group adopted revisions to INT 01-25: Accounting for U.S. Treasury Inflation-Indexed Securities to clarify that foreign inflation-indexed securities are not in scope for INT 01-25. For these securities, insurers should follow the applicable SSAP (e.g., SSAP 26R) without recognition of unrealized gains or losses based on the inflation factor.	April 8, 2017
Revisions to Appendix A-791 (#2016-44)	Adopted	The working group adopted revisions to Appendix A-791, Life and Health Reinsurance Agreements, to add the guidance in Section 5(C) of the related NAIC model regulation (#791) that had been inadvertently omitted related to contractual requirements for these reinsurance agreements.	April 8, 2017
SSAP No. 101 – ASU 2016-16: Intra-Entity Transfers of Assets Other than Inventory (#2016-45)	Re-exposed	The working group had initially proposed adopting ASU 2016-16, Intra-Entity Transfers of Assets Other than Inventory, as part of SSAP 101. After hearing comments from interest parties to reject the ASU since SSAP 101 already provides clear guidance on intra-entity transactions, the working group agreed to expose rejection of the guidance, but with a request for comments whether rejection would create timing differences with U.S. GAAP.	TBD
SSAP 69 – ASU 2016-15: Classification of Certain Cash Receipts and Cash Payments (#2016-46)	Adopted	SAPWG exposed proposed revisions to SSAP 69, Statement of Cash Flow, to adopt the requirements of ASU 2016-15, Classification of Certain Cash Receipts and Cash Payments. The revisions are intended to improve consistency in statutory reporting, as well as minimize differences between statutory and U.S. GAAP for cash flow classifications.	April 8, 2017

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SSAP 48 and SSAP 97 – ASU 2016-07: Simplifying the Transition to the Equity Method of Accounting (#2016-47)	Adopted	The working group adopted this ASU which eliminates the requirement to make retroactive adjustments when an investment qualifies for use of the equity method as a result of an increase in the level of ownership interest. This will allow changes from unaffiliated to affiliated status of investments in common stock and SSAP 48 entities to be accounted for prospectively as of the date the investment qualifies for equity method accounting.	April 8, 2017
SSAP 86 – Derivatives with Future Settled Premiums (#2016-48)	Re-exposed	In its January 2017 exposure the working group recommended immediate liability recognition for derivatives with deferred or financed premiums. After input from interested parties the working group asked industry to propose revisions to Schedule DB to make reporting of these transactions more transparent.	TBD
SSAP 35R - Discounting of Long-Term Care Guaranty Fund Assessments (#2017-01)	Adopted	The working group exposed in January and then adopted in March proposed revisions to SSAP 35R to require discounting of the long-term care guaranty fund assessment liability and related premium tax credit assets, for insurers which wrote long-term care contracts.	January 1, 2017
SSAP 69 – ASU 2016-18: Statement of Cash Flows – Restricted Cash (#2017-02)	Exposed	SAPWG exposed revisions to adopt this ASU which goal is to reduce diversity in the classification and presentation of changes in restricted cash. The working group is also asking for comments as to whether a statutory definition of “restricted cash and cash equivalents” should be developed and whether adoption should be retroactive, as required by the ASU.	December 31, 2019 for entities which are not PBEs
Appendix D – 2017-06: Plan Accounting – Master Trust Reporting (#2017-03)	Exposed	SAPWG proposed rejection as the guidance is not applicable to insurance entities.	TBD
SSAP 86 – Settlement of Variation Margin (#2017-04)	Exposed	The working group requested input from industry as a result of action by the Chicago Mercantile Exchange to legally characterize variation margin payments for OTC derivatives as settlement payments. For statutory purposes these payments are considered collateral. The SEC and FASB may also provide guidance on this issue.	TBD
SSAP 104R – ASU 2016-09: Improvements to Employee Share-Based Payment Accounting (#2017-05)	Exposed	This ASU is part of the FASB simplification project and revises share-based payment accounting in six areas including income taxes and cash flows. The working group proposed adoption of this ASU with requests for comment on the proposed transition guidance which would allow different transition for different amendments and whether transition guidance is needed for non-GAAP reporting insurance entities.	TBD
Appendix D – ASU 2017-02: Not for Profits (#2017-06)	Exposed	SAPWG proposed rejection of this guidance as not applicable to insurance entities.	TBD

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Appendix D – ASU 2017-03: Amendments to SEC guidance (#2017-07)	Exposed	SAPWG proposed rejection of this guidance as not applicable to insurance entities.	TBD
SSAP 97 – Extension of SCA Filing Deadlines (#2017-08)	Exposed	This proposal would revise the deadlines for Sub 1 filings (from 30 days to 60 days from acquisition) and Sub 2 filings (from June 30 to July 31) and requests whether the proposed time frames will improve compliance with filing requirements; NAIC staff noted that more than 95% Sub 1 filings are filed after the 30 day deadline.	TBD
Appendix A-010 – 2016 Cancer Claim Cost Valuation Table (#2017-09)	Exposed	The guidance would incorporate the 2016 Cancer Claim Cost Valuation Tables into Appendix A–010, Minimum Reserve Standards for Individual and Group Health Insurance Contracts.	January 1, 2019 with early adoption permitted
SSAP 26 – Bank Loans (#2017-10)	Exposed	In connection with the discussion of bonds included in SSAP 26 (#2013-36), and the reference to “bank participations” in paragraph 2.e of SSAP 26 (which has no definition), the working group is requesting input on this issue, focusing on loans directly issued by a reporting entity, and whether such loans should be captured within the scope of SSAP 26. Industry has submitted comments strongly supporting continued reporting of such directly issued bank loans as SSAP 26 Schedule D investments, which they believe are very similar to private placements.	TBD
SSAP 65 – High Deductible Policies (#2017-11)	Exposed	Expanded disclosures are proposed for high-deductible policies to require additional information on collateral, unsecured and overdue amounts by line of business. The footnote would also be data captured for year-end 2017.	December 31, 2017
SSAP 41 Surplus Note Amortization and Accretion (#2017-12)	Exposed	SAPWG proposed revisions to provide guidance regarding surplus notes issued at a discount or a premium or with a zero coupon and incorporate illustrations into a new exhibit to SSAP 41R. The amount of the discount is required to be de minimis to the principal of the surplus note and total surplus cannot be increased by the amount of the discount.	TBD
*No additional action was taken on this topic/issue since the 2016 Fall National Meeting.			

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Appendix B

This chart summarizes actions taken by the various RBC Working Groups since the 2016 Fall National Meeting, which are not discussed on pages 4-5 of this Newsletter. The detail of all proposals adopted for 2017 RBC are posted to the Capital Adequacy Task Force's [webpage](#) (under Related Documents).

All RBC Formulas	Action taken/discussion	Effective Date/Proposed Effective Date
Money Market Mutual Funds (2016-15-CA)	CADTF adopted a proposal to create a separate line item in RBC for all money market mutual funds, which will receive no RBC charge.	2017
P/C RBC		
Underwriting Risk Line 4 Factors (2016-14-P)	The P/C RBC Working Group exposed a proposal for premium risk factors and reserve risk factors developed by AAA using a new methodology for use in Line 4 of PR016 and PR017. The factors were computed on a gross catastrophe basis.	2017
Underwriting Risk Line 1 Factors (2017-05-P)	The P/C RBC Working Group exposed a proposal that provides the routine annual update of the industry underwriting factors (premium and reserve) in the P/C RBC formula within PR017 and PR018.	2017
Reat Calculation Methodology (2017-04-CR)	The Catastrophe Risk Subgroup exposed a proposal to clarify the methodology that companies should use to calculate the catastrophe risk charges.	2017
Life RBC		
RBC Level of Action (2017-01-L)	The Life RBC Working Group and CADTF adopted a proposal to include a new line to show the RBC ratio, consistent with the other formulas.	2017
RBC Shortfall Instructional Changes (2017-02-L)	Life RBC ex-exposed the primary security shortfall instruction change proposal; the proposal makes changes needed due to the adoption of the NAIC Term and Universal Life Insurance Reserve Financing Model Regulation.	2017
Health RBC		
Medicaid Pass-Through Payments (2015-27-H)	The Health RBC Working Group exposed a draft of the Medicaid pass-through payment mock-up.	TBD

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IAIS

INTERNATIONAL ASSOCIATION OF
INSURANCE SUPERVISORS

FinTech Developments in the Insurance Industry

21 February 2017

About the IAIS

The International Association of Insurance Supervisors (IAIS) is a voluntary membership organization of insurance supervisors and regulators from more than 200 jurisdictions. The mission of the IAIS is to promote effective and globally consistent supervision of the insurance industry in order to develop and maintain fair, safe and stable insurance markets for the benefit and protection of policyholders and to contribute to global financial stability.

Established in 1994, the IAIS is the international standard setting body responsible for developing principles, standards and other supporting material for the supervision of the insurance sector and assisting in their implementation. The IAIS also provides a forum for Members to share their experiences and understanding of insurance supervision and insurance markets.

The IAIS coordinates its work with other international financial policymakers and associations of supervisors or regulators, and assists in shaping financial systems globally. In particular, the IAIS is a member of the Financial Stability Board (FSB), member of the Standards Advisory Council of the International Accounting Standards Board (IASB), and partner in the Access to Insurance Initiative (A2ii). In recognition of its collective expertise, the IAIS also is routinely called upon by the G20 leaders and other international standard setting bodies for input on insurance issues as well as on issues related to the regulation and supervision of the global financial sector.

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List of Acronyms

AI	Artificial Intelligence
AML	Anti-Money Laundering
BTF	Big Technology Firm
DLT	Distributed Ledger Technology
EU	European Union
FinTech	Financial Technology (see definition in section 1)
FNOL	First Notice of Loss
GAFAs	Google, Amazon, Facebook, Apple
InsurTech	Insurance Technology (see definition in section 1)
IoT	Internet of Things
IT	Information Technology
KYC	Know-your-Customer
ML	Machine Learning
P2P	Peer to Peer
VC	Venture Capital / Venture Capitalist
WEF	World Economic Forum

Executive Summary

1. The term Financial Technologies or “Fintech” is used to describe “technologically enabled financial innovation that could result in new business models, applications, processes, or products with an associated material effect on financial markets and institutions and the provision of financial services”¹ and covers a broad array of technical innovations that are finding their way into the financial industry.
2. In particular, the variety of emerging technologies and innovative business models that have the potential to transform the insurance business is referred throughout this document as “InsurTech”. The IAIS considered it necessary to take stock of these innovations, in particular those relevant to the insurance industry and its supervision.
3. This report contains a description of these innovations, their drivers and possible impacts based on a scenario analysis. The findings in this report are intended to inform the IAIS, the entire insurance supervisory community and other stakeholders allowing further strategic consideration and discussion of possible future work.
4. InsurTech will have a significant impact on insurers’ business models. Regulation, together with firm-level supervision, will need to evolve to ensure the right balance between maintaining policyholder protection without inadvertently stifling innovation.

Stocktake exercise:

5. The level of investment in technology within the insurance sector has historically lagged behind the banking sector. However, as the banking sector matures, innovators are seeking to disrupt other financial services – insurance is viewed by many as the next great opportunity for investment.
6. The number of new companies (“start-ups”) targeting the insurance sector has significantly increased in recent years. These start-ups are targeting all areas of the insurance value chain – from marketing & distribution, through to underwriting & pricing of risks, and ultimately to settlement of claims. In most cases individual start-ups are focussing on improving specific aspects of the value chain and collaborating with incumbents, but there have also been limited examples where start-ups are looking at ways to remove the need for an insurer - using peer-to-peer type business models.
7. According to CB Insights, InsurTech start-ups attracted investment exceeding \$1.7Bn in 2016, although this excludes the significant investments by incumbents to ensure they are not left behind. Note: three out of four insurers see a risk of disruption of part of their business, while 90% fear losing part of their business to InsurTech start-ups.
8. The confluence of a number of supply-side and demand-side factors should increase the pace of change – meaning that it is expected to see more investment and a larger number of technology firms seeking to disrupt the insurance sector. The following have all been cited as reasons for a more rapid pace of change:
 - a. Supply-side factors:
 - i. *Increased investor appetite:* Traditional investors in banking technology are increasingly looking at expanding their investment in perceived similar type ventures. It should be noted that the current low interest rate environment is also contributing the need for investors to expand their investment horizon.

¹ Financial Stability Board; 16 March 2016.

- ii. *Increased intellectual firepower*: Technology firms and entrepreneurs are increasingly looking at insurance as the banking sector becomes more competitive in this space, and driving down profitability.
- iii. *Increased availability of data and analytical tools*: The increasing number of connected devices combined with ever smarter and powerful analytical capabilities is improving firms' understanding of policyholder behaviour.

b. Demand-side factors

- i. *Societal shifts*: A younger "always-connected" generation is changing perceptions as to how to engage with current and future policyholders.
- ii. *Seeking competitive advantages and operational efficiencies*: Most insurers operate in highly competitive markets resulting in continued pressure on premium rates. Improving customer engagement and loyalty through the use of technology, as well as digitising certain back-office functions is a core strategy of many insurers.

9. The main types of innovations that fall within the scope of InsurTech are listed below. The relatively long list highlights both the diverse nature of risks covered by insurers, but also the difficulty in forecasting the impact on the insurance sector. In this paper it is captured how individual innovations could impact different sectors – however, the analysis does not considered "the perfect storm" in which all innovations simultaneously impact the insurance model:

- Digital platforms (internet, smartphones)
- Internet of Things (IoT)
- Telematics / Telemetry
- Big Data and Data Analytics
- Comparators and Robo advisors
- Machine Learning (ML) and Artificial Intelligence (AI)
- Distributed Ledger Technology (DLT), Blockchain and Smart Contracts
- Peer-to-peer, Usage Based and On Demand Insurance

10. Some of the innovations may disrupt the conventional risk pooling that is common to insurance. The collection of data on insurer risk or policyholders may enable a more granular risk categorisation that creates a breakdown of the current risk pooling principles and may lead to issues around affordability of certain insurance products, possibly even leading to exclusion. This seems to be a valid concern regardless of the scenarios below. The role of the supervisor is first and foremost to identify such a trend if and when this occurs and raise awareness at the appropriate policy and political level(s).

Scenario-based exercise:

11. The basis of the scenario-based approach was to consider the varying degrees to which technology firms could disrupt the insurance business model and the insurer landscape. At a more benign level Scenario 1 considers the supervisory implications assuming that insurers effectively maintain the overall customer relationship and leverage technology firms for their own advantage. In contrast Scenario 2 considers the case where the insurance value chain is increasingly disaggregated, such that insurers may no longer own the customer relationship, and instead rely on business relationships with technology firms or service providers for premium income. Finally, Scenario 3 considers the possibility that big technology firms leverage their technology and analytical advantage to squeeze out traditional insurers.

12. The detailed discussion and conclusions for each of the product related scenarios are covered in Section 5. Some of the core themes and the supervisory considerations that need to be addressed as the role of technology in insurance evolves are the following²:

- a. **Competitiveness:** Expected to reduce longer-term regardless of the disruption to the insurance value chain. In part this is driven by the expectation that the technology will improve risk selection and will reduce the risk overall.

Supervisory consideration: should supervisors do more to encourage / accommodate competition and new entrants, noting that longer-term in other areas technology reduces the number of players? For example, there are only a handful of serious mobile phone providers or internet search engines.

- b. **Consumer choice:** Expected to reduce – albeit the extent varies according to the scenario. There are two reasons for this assessment: (1) technology is expected to lead to greater customisation of the product to the individual - however, this could lead to a reduction in comparability between product providers, thereby limiting consumer choice; and (2) existing insurance providers will benefit from increasing individual policyholder data. In the absence of data transferability competitors may be reluctant to quote.

Supervisory considerations: (1) how to ensure that the ability to compare products between providers is not compromised as new technology seeks to find ever smaller segmentations; and (2) whether to legislate on data transferability between providers.

- c. **Interconnectedness:** No material differences were identified for the different scenarios. Instead each scenario highlighted the potential for increased risk of interconnectedness arising from the use of a limited number of technology platforms that support Big Data and increased data analytics - e.g. common cloud storage providers.

Supervisory consideration: current reporting may need to be refined to capture additional information to monitor potential for increasing interconnectedness – e.g. data storage providers.

- d. **Ability for regulatory oversight:** Increased use of technology to optimise processes and analytics is expected to add more participants in the insurance value chain which is expected to reduce the ability for regulatory oversight. Under scenario 2 (i.e. fragmentation) the impact could be significant, as risk carriers are potentially one or more steps removed from the policyholder.

Supervisory consideration: the regulatory perimeter may need to be reassessed to ensure that consumers are adequately protected, and that regulators continue to have the ability to monitor market trends.

- e. **Business model viability & prudential capital requirements:** Underlying business models are expected to adapt - although the extent to which incumbents are able to adapt will depend on the speed of change. However, over the longer term there is potential for a reduction in business model resilience. This is based on the presumption that on the one hand technology will reduce the average risk, thereby lowering the risk premium, but on the other that risks will continue to be susceptible to extreme events. In the latter case the extreme risks may increase due to increased connectivity – and hence may represent a larger proportion of the resources for a typical insurer today.

Supervisory consideration: As the risk-profile changes supervisors will need to ensure that the regulatory capital framework continues to adequately capture the changing risk profile.

- f. **Conduct of business:** Under all scenarios improvements in technology is expected to result in insurers or technology firms providing more bespoke products to policyholders.

² See section 5.1. for a description of these themes and considerations.

However, if, as some anticipate, insurance become an ever reducing part of a service, there is a potential risk that insurance products reflect the firm's objectives rather than the consumer. This is for example seen in the inclusive insurance space where mobile phone operators offer insurance (sometimes for free) as a loyalty mechanism.

Supervisory consideration: Should regulation require a minimum level of transparency for consumers that highlight the potential conflicts of interest – this is particularly relevant should the insurance value chain become highly fragmented?

- g. **Data ownership:** The continual rise of the use of internet connected devices is expected to exponentially increase the data collected and analysed from policyholders. Regardless of the regulation of data protection in each jurisdiction, under all scenarios, insurers and technology firms will need to implement appropriate technical and organisational measures to maintain security of personal data and prevent any unauthorised access or processing.

Supervisory consideration: (1) Regulation on data protection may need to be reassessed to include provisions on data transferability between providers and (2) as more institutions are relying on Big Data technologies, supervisors will need to ensure that regulatory framework includes prudential and organisational obligations related to IT management, cyber security and internal controls for outsourcing services.

13. Developments in Big Data and AI go beyond product level and are affecting business processes of the insurer. For incumbents and innovators, the application of Big Data and AI is a significant competitive advantage. However, they will need to invest in preventing cyber incidents as well as invest in training or hiring specialised expertise for algorithms design and application.

Supervisory consideration: There is a need for measures to protect consumers' personal data in its collection, processing, correction and sharing, as well as to ensure information security and data privacy policies, procedures, methods and tools aimed at protecting data from cyber incidents, breaches or unintended use.

14. Distributed Ledger Technology is still in its infancy as far as the insurance sector is concerned. The impression is that other financial sectors are ahead of the game but the potential use in insurance may be even more significant.

Supervisory consideration: DLT applications may require changes to existing regulations, standards of practice, and the creation of new legal and liability frameworks. It seems too early to take further action than close monitoring, possibly via the usual financial returns or through enhanced reporting where required. Specifically, the implementation of smart contracts may require additional stakeholder alignment and governance considerations.

Conclusions:

15. As it is illustrated in this document, at this stage there are too many unknowns and uncertainties that prevent from concluding the most likely outcome, and hence impact for regulation and supervision in insurance. In most cases the impact will be determined through a combination of:

- Technology: which in many cases still needs to demonstrate longer-term how it can disrupt aspects of the insurance value chain (supply side disruption); and
- Societal changes: understanding how consumers may react to or influence the changing insurance landscape (demand side disruption).

16. The scenario analysis has been designed to specifically draw out the possible implications for insurance supervision (capturing both prudential and conduct of business issues), thereby ensuring that the conclusions can assist in shaping the future strategic

direction for the IAIS in this area. The results of the individual scenarios should also assist in defining future work packages as the implications of specific innovations / technologies for consumers and the insurance industry become clearer.

17. As a consequence, insurance supervisors may face the following challenges in the near future:

- a. Supervisors need to understand how innovations work and are applied in order to ensure adequate assessment of new product and business models.
- b. Supervisors will also need to balance the risks of new innovations against the benefits for policyholders and the insurance sector as a whole, and consider how to create the proper environment to foster innovation for example through regulatory sandboxes or innovation hubs.
- c. Supervisors and policymakers will need to evaluate and where appropriate adjust their regulatory framework from a prudential and conduct of business perspective to adequately address changed risks and business models.
- d. Supervisors need to arrange proper technical resources, knowledge and skills to be able to deal with FinTech in the future. The collaboration with other stakeholders needs to be stepped up to build up and maintain an adequate understanding of innovations.

1. Introduction

18. Under the heading “FinTech” innovations are taking place affecting the way insurance business is undertaken and posing challenges for both the insurance industry, customers and insurance supervision. In the course of 2016, the IAIS considered it necessary to take stock of these developments, in particular those relevant to the insurance industry and its supervision.

19. It therefore has undertaken a stocktaking exercise to identify these developments, their drivers and possible impacts. Part of the exercise was a scenario analysis to gain an understanding of possible implications of these developments for the insurance landscape and insurance supervision. The results of this analysis is included in this report. Its purpose is to inform the IAIS, the entire insurance supervisory community and other stakeholders allowing further consideration from a strategic perspective and feeding into the discussions on possible future work.

Definitions

20. The term FinTech has been described as “technologically enabled financial innovation that could result in new business models, applications, processes, or products with an associated material effect on financial markets and institutions and the provision of financial services”³. Other definitions are:

- The use of technology and innovative business models in financial services (World Economic Forum);
- Organisations combining innovative business models and technology to enable, enhance and disrupt financial services (EY);
- Computer programs and other technology used to support or enable banking and financial services (Oxford Dictionaries).

21. FinTech covers a broad array of technical innovations that are finding their way into the financial industry. InsurTech is the insurance-specific branch of FinTech that refers to the variety of emerging technologies and innovative business models that have the potential to transform the insurance business. Section 3 of this report provides an overview of the relevant InsurTech innovations affecting insurance.

³ Financial Stability Board; 16 March 2016.

2. Drivers of InsurTech Innovation

22. Drivers of innovation result from a combination of “push factors” (i.e. those that impact the *supply* of new technology available for insurers/policyholders) and “pull factors” (i.e. those that impact consumer/insurers *demand* for new products). The following provides a brief overview of the main push and pull factors that are currently driving InsurTech innovation.

Push factors:

23. *Increased investment through leveraging the FinTech ecosystem:* To date, technological investment has focussed on the larger banking sector, for instance by assisting ways to enhance payment services. From an innovation perspective there is little read across of this technology to the insurance industry; however, it has created a heightened level of investor and tech company engagement towards the use of new technologies within the financial sector. This in turn has increased the level of capital investment in this sector more broadly.

24. *Increased intellectual firepower: Entrepreneurs expanding their opportunities:* Many start-ups in the insurance ecosystem are founded by entrepreneurs seeking to find a lucrative business opportunity for their innovations. As the banking industry becomes more competitive some see insurance as the new frontier. In addition, many entrepreneurs are seeking to exploit what they see as weaknesses in the incumbents business models – for instance legacy IT systems and inertia in responding to changing consumer demands, such as a sharing economy.

25. *Increased availability of data and analytical tools:* The IoT and wearables have allowed firms to capture more information on individuals than ever before. This factor combined with increased computing power and increasingly smart algorithms is allowing firms to improve forecasting for a wide range of applications including insurance.

Pull factors:

26. *Societal changes impacting type of product and how it is consumed:* For example catering for millennials potentially requires consideration for an increased appetite for mobility usage (always online generation), sharing economy, self-management and generally simplified on-demand type products (possibly embedded within a service offering).

27. *Competitive advantage:* Many incumbents view technology as a way to expand the consumer interaction beyond the once-a-year renewal request notification with a view to improve customer loyalty. In addition, incumbents are also investigating the use of new technologies to improve pricing, risk selection and detection of fraud in claims settlements.

28. *Back-office efficiency:* In many markets worldwide insurance is a highly competitive industry. Consequently, many incumbents are seeking ways to improve the efficiency of their (back-office) operations to reduce costs – for instance digitising certain operations to reduce human involvement.

3. Overview of current technological innovations in Insurance and impact on insurance business

29. A summary of the significant innovations, together with the expected timelines for more wide-scale adoption, currently being considered by insurers⁴ is provided below. In each case this is followed by a brief description of their potential application and hence impact on the insurance business. A more detailed description is provided in Annex 1.

1. Digital platforms (internet, smartphones) [short-term/already in use]

Various initiatives have emerged to improve the customer experience or service such as pay-per-use products or Peer-to-peer (P2P) Insurance.

2. Internet of Things (IoT)⁵ [medium-term]

IoT involves the internetworking of physical devices, vehicles, buildings and other items (also referred to as "connected devices" and "smart devices"), embedded with electronics, software, sensors, actuators, and network connectivity that enable these objects to collect and exchange data.

3. Telematics / Telemetry [short/medium -term]

In the context of IoT, telematics involves telecommunications, sensors and computer science to allow sending, receiving, storing and processing data via telecommunication devices, affecting or not control on remote objects. Telemetry involves the transmission of measurements from the location of origin to the location of computing and consumption, especially without affecting control on the remote objects.

In the context of insurance its main applications are Connected Cars, Advanced Driver Assistance Systems (ADAS), Health monitoring and Home monitoring.

4. Big Data⁶ and Data Analytics⁷ [short-term / already in use]

In the insurance market, Big Data and Data Analytics could be used in various processes, such as product offerings, risk selection, pricing, cross selling, claims prediction and fraud detection, for example to offer customized products and allow automated underwriting.

5. Comparators and Robo advisors [medium-term]

Online services that provide automated, algorithm-based product comparison and advice without human intervention.

6. Machine Learning (ML) and Artificial Intelligence (AI) [medium-term]

The use of ML and AI enables several insurance industry processes to use data in real time and, especially, use events prediction (e.g. vehicles thefts, health problems and

⁴ Based on PwC Global FinTech Survey 2016 – Key trends

⁵ The term IoT has been defined as a global infrastructure for the information society, enabling advanced services by interconnecting (physical and virtual) things based on existing and evolving interoperable information and communication technologies (source <http://www.itu.int/ITU-T/recommendations/rec.aspx?rec=y.2060>)

⁶ Big Data is the term used for the storage of data from different sources, in large volume and speed.

⁷ Data Analytics is the process of inspecting, cleaning, transforming, and modelling data with the goal of discovering useful information, suggesting conclusions, and supporting decision-making.

weather events). There is a vast scope for AI, not only in a better pricing of risks, but also in fraud prevention, claims handling or in preventive counselling.

7. Distributed Ledger Technology (DLT) [long-term]

A distributed ledger is essentially an asset database that can be shared across a network of multiple sites, geographies or institutions. The security and accuracy of the assets stored in the ledger are maintained cryptographically through the use of 'keys' and signatures to control who can do what within the shared ledger.

a. Blockchain [long-term]

This is a type of decentralised distributed ledger, comprised of unchangeable, digitally recorded data in packages called "blocks" which are stored in a linear chain.

b. Smart Contracts [long-term]

The novelty of DLT is that it is more than just a database — it can also set rules about a transaction (business logic) that are tied to the transaction itself. Smart contract is a term used to describe computer program code that is capable of facilitating, executing, and enforcing the negotiation or performance of an agreement using DLT.

8. Peer-to-peer, Usage Based, On Demand Insurance [short-term]:

Emerging technologies are likely to result in the introduction of new business models, such as:

- a. Peer to peer insurance: business model that allows insureds to pool their capital, self-organize and self-administer their own insurance. Although it is not an innovative concept, emerging technologies (like DLT) offer substantial benefits for implementing this model in a broader scale.
- b. Usage based insurance: new business model introduced by auto insurers that more closely aligns driving behaviors with premium rates for auto insurance.
- c. On demand insurance: new business model that specializes in covering only those risks faced at a certain moment.

30. These technological innovations and new business models are likely to result in changes in the nature and type of risks covered as well as potentially changing the relationship between insurers and policyholders. As a result there are a number of different strategies emerging that are seeking to exploit these changes; notably:

- a. The aggregator model: companies focused on user interaction and positioned on the front-end, with several options for the same product or various insurance products to meet a specific need, always aggregating different insurers;
- b. The integrator model: player whose business aims to meet specific user needs, and the insurance product is a component of the offered solution (insurance embedded within a service);
- c. "Game changer": completely digital insurers focused on specific audiences or niches (e.g. products for "on demand" economy) and peer-to-peer insurance platforms.

4. The InsurTech Landscape

31. The section provides an overview of the current level of investment in FinTech and InsurTech, provides details of the new start-ups and their targeted focus area and provides examples of how some incumbents are working together with these new technology firms.

a. Global Investment in FinTech

32. Global investment in FinTech has grown during the last years. More than US \$50 billion has been invested in almost 2,500 FinTech companies since 2010⁸. Since 2014, FinTech venture investment has grown significantly, driven by a new wave of digitalization of financial services by technology companies. In 2015, global investment in Fintech companies totalled US\$19.1 billion, with US\$13.8 billion invested into venture capital (VC) backed Fintech companies, a 106 percent jump compared to 2014, and a record year for VC-backed FinTech investment⁹.

33. For the 2nd quarter of 2016, overall funding in Fintech was US\$ 9.4 billion, with a decline in funding to VC backed Fintech companies to US\$ 2.5 billion, mainly due to uncertainties associated to global market conditions, such as the UK Brexit, the approaching US presidential election, among other factors. Despite this quarter's decline, KPMG and CB Insights analysts¹⁰ suggest that if companies continue to raise money at the same rate as in the first quarter, FinTech funding will exceed 2015 investment levels.

b. Global Investment in InsurTech

34. In the last years, FinTech investment has been largely focused around banking and capital markets. However, maturity has brought much greater diversification, with innovators seeking to disrupt other financial services, such as insurance, which is viewed as the next great opportunity for investment. In 2014, technology companies targeting the insurance business received less than \$800 million in funding, but in 2015 InsurTech start-ups attracted more than three times that amount, receiving approximately \$2.5 billion. The growth tendency could continue for this year, since in the first half of 2016, VC backed InsurTech companies received \$ 1 billion in funding¹¹.

⁸ http://www.fintechinnovationlablondon.co.uk/pdf/Fintech_Evolving_Landscape_2016.pdf

⁹ <https://home.kpmg.com/content/dam/kpmg/pdf/2016/06/pulse-of-fintech-2015-review.pdf>

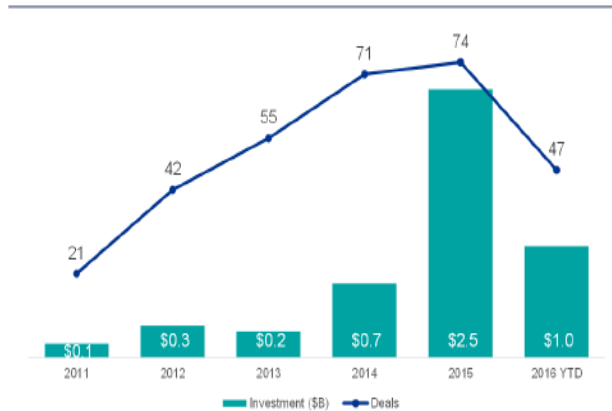
¹⁰ <https://assets.kpmg.com/content/dam/kpmg/xx/pdf/2016/08/the-pulse-of-fintech-q2-report.pdf>

¹¹ <https://assets.kpmg.com/content/dam/kpmg/xx/pdf/2016/08/the-pulse-of-fintech-q2-report.pdf>

INSURTECH INVESTMENT ACTIVITY

Top Deals & Cities, 2016 (YTD)

InsurTech Investment Activity
2011 – 2016 YTD (Q2'16)



Source: The Pulse of Fintech, Q2 2016, Global Analysis of Fintech Venture Funding, KPMG International and CB Insights (data provided by CB Insights) August 17th, 2016.

Source: CB Insights and KPMG International, *The Pulse of FinTech*, Q2 2016.

Top Deals

- Oscar Health**
\$400M // Series C
- Clover Health**
\$160M // Series C
- Bright Health**
\$80M // Series A
- Justworks**
\$33M // Series C

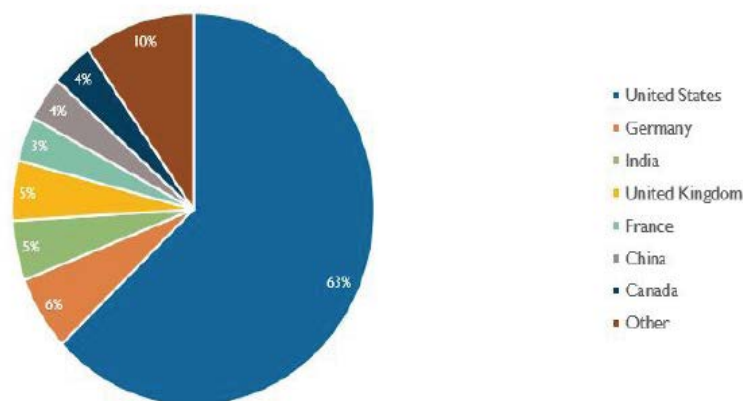
Top Cities

- San Francisco**
8 Deals // \$213M
- New York**
5 Deals // \$467M

35. According to a KPMG International and CB Insights report, in the first half of 2016, 63% of deal activity to InsurTech market went to US-based start-ups, while Germany, India and the UK each took 5%+ of the deal share over the period, with no other country registering more than 3% of deal share. InsurTech start-ups that attracted the most funds were Oscar Health, Clover Health, Bright Health and Justworks. Backing came from venture capital firms, private equity companies and the investment arms of incumbent insurers.

Insurance Tech Deals By Geography

H1'16



www.cbinsights.com

Source: CB Insights, *Analyzing the Insurance Tech Landscape*. 2016

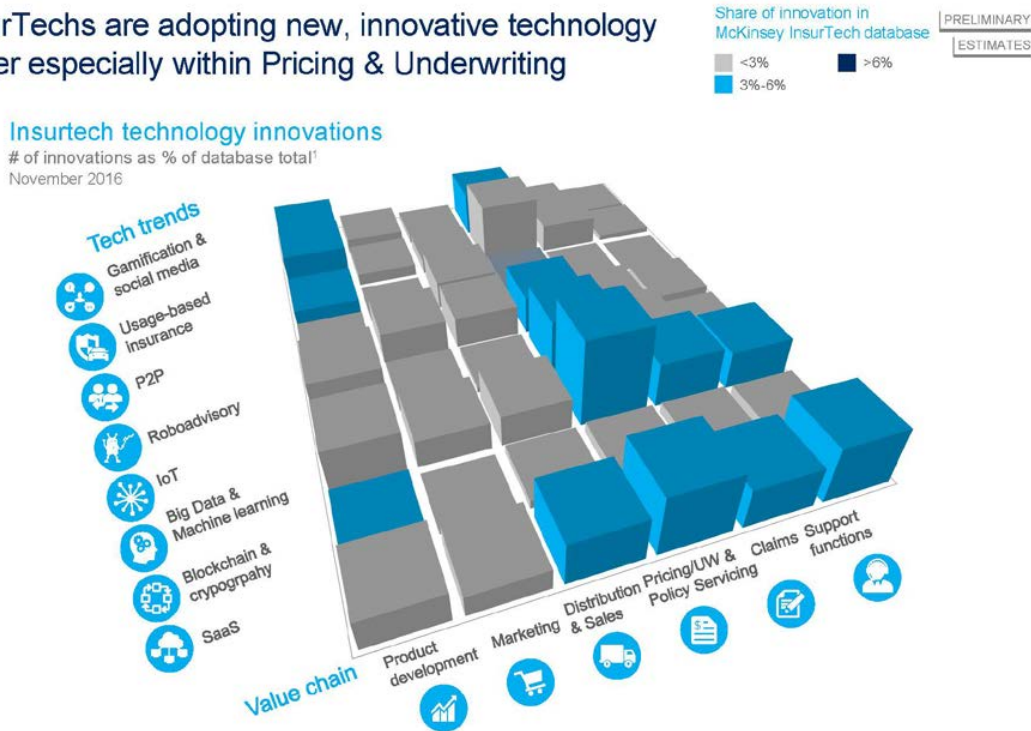
FinTech Developments in the Insurance Industry, 21 February 2017

c. InsurTech start-ups

InsurTech across the value chain

36. InsurTech start-ups are targeting all areas of the insurance value chain and even creating entirely new business models. Every process in the value chain, from product development to claims management is being revolutionized by technological innovations, the pricing and underwriting processes being the most impacted. A detailed description of how InsurTech is affecting each area of the value chain as well as examples of current start-ups that are focusing on the insurance business is provided in annex 2.

InsurTechs are adopting new, innovative technology faster especially within Pricing & Underwriting



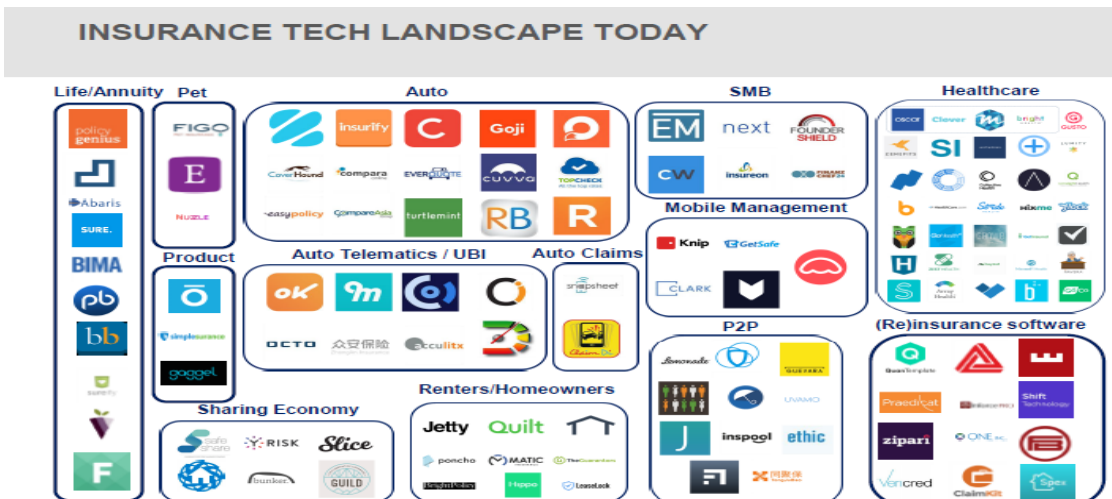
InsurTech across the business lines

37. One approach to categorize the new market entrants by classifying the start-ups according to its main line of business was made by CB Insights¹² that mapped the InsurTech landscape focusing on 11 categories:

1. Life/annuity: Private start-ups providing distribution of life insurance products including term life and annuities, including Abaris and PolicyGenius
2. Auto insurance (split into distribution, usage-based insurance/telematics, and claims): Start-ups ranging from aggregators including CoverHound and Goji to white label auto claims apps (Snapsheet) to per-mile managing general agents like Metromile.
3. P2P insurance: Private peer-to-peer insurance and mutual-based start-ups include Lemonade, Guevara, Friendsurance, and others.

¹² Analysing the Insurance Tech Investment Landscape, CB Insights.

4. Small business insurance: Private tech companies serving as commercial insurance brokers and managing general agents to SMBs include Insureon, Embroker, and Next Insurance.
5. Insurance industry software/analytics/IaaS: Insurance-specific software across the value chain providers range from BI and data-warehousing start-up Quantemplate to insurance fraud detection firm Shift Technology to re-insurance SaaS analytics start-up Analyze Re to claims inspection start-up Spex.
6. Mobile insurance management: Start-ups focusing on allowing consumers to manage and purchase insurance policies via their mobile device including Knip and GetSafe.
7. Product insurance: Companies insuring or tracking products — i.e. smartphones, laptops — for insurance applications.
8. Renters/homeowners: Start-ups providing distribution of renter's insurance and homeowner's insurance as well as lease default insurance programs.
9. Sharing economy: Start-ups working on new insurance products in coverage areas including short-term rental marketplaces and for sharing economy 1099 workers.
10. Health insurance: Across new carriers like Oscar as well as healthcare insurance start-ups targeted at individuals (Stride Health) and employers (Zenefits).
11. Pet insurance: Start-ups include Embrace Pet Insurance and Figo Pet Insurance.



Source: CB Insights, Analyzing the Insurance Tech Investment Landscape. 2016

d. InsurTech Disruption vs Collaboration

38. Insurance companies view InsurTech start-ups as competitors or disruptors. Three out of four insurance companies believe that some part of their business is at risk of disruption, while 90% fear losing part of their business to InsurTech start-ups¹³. However, they also see opportunities that the innovative solutions may bring. Many insurance companies are recognizing that these start-ups can also be partners, since the benefits of InsurTech collaboration are substantial (for example, obtaining early access and being the first mover advantage on disruptive technologies or gaining the ability to influence and shape the focus and strategy of the new start-up). Currently, there is more collaboration between InsurTech start-ups and incumbent insurance companies.

39. Even though insurers can create the internal structures that support innovation, most of them will have to enlist external resources in one way or another. Accordingly, they will need to assess the availability and compatibility of existing talent and determine how and where they can find what may not currently be available. In this sense, collaboration is an important











¹³ <http://www.pwc.com/gx/en/industries/financial-services/fintech-survey/insurtech.html>

opportunity. Given the enabling role InsurTech firms are playing, as well as the challenges facing the established insurance sector and the barriers to entry for new businesses seeking to act alone, collaboration could result in mutual benefit – for the insurers and for customers.

40. According to a PwC report¹⁴, insurance companies are taking the following approaches for embracing InsurTech:


















- *Exploration* – savvy incumbents are actively monitoring new trends and innovations. Some of them are even establishing a presence in innovation hotspots (e.g. Silicon Valley) where they are learning about the latest developments directly and in real time.
- *Strategic partnerships* – some incumbents partner with start-ups and build pilot solutions to test in the market. Ensuring a design environment (“sandbox”) helps boost creativity and also provides tools and resources for designing potential prototype solutions.
- *InsurTech involvement* – incumbents’ involvement in start-up programs such as incubators, mechanisms to fund companies, and strategic acquisitions may result in insurers’ readiness to address specific problems, especially those that otherwise might not be tackled in the short term.
- *New product development* – involvement in InsurTech could help incumbents discover emerging coverage needs and risks that require new insurance products and services. Accordingly, they can refine – and even redefine – product portfolio strategy.

41. Some examples of venture investment funds of prominent insurers are AXA, Aviva, Allianz, American Family, MassMutual, Transamerica and Ping An, which have made significant investments in InsurTech start-ups that can help them reduce costs and risk and capitalize on new markets.

Firm	Stated corporate venture areas of interest/focus
	*Connected world, data-driven insight, insurance innovation*
	*Fintech, connected car/smart home, data & analytics, cybersecurity, digital health*
	*The Internet of Things (car/home/health), data and analytics, innovative customer experiences, distribution i.e. new sharing economy platforms*
	*Enterprise software, financial technology, insurance technology, innovations in travel, health, and auto verticals*
	*Next generation vehicle products, connected home products, sharing economy, insurance innovation*
	*New insurance business models, Internet of Things, cybersecurity, energy, big data/analytics*
	*Underserved risk markets, innovative approaches to risk underwriting, financial technology with application to risk underwriting*
	*Finance, consumption, healthcare, auto, social network, and artificial intelligence*
	*Fintech, data analytics, cybersecurity, digital health, and enterprise software*
	*Fintech/FinServ, Big Data/Analytics, Digital Marketing and Sales, Social Media, Enterprise IT, Content and Publishing, Mobile*

Source: CB Insights, Insuretech Connect 2016

¹⁴ Opportunities await: How InsurTech is reshaping insurance, Global FinTech Survey, PwC, June 2016

INSURANCE DISTRIBUTION STARTUPS BACKED BY INSURERS	
Insurer	Insurance Distribution Startup
	<i>Lemonade</i> EMBROKER <i>Slice</i>
	 
	
	
	
	<i>metromile</i>
	
	<i>trōv</i>
 	<i>Slice</i>
	<i>metromile</i>

Source: CB Insights, Analyzing the Insurance Tech Investment Landscape. 2016

5. Possible scenarios for the future and changes to the insurance landscape and supervisory approach

5.1 Framework for the scenario analysis

42. As highlighted in Sections 3 and 4 there are a significant number of drivers and potential applications of technological innovations that could change the insurance industry. In most cases the speed and scale of change will be determined through complex interactions between societal trends, technological developments, government legislation (& possibly incentives), insurer strategies as well as regulators. In addition, given the scale and divergence of the new technologies, any historic trends based on extrapolating previous technological innovations on the insurance industry, are likely to provide little to no meaningful basis on which to project future impacts.

43. In light of these uncertainties and complexities an analytical scenario-based framework is used that allows supervisors to visualise and explore the regulatory implications on the insurance market. Central to this scenario framework are the following three building blocks:

1. *Scenario context: Products & technology:* Scenarios need to be grounded on specific technologies and specific insurance products to provide context and ensure meaningful discussion on likely outcomes and supervisory consequences;
2. *Scenario diversity:* Scenarios need to be sufficiently diverse to allow supervisors to explore and consider consequences of extreme but nevertheless plausible outcomes – that considers not only market disruption, but the potential for displacement;
3. *Scenario output:* Scenarios need to consider the possible implications for supervisors both at a broader macro perspective, as well as at the individual firm level (micro-supervision). Understanding the required output will inevitably dictate the level of detailed required for each scenario.

Each of these areas is explored in more detail below:

Scenario context: Products & technology

44. The current areas of focus for technological developments largely mirror the size of the different insurance markets. In 2014 motor, health and property represented three quarters of non-life premiums in the EU¹⁵, and according to McKinsey these lines represented over 80% of the innovations¹⁶. For each of these products there are technological developments that have the potential to change / disrupt parts of the insurance value chain – from interacting with the customer, assessing the underlying risks, through to policy administration. The products and technologies included in the scenario-based approach are: Motor insurance and the impacts of telematics and usage based products; Health insurance and the impact of wearable technology and Property insurance, the impact of the internet-of-things and the connected home technology. In addition, two additional technological developments have been added that do not relate to a specific product, but have potential application across several products: DLT and Big Data / Artificial Intelligence.

¹⁵ <http://www.insuranceeurope.eu/sites/default/files/attachments/European%20Insurance%20-%20Key%20Facts%20-%20August%202015.pdf>

¹⁶ McKinsey presentation, “Insurtech: a Threat that Inspires”, Basel, 11 October 2016

Scenario diversity:

45. In designing the scenarios a balance needs to be struck between selecting a large number of scenarios, thereby allowing the consequences of the most important interactions to be identified, and a smaller number of scenarios, that ensures sufficient level of depth of analysis. Three scenarios were selected that illustrate the more extreme state as to how the insurance market may evolve. In doing so, there is no specific probability associated; instead these are used to assist in exploring the different supervisory consequences. The three scenarios are:

- *Scenario 1: Incumbents successfully maintain the customer relationship*
- *Scenario 2: Insurance value chain becomes fragmented; Incumbents no longer in control*
- *Scenario 3: Big technology firms squeezing out traditional insurers*

Scenario output: Supervision

46. Finally from a supervisory perspective for each scenario a view is expressed on the following aspects relative to the current market environment:

Macro / sectorial perspective:

- Competitiveness: number of insurers in the market
- Consumer choice: number of products available
- Level of interconnectedness: with regards to both capital and services provided (i.e. level of systemic risk)
- Ability for regulatory oversight: the extent to which risks are within the regulatory perimeter

Micro / firm supervisory perspective:

- Business model viability: this will consider viability based on the current insurer business models, and an assessment of the impacts on each component of the insurance value chain (i.e. product development, marketing, distribution, underwriting, policy/claims administration)
- Conduct of business: this will consider the potential consequence towards treating customers fairly, and the potential for uninsurable consumers
- Supervisory oversight: is the current information reported by individual insurers sufficient to identify adverse developments / risks

5.2 Description of the current market

5.2.1 Property Insurance / Connected House

47. The property insurance market is a very significant part of the whole non-life insurance market. Though generally not explicitly considered legally compulsory, it is indeed frequently in practice compulsory to rent an apartment or get a mortgage, and moreover the nature of the risks reduces the opportunities and relevance of self-insurance (strong severity potential).

48. Incumbents draw a significant part of their turnover from this historical market, frequently in combination with the motor insurance market.

49. Banks have gradually invested this market during the last thirty years, at first essentially in partnership with incumbents for quite standardized products. They now represent a significant part of the market, but not as significant as their part in life insurance.

50. In view of the complexity of the risks (combination of fire, theft, water leakage, frost, etc...), possible accumulations incurred in case of natural events (flood, subsidence, earthquake, storm) and of the rather strong competition - low margins on high volumes -, this market is very concentrated, with mainly insurers or bank-insurers of important size.

51. Regarding the distribution side, there has been during the last fifteen years the development of new intermediaries: online comparators. They are however more dedicated to the motor insurance market, as it is more pulled by the price criterion than the Property market where the damage to the property shows a more emotional component for the customers, making the quality of service, financial soundness of the insurer, all the more important.

52. The claims settlement may be either managed in house, or delegated to service providers - sometimes created through market initiatives - with also existence of compensation schemes facilitating the treatment of the very small claims (water leakage for example). The insurers and bank-insurers of important size which represent the major part of the markets are generally looking for solutions to optimize their processes of risk selection, underwriting, pricing and claims management, the low technical margins generally incurred on these products requiring these optimizations. This historically incited them to explore solutions proposed by technology, with however the limitation of the IT legacies, and they now wish to exploit the digitalization of their processes to improve them, in terms of costs as well as for the customer contact quality.

5.2.2 Motor Insurance / Telematics / Autonomous Car

53. The motor insurance market is a very important market, if not the main one in non-life insurance. There are third party liability and damage guarantees - which can be combined with theft and engine failure for example.

54. For jurisdictions in which the third party liability for motor vehicles is compulsory, the price criterion is the deciding factor, and it is a very competitive market on which the intermediaries already use the internet opportunities, for instance for Price Comparison Websites that have gained large market shares during the last decade.

55. In terms of risks, they are technically complex, with a high diversity: personal injuries (big), material damages (accumulations), natural events, theft, small damage (broken windows, other)... which led to multiple partnerships with experts, repairers, as well as compensation conventions between insurers themselves, and the development of acute legal skills for the biggest claims.

56. It is a rather promising area in terms of technological tools usage for prevention and underwriting. Technology can also add value to the assistance services. These characteristics already strongly appeal to the incumbents.

5.2.3 Health Insurance / Connected Lifestyles

57. The health risk for individuals can be split into: a basic state coverage, additional coverage via, for instance, employers; another coverage purely private - generally aimed at adapting the coverage to the risk profile of the individual and his family -, and self-insurance.

58. The respective shares of these different schemes are quite diversified according to the country, generally linked to the history and to the principles of state intervention, or of collective approaches in the coverage of risks.

59. This makes it difficult to draw a general picture of health insurance markets in terms of structure, but health risk per se is particularly sensitive for people, especially as it interacts with ethical issues (Bio-ethics, medical secrecy, genetics, illegal medicine practice). These different subjects are often linked to the development of opportunities to improve prevention, pricing and personal services associated with health insurance. Therefore the innovations will depend on the way different countries deal with these subjects.

5.3 Scenario analysis 1: Incumbents successfully maintain customer relationship

60. Under this scenario the insurance value chain remains essentially with the (re)insurers. Product development, distribution, underwriting, policy & claims administration and customer interaction is either in-house or out-sourced by the insurer. From the customer perspective the insurer continues to be the key provider. This scenario may be the result of natural, social, regulatory or capital barriers to the entry of InsurTech start-ups unrelated to traditional incumbents. Through acquisitions, corporate ventures or internal innovation initiatives, incumbents can achieve to stay in the front line for the consumer.

Impact on the market

61. A selection among insurers in general can be expected: global companies (high level of capital) and those with more tech-savvy structures with more flexibility are likely to have the upper hand. In general less competitiveness is expected.

62. There is likely also going to be a selection among InsurTech start-ups: they must help to attract and retain the insurer's target customer.

63. Insurers will try to maintain the customer relationship transforming its business models around monitoring, prevention and for example energy saving.

64. In motor insurance, for which autonomous vehicles and telematics become increasingly important, insurers are expected to work together with manufacturers. As a consequence, there will be an increasing volume of individual data collected and kept by the insurers, causing the customer relationship to be more dependent on trust.

Implications

65. The fact that traditional insurers maintain their positions does not mean that significant changes in the insurance business will no longer occur. In general, the expected implications are as follows:

- a. **Competitiveness:** Inserting technology into the insurance value chain tends to enhance processes that have high-impact on premiums such as pricing, risk selection, and fraud detection, which translates into competitive advantages in the first place. Those incumbents with greater difficulty in adapting to the new scenario will suffer from pressure on the profit margins and may come to succumb. More tech-savvy insurers with more flexible structures and capable of managing the legacy in terms of information technology tend to excel and remain in the market. **In the medium term, competitiveness tends to be reduced.**

- b. **Consumer choice:** A natural consequence of expanding the use of data for product formatting, which is a consumer demand, is the individualization of insurance. The adverse effect is the reduction of price comparability, which could reduce the choices. The fact that the processes are still under the control of traditional insurers tends to minimize this effect, but not to the point of canceling it. **In this sense, there should be a slight reduction of possible choices.**
- c. **Level of interconnectedness:** There is a special issue in this point regarding the possibility of an increase in outsourcing of the insurance value chain processes. The formation of highly captioned InsurTech start-ups and the establishment of partnerships with several incumbents can lead to concentration risks that should be monitored. One example is the possible adoption by incumbents of a limited number of technology platforms for telemetry in motor insurance or the diffusion of software-as-a-service. **Therefore, it could increase the level of interconnection among market players due to technological concentration.**
- d. **Ability for regulatory oversight:** In this scenario, considering that to bring a new product to market, customer-facing product distributors will rely on insurers' licenses to issue policies, as it is easier to obtain the appropriate licenses required for conducting FinTech activities under the label insurer, **the licensing process shall remain unchanged.**

Regulators will have to develop expertise and new skills, to identify and mitigate technological risks, to verify technological neutrality, to identify gaps, to propose strategies and rules. It means exploring how to work with the market to promote innovation on secure bases. In the same way comes the need to attract and retain talents to catalyze the development of InsurTech innovations. **Regulatory activity tends to become more challenging** and supervisors are likely to be behind market developments and in regulating FinTech activities. However, **the lower market fragmentation in this scenario may facilitate opportunities for joint learning in controlled regulatory environments.**

- e. **Business model viability:** with the tightening of the margins, insurers will have to seek new profit sources. The insurer of tomorrow will be one that can transform its business model around prevention and become a prevention specialist. New prevention services charged on a subscription basis will likely be a new source of profit for insurers. **This need to adapt to new business models will reduce the number of market participants.**

By increasing the efficiency of insurers' back office processes and systems, there is potential to enable insurers to operate with reduced premiums at larger scale. In a cyclical effect, **the reduction of premiums can endanger the sustainability of business models at first, until there is accommodation between risk and financial return, reducing the number of market participants.**

National and international regulations on the sharing of data and data privacy will have a large impact on costs that will be involved in company's compliance costs and how insurers will be able to effectively use consumer information. This will affect the ability of some insurers to adapt to the new standard of products and reduce the number of participants.

- f. **Conduct of business / consumer protection:** In this scenario of increased visibility of traditional brands and tighter margins, insurers will increasingly be concerned about enhancing interactions and building trusted relationships. As an industry that has traditionally focused on distribution through brokers and financial advisors, **the focus on customer experience can bring incumbents to increase efforts in monitoring the customer relationship and treating customers fairly.**

- g. **Supervisory oversight & prudential requirements:** The major concerns with respect to supervisory oversight and prudential requirements are related to new players' market entry and fragmentation. From the perspective of this scenario there will be no significant changes.

5.4 Scenario analysis 2: Insurance value chain becomes fragmented; Incumbents no longer in control

66. Under this scenario specialist technology firms have successfully established a customer relationship that increasingly considers insurance as a reducing component of other services provided. Sophisticated data analytics across multiple platforms / customer interaction points is carried out by the customer interfacing technology firm, leaving the insurer to focus on claims handling. The insurer continues to be the ultimate risk carrier, but is increasingly marginalised with many products being white-labelled. Customers may no longer know (or care) who their insurer is.

Impact on the market

67. In motor insurance, technology firms working together with motor manufacturers could increasingly interact with the consumer – providing vehicle and other life-style choices (increasingly infotainment in vehicles). Under this scenario insurance could be sold together with the product (i.e. the vehicle) or as part of infotainment service package. Insurers would deal with these technology firms to obtain the insurance risks embedded within the service. Under the worst scenario (for insurers) technology firms only provide the minimum necessary claims data.

68. In property insurance, technology firms would provide the necessary service of an overall security life-style package for the consumer. This could cover anything from boiler maintenance to on-demand films and music. Under this scenario the service could include attaching monitors to pipes to assess risk of freeze or on cookers for gas leaks. The insurance product is increasingly marginalised reflecting the reducing level of risk.

69. In health insurance, technology firms provide the necessary service of an overall package that promotes an active healthy life-style for the consumer. This could cover anything from providing fitness programmes, recommending recipes to providing traditional medical health insurance related check-ups. Under this scenario the service relies on monitors worn by the customer (“wearables”) to reduce the potential insurance risk. The insurance product is increasingly marginalised reflecting the reducing level of risk.

Implications

70. Potential implications arising from this scenario are:

- a. **Competitiveness:** As insurance products become embedded in services or products, the customer demand will be driven by the service provided rather than the insurance product. This dynamic will increase for products where technology is expected to significantly reduce the risk – hence the overall proportion of the consumer wallet relating to insurance reduces even faster. Under this scenario the customer has less incentive to shop around and technology firms are likely to minimise insurance partners to manage costs. **As a result competition is likely to reduce.**

As the insurance product increasingly relates to more sophisticated technology it could ultimately favour global insurers that have a global reach, ability to write in multiple jurisdictions and take a longer term business relationship view (long term business partners will be key). **Again this would suggest that competition is likely to reduce as smaller insurers are squeezed out.**

- b. **Consumer choice:** As insurance is embedded in a service the ability to compare insurance products may fall significantly. In the extreme case there is a possibility that the service provider does not offer an alternative insurance. However, even where consumers have the possibility to shop-around, the increasing customisation of technology to individual requirements is likely to reduce the comparability of products – **thereby reducing overall consumer choice.**
- c. **Level of interconnectedness:** The level of interconnectedness is unlikely to significantly change due to the fragmentation of the insurance value chain. Rather any increase in the level of vulnerability at a sector level is likely to arise if insurers and technology firms use similar platforms (e.g. cloud based or software providers). **No material change expected as a result of fragmentation.**
- d. **Ability for regulatory oversight:** As the insurance value chain fragments, the customer facing entity will differ from the risk taking entity. This may make it more difficult for regulators to identify and understand trends relating to changes in product design and the implication on prudential requirements. This is likely to be more challenging in jurisdictions where conduct and prudential regulation is not carried out by the same institution. **Ability for regulatory oversight is likely to become more challenging.**

Assuming that fragmentation is likely to favour larger global insurers (i.e. using their scale to maintain partnership deals with the large technology firms) this could lead to a reduction of domestic insurers. With global insurers increasingly gaining market share, there is potential that material decisions such as strategy, product design and exposure limits will increasingly be decided outside of the country jurisdiction. In addition, significant processes such as pricing, claims handling and marketing could be carried out in different geographical areas as well as different legal entities. **In these circumstances regulatory oversight and influence may significantly reduce.**

- e. **Business model viability:** Fragmentation of the insurance value chain is likely to result in a higher and more rapid contraction of the overall insurance premium. Under this scenario ancillary income, which currently benefits insurers, will be expected to benefit technology firms. The faster the reduction in market premiums the greater the risk of business model viability as many firms may fail to adapt. In the longer term it would be expected that the insurance industry adapts to reflect the new norm, and use the data available from technology firms to re-price risk to maintain an adequate level of return. **In the short/medium term expect business model resilience to reduce.**
- f. **Conduct of business / consumer protection:** As the value chain fragments, insurers will be reduced to price takers rather than price setters. In addition, as their interaction with the customer diminishes, insurers may not know what the actual premium being charged is – particularly in cases where it is embedded within a service offering. Under these circumstances understanding the extent of any cross-subsidies and whether the consumer is being treated fairly is likely to be less transparent. Specifically, the regulators ability to understand how the technical price of an insurance product is translated to a final price that is charged to the consumer will be more difficult to evaluate where different firms are involved within this process. In addition, as insurers become one or more steps removed from the customer it will be harder for them to establish whether the product is best suited for the customer. (i.e. demonstrating that requirements around Treating Customers Fairly is met may become increasingly difficult). **Expect reduced transparency.**

Implications for consumer protection typically arise as a consequence of Big Data. Specifically who will own and analyse the Big Data and for whose benefit (firm or customer). A firm seeking to minimise the claim experience has different vested interests than a firm that is concerned with customer engagement. Fragmentation of

the insurance value chain is likely to increase risk of disputes between insurers and technology firms – particularly where the technology firms are the priced setters.

- g. **Supervisory oversight & prudential requirements:** Fragmentation of the insurance value chain should not in itself change the underlying nature of the risk. However, the fragmentation is likely to lead to reduced share of the consumer wallet for insurers (as ancillary income and other services are expected to be taken by technology firms). Under this circumstance the risk profile could become more volatile – stable profits in normal years followed by very extreme results when exceptional losses occur. The level of volatility is expected to increase as the ability of the insurer to cross-subsidise with other parts of the insurance value chain no longer exists. **The capital regime could become at risk of under-estimating insurer capital requirements if not recalibrated to reflect the changing market structure.**

As insurance is increasingly tied to underlying services and reliant on partnerships, actual business volumes could become more volatile - i.e. insurance premiums could significantly differ depending on the ability of the insurer to win or lose a particular partnership deal. **These developments may make industry results and capital requirement more volatile on average.**

As the insurer becomes increasingly removed from the customer, the ability to understand and react to consumer trends will be harder. **This has implications for supervisory oversight and the ability of regulators to identify and monitor potential adverse trends.**

As the insurance value chain fragments, an increase in profit commission arrangements would be expected, whereby those firms that own the customer relationship benefit from better experience. Under these circumstances understanding the level of loss absorbency will be critical to determining regulatory capital requirements. **Regulatory capital requirements are expected to change to reflect changes in payments impacting insurers' ability for loss absorbency (e.g. profit commissions is likely to increase in importance and is typically not well considered within current regulatory rules).**

5.5 Scenario analysis 3: Big technology firms squeezing out traditional insurers

71. Under this scenario Big Technology Firms (BTF) provide products that seamlessly integrate the insurance element, thereby capturing the entire insurance value chain. Premiums are embedded within other services or as part of a consumer lifestyle package. Sophisticated data analytics and the increased prevalence of connected devices allow BTF to develop enhanced claims prevention measures, thereby allowing them to undercut and to be even more competitive than traditional insurers.

Impact on the market

72. In property insurance, BTF use their modern computing capacities and digital natives IT systems, as well as a “trust capital”/“brand recognition” of a growing part of the population - millennials for whom the GAFAs and other actors of new economy are often more trusted than incumbents – to sell insurance products. In some cases it could not be much discernible from the other services that they propose. They might even use financial strength and their skills in data mining and data management to carry out the insurance risk themselves.

73. By applying the same reasoning as the bankinsurers did in the past, BTF would begin by distributing, then partnering with incumbents in joint ventures, then being strongly reinsured

players to finally benefit from a position of leading player on several national markets to even mutualize the risks for which national insurers have so far to resort to the reinsurance market.

74. The question of the timing of these evolutions - even of their realization - is probably not linked to a specific non-life insurance market. BTF are generally thinking globally - even if they would probably first test their concepts in markets where the regulatory barrier is believed to be lower before extrapolating. Moreover they could begin with other risks than Property.

75. Beyond the GAFAs, it is possible that a technological actor specialized in domestic connected devices, and seeing a benefit of its products in terms of prevention or risk assessment that it does not succeed in "selling" to traditional insurers, decides to be the risk carrier itself. Although nothing can be absolutely excluded, it is still difficult at this stage to imagine a scenario of this kind revolutionizing the Property insurance market.

76. Even more than for the property market, the incentives for GAFAs to enter the motor insurance market could take a significant time to be effective, since technical margins in this very mature market are quite low and require mobilizing diversified and costly skills – technical, IT, marketing, operations - to reach the critical size necessary in terms of profitability.

77. This does not mean that GAFAs will not use their tools and their brand strength to sell this type of products, but it seems for the moment more likely that it would be in partnership with incumbents. The transition to a phase where they would carry the risk and manage claims could be in a later phase – apart from the specific case of P2P insurance schemes.

78. However, once the autonomous car is actually used on a large scale, the companies producing and selling it could use their knowledge of customers and risk (this time from a technical point of view) to capture what would be the car insurance market tomorrow: a smaller, but with lower losses, and less volatility.

79. The other possibility would be that the collaborative economy ends up altering the traditional situation of a vehicle owned by its driver who uses it only for his own needs, to move to a model of collective sharing of this vehicle, thus changing the way risk is assessed. In this context, a platform of significant size belonging to this market could be tempted to use its huge user database – and associated behaviour knowledge - to efficiently sell and even eventually capture the whole value chain. Moreover they could wish to do so just to be able to tailor the insurance products to the needs of their clients if their incumbent partners do not accept to do so.

80. Apart from the regulations on health, genetics, bioethics, illegal practice of medicine mentioned above, GAFAs-type technological players are quite naturally well placed in the field of health insurance. Indeed, via social networks and connected health objects (wearables, ingestibles, etc.), which are usually interconnected with these social networks - they get at the same time a precise knowledge of behaviours and parameters influencing the health risk, and can even contribute to its prevention - cf. assessment of probability of certain pathologies via high quality selfies of people.

81. The degree of trust from people in these actors for such sensitive subjects appears to be an obstacle for older generations, but the question remains unanswered for millennials more accustomed to these brands than to traditional insurance companies. It is probable that GAFAs' success would depend on the progressivity of entry into this universe so that they are not perceived as excessively intrusive and rejected even by their usual clients.

82. Where all the regulations would be adapted to these new value propositions, it seems that health insurance could be integrated into a "lifestyle" package offered to people on platforms that would not only offer products or services but offer these packages accompanying them on all dimensions of their existence.

83. In this context, the GAFAs mastery of information technologies could improve quality of services that incumbents fail to reach up until now. In addition, since health risks are

generally less volatile than other insured risks, they could indeed carry these risks with the support of reinsurers on peak risks (pandemic), and also partner external providers on operational issues – for instance linked to the interconnexion with State systems.

Implications

84. **Competitiveness:** BTF have an advantage over traditional players either by their strong presence in terms of social networks, which presents a high premium to the market leader, or by their link with the product (producer of autonomous vehicles). In both cases, traditional small and medium-sized insurers appear to be poorly adapted to cope with this competition, notably in terms of information systems and additional services dimension, and a significant reduction in the number of players is expected.

85. However, other players than those who would disrupt car insurance could possibly enter this market, for example via home automation or anti-theft companies, who would decide to diversify their activity towards home insurance. It seems however likely that they would remain on the distribution part rather than carry the risk for most of them.

86. If abstracting from Peer-to-Peer models that could be promoted by technological players specialized in social networks, the required new services proposed to clients, and the complexity it generates, would require investments from incumbents that could lead to a reduction of the number of players. Another possibility would be that the platforms specialize in these value-added services but do not carry the risk itself. The competition would in this case also be reduced, as the tech platforms would only partner with some of the biggest incumbents.

87. In force regulations or collective agreements may grant unwanted protection to a certain number of players due to barriers these form new players, which in a sense would maintain a greater diversity of insurers but not necessarily competition because their highly prescriptive dimension reduces consumer choice at the end of the day.

88. **Consumer choice:** Despite this reduction in the number of players, as one of the strengths of GAFAs lies in the use of data and new technologies to make "tailor-made" products, the variety of products could increase significantly.

89. On the other hand, as far as the inclusion is concerned, two contradictory effects would be at work, simultaneously: a greater inclusion by the use of means of cheaper marketing, selling and managing tools and a reduction of the risk via increased prevention - with the extreme case of the autonomous car. But potentially an exclusion by the price of certain profiles for which the risk would be measured more precisely than today and less mutualized.

90. The stronger link between real activities (home automation, security of dwellings and people) and insurance could give rise to an abundance of strongly differentiated offerings, which would therefore increase the choice of consumers.

91. It is more on the service dimension than on the insurance product itself that an increase of consumer choice could take place, the products corresponding naturally to a partial or total reimbursement of the health expenses borne by the insured after what state systems pay.

92. **Level of interconnectedness:** The fact that platforms generally use more modern financial services, notably payments, or the fact that, like these services, the insurance business is housed in a cloud - and thus sensitive to the same cyber-attacks - can also increase interconnection with critical financial services, all the more so if some of these services are themselves interconnected with services related to housing. This raises the crucial issue of security against the cyber-attacks of connected objects.

93. GAFA operators would use more modern financial services to optimize premium collection, compensation, and thus increase interconnection with innovative financial services.

94. **Ability for regulatory oversight:** In the case of autonomous cars, the regulations will have to adapt to an environment without identified responsible drivers and decide on the sharing of responsibility between owner and manufacturer in the event of an accident.

95. Apart from this, the adaptation of legal frameworks to an approach more tied to the use than to the possession of the vehicle may prove necessary, or in any cases its clarification.

96. In the case of platform-type models, which will often produce solutions more related to use than to vehicle ownership, the considerations will be more technical than regulatory as such. An important issue will be the protection of consumers in an environment that tends to make the insurance product transparent to them, embedded in a global package, as well as protection of personal data and cyber security.

97. In health insurance, the regulation of this type of activity goes beyond the insurance field to cover very sensitive subjects – and its approaches are highly differentiated according to the cultures and histories of the different countries - such as genetics, personal data, bioethics, exercise of medicine. It is more through the strong interaction with these subjects that the use of new technologies in health insurance by technological players implies that regulatory topics will be put on the table rather than questions relating to insurance in the strict sense - apart from peer-to-peer insurance otherwise dealt with.

98. **Business model viability:** For traditional players this scenario would certainly be an important stress on the viability of their business models, likely leading to mergers and absorptions (at least) - and therefore to the reduction of the number of insurers. These mergers are moreover generally costly and temporarily degrade the agility of the information systems that would be needed to play on an equal footing with the new players.

99. Some incumbents are willing to anticipate this global evolution of the insurance market by strengthening their points of adherence with their customers, by proposing other services - financial, assistance, repair, prevention and participating in the collaborative economy etc. - in order to become themselves a reference platform for the car owner.

100. For the new players, the difficulty will lie in the management of the peak risks, which they can cede to reinsurers, and the need to develop partnerships with expert networks, assistance, repair and so on.

101. By reducing the cost of acquiring customers via the use of social networks and the notoriety gained elsewhere, as well as management costs via an a priori more efficient computing, new players could offer products at highly competitive conditions which would be difficult to keep up with for traditional actors apart from market or legal mechanisms inherited from the past that can - temporarily and partially - protect their market share.

102. It is all the more true as risk management and pricing require less statistical skills and knowledge a priori than for more complex risks: it is possible to retro-engineer the pricing associated with different guarantees of existing insurers and to build up a reasonable pricing base without the availability of hard-won historical data on such risks.

103. The main risk will be linked to the cost of the legal litigations that would be supported in the context of the complementary services offered to the insured, or the use of their data for prevention and pricing.

104. **Conduct of business:** An important topic will be the use of customer data not explicitly related to insured risk, but which will eventually include a statistical relevance in predicting the risk (e.g. pricing via Facebook profile). An important issue will be the collection and use of customer data, not necessarily directly related to the insured risk, or at least not obviously at first sight. For example use of customer data to its disadvantage on the basis of its behaviours more or less risk averse in other areas than driving.

105. The asymmetry of information between the insured and the technological society could be very strong for the benefit of the latter, which will not only benefit from knowledge of risk-

pricing like today's insurers but also behavioural data. This asymmetry could lead to practices unfavourable to consumers, especially in an environment closer to the oligopoly for products sometimes confusing between insurance and other services.

106. **Supervisory oversight:** The BTF envisaged will generally be multinational, with systems and processes, notably IT, which will not recognize borders. Consequently, their supervision at national level would be complex, if only because of data present on a cloud whose servers are on another continent, with centralized pricing teams elsewhere. The national supervisory approach may also be a constraint on the development of these players as risk carriers.

107. Moreover, certain issues are related to other regulations which may make cooperation between insurance supervisors and other agencies specialized in data protection, medical ethics, cybersecurity, etc. more complex (cybersecurity, data protection, protection of the mixed consumer between insurance and other services). Reinforced co-operation between national supervisors would be imperative in order to supervise such complex and sprawling projects.

5.6 Distributed ledger technology

108. According to the WEF report "The Future of Financial Infrastructure", DLT is one of many transformative new technologies that will shape future financial services infrastructure. The WEF identifies six key value drivers of DLT:

1. Operational simplification: DLT reduces / eliminates manual efforts required to perform reconciliation and resolve disputes.
2. Regulatory efficiency improvement: DLT enables real-time monitoring of financial activity between regulators and regulated entities.
3. Counterparty risk reduction: DLT challenges the need to trust counterparties to fulfil obligations as agreements are codified and executed in a shared, immutable environment.
4. Clearing and settlement time reduction: DLT disintermediates third parties that support transaction verification / validation and accelerates settlement.
5. Liquidity and capital improvement: DLT reduces locked-in capital and provides transparency into sourcing liquidity for assets.
6. Fraud minimization: DLT enables asset provenance and full transaction history to be established within a single source of truth.

109. Regarding the insurance business, DLT will transform the way information is transferred and verified in most areas of the insurance value chain, with the opportunity for all possible firms to adopt. However, DLT is still in its infancy with many firms and groups reviewing possible projects, applications, and use cases¹⁷, working jointly incumbents and new entrants providing early proof of concept, focusing mainly on: creation of immutable insurance claim records, development of asset provenance to assist in risk profiling and claims processing and P2P insurance.

Impact on the market

110. The existing insurance products that may be potentially impacted by DLT are retail insurance, commercial insurance and reinsurance, mainly in non-life insurance products.

¹⁷ B3i and R3 are just a couple of examples of consortiums trying to move forward with DLT.

Regarding the insurance value chain, the main activities that may be potentially impacted by DLT are: product development, distribution, underwriting, claims processing and fraud prevention.

111. For product development, DLT could be applied in new business models like Peer to Peer insurance, where the insurer could be just another node of the distributed ledger, playing a major role by guaranteeing the financing of the system.

112. In the case of distribution and underwriting, DLT could be used to efficiently store verified records such as ownership details and transfers, claims history, and other exposure information that may be used in the procurement of insured data for the use in underwriting through asset registries or the like. The potential impact would reduce the time needed for underwriting risks, including the verification process. The adoption of DLT in the distribution process may lessen the reliance on agents and brokers as an intermediary in the information gathering phase as well.

113. As for the claims processing¹⁸, DLT may enable reduced administrative costs, lessening the need for adjusters and allow faster claims payments. This may reduce the overall expense of adjusting and settling through products such as smart contracts on a distributed ledger. In addition, the Internet of Things (IoT) products may assist in verifying an actual claim occurred and is eligible for payment/reimbursement. If claims efficiency was drastically standardized through the use of DLT, the value proposition of different insurers could be minimized, causing the barrier to entry to become even lower than it is today.

114. Regarding AML and fraud prevention, DLT provides an immutable record that could streamline KYC processes and reduce overall fraud levels by eliminating the possibility of duplicate claims or claims for events that did not occur.

Implications

115. Since DLT may affect all areas of the insurance value chain, its impact and risks are similar in all possible scenarios. Under this context, for this report, the possible impact of DLT is similar under all scenarios. In general, the expected implications are as follows:

- a. **Competitiveness:** DLT could lower the barriers to entry and allow non-traditional companies like BTFs to compete with current insurers. In the longer term, the players that remain may be the ones that apply DLT for risk selection, claims management and fraud prevention.
- b. **Consumer choice:** Consumer products may become more standardised due to operational issues of smart contracts. However, different types of product offerings may arise and become real time offerings through DLT and other devices such as telematics and IoT.
- c. **Level of interconnectedness:** The level of interconnectedness could increase since DLT platforms and protocols may need to be standardised for the entire financial sector.
- d. **Business model viability:** Insurers that adopt DLT may see cost reductions and improved efficiencies that could increase their competitiveness and enhance viability in the long term.
- e. **Conduct of business / consumer protection:** DLT might generate legal issues depending on local legislation on contract legal value. Issues around consumer protection may arise such as resolving disputes whether a smart contract corresponds to what has been sold to the client.

¹⁸ A detailed example of analysis on DLT impact on P&C Claims Processing can be consulted in the WEF report "The future of financial infrastructure".

- f. **Data ownership:** In current Blockchain technology, data is fully transparent in the DLT, therefore it would be difficult to say who owns it. In the future, some cryptographic anonymization algorithm could be devised, but it would cause other issues (AML and performance)
- g. **Supervisory oversight & prudential requirements:** Capital solvency and customer protection are still going to be key issues even in a blockchain environment (except for P2P schemes). DLT may increase liquidity risk if proper controls are not put into place due to increased claims efficiency and the use of smart contracts. DLT may increase AML risk depending on the structure used.

5.7 Big Data and Artificial Intelligence

116. The use of Big Data comprises the collection, processing and use of high volumes of different types of data from various sources, using IT tools (powerful processors, software and algorithms), in order to reveal patterns or correlations, generate ideas, solutions or predict certain events or behaviours in a more accurate and timely manner.

117. Artificial Intelligence (AI) is “intelligence” that is not the result of human cogitation¹⁹. AI is the result of exponential growth in computing power, memory capacity, cloud computing, distributed and parallel processing, open-source solutions, and global connectivity of both people and machines.

118. AI has many topic areas²⁰ that add to the notion of “intelligence”, and Machine Learning (ML) is just one topic area of AI. ML is the science and engineering of making machines “learn” by finding patterns in data in an automated manner using sophisticated methods and algorithms²¹.

119. Together, AI and ML aim to embed human intelligence into machines, enabling systems to learn, adapt and develop solutions to problems on their own.

Impact on the market

120. All the existing insurance products as well as all business lines may be potentially impacted by the use of Big Data and AI. Likewise, all the activities of the insurance value chain could be impacted, such as product development and pricing, underwriting risks, claims processing, preventing fraud, undertaking AML/customer identification, increasing internal efficiency, among many others.

121. For underwriting purposes, AI and ML can help insurers and agents underwrite risk effectively, by using big data from customer that it has collected by multiple sources, many of them in real time. Through automation, pattern spotting and machine learning, AI can assist agents in sorting through information and identifying cases that pose higher risk.

122. As for distribution activities, digital advice could soon replace many functions of a typical independent agent. This technology can also improve internal processes and assist insurers in cutting down on time spent on traditional tasks. For the insurance industry, AI provides predictive consulting to provide better around the clock customer service. Whereas humans are unable to offer 24-hour support, AI systems like chat bots provide real-time feedback and insurance consulting to deliver quality service and improve the business’ bottom line.

¹⁹ <https://www.pwc.com/us/en/insurance/publications/assets/pwc-top-issues-artificial-intelligence.pdf>

²⁰ Source: PwC, AI in Insurance: Hype or Reality

²¹ <http://www.skytree.net/2015/08/06/driving-profitability-and-lowering-costs-in-the-insurance-industry-using-machine-learning-on-hadoop/>

123. Regarding claims handling, AI and automation allow insurers to cut down on claim processing times significantly and obtain cost savings. Tasks that once took months to finish are now accurately completed in the matter of minutes, opening the gate for insurers to focus on more complex and creative projects.

Implications

124. Since the use of Big Data and AI may affect all areas of the insurance value chain, its impact and risks are similar in all possible scenarios. Under this context, for this report, the possible impact of the use of Big Data and AI is similar under all scenarios. It is worth mentioning that the analysis of some possible future state is based on the preliminary assessment that has been made by the European Supervisory Authorities (ESAs) on the Use of Big Data by Financial Institutions²².

125. The ESAs consider that the use of Big Data has the potential to continue to grow and the capacity to use it may be a key determinant of competitive advantage in the future. The adoption of Big Data technologies may change the way financial services are provided. Tech firms may also expand their activities to provide financial services, by leveraging their own technical expertise, innovative and integrated platforms or extensive consumer data or loyalty among millennials. Many financial incumbents understand this reality and are well aware that Big Data related technologies are a potential threat as well as an opportunity for their sector. In general, the expected implications are as follows:

- a. **Competitiveness:** Insurers that use Big Data and AI may have benefits relating to increased revenues/lower costs derived from cost-effective processes linked to the exploitation of data and from access to a wider/more stable client base.
- b. **Consumer choice:** Consumers may have benefits in terms of better/innovative processes, products and services as well as more personalised products and services. However, consumers may experience a reduced comparability of financial services related to limited/unclear information and comprehension about the extent to which the offer/service is tailored to consumers and/or represents a personal recommendation.
- c. **Business model viability:** Insurers may face budget and human capital challenges. Errors/inadequacies of the Big Data tools or errors in algorithms design could be more likely to arise if tools are developed without the input of qualified staff. New skills, in particular data scientists or behavioural and social specialists, will be required, as well as the need to train staff and develop specialised expertise to be able to design algorithms, handle, analyse and monitor any decision-making process based on Big Data analytics.

Companies may also face higher costs regarding the collection of data or the establishment and maintenance of data centres to prevent IT-system breakdown or to recover from them (Disaster Recovery plan, data mirroring). These challenges may act as a barrier or be overwhelming for certain financial institutions and could lead them to exit a specific market.

- d. **Conduct of business/ consumer protection:** The use of Big Data and AI may bring potential benefits for consumers and financial institutions linked to improved detection of fraud and other illegal activities. However, there are increased risks related to flaws in the functioning of Big Data tools, as well as consumers having limited ability to correct information errors, challenge the use of data/decision-making processes or seek clarifications. Furthermore, there are other broader ethical considerations linked to the

²² Joint Committee of the European Supervisory Authorities Discussion Paper on the Use of Big Data by Financial Institutions: https://esas-joint-committee.europa.eu/Publications/Discussion%20Paper/jc-2016-86_discussion_paper_big_data.pdf

use of Big Data, such as the risk of penalising any deviations from what is deemed as the statistical/expected norm could push or coerce individuals into avoiding certain behaviours or contact with certain people or companies, or from visiting certain areas.

- e. **Data ownership:** Companies using Big Data should be mindful of the consumer protection requirements in their jurisdiction related to the processing of consumers' personal data, including how data is collected, from what sources, how well-informed consumers are about the processing and whether they consent to it. In particular, any processing of personal data must be lawful and fair to the consumers concerned.

New regulations on data protection, like the General Data Protection Regulation (GDPR) in Europe, establish stronger rights for consumers (access and correction of personal data, an explicit right to be forgotten, a right to object to data processing, the right to be informed when data security is breached or better information on firms' data protection policies, and data portability). The new rules provide more clarity on the due diligence that entities are expected to observe when dealing with personal data, they are likely to encourage the use of "big data" analytics, by using anonymised or pseudonymised data.

The protection of consumers' rights with regard to the processing of personal data also requires that appropriate technical and organisational measures be taken, both at the time of the design of the processing system and at the time of the processing itself, particularly in order to maintain security and to prevent any unauthorised processing

- f. **Supervisory oversight:** Sectoral financial legislation is in principle technology neutral and as such does not specifically deal with Big Data related matters. However, financial regulations include various prudential and organisational obligations relevant, while not drafted with Big Data technologies in mind, for financial institutions using Big Data technologies, such as: establishing and operating sound internal control mechanisms, effective procedures for risk assessment and effective control and safeguard arrangements for information processing systems; ensuring continuity and regularity in the performance of their activities; or ensuring that any reliance on a third party (outsourcing) does not impair the quality and the continuous performance of services. Another relevant issue will be the regulation of algorithms behind AI and ML.

6. Conclusions

126. Technological innovations and the changing expectation of customers have promoted InsurTech developments which are reshaping the insurance industry. Some innovations are being used throughout the insurance value chain, while others, like DLT, are still in a nascent phase in which it remains unclear to be seen how widespread will they be applied in the insurance sector.

127. Both innovators and incumbents are responding to the challenges. Global investment in InsurTech has grown during the last years, in which the most relevant investments in 2016 were made in start-ups based in US, Germany and UK. Even though InsurTech start-ups may be seen as competitors or disruptors, the collaboration between them and incumbent insurance companies may bring significant competitive advantages.

128. InsurTech innovations have the potential to deliver a wide range of benefits, in particular efficiency improvements, cost reductions, improved risk assessment, superior customer experience and greater financial inclusion. However, some of these innovations could also pose negative implications to the consumer and the financial stability of insurance markets.

129. Under scenario 1 - if market conditions remain such that incumbents successfully maintain the customer relationship - there will be significant changes in the business models adopted by market participants. In many ways the insertion of technologies and start-ups in the value chain of insurance will occur as a competitive differential and as a way to build a longer and trustworthy relationship with consumers. After some time of accommodation less providers are expected in this "new" market, those with more flexible structures who succeed in changing their roles around damage prevention, health monitoring and others.

130. Although there might be a reduction in price comparability and therefore customer choice, the incumbents are likely to increase customer focus from a business conduct perspective.

131. From a regulatory perspective, supervisors will be more challenged in keeping up with technological innovations. Their practices as well as regulations may be lagging behind. However, the lower market fragmentation may provide opportunities for joint learning in controlled regulatory environments.

132. In scenario 2 - assuming that the insurance value chain becomes fragmented and incumbents are no longer in control - insurance could become more embedded in other services or products. There will be a lesser incentive to shop around reducing competition. Also comparability will be negatively affected which will reduce consumer choice.

133. Business model resilience is expected to significantly reduce due to the fragmentation of the value chain and revenues moving to the technology firms. This will at a minimum apply in a transitional time during which insurers need to adapt their business models.

134. As increased fragmentation will lead to decreased transparency of the value chain, consumer protection may be negatively affected, challenging supervisors with responsibility for business conduct. The same will apply from a prudential perspective as key processes, such as pricing, claims handling and marketing are geographically fragmented and technical product complexities challenge the knowledge of supervisors.

135. In scenario 3 - if BTFs squeeze out traditional insurers - a first phase would be expected in which the BTF or GAFAs partner with incumbents and focus on what they know best, use their digital ease and the trust they would have successfully built amongst millennials to progressively capture big shares of the insurance market. Then, once they would have increased their knowledge about the insurance industry, they would progressively carry themselves the risks, which would also allow them the possibility to tailor the products to what their global marketing strategy would be, insurance being one of the multiple aspects of a

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lifestyle package they provide their users with. This would therefore adversely affect traditional insurers that would progressively lose client ownership, and that is why a strategy currently observed in incumbents is to try and become themselves sort of a thematic community platform (around health issues, cars, etc.).

136. Supervisors could then have to manage the progressive end of activities from some incumbents (those not very digital oriented) while at the same time be confronted with the consumer protection issues raised by these new insurance distribution models – including data protection – as well as cyber-security risks stemming from their multinational data oriented models. Even if customers might benefit from having insurance products included in the user friendly environment they already enjoy, with many facilitating interconnections with their other services and goods, these are also the source of misselling, unethical use of data or even bioethics issues.

137. Regardless of which of the previous scenarios develop, the use of Big Data will impact all insurance business lines and processes. Its application for analysis and decision making through Artificial Intelligence (AI) will grow as connectivity of devices becomes widely adopted. For incumbents and innovators, the application of Big Data and AI is a significant competitive advantage. However, they will need to invest in preventing cyber incidents as well as invest in training or hiring specialised expertise for algorithms design and application. Authorities will have to establish regulations for protection of consumers' personal data regarding its collection, processing, correction and sharing, as well as in order to ensure that insurers have information security and data privacy policies, procedures, methods and tools aimed at protecting data from cyber incidents, breaches or unintended use.

138. Distributed Ledger Technology is still in an early phase where applications in insurance will differ by use case. The most impactful DLT applications will require deep collaboration between incumbents, innovators and regulators, adding complexity and delaying implementation. For supervisors, implementing DLT applications may require changes to existing regulations, standards of practice, and the creation of new legal and liability frameworks. Specifically, the implementation of smart contracts will require additional stakeholder alignment and governance considerations. For incumbents and innovators, implementing DLT applications may require to conduct cost-benefit analyses in order to determine its financial viability.

139. Under this context, insurance regulators and supervisors may face the following challenges in the near future:

- a. Understanding and evaluating technological innovations: Technological development is ongoing and often rapid and many innovations are still in a nascent phase. Supervisors need to understand how innovations work and are applied in order to ensure adequate assessment of new product and business models. In some cases, like DLT, understanding the true potential of an innovation requires not only research but also using the technology for real applications.

Supervisors need to establish guidelines for appropriate and responsible use of new technologies and to define under which principles innovations will be supported for the market. Identification of principles developed by other national and international regulators as well as issue papers and policy recommendations made by international organisations and standard setting bodies are relevant for this task.

Supervisors will also need to balance the risks of new innovations against the benefits for policyholders and the insurance sector as a whole, and consider how to create the proper environment to foster innovation for example through regulatory sandboxes or innovation hubs.

- b. Adjustments to Prudential regulation framework: Supervisors and policymakers will need to evaluate and where appropriate adjust their prudential regulation framework, in order to include the assessment and quantification of new risks (such as the use of

algorithms for underwriting purposes), changes in corporate governance framework regarding third-party collaboration with InsurTech companies, among others. There needs to be a proper understanding both in the insurer and the supervisor of the IT architecture and infrastructure used by the insurer and how this is addressed in the insurers risk management framework.

- c. Adjustments to the regulatory framework for conduct of business: FinTech innovations will have an impact on consumer protection and the extent to which customers are treated fairly. The technical infrastructure and applications used for maintaining customer relations need to cater for the fair treatment of customers and - for example in the use of AI and robo advice mechanisms – provide safeguards for advice and services that are suitable and affordable for the customer.
- d. Collaboration with other stakeholders: Collaboration and dialogue between stakeholders, such as supervised institutions, other market participants, academics, financial regulators and supervisors, as well as other authorities governing use of technology and communications are essential to address the challenges mentioned above.
- e. Adjustments to supervisors resources: Supervisors will need to examine if their supervisory tools and IT infrastructures need to be improved, since technological innovation also offer opportunities for supervisors to automate certain supervisory processes and compliance requirements. Additionally supervisors' staff may need new technical skills to understand in depth innovations and identify risks associated. In this sense, there is a need for supervisors to attract and retain talent with this skillset.

Annex 1: Overview of current technological innovations in Insurance

The most significant innovations, and their potential applications in the industry are:

1. Digital platforms (internet, smartphones):
 - a. Traditional players seek to improve the customer experience, leading the processes for the digital environment and seeking to reach new markets;
 - b. Gamification, application of game-design elements and game principles in non-game contexts, in this case, to increase the interaction with the user;
 - c. Servicing the "on demand" economy²³: InsurTechs whose focus is the provision of pay-per-use or period based products (e.g. short term insurance focused on online platforms like Uber and Airbnb, and the increasing property sharing culture);
 - d. Help on the claims process: InsurTechs offering services for taking over the claims process end-to-end for the customer;
 - e. Peer-to-peer (P2P) Insurance: Platforms allowing groups having common interests to negotiate coverage in "communities".
2. Internet of Things (IoT): The term IoT has been defined in Recommendation ITU-T Y.2060²⁴ as a global infrastructure for the information society, enabling advanced services by interconnecting (physical and virtual) things based on existing and evolving interoperable information and communication technologies. This means the internetworking of physical devices, vehicles, buildings and other items (also referred to as "connected devices" and "smart devices"), embedded with electronics, software, sensors, actuators, and network connectivity that enable these objects to collect and exchange data.
3. Telematics / Telemetry: In the context of IoT, telematics involves telecommunications, sensors and computer science to allow sending, receiving, storing and processing data via telecommunication devices, affecting or not control on remote objects. Telemetry involves the transmission of measurements from the location of origin to the location of computing and consumption, especially without affecting control on the remote objects. In the context of insurance its main applications are:
 - a. Connected Cars: vehicles with devices that connect to networks (eg.: Internet) and services outside the car including other cars, home, office or infrastructure. Allow, for example, the supply of products based on vehicle use or behaviour of the driver.
 - b. Advanced Driver Assistance Systems (ADAS): systems developed to automate, adapt or enhance vehicle systems for safety and better driving. Vehicles equipped with this technology can be treated as a special category of connected cars and their presence on the streets should force insurers to adapt their pricing models.
 - c. Health monitoring: Use of devices that allow monitoring to set premiums based on vital signs (blood pressure, heart rate, respiratory rate and body temperature) and the adoption of healthy habits.
 - d. Home monitoring: Use of devices that allow the monitoring of the property situation, such as smoke detectors and carbon monoxide meters.

²³ On-Demand Economy is defined as the economic activity created by technology companies that fulfill consumer demand via the immediate provisioning of goods and services. (<http://www.businessinsider.com/the-on-demand-economy-2014-7>)

²⁴ <http://www.itu.int/ITU-T/recommendations/rec.aspx?rec=y.2060>

4. **Big Data and Data Analytics:** Big Data is the term used for the storage of data from different sources, in large volume and speed. The process of inspecting, cleaning, transforming, and modelling data with the goal of discovering useful information, suggesting conclusions, and supporting decision-making is called Data Analytics. In the insurance market, its application may be related to various processes, such as product offerings, risk selection, pricing, cross selling, claims prediction and fraud detection. Data from social media, for instance, can be used to offer customized products and combined with data from other sources to allow automated underwriting.
5. **Comparators and Robo advisors:** online services that provide automated, algorithm-based product comparison and advice without human intervention. May have more or less individualized answers according to information provided by the user. In addition to offering products, comparators and robo advisors are used for addressing concerns of right coverage through digital advice.
6. **Machine Learning and Artificial Intelligence:** Machine Learning is the modern science of finding patterns in your data in an automated manner using sophisticated methods and algorithms²⁵. Artificial Intelligence is “intelligence” that is not the result of human cogitation²⁶. Some authors argue that Machine Learning is a type of AI, while others argue that these terms are synonymous. They are closely linked to the technologies mentioned here and, in general, their use means leaving to base several insurance industry processes only on historical data to use data in real time and, especially, use events prediction (e.g. vehicles thefts, health problems and weather events). There is a vast scope for AI, not only in a better pricing of risks, but also in fraud prevention, claims handling or in preventive counselling.
7. **Distributed Ledger Technology (DLT):** A distributed ledger is essentially an asset database that can be shared across a network of multiple sites, geographies or institutions. All participants within a network can have their own identical copy of the ledger. Any changes to the ledger are reflected in all copies in minutes, or in some cases, seconds. The security and accuracy of the assets stored in the ledger are maintained cryptographically through the use of ‘keys’ and signatures to control who can do what within the shared ledger. Entries can also be updated by one, some or all of the participants, according to rules agreed by the network²⁷.
 - a. **Blockchain:** is a type of decentralised distributed ledger, comprised of unchangeable, digitally recorded data in packages called “blocks”. These digitally recorded “blocks” of data are stored in a linear chain. Each block in the chain contains data and is cryptographically hashed²⁸. Each block is then ‘chained’ to the next block, using a cryptographic signature. This allows blockchains to be used like a ledger, which can be shared and corroborated by anyone with the appropriate permissions.

There are many ways to corroborate the accuracy of a ledger, but they are broadly known as consensus (the term ‘mining’ is used for a variant of this process in the cryptocurrency Bitcoin). If participants in that process are preselected, the ledger is permissioned. If the process is open to everyone, the ledger is unpermissioned.

²⁵ <http://www.skytree.net/2015/08/06/driving-profitability-and-lowering-costs-in-the-insurance-industry-using-machine-learning-on-hadoop/>

²⁶ <https://www.pwc.com/us/en/insurance/publications/assets/pwc-top-issues-artificial-intelligence.pdf>

²⁷ https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/492972/gs-16-1-distributed-ledger-technology.pdf

²⁸ <http://www.blockchaintechnologies.com/blockchain-definition>

b. Smart Contracts: The novelty of DLT is that it is more than just a database — it can also set rules about a transaction (business logic) that are tied to the transaction itself. Smart contract is a term used to describe a contract whose terms are recorded in a computer language instead of legal language. Smart contracts can be automatically executed by a computing system, such as a suitable distributed ledger system. The potential benefits of smart contracts include low contracting, enforcement, and compliance costs; consequently it becomes economically viable to form contracts over numerous low-value transactions²⁹. It could also help customers and insurers to manage claims in a transparent, responsible and irrefutable manner as contracts and claims could be recorded onto a blockchain and validated by the network, triggering payments automatically when certain conditions are met.

8. Peer to peer, usage based and on demand insurance

a. Peer-to-peer Insurance: business model that allows insureds to pool their capital, self-organize and self-administer their own insurance. The core idea of P2P is that “a set of like-minded people with mutual interests group their insurance policies together introducing a sense of control, trust, and transparency while at the same time reducing costs”³⁰.

Although it is not an innovative concept, P2P insurance is already being offered using standard technology, blockchain makes it even more transparent and trustworthy for consumers as no central authority controls its operation. For the provider, it is a tool to widely automate P2P insurance operations³¹.

- b. Usage based insurance: is a new business model introduced by auto insurers that more closely aligns driving behaviors with premium rates for auto insurance. Mileage and driving behaviors are tracked using Telematics with which the driver's behavior is monitored directly while the person drives. The insurance company then assesses the data and charges insurance premiums accordingly³².
- c. On demand insurance: new business model that specializes in covering only those risks faced at a certain moment. A number of companies is already successful in applying these ideas to the insurance market. Sure developed a mobile app to quickly close flight insurance to cover risks from take-off to landing. Mobile insurance company Trov developed a way to insure the objects that need to be insured, in a specific circumstance. Cuvva enables to insure a car exactly from the moment it starts driving till it reached its destination. Slice offers insurance policies for hosts using homeshare platforms like Airbnb, HomeAway, OneFineStay and FlipKey

²⁹ https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/492972/gs-16-1-distributed-ledger-technology.pdf

³⁰ NAIC, definition of P2P insurance available at http://www.naic.org/cipr_topics/topic_p2p_insurance.htm

³¹ <http://www.mckinsey.com/industries/financial-services/our-insights/blockchain-in-insurance-opportunity-or-threat>

³² NAIC, definition of usage based insurance available at http://www.naic.org/cipr_topics/topic_usage_based_insurance.htm

Annex 2 Description and examples of InsurTech activities in all areas of the value chain.

a) Product development

1. Many new entrants are fundamentally shifting the traditional operating model with new structures and ideas, often enabled by technology, developing differentiated products and services to address customer segment needs. This most often takes the form of new types of policies and covers, like pet insurance or highly differentiated pricing for low-income customers.
2. Start-ups in this area are innovating through new business models such as Peer to Peer insurance (which redefines insurance structure by leveraging digital networks and promising transparency through models of pooling consumers together to share risk and premiums) and on-demand coverage (start-ups that are unbundling policy times and coverage and bringing new mobile-first purchasing experiences to insurance).
3. In this value chain area, innovation is focused on meeting changing customer needs with new offerings:
 - Reaching the Un(der)insured;
 - Spread of value propositions for microsegments;
 - Leveraging peer to peer networks;
 - Emerging solutions for shared economies (innovative/specialty insurance):
 - Usage & Behaviour based personalized insurance (on demand insurance or scenario based insurance: consists of small, situational insurance protection offered for high-frequency, location-based or internet transactions, including online travel and various online-to-offline (O2O) services
 - New models of holistic advise (Robo-Advice).

Some examples:



Source: Financial Technology Partners, Infographic of the InsurTech Universe Landscape, Sept. 2016



Source: Financial Technology Partners, Infographic of the InsurTech Universe Landscape, Sept. 2016

b) Sales & Marketing

4. New entrants are developing software and providing solutions for agents and insurers to help them become more connected to their customers through better online marketing and digital customer relationship tools.

Some examples:



Source: Financial Technology Partners, Infographic of the InsurTech Universe Landscape, Sept. 2016

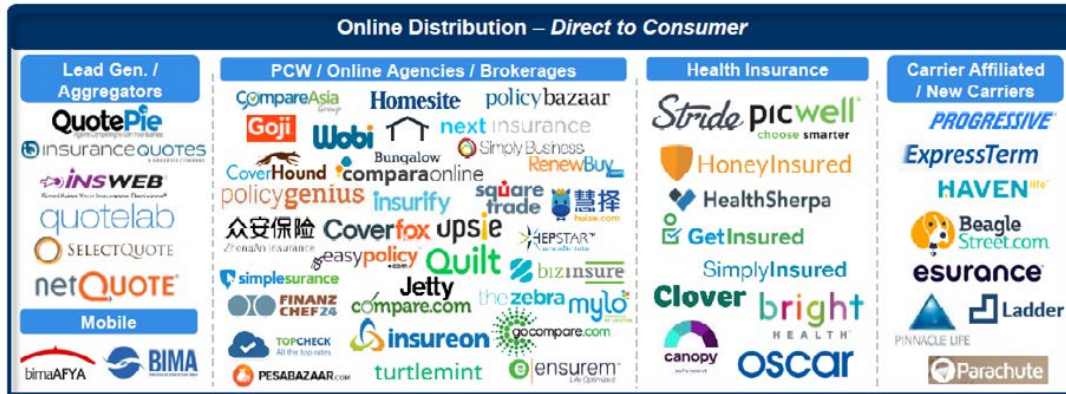
c) Distribution

5. One way that start-ups are taking advantage of this segment is by exploiting the traditionally poor interaction in a customer's life-cycle—everything from highly engaging online acquisition sources to more customer focused claims management experiences that improve user perception and loyalty. Start-ups in this area are taking a customer-focused approach and designing the interaction between insurer and policy holder to be pleasing, frictionless and even enjoyable, the customer's appreciation and perceived value are much higher, locking in loyalty and brand equity. While insurance agents are still the main distribution channel for insurance products, the online distribution models are disrupting this area, taking advantage of the increasing consumer's trend to purchase insurance online.
6. In this value chain area, innovation is focused on enhancing interactions and build trusted relationships:
 - Online channel experience
 - Online aggregation and comparison sites
 - Targeted engagement & Retention models
 - Consolidation of Self directed services

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- Education & Shared Knowledge

Some examples:

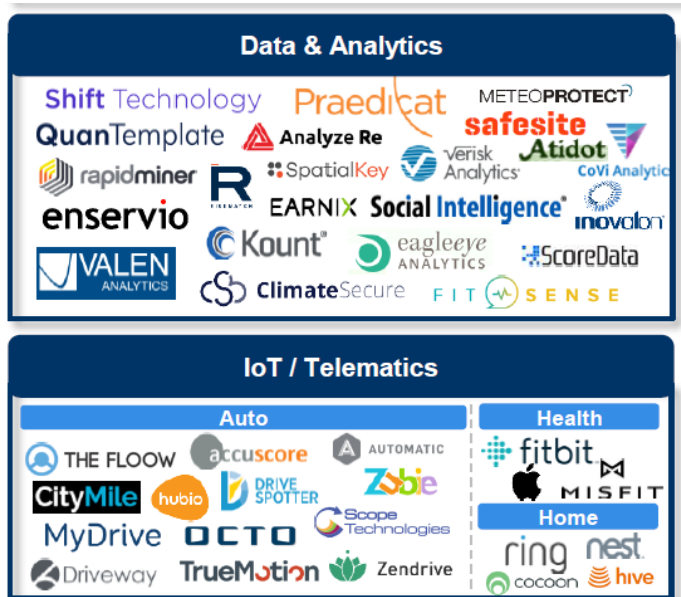


Source: Financial Technology Partners, Infographic of the InsurTech Universe Landscape, Sept. 2016

d) Pricing & underwriting: data collection and analytics

- In a time of exponential data collection, the ability to analyse that data becomes equally as valuable as collection itself. For insurers, there is an abundance of personal data that can lead to valuable insights into the minds and lives of customers that translate into very real business intelligence and a distinct competitive advantage.
- Start-ups are looking to exploit this sector in a couple of ways. On the one hand, the collection of data, technology like the Internet of Things (IoT), and internet-connected wearables is allowing to capture more data than ever imagined. Sensor technologies in the car, the home and on the body promise to lay the foundation for tailored insurance plans and a claims model built around prevention rather than reaction (connected coverage). On the other hand, many start-ups are flexing their analytical prowess by developing solutions to process the vast data available and turn it into actionable insight.
- In this value chain area, innovation is focused on:
 - Leveraging existing data and analytics to generate deep risk insights:
 - Connected car and automated driving systems
 - Connected Health & P4 Medicine
 - Remote data capture and analysis
 - Quantification of emerging risks
 - Utilizing new approached to underwrite risk and predict loss:
 - Sophistication of preventative insurance models
 - Shift from probabilistic to deterministic model
 - Granular Risk and/or Loss Quantification
 - Pay-when-you-need service

Some examples:



Source: Financial Technology Partners, Infographic of the InsurTech Universe Landscape, Sept. 2016

e) Claims management

10. Start-ups in this area are developing digital tools aimed at making claims management processes easier for consumers, brokers and adjusters. Innovators are exploring how drones can transform the claims processes, and are developing applications of distributed ledger technology for claims management and for preventing insurance fraud.

Some examples:



Source: Financial Technology Partners, Infographic of the InsurTech Universe Landscape, Sept. 2016

f) Support functions

11. In the majority of businesses, optimization equals automation — using technology to replace administration tasks and decrease the need for human oversight and interaction.
12. Where many insurance companies have not introduced process improvement and digitization, many start-ups are stepping up to help improve these functions, both for customers and for employees.

13. Some new entrants are focusing on the development of digital tools for consumers to better manage their policies and administration software for insurers to automate various policy management processes, while others are concentrating in solutions or tools for employee benefits administration, benefits shopping, as well as private insurance exchange technology and platforms for carriers and employers.

Some examples:



Source: Financial Technology Partners, Infographic of the InsurTech Universe Landscape, Sept. 2016

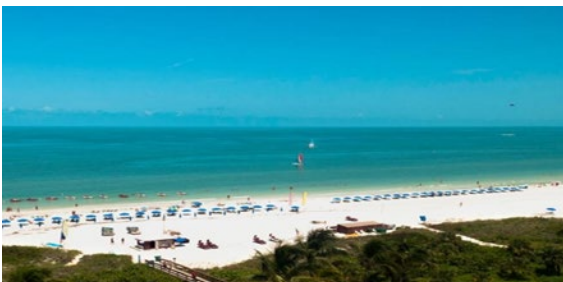


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