Beyond Reserving and Pricing

IofA Asia Conference
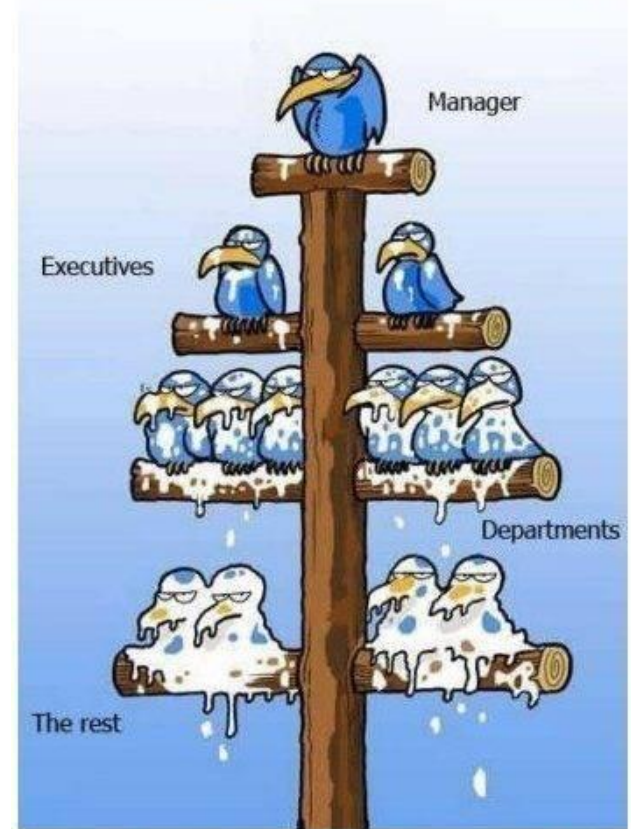
Beijing, 2015

John Donghui Chen

- Overview

- 5 Adventures

- Concluding remarks

Overview – Young companies and young actuaries

1. There are around 140 insurance companies in China.
2. Total assets: US$2 trillion. GWP: $300 billion. Net assets: $150 billion.
3. No more than 10 of the domestic insurers have a history of 10 – 30 years. All the rest have a history of no more than 10 years.
4. The history of chief actuary is also less than 10 years.
5. 4 major types of chief actuaries around:

	Responsibility	Influence	Company
Consultant/Guest	Compliance Investor relation	Nominal/Formality Not involved in operation and management of the company	Joint ventures with chief actuaries recruited by the foreign party
Junior Partner	Compliance Technical	Department level Not involved in key decision making process	Non-life companies New start-ups
Senior Partner	Compliance Management Asset and capital	A core member of the executive team	Mature and large companies
Part-time	CFO/CRO/CIO Reinsurance Investment Distribution	Actuarial is no longer the main portfolio	Mature life companies

Overview – A tale of two worlds

1. The first milestone for life actuaries – Life Table 1996.
2. The first milestone for non-life actuaries – Non-life reserving guidelines 2005.
3. Actuarial function for non-life companies was first initiated by motor deregulation in 2002, and challenged by the introduction of CTP and winding-back of the motor deregulation in 2006.
4. Today, life companies are required to have a chief actuary, while non-life companies need only to have an appointed actuary.
5. Chief actuaries for non-life companies are typically younger, less experienced and more junior in the company's ranking.
6. They are less involved in functions outside the traditional domain of reserving and pricing, such as investment, ALM and risk management.
7. Their career path is fairly restricted with little prospect of taking on other management roles other than actuarial.
8. They are more open to new ideas, growing fast and willing to cooperate within the industry.

Overview – A pair of crystal shoes

1. Arguably the most successfully promoted and well respected professional brand in China
2. A small and closed community dominated by actuaries coming back from abroad
3. Strong regulatory support and protection
4. Almost unique identity or personality
5. Burden of being an actuary
6. Oversupply of actuarial students and young actuaries
7. More opportunities are brought by C-ROSS, motor deregulation, investment deregulation, etc.
8. Struggling with communication issues: shareholders, business units, subsidiaries, regulators.
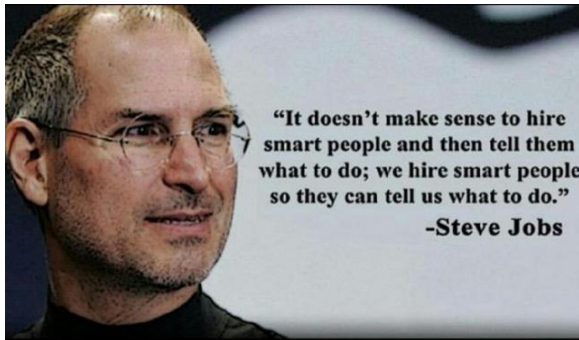
Overview – A Road Map

1. A road map set in 2007 for building up the actuarial function for PICC
2. Tracking well following the map in the last 8 years, while new questions keep arising, demanding answers
3. Reserving - most political and high stake to fix
4. Pricing - most painful to implement and takes a few rounds
5. Capital modeling and customer insights still require a lot of stakeholder education before really taking off
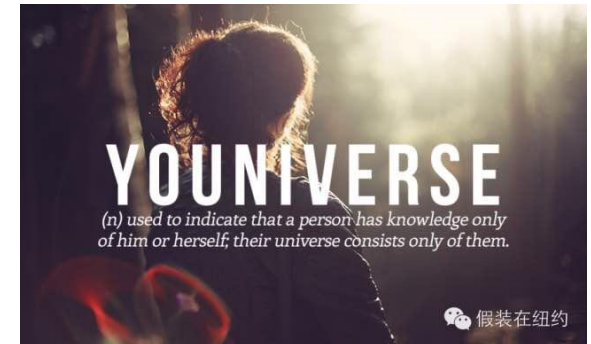
准备金评估

•2009年之前

产品定价

•2009年-2012年

资本计量

•2013年之后

客户价值分析

•2013年之后

大数据

5 adventures

1. Performance assessment
2. Portfolio monitoring
3. Capital modeling
4. Customer insights
5. Big data

"It doesn't make sense to hire smart people and then tell them what to do; we hire smart people so they can tell us what to do."
-Steve Jobs

When the winds of change blow, some people build walls and others build windmills.
-Chinese proverb

YOUNIVERSE
(n) used to indicate that a person has knowledge only of him or herself; their universe consists only of them.

假装在纽约

Adventure 1 – Performance assessment

1. The big question – financial results or actuarial results?
2. In other words, whether to get involved or stay out of the political game of subsidiary performance review?
3. In those early years, when actuarial reserves were not understood or accepted by local managers, or financial results could be interfered, it was the most effective way to stamp authority to adjust the financial results by actuarial valuation.
4. As at 2008, around 1/3 of the 38 subsidiary companies were under-reserved. By adjusting annual financial results with actuarial valuation results in the performance review, all companies were sufficiently reserved by the end of 2011.
5. A system was since then set up to integrate actuarial re-estimate of the P/L as an important part of the internal auditing process, which is the base for long term incentives and promotion.

Adventure 1 – Performance assessment

1. This is highly political and can be rewarding and damaging at the same time.
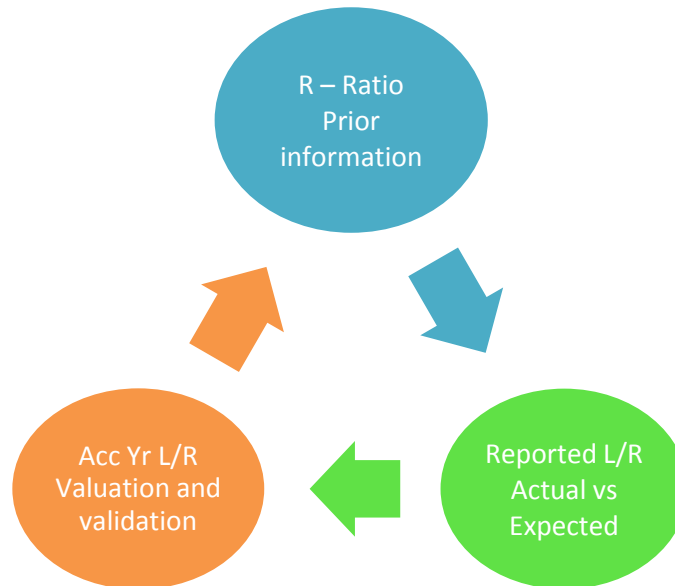2. When time is good, the chief actuary should step back from this process.

I asked the reverend once, "What are we supposed to do in the face of so much senseless pain?", and he said to me, "What else can we do but take what seems meaningless and try to make something meaningful from it."

There are two kinds of pain. The sort of pain that makes you strong and useless pain, the sort of pain that's only suffering. I have no patience for useless things.

@chaiaohood

Adventure 2 – Portfolio monitoring

3 – dimensional monitoring

R – Ratio
Prior information

Reported L/R
Actual vs Expected

Acc Yr L/R
Valuation and validation
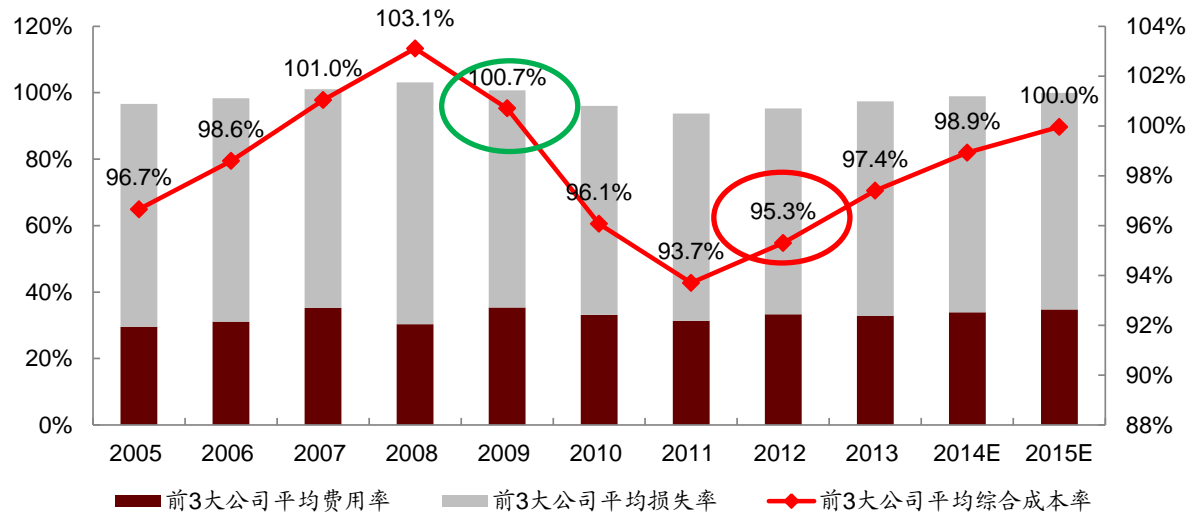
1. R ratio = risk premium / actual premium collected
2. A crude measure of rating strength and business mix
3. For pricing to take off, effective monitoring is the pre-requisite

# Adventure 2 – Portfolio monitoring

The chief actuary should be the first in the company to recognize, verify and alarm the change in the underwriting cycle.

1. In 2009Q3, we alarmed the management about the turning of the cycle. The growth in motor GWP in 2010 was 35%, an all time record.
2. In 2012Q3, we alarmed the management about the turning of the cycle. The combined ratio for in 2013 and 2014 was lower than the industry average for more than 2%.

Adventure 3 – Capital modeling

- Enforcement of reserving standards is almost compulsory, while pricing deliver quick results, but capital modeling is tough to sell as nobody seems to understand it.

- C-ROSS provides a good opportunity to implement capital modeling, budgeting and risk-based assessment.

- External communication contributes to the firm's valuation.

- Internal implementation contributes to a better risk and return match.
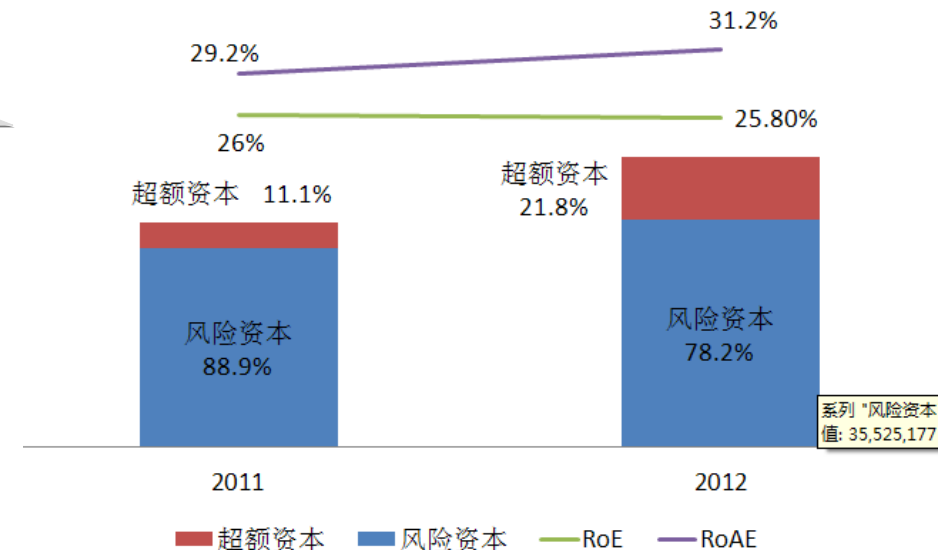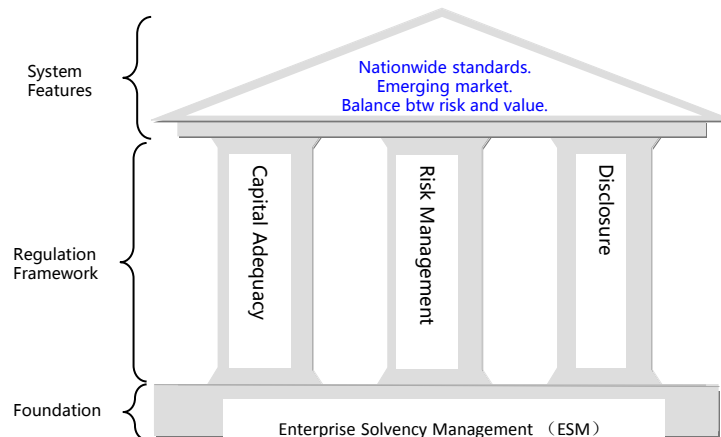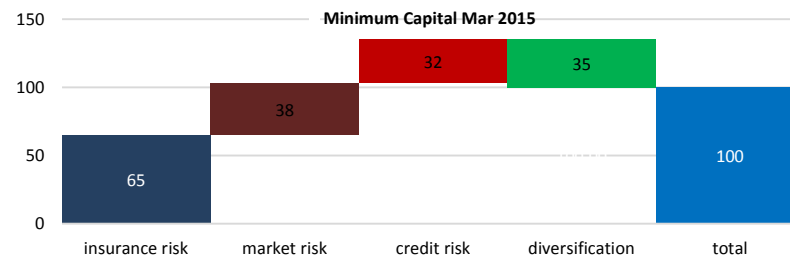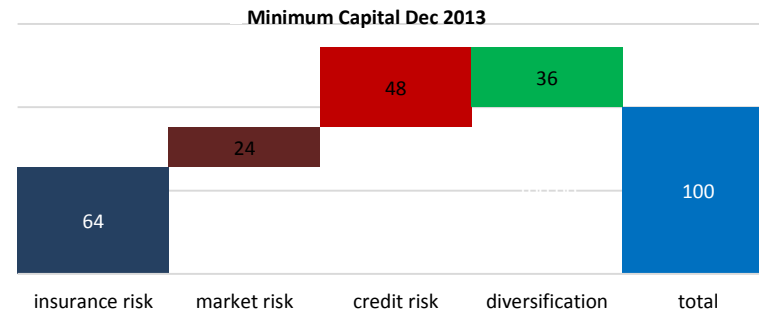
Adventure 3 – Capital modeling

- Actuaries will be more sensitive to investment decisions, capital market movement and reinsurance arrangements than before.

- Different product lines will have very different capital consumption, and therefore risk and return match.

- All in all, the non-life business in China under C-ROSS is very attractive. With 4% investment yield and 97% combined ratio and a 180% solvency ratio, the return on risk capital would be > 15%.

LOB	% of net premium
Motor	16. 9%
Commercial	99. 6%
Marine/Cargo	117. 0%
Liability	50. 3%
PA	65. 6%
Health	23. 5%
Agriculture	45. 3%
Credit	72. 7%
Total	27. 3%

LOB	Profit Margin
Motor	1.8%
Commercial	9.8%
Marine/Cargo	12.1%
Liability	5.3%
PA	7.0%
Health	2.4%
Agriculture	4.7%
Credit	8.7%
Total	2.9%

Minimum Capital Dec 2013

insurance risk 64, market risk 24, credit risk 48, diversification 36, total 100

Minimum Capital Mar 2015

insurance risk 65, market risk 38, credit risk 32, diversification 35, total 100

Adventure 3 – Capital modeling

- EVA has been included in the company's internal assessment KPI's since 2009. Capital cost is subtracted from the annual profit in the performance review of the business unit managers.

- Capital is only calculated for insurance risks as investment and reinsurance are managed at the head office.

- With the implementation of C-ROSS, it would be appropriate to integrate the capital calculation for this purpose into the C-ROSS framework so that the total capital of the company that matches the C-ROSS result is properly allocated to the subsidiaries.

分公司保险风险最低资本占自留保费之比
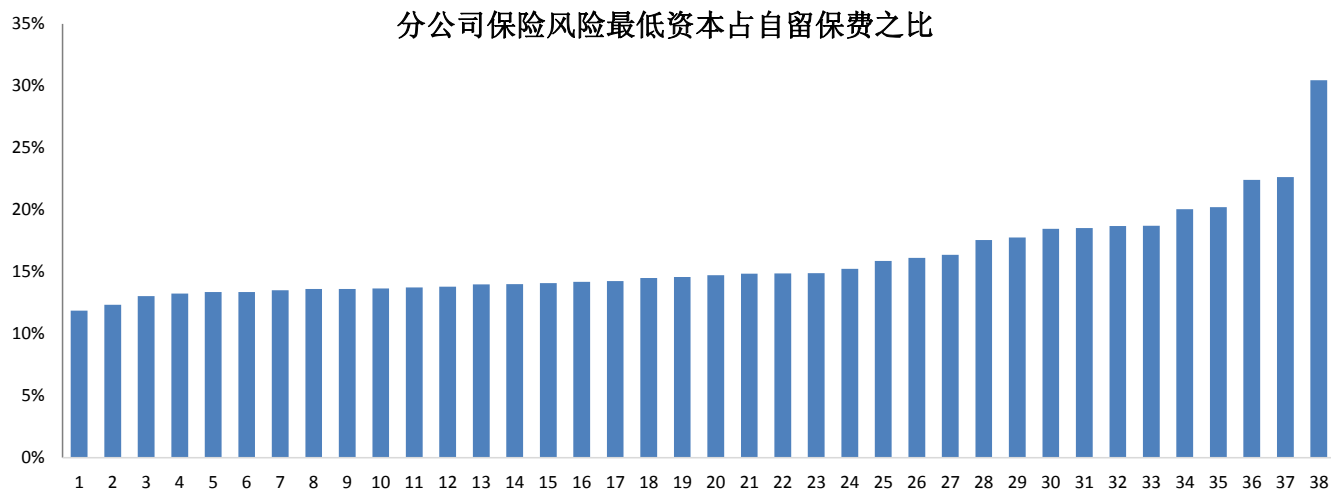
Adventure 3 – Capital modeling

- It is also crucial to find the key factors driving the capital consumption. These driving factors need to come from the daily operation of the business, so that business managers will be able to optimize their capital consumption by changing their business planning or decision making. Otherwise, the capital factors will always be a black box beyond their control.
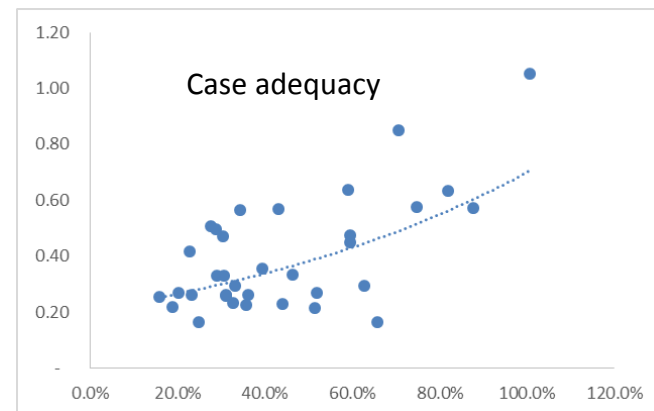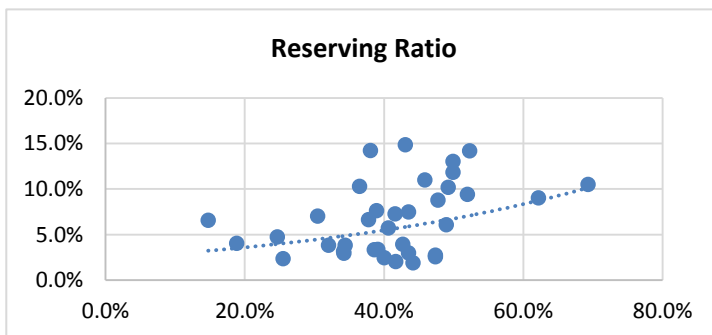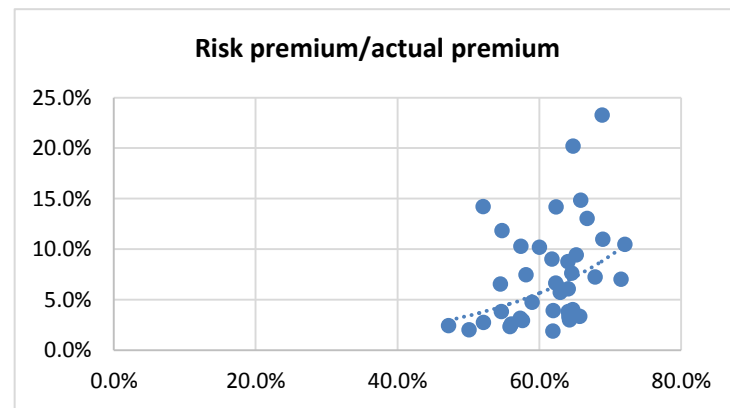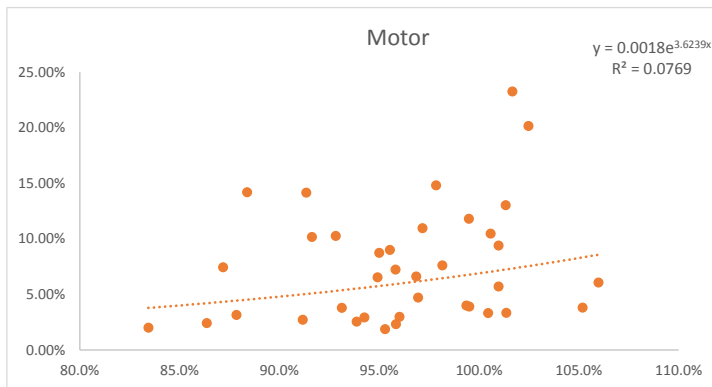
Adventure 4 – Customer Insights

- Predictive modeling

- Customer segmentation
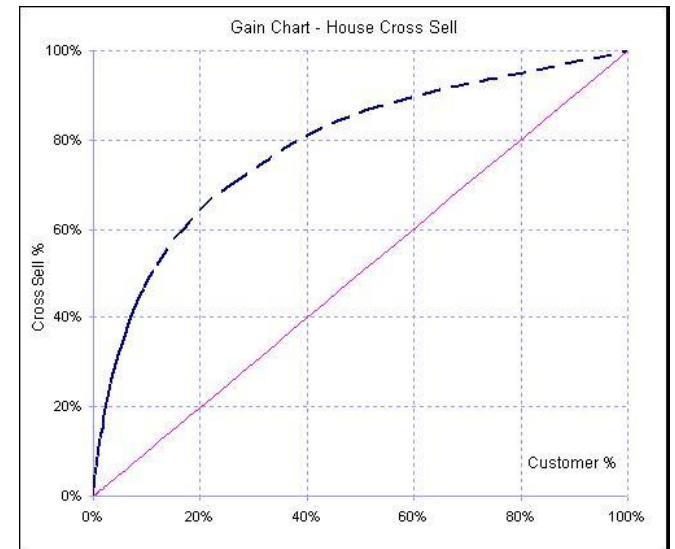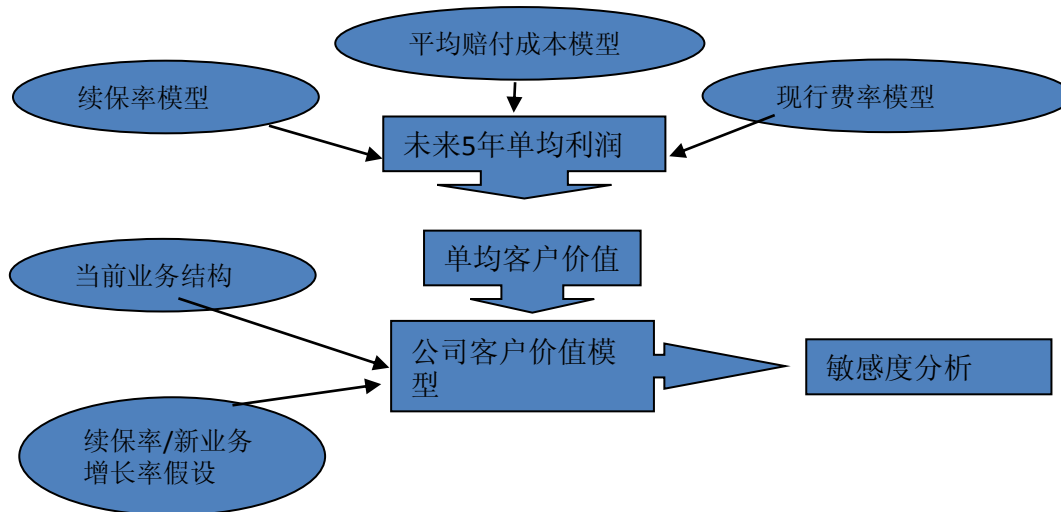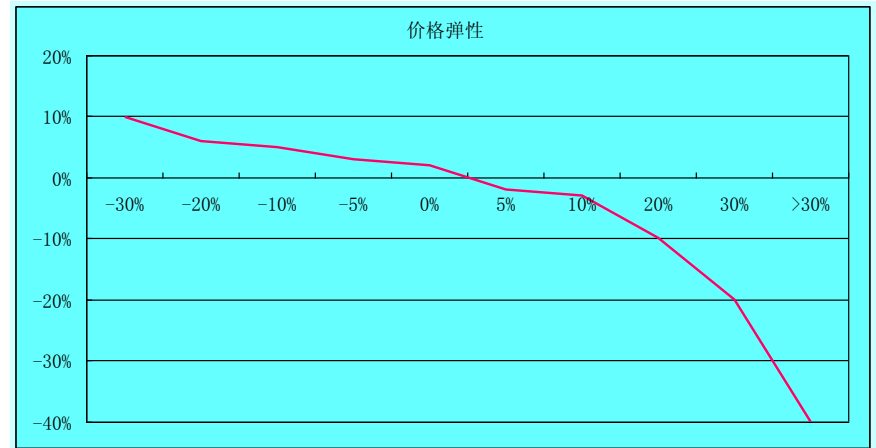
- Customer value

- Behavior modeling

A uni student in Changsha spent a night in an internet café with his girl friend, whose mobile phone was stolen. In order to get the phone back for her, he got the job of helping out at the café and worked there for 13 nights in a row before catching the thief to get the phone back. His girl friend was deeply moved by this but apologized to him that she already had a new boy friend who gave her an iphone as a gift. This is a typical story of customer demand vs product manager.

- More and more data becomes available for segmenting customer groups.
- Quantifying customer demand and customer buying behavior becomes fundamental in the process of price optimization.
- Long-term customer value is used in the place of one year profit.
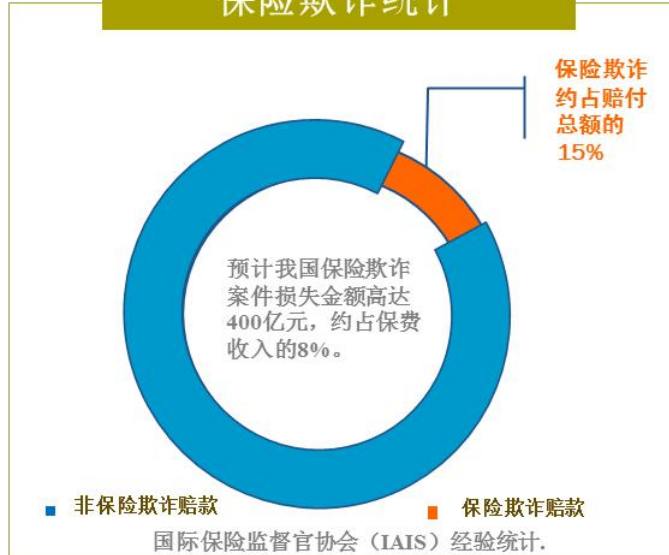- Understanding customer demand is a new demand for the actuaries.

Adventure 4 – Customer Insights

- Price elasticity
- Conversion rate
- Renewal rate
- Cross selling success rate
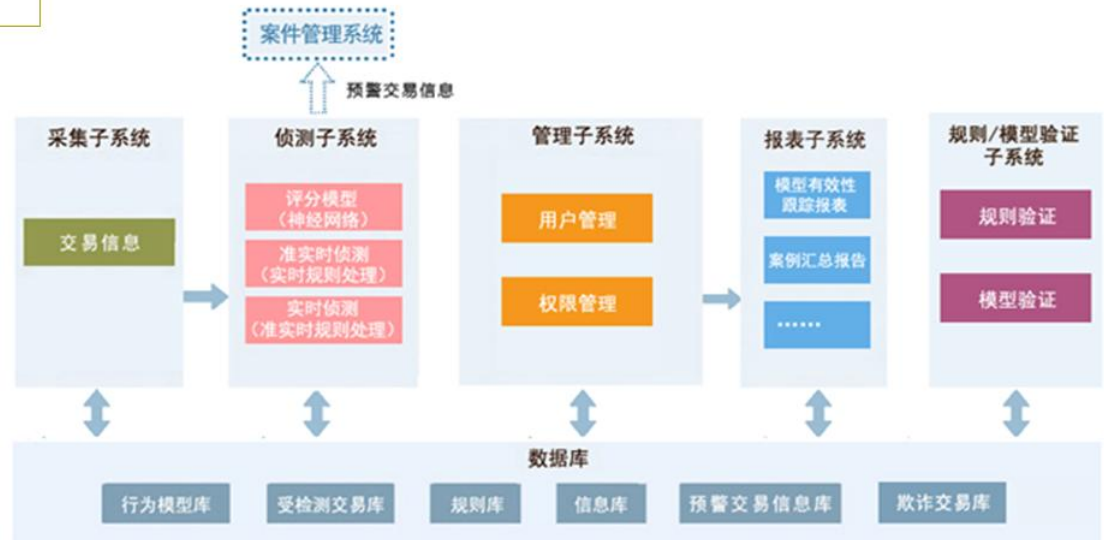- Customer lifetime value (CLV)

Adventure 4 – Customer Insights

保险欺诈统计

保险欺诈
约占赔付
总额的
15%

预计我国保险欺诈
案件损失金额高达
400亿元，约占保费
收入的8%。

■ 非保险欺诈赔款   ■ 保险欺诈赔款

国际保险监督官协会（IAIS）经验统计.

❖ Based on predictive modeling technique, a scoring system was developed for motor claims, so that claims with higher fraud probability are instantly and automatically identified. The claims are then sent to different parties for processing following different protocols.

❖ If we can identify 30% of the fraudulent claims, the saving in claims cost would be more than 5 billion RMB.

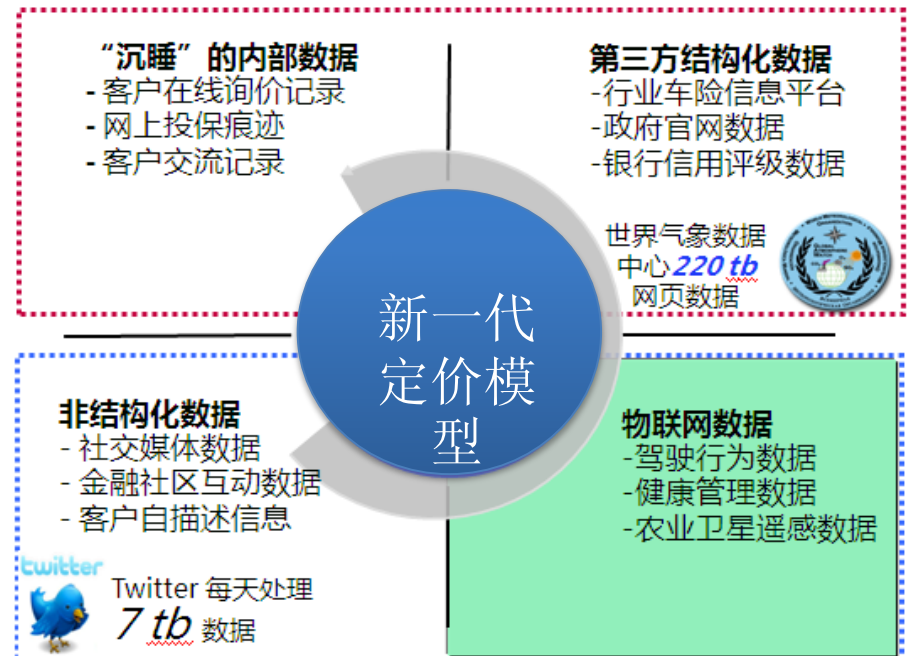优势分析

控制成本支出

客户细分，提高市场竞争力

提升企业核心竞争力

案件管理系统

预警交易信息

采集子系统

侦测子系统

管理子系统

报表子系统

规则/模型验证子系统

交易信息

评分模型（神经网络）

准实时侦测（实时规则处理）

实时侦测（准实时规则处理）

用户管理

权限管理

模型有效性跟踪报表

案例汇总报告

......

规则验证

模型验证

数据库

行为模型库   受检测交易库   规则库   信息库   预警交易信息库   欺诈交易库

Adventure 5 – Big data

Data is the new oil.

❖ Transaction data – interaction data

❖ Causal link - correlation

❖ Web browsing data, search engine data, social media data are not currently collected.

❖ Service line recording, touch point video, on-site audio recording are collected but not analyzed.

❖ 3rd party data not sytemetically integrated into analysis.
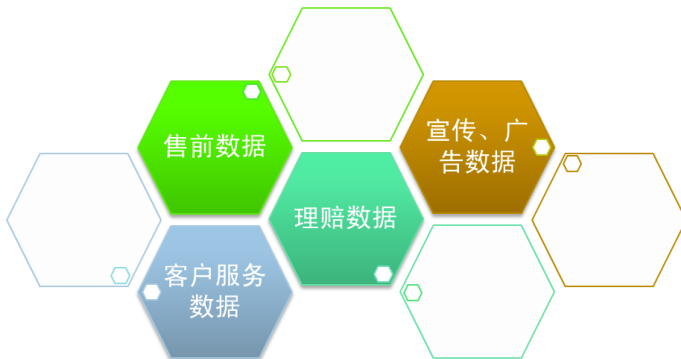
Big data is like teenage sex: everyone talks about it, nobody really knows how to do it, everyone thinks everyone else is doing it, so everyone claims they are doing it ...

"沉睡"的内部数据
- 客户在线询价记录
- 网上投保痕迹
- 客户交流记录

第三方结构化数据
- 行业车险信息平台
- 政府官网数据
- 银行信用评级数据

世界气象数据中心 *220 tb* 网页数据

新一代定价模型

非结构化数据
- 社交媒体数据
- 金融社区互动数据
- 客户自描述信息

Twitter 每天处理 *7 tb* 数据

物联网数据
- 驾驶行为数据
- 健康管理数据
- 农业卫星遥感数据

售前数据

宣传、广告数据

理赔数据

客户服务数据

Adventure 5 – Big data

❖ UBI is considered by almost all insurers as the next big innovation in motor insurance.

❖ The data amount and data structure are very different from the traditional transaction data. New tools and methods are needed to explore the telematics data.

❖ Adoption of new technology and availability of new data will only enhance the motor operation model. The essence of the business model will not change.

Concluding remarks