



K FORUM

A magazine for motor insurers





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EDITORIAL



The motor insurance sector is on the move worldwide, although the requirements and challenges differ from market to market. In addition to providing reinsurance cover, Munich Re has an experienced team of dedicated experts in its Motor Consulting Unit (MCU) that offers support to clients at local level to further develop their business potential.

In this issue of K Forum, our experts report on current trends in a variety of markets at very different stages of development, i.e. Singapore, China, and Brazil.

In Singapore, only about 550,000 private motor vehicles are registered. However, since the local population makes extensive use of the internet, it is an ideal test market for direct insurance in connection with motor vehicles. Munich Re supported and reinsured the launch of DirectAsia in Singapore. We report on the perfect start to DirectAsia.

In China, commercial motor business accounts for almost 50% of the whole motor insurance market. Not only do the size and weight of commercial vehicles result in significantly higher losses than in the case of private motor vehicles; driver fatigue and a lack of safety standards also hamper the generation of profitable business. What is needed here is a detailed underwriting strategy. Our article provides examples of possible solutions.

In search of the best possible pricing, Brazilian car insurers use a range of variables within a no-claims bonus system in order to attract and retain customers. But which of the variables and combinations are the most successful? Having compared and contrasted the bonus curves of 18 insurers, Munich Re demonstrates how precise risk analyses can support insurers in terms of target-oriented pricing management.

The last article in this issue looks at the future and insurability of electric vehicles. While the first electric vehicles are already on the road, the insurance data available is insufficiently reliable. However, now is the right time for the insurance industry to prepare for the challenges and opportunities this development poses. Here we provide an overview.

We hope you will enjoy reading this issue of K Forum and look forward to working together with you.

A handwritten signature in black ink, appearing to read 'Stefan Schulz', written in a cursive style.

Stefan Schulz
Global Head of Motor Consulting Unit
Munich Re



The direct insurer is headquartered in the heart of the city's financial district. The colonial-period building sports the colours of DirectAsia.

DirectAsia in Singapore

PIONEER WORK: DIRECT MOTOR INSURANCE IN SOUTHEAST ASIA

Joachim Michaely, Munich Re, Hong Kong
Axel Fürderer, Munich Re, Munich

Since mid-2010, the Whittington Insurance Group has been represented in Singapore by its direct insurance unit, DirectAsia. Supported and reinsured by Munich Re, DirectAsia got off to a perfect start.

2010 marked a reform in the history of Singapore's insurance market. Within a few months not one, but two direct insurers started their operations focusing on motor insurance: Aviva and DirectAsia. After a five-year absence from writing liability, accident, and property insurance business, Aviva returned to Singapore in April 2010 and set up a direct insurance unit. DirectAsia, established as a pure direct insurer by the Whittington Insurance Group, was launched in June 2010.

Singapore, whose land area is roughly equivalent to that of the city of Hamburg in Germany, has an estimated population of 4.8 million. Due to the city state's restrictive traffic policy, private car ownership is subject to strict regulations. Levies on imported motor vehicles amount to over 200% in some cases, while driving in the downtown district can be a very costly business due to the electronic toll system. Given that there are only about 550,000 registered passenger vehicles, the Singapore market is reasonably transparent and also an ideal platform for transferring the experience gained here with processes, systems and marketing activities to other Southeast Asian markets.

Direct motor insurance in Singapore: Perfect timing and many good arguments

As the population is receptive to and heavily reliant on the internet, Singapore may be regarded as a perfect test market because of its leading position in Southeast Asia. According to market research institute Internet Stats, there are 3.66 million internet users in Singapore, corresponding to 77% of the entire population. Only Japan and South Korea, at 78% and 81% respectively, boast a higher user concentration. And it is precisely in these markets that direct insurance business has been booming for years.

With approximately 550,000 registered private motor vehicles, the market in Singapore is manageable but nonetheless attractive for direct insurance business: 77% of Singapore's residents use the internet on a regular basis. That translates into 3.6 million potential customers.

The motor insurance market in Singapore is dominated by brokers commanding high levels of commission that, among other issues, affect premium rates. Direct insurers take advantage of this situation by not charging commission, offering leaner processes and carefully selecting their customer base. In this way, they can pass on a portion of their cost advantage to insureds. DirectAsia was launched in the belief that a real direct insurer can take over significant market shares and that customer support via the internet and phone will be widely accepted in Southeast Asia.

The Whittington Insurance Group and Munich Re – A great team

The Whittington Insurance Group began preparing to launch DirectAsia in Singapore at the beginning of 2009. From the outset, the international team of experts included specialists familiar with the intricacies of the local market, with direct insurance business and local market and product launches.

Munich Re acted as a solution provider, supporting DirectAsia through its local market knowledge, access to an international network of experts and comprehensive motor insurance expertise. This strong cooperation led DirectAsia and Munich Re to negotiate a tailor-made reinsurance solution.

Besides knowledge and experience, solvency was a strategic factor behind DirectAsia's decision to cooperate with Munich Re. Particularly with insurance startups, clients and the local insurance supervisory authority keep a close eye on an insurer's reliability. Munich Re's financial strength and rating were key elements in DirectAsia's decision to select Munich Re as a risk carrier. Impressed by the professionalism of the Whittington/DirectAsia team, Munich Re was in turn happy to enter into this new business relationship.



Only 550,000 private motor vehicles are registered in the small but profitable Singapore market. As a result, word of the new direct insurance approach spreads fast.

More than reinsurance: Munich Re as a cross-line partner for products, ideas and processes

Munich Re put together a project team for DirectAsia consisting of employees from Munich Re in Singapore and Munich and from the Motor Consulting Unit (MCU). DirectAsia had already acquired above-average expertise and drafted a very solid business plan. Over the course of the entire project phase, Munich Re provided support for products, ideas, and processes across several classes of business.

In particular, the MCU's many years of experience with internet startups of motor insurers in Europe – one MCU expert was involved in the direct insurance launch team of a major German primary insurance company – helped DirectAsia to refine its processes, such as the ability to precisely plan the number of call centre and IT employees. Measures like these have a direct effect on revenue, employee response time and of course customer satisfaction.

DirectAsia identifies with Singapore

DirectAsia was firmly committed to identifying with Singapore right from the start. Besides a creative approach to promoting its advertising messages using guerilla marketing tactics, DirectAsia launched a variety of campaigns, such as a series of TV ads about traffic safety with a famous actor and his family highlighting dangerous situations, for example driving without a seat belt.

Great start and even better prospects for the future

The formula was successful – DirectAsia is progressing in line with its ambitious business plan. Charles Burgess, Managing Director of Whittington, is satisfied: "After six months we believe that DirectAsia is a proven model. It has achieved traction. Sales are strong and getting stronger every week, the system is stable, claims are as expected and the team culture is excellent."

The outlook is encouragingly optimistic: DirectAsia is planning to expand into new markets and wants to service the entire region in the long run. Burgess: "The business was called DirectAsia for a reason. We would not have started down this line if our ambitions had not extended beyond Singapore. Each country in Asia has its own opportunities and limitations in both the personal lines space and in the buying habits thereof. Despite this, there are similarities and lessons that can be learnt in one and leveraged in others. Our strategy is to enter one country at a time in a fairly defined order at a fairly brisk pace. By the end of 2012 we would hope to be selling insurance in four Asian territories." And with Munich Re, DirectAsia can always rely on the service and the reinsurance protection of a strong and experienced partner.



It pays to drive carefully in Brazil. The no-claims bonus system has now been in operation for some 15 years.

No-claims bonus system in Brazil

BONUS IN BRAZIL – SEARCHING FOR THE BEST POSSIBLE PRICING SYSTEM

Viviane Mardirossian, Munich Re, São Paulo

Exact risk analyses help insurers to establish an efficient pricing system. This realisation is only slowly taking hold in Brazil. But there are already some examples from the Brazilian motor insurance market which show that insurers are able to set themselves apart from the competition and write sustainably profitable business with differentiated pricing.

For insurers, the pricing of a product is an important strategic tool that not only influences profitability but also the position in the respective markets as well as the brand consciousness of consumers and distribution channels. In the past, insurers based their rating system solely on the technical rate. They estimated the risk costs overall and per segment and converted them into the technical rate of the product. This technical rate was supposed to ensure that the total value of the premium income would exceed the total value of the costs, if possible. For this purpose, the premiums were distributed to different risk classes in proportion to the cost or risk level. The result was that all policyholders paid the same insurance rate, regardless of their individual risk.

The technical rate as the only criterion is no longer sufficient to enable insurers to grow sustainably and successfully – and that also applies to Brazil. For about 15 years, the Brazilian motor vehicle insurers have been adding more and more variables to the existing variables vehicle type, age of the vehicle and geographic region. In particular, the variables that matter to the Brazilian insurers are those regarding the vehicle owner. In this context, the insurers pursue quite different strategies, so that there is considerable fluctuation in the number of variables used.

More variables, better loss ratio?

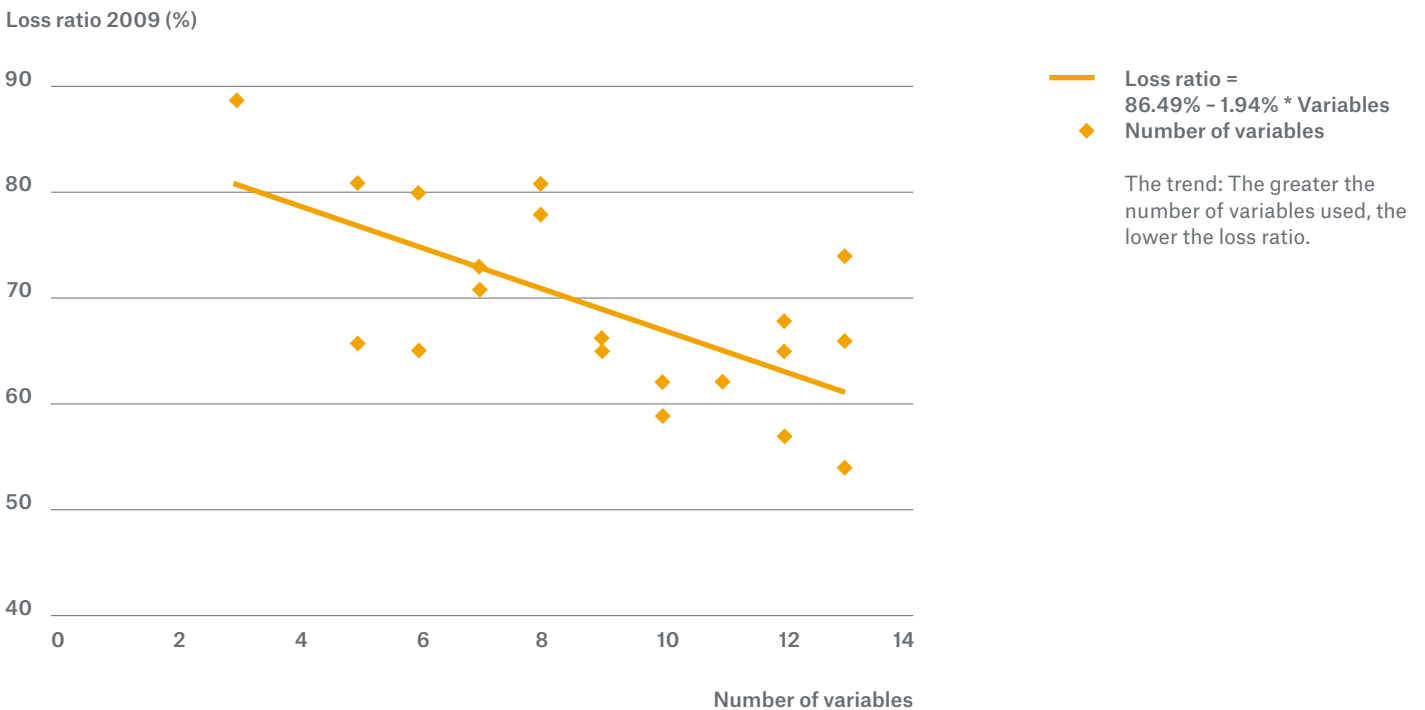
With regard to the loss ratios of the individual insurers, there is according to the findings of the supervisory authority for private insurers SUSEP (Superintendência de Seguros Privados) a clear connection between the number of variables and the loss ratio for 2009: the greater the number of variables used, the lower the loss ratio of the insurer. This use can also be measured. Each additional variable improves the loss ratio by an average of almost two percentage points (Figure 1).

In Brazil there is a clear connection between the number of variables and the loss ratio: the greater the number of adequate variables used, the lower the loss ratio of the insurer.

But the loss ratio is not only influenced by the number – the right selection and the combination matter as well. A number of variables which were increasingly used in the market (by five or more insurers) lead to a significantly lower loss ratio (a difference of four or more percentage points) compared to insurers who did not use them. The variables in question are:

- Garage
- Mileage
- Anti-theft system
- Type of residence (owned, rented, etc.)
- Household shared with persons between the ages of 18 and 25

Figure 1: Loss ratio compared to number of variables used



Insurers in Brazil rely on a (no-claims) bonus system

The bonus classification concept has a great following in Brazil. Policyholders consider the system fair. They accept that their insurance premium increases when there were losses related to the policy in the past, and that driving without claims is rewarded. In Brazil, a bonus class system with ten classes from zero to ten has become established. When policyholders enter the insurance market, they automatically start with the "0 bonus". This is the lowest level in Brazil. From the first contract renewal, the bonus level is determined through a number of fixed rules (see box: "The bonus system in Brazil at a glance").

The credibility of the bonus system in the market is ensured by the bonus centre, a service of the Confederação Nacional das Empresas de Seguros Gerais (CNSeg), whose administration and exchange of information are carried out by Federação Nacional das Empresas de Seguros Privados e de Capitalização (Fenaseg), the Brazilian Insurance Association. Within this system, the insurers exchange text files that store the data of the vehicle, the policyholder, and other information. This ensures that policyholders can keep the achieved bonus classes when they switch insurers.

Insurers who apply reliable and more in-depth risk analyses to the Brazilian bonus system can use the findings for optimal pricing.

The bonus system in Brazil at a glance

The rules showing how bonuses granted in the Brazilian market differ by period and loss history in the renewal year of the contract. The decisive factors are:

- Number of claims during the term of the preceding policy: If there were any claims, the bonus class will be downgraded by one class per claim (down to the lowest bonus class zero). Policyholders who had no claims will be upgraded by one bonus class (up to the highest class 10).
- Renewal date of the policy in relation to the end of the term of the preceding policy: If the policy is renewed more than 30 days after the preceding policy has expired, the policyholders are no longer entitled to an upgrade by one bonus class, even if they did not submit a claim during the term of the preceding policy. If the policyholders only renew their policy after 60 days, the bonus class will be downgraded by one class, and after 120 days it will be downgraded by two levels. If the policy is only renewed after 180 days or later, the policyholder will start in the bonus class 0 again.
- Transfer of the bonus (with the vehicle) to another policyholder: The bonus can be fully transferred to parents, children, spouses and co-owners. All other transfers (e.g. to in-laws, stepchildren, third parties) will reset the bonus to zero.

Insurers grant different discounts in the bonus classes

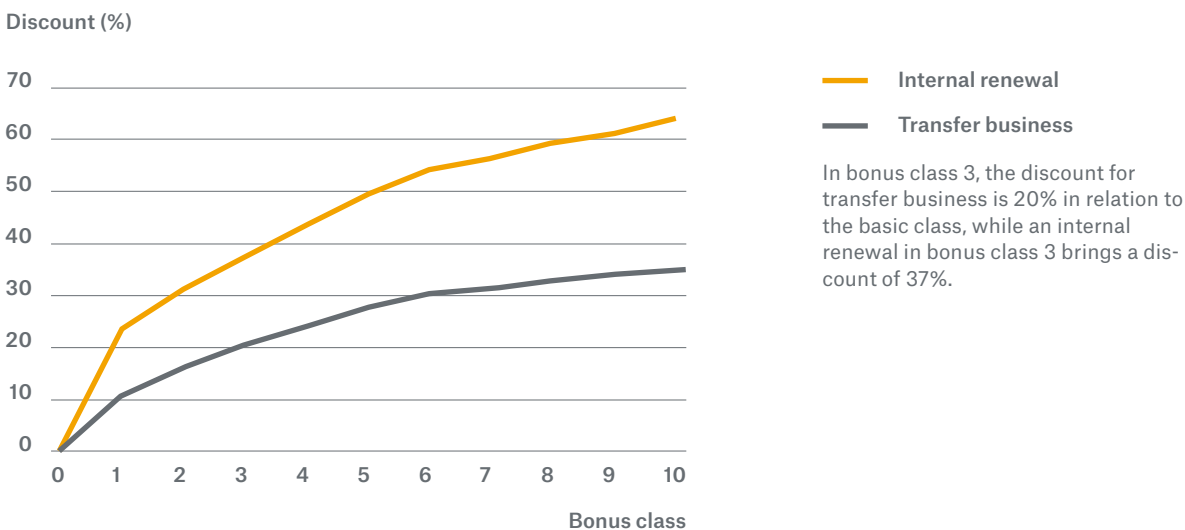
While the bonus classes are predetermined, insurers now have different options for calibration to attract “good risks” and avoid “bad risks” with the discounts that are offered for the bonus classes. In the interests of simplification, this example assumes a policyholder with a 0 bonus as the basic class. Insurers in Brazil differentiate between “internal” renewals and transfer business. Renewals with the same company and new customers without previous insurance are referred to as “internal” renewals. Therefore, in the following, the basic class is defined as a 0 bonus for the transfer business.

An insurer’s bonus curve traces discounts for individual bonus classes that have a value above zero. Most insurers differentiate the bonus discounts based on the type of renewal. Thus Figure 2 shows the example of a bonus curve with differentiation based on the type of renewal.

Searching for market prices where only the bonus level and the renewal type vary, Munich Re produced estimates for the bonus curves of 18 insurers (13 for internal renewal). The aggregate bonus curves illustrate big differences in the discounts granted (Figures 3 and 4).

The bonus class 0 applies to policyholders who take out insurance for the first time or were not able to reach or maintain a bonus. While the latter group is a less attractive group with worse risks for the insurer, the new policyholders present unknown risks. Therefore, the Brazilian insurers still grant a discount of up to 5% to the new policyholders in spite of the 0 bonus.

Figure 2: Percentage of the discount by type of renewal



Risk-based bonus discount: Differentiation based on risk types pays off

Private vehicle insurance is a commodity product, with only slight differences in the coverages from one company to another. Therefore, pricing is the key factor. But why do insurers place different emphases with regard to the percentage of the discount in the bonus classes? Are they based on sustainably motivated, systematic risk analyses or do insurers simply make short-term decisions, trying to add attractive policyholders through aggressive discounts? The exemplary risk analyses in relation to the risk curves show that smart differentiation of discounts granted for different types of risk helps insurers grow in the long term.

Motor insurance covers different types of risk: theft, collision (partial and total loss) and fire. In addition, people can take out a separate, voluntary private liability insurance (RCF) in Brazil. While policyholders in a high bonus class have proven over the course of many years that they are able to avoid accidents, their risk of theft remains unchanged. Figure 5 shows that risk reductions in the collision/partial loss or collision/total loss areas lead to greater discounts than risk reductions in areas such as theft and liability (RCF). At the same time, the figure also raises other ques-

Figure 3: Differences in bonus discounts – Transfer business

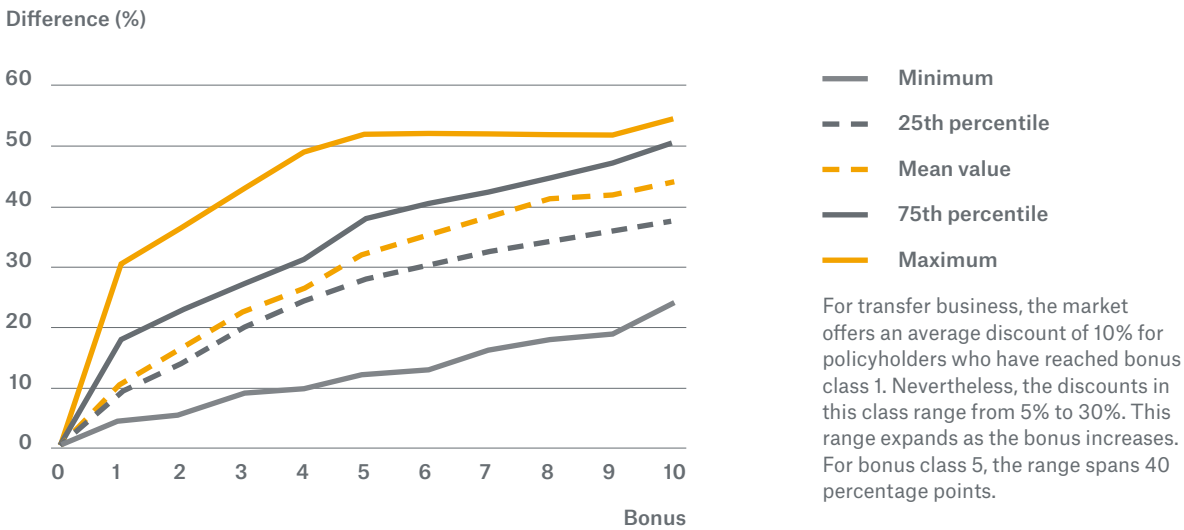
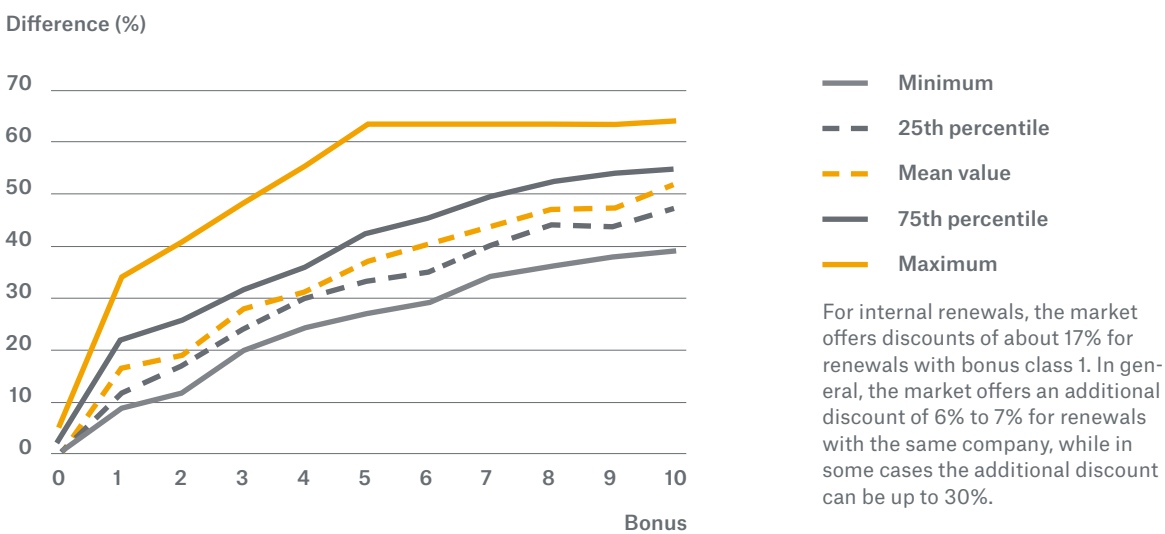


Figure 4: Differences in bonus discounts – Internal renewal



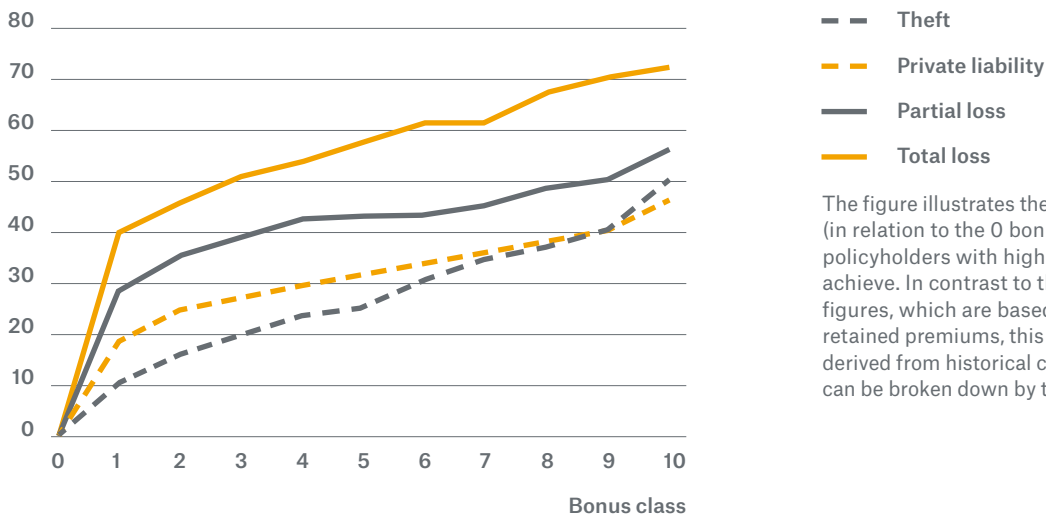
tions: Do insurers grant overly high discounts for higher bonus classes in high-theft areas such as the major cities of the states of Rio de Janeiro and São Paulo? Are discounts insufficient in areas with an increased collision risk such as in the state of Minas Gerais?

The bonus curves in Figure 6 show an odd phenomenon in the data series of the collision/partial loss risk area. One group of insurers grants discounts for policies with bonus classes 5 and higher that keep increasing at the same rate while the curve of the other insurers presents a kink and grows at a lower rate. And why does this only occur for the collision/partial loss risk and not for the collision/total loss, theft or liability risks?

The difference results from an advantage that some insurers grant to their policyholders with higher bonus classes, i.e. a lower deductible. This lower deductible means that more losses are covered, which in turn means that the policyholders submit more claims. However, this leads to higher costs for the insurer, which can hardly be offset by the lower price and possibly increased demand. In the medium term, the perceived competitive advantage turns into a disadvantage in this segment.

Figure 5: Bonus curve based on the type of loss (risk)

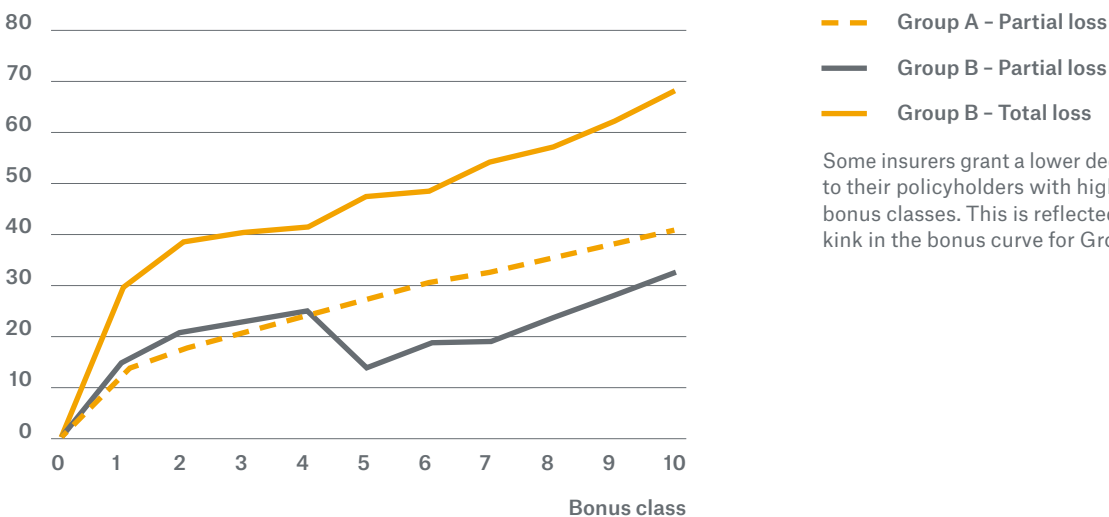
Discount in relation to bonus 0 (%)



The figure illustrates the risk reduction (in relation to the 0 bonus class) that policyholders with higher bonuses achieve. In contrast to the preceding figures, which are based on the retained premiums, this information is derived from historical claims and thus can be broken down by type of loss.

Figure 6: Bonus curve - Partial loss

Discount in relation to bonus 0 (%)



Some insurers grant a lower deductible to their policyholders with higher bonus classes. This is reflected in the kink in the bonus curve for Group B.



Various bonus classes, different rates: a decided lack of transparency in Brazil to help customers decide on the right motor insurance.

Conclusion

The great differences among premiums for comparatively homogeneous risks show that the Brazilian market is not primarily controlled by technical analyses. This creates potential for growth. Insurers who apply reliable and more in-depth risk analyses to the Brazilian bonus system can use the findings for optimal pricing.

These risk analyses show that

- more detailed pricing structures can create profitable growth for insurers: insurers that fall behind in this area will suffer disadvantages due to antiselection;
- even "simple" variables offer a lot of opportunities with regard to the risk analyses;
- a pricing system that takes into account the risk differences by type of loss allows the insurer to pursue a strategy of customised rates;
- numerous aspects of the product design (as in the example of the changed deductible) can influence the result either positively or negatively.

Better risk analyses help insurers make successful decisions for their pricing. This is the only way to achieve the goals of profit maximisation and growth in a sustainable manner.



In China, trucks dominate the roads. The insurance of commercial vehicles is therefore very interesting and much more than niche business.

Commercial motor insurance in China

A MARKET ON THE MOVE

Kevin Jing, Munich Re, Hong Kong
Anthony O'Brien, Munich Re, Hong Kong

Commercial motor is a key feature in Asia's motor insurance landscape. A niche segment in most mature markets, the share is almost as high as private motor in the Chinese market. To profit from this big opportunity, insurers must look closely at the country's logistics and transportation industries and their special needs. Above all, sophisticated risk management is called for.

China's fast-growing economy has given rise to booming logistics and public transportation industries. This growth, coupled with the fact that the trend toward private car ownership is still young, has handed the commercial motor insurance segment an exceptionally large role in the country.

On a global scale, commercial motor insurance is traditionally regarded as a problem area. The sheer size and weight of commercial vehicles result in considerably larger losses than in private vehicles. Utilisation is disproportionately high and often takes place during the high-risk hours between 11 p.m. and 6 a.m. Ensuring that drivers are equipped with required levels of skill, experience and safety awareness – as well as the right attitude – can be difficult.

These and other factors add up to a set of stiff challenges. But in a market characterised by an exceptionally large proportion of commercial motor business, it pays to look closely at what is required to master them.

The three Ms: Measure, modify, monitor

On average, the safety record of China's commercial operators is by no means poor. Professional risk management practices are, however, not widespread. As traffic density and frequency increase in coming years, current deficits can be expected to take their toll.

To realise the potential the segment represents, leading commercial motor insurers have developed active risk management service offerings, with a focus on driver- and situation-related factors. In an initial step, driver and situational risks are measured, in some cases as a response to a poor claims history. These risks are then modified. Modification can mean requiring the client to implement risk-mitigating measures, adding risk-related surcharges to the premium or excluding certain risks. By adopting this approach and offering active risk management support, you can help commercial operators reduce losses and improve their efficiency while at the same time enhancing the quality of your portfolio.

Share of commercial vehicle business in the motor insurance market: in China it is almost 50% as against less than 18% in the USA.

Sound underwriting, sound business

Ultimately, the long-term performance of your portfolio can be only as good as the quality of your underwriting. Although approaches depend on the individual company and its goals, a detailed underwriting strategy provides a solid foundation to build on. The following is a hypothetical – yet realistic – example:

Decline 20% of risks

Predefined risks that do not meet underwriting standards are documented in a list. These “red-light risks”, including certain types of vehicle, driver experience, history of traffic offences and claims, occupational segment and other moral risk information, are systematically declined.

Accurately price 60% of risks

Target business – “green-light risk” – is defined according to vehicle type, class, make and model, driver profile and occupational performance. Different premiums are offered for each type of risk. Trends are monitored and target business is updated on an ongoing basis.

Special terms and conditions for 20% of risks

A list of predefined risks requiring special treatment is established. This category of modifiable “yellow-light risks” includes vehicle type, class, make and model as well as driver profiles and classes of occupational performance. The quality of each risk is enhanced by means of targeted methods such as no-claims bonus systems, claims rating, varying excess levels (including punitive excesses), limitations of cover and risk management as a precondition for insurance cover.

A major risk factor: Driver fatigue

A ten-year analysis of claims in a typical portfolio identified “lost control” and “collision” as the causes of around 80% of claims and 75% of total losses. However, claims management has not traditionally captured detailed data on the root causes of such losses – accident reports of lost control or collision are of limited use in designing strategies for avoiding future losses when the contributing factors are unknown.

At the same time, studies on the issue have produced a pool of compelling findings. Above all, fatigue – the loss of alertness that eventually leads to sleep – has emerged as a major factor in a large proportion of serious accidents. In the USA, for example, the National Transportation Safety Board (NTSB) has linked fatigue to over 50% of single-vehicle accidents involving heavy trucks and around 20% of commercial vehicle crashes. In the UK, fatigue has been shown to be responsible for more than 20% of traffic accidents overall. A study by German insurers pointed to fatigue as the cause of 25% of fatal crashes. On a global scale, it can be said that fatigue is associated with 30% to 50% of all major transport accidents.

A number of specialist commercial motor insurers have responded to these statistics and identified fatigue as a major root cause of accidents – and thus a major underwriting issue.

State-of-the-art research on fatigue has not only pointed to its prominent role in accidents, but also yielded new approaches to dealing with the hazard. Organisations like Fatigue Science (www.fatiguescience.com), the global leader in fatigue management technology and solutions, have developed a range of highly useful tools. These proven systems include:

Roster analysis

Roster design directly affects the risk of fatigue-related accidents. The Fatigue Science solution FAST™ (Fatigue Avoidance Scheduling Tool) helps not only to determine which work schedules involve increased accident risk, but also to pinpoint the exact times the risk would occur. This type of roster analysis allows the transport company to schedule breaks at key times, adjust rosters and determine whether the changes actually reduce the risk of fatigue-related accidents.

Sleep and fatigue analysis

While transporters can optimise their rosters to reduce fatigue, there is no guarantee that drivers will take full advantage of their sleep opportunities. Some operators may suffer from sleep disorders or have lifestyles that restrict sleep. In Readiband, Fatigue Science has developed a small and easy-to-use instrument that can accurately track an operator's sleep patterns, fatigue and accident risk. Drivers are merely required to wear it like a wristwatch 24 hours a day for a minimum of seven days.



The Readiband from Fatigue Science tracks drivers' adherence to their biorhythms.



Growing market: The number of commercial vehicles on the roads is directly related to China's economic growth.

Fatigue-mitigation training

The company also offers employee training in strategies for reducing fatigue-related risks. The classroom-style courses and web-based training sessions are designed to address the needs of specific industries, including transport and logistics.

Of course, effective risk management involves a long list of factors in addition to fatigue mitigation. Depending on the client, it begins with driver selection and can include a wide variety of training, safety awareness and maintenance measures. As China's highly attractive market for commercial motor insurance continues to grow, the demand for comprehensive support in risk management and risk transfer will grow with it.

Fatigue facts

- The body responds to darkness by preparing for sleep. There is a major dip in body temperature and alertness from 11 p.m. to 6 a.m.
- Most trucks travel during the night.
- The largest loss events generally occur between 11 p.m. and 6 a.m.
- Many drivers report having nodded off for a few seconds at the wheel. At a speed of 100 km/h, the vehicle will have travelled 120 metres during a mere five-second "micro-sleep".
- In practice, many long-haul drivers are unable to fully utilise scheduled discretionary sleep periods, as the freight departs from manufacturing plants in late afternoon for early morning delivery in major cities.
- A study by the Adelaide Centre for Sleep Research showed that after 24 hours without sleep, drivers displayed performance equivalent to drivers with a BAC (blood alcohol content) of 0.1 g/100ml – resulting in a seven-fold increase in the likelihood of an accident.
- According to US Department of Transportation statistics, fatigue-related accidents result in average costs five times as high as those in which fatigue was not a factor.

Accident statistics from a sample commercial motor portfolio

- Lost control and collision are behind approximately 80% of all claims.
- Collision claims account for 70% of volume and 40% of costs.
- Lost control claims account for 10% of volume yet 35% of costs.
- Further analysis suggests that drivers' inability to react quickly to dangerous situations – i.e. lack of alertness associated with fatigue – results in higher-than-average claims costs.



Up to now, recharging stations have been few and far between. Only if the infrastructure is drastically improved will it be possible to boost sales of electric vehicles in the long run.

Electric vehicles are coming, with new risk factors in tow

INSURING NEXT-GENERATION MOBILITY

José Antonio Sobrino Reineke,
Munich Re, Munich

The future of mobility is still taking shape: precisely what it will look like is not yet clear. But whichever technology becomes established in the coming years, there are strong indications that electric drive systems will be involved. Now is the time for the insurance industry to prepare for the challenges and opportunities these developments will bring.

With travel by air, rail and road accounting for around 14% of CO₂ emissions worldwide (2005), the race is on for cleaner propulsion technologies. Nowhere is the push for systems that reduce or eliminate reliance on fossil fuels stronger than in the car industry. Although solutions such as hydrogen fuel cell (HFC) vehicles, hybrid electric vehicles (HEV) and purely electric vehicles (EVs) are still in their infancy, most automotive experts agree that regardless of which technologies prove the most viable, electric motors and batteries will play a key role.

HFC technology, as enticing as its potential for clean mobility is, is generally not expected to reach maturity for many years. EVs are also plagued by technical problems – for example operation in cold weather, limited range or lack of recharging infrastructure. Despite these teething troubles, major carmakers promise electric models by 2012 or 2013. Hybrids, on the other hand, have clearly established a foothold, representing 2.5 million vehicles worldwide. In Japan alone, one in every ten new cars purchased is a hybrid.

*2.5 million hybrid vehicles
already sold worldwide*

To encourage sales of alternative fuel vehicles, many governments and municipalities offer a range of incentives, including rebates, tax breaks and exemption from parking restrictions. Car manufacturers, power providers and other companies are cooperating to expand battery recharging infrastructures. A forward-looking project in Israel dubbed "Project Better Place" even seeks to relieve consumers of the need to charge batteries by setting up a network of automated battery-exchange stations.

Cautious optimism

In 2009, Volkswagen CEO Dr. Martin Winterkorn warned against creating the impression that electric cars were already fully mature. "We are witnessing an electro-hype,"¹ he said, and cautioned of the risk of disappointing car buyers. Alongside healthy scepticism, however, Winterkorn expressed VW's commitment to the technology: "The everyday, affordable and safe electric car for everyone is feasible."² For the motor insurance segment, this sends a clear message: the specific risks and business opportunities involved in insuring vehicles with electric motors and batteries belong high on the agenda.

Electric drive systems: Pros and cons

Disadvantages of electric vehicles (EVs) compared to conventional internal combustion engine (ICE) vehicles:

- Range: EVs are typically limited to around 160 kilometres between charges.
- Price: EVs are much more expensive than standard ICE vehicles.
- Infrastructure: Petrol stations are ubiquitous, while battery charging stations are not yet widely established.
- Resale value: Possible problems
- Disposal of battery: Environmental concerns
- Cold weather difficulties for batteries
- Safety issues in case of an accident

Advantages of EVs over ICE vehicles:

- Fewer moving parts to wear out
- No engine oil or power-steering fluid
- Braking is used to charge the batteries, reducing wear on brake pads.
- Less noise pollution

New technologies, new risks

As EVs and HEVs have only recently been sold in significant numbers, there is as yet very little sound insurance data. The re-thinking must begin with premium calculation: in many countries, motor insurance is priced on the basis of engine (displacement or horsepower) for third-party coverage, and on vehicle value for own damage covers – factors that apply differently to EVs and hybrids. For example, an electric motor has no displacement and its horsepower is of limited relevance (top output can be utilised for a few minutes at the most). On the other hand, electric vehicles are generally capable of considerably faster 0-100 km/h acceleration than their internal combustion engine (ICE) counterparts.

^{1,2}Dr. Martin Winterkorn, 3 July 2009, https://www.volkswagen-media-services.com/medias_publish/ms/content/de/reden/2009/07/03/prof_dr_martin_winterkorn.standard.gid-oeffentlichkeit.html

The limited availability of recharging facilities mean EVs are driven fewer kilometres – a disadvantage today’s target group seems willing to accept: current buyers of such forward-looking vehicles can be considered a more solvent, environmentally-conscious cohort than the average random sample.

High costs

Hybrids and EVs are significantly more costly than ICE cars with similar characteristics. Another issue to address is the cost of spare parts compared to the vehicle’s purchase price. No large pool of salvaged vehicles is available, and many of the parts are completely new or proprietary. The relationship to a market price that has been subsidised by the state presents new rating challenges for motor own damage insurance rates. The risk of theft might be significantly less as the most popular car models are most frequently stolen, but the high cost of spare parts might represent an additional incentive for thieves. The current EV micro-cars present problems for collision claims, as declaring a total loss is often cheaper than repair.

The high-voltage batteries used in electric cars and hybrids pose a potential safety threat to vehicle occupants and emergency rescue workers in the event of an accident. Manufacturers maintain that their EVs comply with current safety standards, yet it remains to be seen if those standards need to be revised in the light of the new technology. An additional hazard arises for pedestrians due to the lack of engine noise: especially the sight-impaired and young children are at risk of failing to notice an oncoming vehicle.



Next-generation EVs are real head-turners as well as status symbols for a wealthy and environmentally conscious target group.

Data capture: An ongoing challenge

To sum up, risk-mitigating factors should not be overestimated and unknowns should be accounted for. "Green car" discounts now offered by some insurers are generally a marketing tactic rather than a realistic reflection of the risk carried. In practice, the commercial premium should remain substantially higher due to the lack of experience in the segment. In the long run, only ongoing research and observation can provide the much needed deeper understanding of this emerging market segment and its insurance business potential.

"This is not a sprint, but a marathon."¹

Dr. Martin Winterkorn, CEO Volkswagen AG

A new angle on risk parameters

In the UK, many motor insurers use the ABI vehicle risk groups determined by new car price (cost of settlement in the event of a total loss), performance (both 0-100 km/h acceleration and top speed), parts pricing from a standard list of 23 parts and security levels. In Germany, vehicle risk groups (separate for MTPL, comp. and OTC) are determined by the GDV and initially based on engine power, new vehicle price and comparison to similar vehicles. The risk groups are then modified according to country-wide insurance experience that has been adjusted for other insurance variables. The challenge is to develop comparable parameters that apply to EVs and HEVs.

New safety issues

Firefighters and other emergency personnel are as yet inexperienced in dealing with the possible dangers arising from a damaged high-voltage battery. The website <http://www.autodesignedextrication.com/aeg.html> (sponsored by State Farm) offers instructions for emergency response for various models. Reduced noise pollution is a benefit of EVs and HEVs, but also a danger for those who rely on those engine sounds to warn of an oncoming vehicle – such as the sight-impaired and young children. One proposal for addressing this is to equip vehicles with simulated ICE sounds.

¹ Dr. Martin Winterkorn, 3. Juli 2009, https://www.volkswagen-media-services.com/medias_publish/ms/content/de/reden/2009/07/03/prof_dr_martin_winterkorn.standard.gid-oeffentlichkeit.html

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