

De-Tariffication: A Risk Based Pricing & Risk Reduction regime

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An insurance provider or a regulatory agency may be interested in determining a risk measure consistent with observed market prices of a collection of risks. Using a relationship between distorted coherent risk measures and spectral risk measures, we tried to calculate distortion functions from the observed prices of risk. Under the de-tariffed market regime, the insurance companies are forced to rate risks scientifically. The only way insurance companies can make profit and, thereby, maintain their solvency ratio without going back to their shareholders is by prudent underwriting. Till date customers are used to pay insurance only on the basis of Car make, Model, Cubic Capacity, IDV (Insured Declared Value) and area of operations. But now insurers are measuring the risk scientifically which will make motor insurance product pricing complex and difficult for customers to understand. In India people were offered almost same rates from different companies but now on every company will offer different rates depending upon customer behavior in other words, insurers will offer personalized insurance rates based on more factors like, driving pattern, color of the car, age of the driver, gender, annually driven mileage, the time of day and season typically driving, the predominant weather conditions when driving, the type of route driven, or the neighborhood where the car is usually parked. Personalized insurance rates would have several advantages over today's demographics-based

systems. In this paper we tried to find out whether on de-tariffing, the rating will be based on the risk profile of the customer, and then risk should be judged on its own merits. De-tariffication will force insurers to scale up their risk-assessment capability and give the underwriting function its due importance in the insurance process. As, this is the core function of analyzing and pricing transfer of risk, but it is difficult to make customers understand that the biggest impact of de-tariffing is good for customers itself. Now, a car-owner with good track record subsidizes compared to those who makes large claims. Research is conducted to see what do customers think about risk based pricing. Are they ready for it and to what extent?

Key Words: Risk Based Pricing, Risk reduction, De-tariffication, motor-insurance

Introduction

Following independence in 1947, the Indian government implemented an economic model based on the Soviet system of national planning. Insurance was not seen as advantageously important and so was not initially nationalized. Before nationalization there were a large number of insurance companies and the level of competition was high. There were also allegations of unfair trade practices. The Government of India, therefore, decided to nationalize insurance business.

In 1957 the General Insurance Council was formed, a wing of the Insurance Association of India. The General Insurance Council framed a code of conduct for ensuring fair conduct and sound business practices. In 1968, the Insurance Act was amended to regulate investments and set minimum solvency margins. In 1972 the General Insurance Business (Nationalisation) Act was passed and, with effect from 1st January, 1973 general insurance business was nationalized. All 107 insurers were amalgamated and grouped into four

companies, namely National Insurance Company Ltd., the New India Assurance Company Ltd., the Oriental Insurance Company Ltd and the United India Insurance Company Ltd. The General Insurance Corporation of India was incorporated as a company in 1971 and it commenced business on January 1st 1973. Motor insurance is one captivating branch of general insurance and first started in United Kingdom in the early years of this century. In India, the Motor Vehicle Act was passed in 1939 and provision of compulsory third party insurance were introduced in the Act only on 1st July, 1946. Then the Motor Vehicle Act 1988 replaced the earlier 1939 Act and became effective from 1st July 1989.

The Tariff Advisory Committee was set up and it administers all tariffs relating to general insurance. Motor insurance in India is also governed by the India Motor Tariffs formulated by the TAC. The Tariff Committee was so influential that it soon became known as the "Rate Maker". The Tariff Advisory Committee (TAC) replaced the process of liberalization of the sector had begun under Manmohan Singh. In 1993, the

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Government set up a committee under the chairmanship of RN Malhotra, former Governor of RBI, to propose recommendations for reforms in the insurance sector. The objective was to complement the reforms initiated in the financial sector. The committee submitted its report in 1994 wherein, among other things, it recommended that the private sector be permitted to enter the insurance industry. They stated that foreign companies be allowed to enter by floating Indian companies.

These recommendations were put into practice via the Insurance Regulatory and Development Authority Act (IRDA 1999). In particular, the monopoly previously enjoyed by the GIC was removed. The act effectively reinstated the 1938 legislation. The following year, the first licenses were granted to private companies. There are now 46 insurance companies in the market, of which 23 are in the general insurance business.

Tariff Committee by statute in 1968. The new body was designed to be independent and scientifically driven in its rating approach. However, post nationalization in 1972, the independence of the TAC came into question –observers described the TAC as the “handmaiden of the nationalized companies” (senior management of these companies took the most senior positions on the TAC) – as rates did not necessarily reflect “market price”. The tariffs has undergone various revisions, the latest revision being effective from 1st July 2002. The progress towards full detariffication of the non-life sector began in 1994 when insurance tariffs on personal accident and bankers' indemnity were dismantled. Detariffication began in 2005 with marine insurance, with rates for property and motor being detariffed in January 2007. However, insurers are not allowed to change the terms and conditions for existing products until 2008 in an effort to avoid confusion during the initial stages. As of January 2007, all classes of business except for motor third-party liability are no longer under price tariffs. Motor third-party liability has not yet been detariffed as it was thought that the poor pricing could be addressed separately.

Detariffing of the Indian insurance industry has steered itself on to a completely different route, where the market has been transformed overnight from a sellers' market to a buyers' market. Since then, the insurance industry has been constantly evolving, becoming more sophisticated with the passage of time. Though the transformation was initiated in 1999 with the liberalization of the industry, which threw open the government-owned industry to private competition and foreign minority ownership. The removal of tariffs also was a major driver in product innovation, and gave customers a lot more choice of products. Pre-detariffing, tariffs in motor were a stumbling block for insurers in offering differential solutions to customers, which in turn placed a cap on creativity and innovation. Today, insurers have the freedom to offer differential pricing, a different set of premium rates based on their perception of risks and segment customers by the nature of their risk. At the same time, customers have been given the

liberty to avail different kinds of covers in motor insurance products. As prices are not uniform, customers have more room to negotiate for the best price in the market.

Now the consideration is risk based, resulting in premiums to progress from tariff based to risk based. The tariff-based regime inhibited the development of risk based pricing, which is of fundamental importance for companies seeking profitable growth. Risk based pricing introduces a discipline and associated processes and controls that were not well developed within the general insurance companies under the tariff regime.

The controlled pricing regime of the pre-detariffing era has now given way from rule-based underwriting practices to risk-based decision-making of the subject matter offered for underwriting. It means that the pricing of insurance policies is left to the individual insurance company, based on an analysis and perception of risk. Competition is expected to carve down the fat margins that insurers enjoy in fire and engineering insurance, eliminate cross-subsidies and force companies to look at small businesses i.e. it has put an end to cross subsidization and today, each portfolio must stand on its own feet. Risks in the corporate/industrial segment are now individually assessed particularly in terms of their risk management, safety features and rated appropriately. Growth in this segment is driven by the insurer's expertise and ability to assess and rate risks differentially. The drive is to charge an appropriate price, which reflects the risk insured, which is the key to providing sustainable services to meet customers' needs. At present, actuaries are increasingly playing a vital role in the industry by design new products, determining the appropriate premiums and implementing the necessary portfolio management controls. Their mathematical expertise, statistical knowledge and analytical skills are requisite to insurers to help evaluate the long-term financial implications of their decisions.

During tariffed market there was restricted scope for product differentiation and products were distributed through intermediaries. But it was the valiant new post-detariffing world that was the real game changer, where private insurers challenged the status quo with new products and distribution channels the abolition of tariffs has been the pioneer for the development for many alternate channels for distribution. Direct marketing has gained eminence including the path breaking online channel, which holds great promise from the insurer's perspective and has been an eternal source of customer satisfaction. The benefits of detariffing are manifold, both for the customers and the industry.

Competition has been intense and is set to intensify in the future with many more insurance joint ventures set to enter the market. The resultant beneficiary of this competition has been the customer who has been able to shop around in the wake of the heavy discounting in the industry. This was unthinkable in earlier days when a sellers' market dispensed the products,

leaving the hapless consumer with no choice. Competition has been a major driver towards service excellence and the customer couldn't be happier in this regard. Moreover, with price no longer being the only differential to woo customers and clients, general insurance companies now look at improving both their customer service as well as the products offered.

Focusing our further discussion on private motor insurance. In India Policies insuring Motor Vehicles are to be issued only as per the Standard Form(s) given in Section 6 of the India Motor Tariff. There are only two types of policies

- (i) **Liability Only Policy:** This covers Third Party Liability for bodily injury and/ or death and Property Damage. Personal Accident Cover for Owner-Driver is also included.
- (ii) **Package Policy:** This covers loss or damage to the vehicle insured in addition to (i) above.

Restricting the scope of cover under Section-I (loss of or damage to the vehicle insured) of the Package policy without any reduction in Tariff rates is permitted. Excepting this, no alteration or extension of any of the Covers, Terms, Conditions, Exclusions, etc. of any of the Policies/Endorsements laid down in this tariff is permitted without prior approval of the TAC. Rates provided under this Tariff are minimum rates. Loading on tariff premium rates by 100% may be applied for adverse claims experience of the vehicle insured and individual risk perception as per the insurer's assessment. If the experience continues to be adverse, a further loading of 100% on the expiring premium may be applied. No further loading shall apply.

Before detariffication the premium was based on following factors:

- i. Insured's Declared Value (IDV) of the vehicle
- ii. Cubic capacity of the vehicle: Not exceeding 1000cc, exceeding 1000cc but not exceeding 1500 cc and exceeding 1500 cc
- iii. Geographical Zone: Zone A: Ahmedabad, Bangalore, Chennai, Hyderabad, Kolkata, Mumbai, New Delhi & Pune and Zone B: Rest of India
- iv. Age of the Vehicle: Not exceeding 5 years, exceeding 5 years but not exceeding 10 years and exceeding 10 years.

The policy schedule wordings limits the use of vehicle .The Policy covers use of the vehicle for any purpose other than

- Hire or Reward
- Carriage of goods (other than samples or personal luggage)
- Organized Racing
- Pace Making

- Speed Testing
- Reliability Trials
- Use in connection with motor Trade

Consideration for driver is only limited that Any person driving the vehicle including the insured holds an effective driving license at the time of the accident and is not disqualified from holding or obtaining such a license. And person holding an effective Learner's license may also drive the vehicle and that such a person satisfies the requirements of Rule 3 of the Central Motor Vehicles Rules, 1989. Statutory limit for third party liability is Rs 6000 and can be extended to Rs 7.5 lakhs by paying additional premium.

Discounts:

The following discounts may be granted.

- i. Voluntary deductibles. Insured may opt for higher deductible over and above the compulsory deductible
- ii. No Claim Bonus
- iii. Automobile Association Discount
- iv. Discount for Vintage Car
- v. Discount for Anti-Theft Devices

No other discount is permissible. Additional premium is charged for use of CNG/LPG. These were the ratemaking factors in tariffed market.

In India, de-tariffing is, at present, partial to the extent that coverage parameters have not been completely opened up for customization. The freedom to price a cover is given to insurance companies. Since Insurance, probably, remains the best form of protection against uncertainties that lead to financial losses. Covers and cost should dependent on an individual's perception of risk and a fair estimate of the propensity to loss. In the future, an individual would possibly be in a position to tailor the policy to his needs. This would complicate both the sale and purchase of insurance. If we compare Indian motor insurance underwriting practices with international market where US markets are considering more than 75 factors to rate motor insurance, UK has more than 20 factors, Japan has around 9 risk factors, and India is employing mainly 4 factors , due to this safe drivers are cross-subsidizing for risky motorists.

The underwriting of motor business may be considered under the following heads:

- (i) Factors associated with Insured: Age, Marital Status, Gender, Education, Occupation, Driving Record, driving History , health and habits etc
- (ii) Factors associated with vehicle: Make & Model, Engine Capacity, age of the vehicle, safety features, repair and replacement cost

- (iii) Factors associated with Use of the vehicle : Annual Mileage, geographical location, personal or commercial use

The above list of critical factors for universal adoption by companies leaving it to each company to determine the weightage they would attribute to the parameters.

The following is an indicative list of other rating factors, which also play a role in underwriting a risk:

- Theft-proneness of the vehicle or its parts
- Frequency and nature of accidents
- Named Driver
- Occupation of Owner
- Traffic conviction record
- Special driving education, safety training
- Membership of Automobile Association
- Motor Risk Management of the Country
- Vehicle Density
- Condition of the Road
- Availability of garage
- Safety Regulations
- Uninsured population
- Credit Rating: financial position of Insured

The factors in the indicative list are not exhaustive. There may be others that insurers may identify for adoption as deemed appropriate depending upon nature of vehicle, proposal, location, their own experience etc.

Underwriting Importance of Risk Factors:

Factors Associated with Insured:

Age: Age has mental bearing on the risk. Young drivers poses high risk due to their attraction for high speed whereas elderly people involves increased physical hazard due to slow reaction in any emergency due to decreasing physical capabilities

Gender: Men are more likely to die in a car crash than women. In fact, studies have shown that male fatalities significantly outweigh female fatalities. However men and women do not drive the same number of miles under the same conditions- men do about more driving than women. Studies show that woman take shorter trips and female drivers have a greater number of minor crashes than do men. However men are more likely to be in a serious crash. Women drivers also make safe drivers may be because of mothering instincts and fewer fantasies.

Driving History: Driving history is important to account in respect of person driving in night. His driving experience like

miles driven per year, age of the person, training undergone, fresh or old driving license, past accidents, whether driving owners vehicle or self owned.

Occupation: The occupation is an important risk factor for determining exposure to hazard while using a vehicle for example a person involved in time bound jobs are more prone to accidents due to hurry in reaching workplace on time like BPO professionals, Pizza delivery boys and entertainment professionals due to irregular working hours.

Health & Habits: Any physical defect like impaired vision, hearing loss, loss of limbs etc introduces physical hazard. Smokers get into more auto accidents due to being less alert, having slower reflexes, and also due to fussing around while driving (lighting up, etc.). Driving while either intoxicated or drunk is dangerous and drivers with high blood alcohol content or concentration (BAC) are at greatly increased risk of car accidents, highway injuries and vehicular deaths

Credit Rating: Insurers have identified an inextricable link between the likelihood of policy claim and an adverse credit history. An increasing number of insurers now use credit scoring to help determine the customer's premium. People with low credit scores tend to file more claims than those with a high score. This means that overall; people with a low credit score are more likely to cost the insurance provider time and money by filing claims.

Education: An uneducated driver is unable to follow the road signs and instructions resulting in adding more risk on the road.

Driving Violations: Having an accident or moving violations on drivers' record (speeding tickets, reckless driving, etc.) put at a higher risk for accidents and will likely mean a high premium. However improvement in driving records can lower the premium rates.

Factors Associated with Vehicle:

Insured Declared Value: The most important factor is the year of manufacture, the purchase price and IDV based on the depreciation table provided in the policy. It is to be considered during constructive total loss or repair of the vehicle

Age of the vehicle: It is important underwriting factor as vehicle becomes older, defects appear more frequently and metal fatigue sets in. car over 15 years cannot be accepted on comprehensive terms but only for third party risk

Type of Vehicle: Vehicles using latest technology and more safety measures like airbags, ABS (Anti Skid Braking), crumple zones, Collapsible universally jointed steering columns, and Side impact protection beams etc have steadily reduced injury and death rates after accidents.

Fuel Used: In case of vehicles fitted with bi-fuel system such as CNG and Petrol attracts high premium. Even CNG kits which are factory fitted considered safer than CNG kis fitted later on

should be a concern for underwriters.

Car colour: Researchers believe bright reds and yellows as faster cars. Silver and white are great at hiding scratches. Well researchers have discovered a link between accident risk and the colour of car many large insurance companies actually use this in their quotes and premiums. So certain colour choices can and do lead to higher rates and significantly higher accident risks. There is a popular urban legend that says that people who own red cars get more aggressive drivers than people with other colour cars, well the owners of such cars do seem to back up this legend, but it's still not proven yet. Studies also shows that owners of black cars are more likely to be involved in a crash than owners of cream colour cars.

Vehicle Maintenance: Regular car maintenance involves keeping tires and brakes and suspension in good working order. New tires and brakes affect the stopping distances of a vehicle and can make the difference in whether a vehicle is involved in a collision or not. Proper vehicle maintenance is responsible for containing loss assessment and even prevention of accident due to greater roadworthiness.

Repair and Spare part Cost: Over 50% of all money paid out in motor insurance claims goes on repairing cars. The cost of spare parts and the times taken by repairers are therefore major factors in pricing motor insurance. 'Difficult to repair' imports may attract a higher rating than a similarly manufactured car from the domestic market or principal foreign makers. Insurance of imported car presents several problems due to problem of obtaining spare parts.

Factors Associated with usage of the Vehicle:

Annual Mileage: Consumers believe that if they're driving less, they should pay less for their insurance, and indeed the claims statistics support that and study shows that those insurers who fine-tune their premium to a customer's driving habits will be better positioned to offer competitive pricing. Hypothetically it means a person having two identical cars, same make and model, will shell out different premiums if one car is used less than other i.e. one used more will attract higher premium rates.

Geographical Zone: The segmentation of risk zones is required to be done on the basis of risk exposure, probability and severity of loss. Geographical segmentation can be done in following areas:

Rural area and urban area: living in rural area means less accident but bad roads resulting in more wear and tear

Coastal Area requires more maintenance due to rusting and humidity

Hilly areas pose more risk due to requirement of experience driving and higher probability of total risk in case of accident

Metropolitan cities involve more risk due to congested traffics and variety of vehicles on the roads varying in manual rickshaw to heavy motor vehicle.

Parking Area: Insurance companies use the location where the vehicle parked to set the auto insurance rate. A car park in a garage will receive a higher rating than a car parked on the street. They figure the car parked on the street chances of having an accident, vandalism or theft is greater than a car that is parked in a garage.

Multiple Drivers: Vehicle driven by more number of drivers involves higher risk than single owner-driver car as it is more carefully driven and often better maintained

Availability of Garages: If vehicle is used in the area where garage is not available in close vicinity it increases the repair and maintenance cost both. Even in case of accident high towing charges will be applicable and will increase the claim cost

It is not easy for insurer to consider all factors for rating the risk but with advancement of technology it is now possible. Few risk factors can be assessed from proposal form and few from inspection of the vehicle, remaining factors which are usage based can be analyzed with the help of technology.

1. Cover is based on the odometer reading of the vehicle.
2. Cover is based on other data collected from the vehicle, including speed and time-of-day information in addition to odometer readings. .
3. Driving is monitored using a GPS device.

The formula can be a simple function of the number of miles you drive, or can vary according to the type of driving or the identity of the driver. Once the basic scheme is in place, it is possible to add further details, such as an extra risk premium if someone drives too long without a break, uses their mobile phone while driving, or travels at an excessive speed.

Global Practices:

Worldwide in the automotive industry, satellite navigation is becoming increasingly available on new mid range car models as standard feature. Alternatively, aftermarket GPS navigation products are also becoming increasingly affordable and available. This capability permits the use of positioning equipment for other value added services. Researchers have recently started exploring opportunities of offering novel applications in the automotive sector by using positioning technologies. Due to socio economic activities attracting more and more people to larger metropolitan cities, there is a proportionate increase in road traffic. As a result, mobility based pricing of services has received recent attention to solve the issues increased accident rates. One such practice is to convert the fixed cost of motor vehicle insurance to a variable one based on the annual mileage. These classes of insurance schemes are generally referred to as Pay-as you-drive (PAYD) Insurance.

The key idea here is to transform the drive all you can flat insurance premium to a mobility-based paradigm. In such a

design approach, the risk and premiums are modeled depending on the actual usage rather than approximation of future risks. This approach would give incentives to drivers for using the roads more efficiently and safely.

Traditional motor insurance products work on statistical data by dividing the population into different risk classes based on long term demographics. The parameters used to model risk and design the payment equation use fairly static quantities like age and sex of driver, driving experience, residential post code, vehicle garaged or parked off street, vehicles safety equipment, intended vehicle use (business or pleasure), claims history. Cost of insurance depends on the future, there can only be predictions about the number of losses, their respective costs and times of occurrence. Actuaries designing traditional insurance policies do not have access to real-time risks faced by the motorists on road and thus cannot model these risks in premium calculations. This adversely affects the subset of low risk drivers in a particular class who ultimately pay a higher premium the successive year due to the claims made by high-risk drivers of the insured group.

The technological developments in positioning and availability of mobile communications infrastructure have paved the technical feasibility for PAYD. Several insurance companies outside India have launched pilot projects to market this idea. Currently these projects may focus on different market segments and adopt different approaches and variables for calculating premiums, but the general idea is to charge consumers based on mileage.

Norwich Union (2006) in the UK was amongst the first insurance providers to market a GPS based pilot insurance product where the trips done by a vehicle were logged and then transmitted to the Insurance provider using the GSM network. Premiums were calculated on a monthly basis and invoices mailed out to vehicle owners. Their product focused on young drivers who pay higher premiums using classical insurance policies.

Progressive Insurance in the United States took another possible design approach. Their product called Trip Sense did not use GPS to track the trips, but a device was used to register the time and day for each trip, the distance travelled, and speed. This system also kept track of hard braking and quick accelerations. The insured person could download the data to a personal computer, and if satisfied, could upload this data to the insurance company's server at their discretion. Discounts of up to 25% were offered to drivers for volunteering for these insurance policies. This system motivated safe driving, and also gave incentive to drivers to use roads during off peak hours.

PAYD is a business model of individualizing insurance products. The aim is to get closer to the consumers using telematics services. Since there is exchange, storage and retrieval of precious personal spatial information, consumers can be very skeptical about the processing of their private information, especially location information, which can reveal

a lot about an individual's personality traits. Using the aforementioned insurance products, specifically the ones that use GPS to locate and report the position data, there is a possibility of ubiquitous surveillance of individuals, both on a real-time and retrospective basis. Therefore, it is important to recognize and respect the driver's location privacy concerns if the insurance industry wants PAYD to be a successful business model.

Payd and Privacy: In the context of automotive telematics, location privacy is a special case of privacy, relating to the privacy of location information of the vehicle, and therefore, the driver. Telematics applications are diverse in nature, but nearly all of them depend on vehicle location information. It is also possible to derive driving profile of a person from GPS track data. They sought an understanding of driving behaviors in real world scenarios by fitting low-cost GPS receivers to vehicles, and logging the vehicle movements. Consequently they were able to identify driving styles from this data.

Imagine a PAYD insurance provider accessing this information, in order to identify an individual with an aggressive driving style. The insurance provider can then assign the individual a higher risk, leading to a higher premium or denied motor insurance altogether, not to mention the capability of locating and tracking individuals in real-time or retrospect. Thus Personal location information collected may be used for unsolicited marketing, locating people with malicious intent, or for creating personality profiles by behavior on road and may offend people.

The simplest form of PAYD is performing odometer audits. These can be done when a vehicle is serviced. Service personnel can be trained to check and validate the odometers and report them to the insurance agency securely. The insurance company can then readjust the premiums of the vehicle based on the kilometers driven. This method does not reveal any private information about the motorist, only the total kilometers driven in a financial year. Total kilometers of a vehicle are also used when trading cars, so it is not much of an issue.

Besides, there are minimal infrastructural costs required to setup such a system.

A second, richer approach is to have devices fitted to the vehicle, similar to the ones adopted for Trip Sense (2006) by Progressive Insurance. The times of the day the vehicle was driven can be recorded, and hard braking and rapid accelerations are noted. It is at the discretion of the vehicle owner to view this data on computer, and if deemed appropriate, upload this to the insurance company's server to receive discounts and rebates on existing insurance policy. This type of a system requires more costs for setup as compared to the odometer based system. However, it has more information transmitted to the insurance company.

The insurance provider can infer the number and durations of travel made during peak hours and off peak hours and regulate

premiums accordingly. The driver is encouraged to use the vehicle more economically and, at the same time, help in problems like congestion and pollution. The number of hard braking and accelerations can reflect information about the individual driver's behavior on road. Therefore, there is more invasion of privacy compared to odometer based auditing, even though no real-time or passive information about the vehicle's location is transmitted.

Potential benefits of GPS based PAYD System:

- Commercial benefits to the insurance company from better alignment of insurance with actual risk.
- Improved customer segmentation
- Product Differentiation, it means More choice for consumers on the type of car insurance available to buy
- Potential cost-savings for responsible customers and incentives for safe drivers
- Social and environmental benefits from more responsible and less unnecessary driving.
- Due to the constant monitoring of location of vehicle aspects of, it enhances security - both personal security and vehicle security. The GPS technology could be used to trace the vehicle whereabouts following an accident, breakdown or theft
- The same GPS technology can often be used to provide other (non insurance) benefits to consumers, e.g. satellite navigation
- Social benefits from accessibility to affordable insurance for young drivers - rather than paying for irresponsible peers, with this type of insurance. The young drivers pay for how they drive.

Potential drawbacks:

- The system recognises only codified, rather than actual, risk. A speeder, for example, would be heavily penalised in comparison with someone who drove in observance of the speed limit. This would not take into account the circumstances involved, e.g. if the speeding driver in question was driving in an otherwise safe manner, or if the slower driver was changing lanes abruptly, or driving in an inattentive or careless manner.
- Charges would be very high for young drivers, especially at night, and as such would strongly discourage them from driving socially. In many areas public transport is non-existent at night, and such high charges could have a strong negative impact on their quality of life.
- GPS tracking of vehicles, 24 hours a day, could be seen by many people as an unacceptable infringement on their right to privacy.
- The potential of usage based insurance systems for

automated traffic law enforcement could result in a reduction of the use of human traffic police as has been reported since the widespread introduction of speed cameras. This could result in reduced detection of drunk driving and other dangerous offenses.

Current Practices in Indian Market

In the initial years of detariffed market insurance companies are trying to maintain the same quantum of revenues, which will mean writing a larger number of risks at lower prices. But this model of maintaining market share has its own pitfalls, namely, accumulation and sudden unforeseen exposure on the balance sheet. This is expected for some time till the market moves to a risk-based pricing model. Companies are trying to grab market share by introducing new add on covers. Insurance Regulatory and Development Authority (IRDA) allows insurers to change or charge deductibles, and also charge customers extra for providing them with add-ons. This will lead to customization that will further lead to the customers getting more from their motor insurance cover. Keeping an eye on the breathing space to get the 'additional premium' for add-on products, insurance companies are looking at inclusion of add-on covers offering value propositions to the customers.

New Products

The insurance regulator has recently permitted 'add-on covers'. These primarily enhance or amend the existing standard coverage. The industry is pinning its hope on add-ons because of the belief that they can be growth triggers in the future. Some possible covers are:

Roadside assistance: This is a motor insurance cover that will help you if your vehicle breaks down. The insurance regulator has also allowed insurers the freedom to give add-on covers (at an extra cost) which could be in form of 'loss of use', 'replacement car' and 'extended warranty'

Depreciation waiver: Anomalies in terms and conditions governing the depreciation of parts is a major irritant in motor insurance claims. While Bajaj Allianz has ensured some transparency by issuing a 'claims assessment calculation' sheet, a cover that waives depreciation completely will be more beneficial to the customer. **Vehicle replacement:** This is a cover that offers a new vehicle of the same make and model if the insured vehicle is stolen. This would include applicable taxes and charges, such as road tax and registration charges.

Emphasis on Service: Over the past couple of years, we have seen improvements in the service delivery standards. The customers have become more discerning in their choice of service providers, placing more emphasis on speed and the courtesy with which a contract is fulfilled. Service, not price, will be the key differentiator in the market. In keeping with this trend, insurers are using technology to extend their services. Some of our innovative services include:

SMS alerts: On registering a motor claim with Bajaj Allianz, the

customer receives a chain of SMS alerts updating him on the claim status till the final cheque is dispatched.

On-the-spot assessment: Our team visits the customer, not the other way around, thus reducing the hassles of getting claims assessed. Home visit: This is a service for senior citizens for pre-policy medical check-up and diagnostics.

In-house claim settlement: To lower the turnaround time in settling hospitalization claims, more firms are setting up teams to manage the claims, instead of depending on third-party administrators.

In short, despite the many ramifications of detariffing, the industry is still in a nascent stage and constantly evolving. In the future, many expected changes such as higher FDI, increasing number of players in the market and additional regulatory changes by the IRDA would be the catalysts for a further metamorphosis of the industry. The future holds many turbulent and exciting times for the Indian insurance industry.

We are seeing the metamorphic changes in motor insurance industry where companies are coming with new products, add on covers and will eventually move to risk based pricing model. It might take insurers 2 to 3 years after de-tariffing to build a robust database. It might be worthwhile for the individual insurance companies to use agreed benchmarks during the initial phase.

The purpose of this paper is to find out are consumers of India are ready for motor insurance products based on risk based pricing. Where till now they were only buying insurance cover only based on three risk factors without worrying about the risk they are adding to the pool. Worldwide all the insurance companies are working hard to personalize insurance rates by considering more and more factors. Intense competition force insurance companies to float various products with maximum coverage and competitive rate. Currently companies in India only giving add on covers to attract customers but eventually they will steer to risk based pricing. This paper will reflect the perception of customers, their acceptance for new risk based pricing and how their personal profile, past experience about traditional products and services affects their acceptance for risk factors. Since different insurance companies will rate their customers differently and products will vary company to company, perception and acceptance of customers is critically important as they can they can shop around for best suited product.

Methodological Framework:

The present study is exploratory in nature. The findings of this study are based on a survey conducted with majority of the responses from Delhi-NCR. The objective was:

- To study the most acceptable risk factors, associated with pricing of motor insurance by Indian customers.
- To study the attribute based perceptual map of customers towards pricing of motor insurance associated with

Insured, Usage and Vehicle.

Understand the factors important for insured for their satisfaction so as to suggest factors to be considered in pricing of motor insurance. A structured questionnaire was used in the survey. The questionnaire contained about the expectations of Insured and their satisfaction with the current factors in use. Various parameters were used in the questionnaire to analyze the acceptance of customers for varied risk factors.

Data Collection:

A questionnaire was developed to gather information from the customer who has an insured vehicle insured. Respondents have been asked to rate fifteen variables in a 5-point scale on their importance level. Questionnaires were distributed to 200 people. 150 completed questionnaires were received who satisfy conditions of having insured four wheeler. The questionnaire was analyzed with the help of SPSS 16 version to perform factor analysis and discriminant analysis.

Discriminant analysis:

Tests of Equality of Group Means

	Wilks' Lambda	F	df1	df2	Sig.
Age	.723	27.960	2	146	.000
Color	.974	1.959	2	146	.145
Parking Area	.985	1.139	2	146	.323
Health & Habit	.994	.418	2	146	.659
Driving History	.822	15.847	2	146	.000
IDV	.669	36.100	2	146	.000
Mileage	.841	13.847	2	146	.000
CCV	.904	7.742	2	146	.001
Geographical Location	.942	4.491	2	146	.013
Multiple Drivers	.995	.360	2	146	.698
Repair & Spare cost	.938	4.850	2	146	.009
Gender	.769	21.884	2	146	.000
Time of the Day	.887	9.326	2	146	.000
Fuel used	.751	24.218	2	146	.000
Education	.907	7.519	2	146	.001

Here the value of Wilks' Lambda indicates group differences. A low value of degree of significance also indicates higher group differences. However in this case, the values of wilks lambda are for Age, Gender and Fuel Used. But looking at the last column, all attributes except Color, Parking Area, Multiple Drivers and Health & Habit seem to be significantly between the risks based factors.

Eigen values

Function	Eigen value	% of Variance	Cumulative %	Canonical Correlation
1	4.656 ^a	77.5	77.5	.907
2	1.350 ^a	22.5	100.0	.758

a. First 2 canonical discriminant functions were used in the analysis.

The Eigen value is the ratio of the between-group sum of squares to the within-groups sum of squares. The largest Eigen value corresponds to the Eigen vector in the direction of the maximum spread of the groups mean. The second largest Eigen value corresponds to the Eigen vector in the direction that has the next largest spread, and so on. The percentage of variance column allows you to evaluate which canonical variable accounts for most of the spread. Here, the first Eigen value is able to explain 77% of the variance.

Wilks' Lambda

Test of Function(s)	Wilks' Lambda	Chi-square	Df	Sig.
1 through 2	.075	359.601	30	.000
2	.426	118.753	14	.000

This table is used to identify the function, which is significant in explaining the differences among the groups. Wilks Lambda is the proportion of the total variance in the discriminant scores not explained by differences among the groups. Wilks lambda ranges between 0 and 1. Value close to 0 indicates the group means are different. Value close to 1 indicate that the group means are not different. Here since both the Wilks lambda values are close to zero they are able to explain the differences in the groups. Thus both the functions are significant.

Standardized Canonical Discriminant Function Coefficients

	Function	
	1	2
Age	.751	.205
Color	2.191	.962
Parking Area	.952	.969
Health & Habit	1.921	.995
Driving History	-.889	1.054
IDV	.076	.748
Mileage	.240	.034
CCV	2.536	-.479
Geographical Location	.901	.713
Multiple Drivers	.957	.137
Repair & Spare cost	.701	1.179
Gender	1.931	.354
Time of the Day	1.046	.055
Fuel used	1.222	1.137
Education	.555	.641

When variables are measured in different units, the magnitude of an unstandardised coefficient provides little indication of the relative contribution of the variable to the overall discriminant function. Standardizing the coefficient allows one to examine the relative standing of the measurements. The higher value of the coefficients allows one to examine the relative standing of the measurements. The higher value of the coefficients for a particular attribute on a function indicates the higher loading of the same on that function.

Structure Matrix

	Function	
	1	2
Education	-.309*	-.192
Time of the Day	.164*	-.040
IDV	.145*	.061
Parking Area	.057*	-.022
Health & Habit	.034*	.019
Multiple Drivers	.032*	-.011
Mileage	-.025	-.372*
Driving History	-.123	.330*
Gender	.194	.304*
Age	-.241	-.288*
Fuel Used	.220	.281*
CCV	.067	-.251*
Repair & Spare Cost	.007	.221*
Geographical Location	-.084	-.146*
Color	-.020	.136*

*. Largest absolute correlation between each variable and any discriminant function

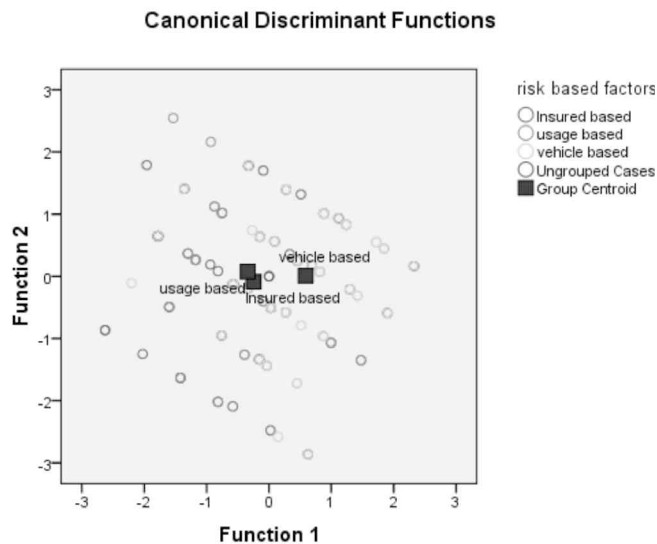
The structure matrix contains within group correlations of each predictor variables with the canonical function. For each variable, an asterisk marks its largest absolute correlation with one of the canonical functions.

Functions at Group Centroids

Factors Associated With	Function	
	1	2
Vehicle	.433	1.601
Insured	-2.838	-.604
Usage	2.349	-1.010

Unstandardized canonical discriminant functions evaluated at group means

This table displays the canonical variable means by groups. Within-groups means are computed for each canonical variable.



As seen from the graph factors associated with Vehicle, Usage and Insured have their unique positions on the map. In addition, on the same map, we have now plotted values of the attributes on the same two dimensions. As we can see, dimension 1 seems to be combination of Color, Health & Habit, Gender, time of the Day, Mileage, Multiple Drivers, Parking Area and Fuel Used. This is also evident from the standardized discriminant coefficients for these factors.

Dimension 2 seems to comprise mainly CCV, Repair & Spare Cost and Driving History, the vector (arrow) that is closest to the vertical axis. This is also evident from standardized discriminant coefficient of this variable.

Factors and their association with attributes/dimensions:

Factors Associated with Vehicle seems to be stronger on dimension1 (a combination of Color, Health&Habits, Gender, Time of the Day, Mileage, Multiple Drivers, Parking Area and Fuel Used) and Factors Associated with Usage on dimension 2 (CCV, Repair Spare Cost and Driving History). However Factors Associated with Insured seems to score low on both the dimensions compared to its competitors.

Limitations & Directions:

While generalizing the finding of the study for varied class of customers, caution should be made, considering sample size and area of study and that study was conducted in NCR with similar vision and purpose. Since the study focused only on insured perception but other contributors in risk analysis also need to be identified. Future research is needed in establishing a model, which can guide Indian risk based pricing in line with globally accepted pricing attributes in ever changing environment.

Conclusion:

Till now Indian customers are only buying insurance on the basis car make and model, geographical area and our research found that Indian customers prefer vehicle based factors, there

next preference is usage based factors and the least preferred is insured based. Indian insurance market is in infant stage, customers are looking for lower price but do not want to get judged on multiple factors rather interested only in easy to understand risk factors. Insurance industry needs to introduce factors slowly with improvement on customer service. If we see factors individually the new factors on which customer are ready for discrimination are education, health and habits, color of vehicle, fuel used and driving history. Since the study is based in Delhi and NCR where mostly respondents are educated that's why they prefer factors like education, driving history, health and habits are preferred. In India there are more than 16 insurers dealing in motor insurance and after de-tariffication every insurer is working on their loss ratio and factors affecting the loss. Each company has their own preferred risk factors based on past claims and customer base. They are trying to tap the market on the basis of variation in services and adding new factors, which are highly influential. Customers are aware of changing market scenario and inspite of understanding need of risk based pricing they are simply ready to check various insurers for premium rates. Discussion with the customer revealed that they are ready to explore market; respondent said that if they had choice they'll go for alternatives offered by other insurers. Indian insurance industry takes time to statistically analyze the most important factors, which will be acceptable by customers. They should focus on risk management and educating customers about the importance of risk based pricing. Focus should be on rewarding good customers and penalizing the risky one so that they can fully utilize the benefit of de-tariffed market.

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