



CASE STUDY On-Line Analytical Pricing Solution



Motor Vehicle Insurance: Risk modeling, Demand Based Pricing and Online Solution Implementation

Case Summary

Industry: Insurance

LoB: Motor Insurance

Project Focus: On-line analytical pricing solution

Challenges

Improve the business performance of the motor vehicle insurance division through adjustments in pricing. The company was looking to implement a new rating engine.

Business Results

- Observed uplift in the field test of about 1% of GWP, hitting the target goal set by the insurer under its strict constraints. The potential for much higher gains was also verified, should the insurer decide to ease its self-imposed constraints.
- One-stop solution for real-time Demand Based Pricing, risk modeling and demand modeling
- Company adopted measurable KPIs and gained clarity on business drivers

Background

The company is a large insurance company in South America that is owned by a multinational insurance company. They offer all types of life and non-life insurance in the private sector. The auto book is over \$500 million and includes over 800,000 customers.

Business Process

The company sells motor vehicle insurance policies through several distribution channels including the internet, call-centers, agents and brokers. The majority of policies held are monthly.

The price of the policy can change every month and is affected by various rating factors including car value. In this country, car values can be volatile and are impacted by the inflation rate.

Every three months, the insurance company sends out a price that covers the next three month period. This price usually remains static for each month during this period.



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Project Process The Earnix way

Project preparations



Define business goals
e.g. Improve performance,
increase market share



Define project constraints
e.g. Range of price changes



Determine base line
e.g. Regenerate existing
pricing models and
methodologies



Data cleansing and analysis
Gathering, cleaning and
analyzing data



Statistical modelling
Build models to predict
business processes



Extensive scenario analysis and testing
Exploration of what-if
scenarios



Optimized pricing strategy recommendations
Support decision -
making process



Pricing

Business Needs

The company wanted to achieve the following:

- > A new flexible rating system to calculate policy prices
- > More sophisticated risk models with geo-modelling
- > An individually Demand Based Pricing capability that would be based on risk and retention models
- > Understand the difference in price flexibility and product preferences in different segments
- > Predict the effect prices had on retention and calculate whether more sophisticated pricing methodologies would add any value

Business Goals & Constraints

The company wanted to explore the tradeoffs between an increase in market share and profitability. They required constraints for price changes that were dynamic i.e. a function of car value.

The Earnix Solution

The Earnix project process included the following steps:

- > Project preparation:
 - Definition of business goals and constraints
 - Baseline calculation
- > Data cleansing and analysis
- > Statistical modelling
- > Pricing
 - Extensive scenario analysis
 - Optimized pricing strategy recommendations



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A demand based scenario was agreed upon which respected the dynamic individual constraints.

The process above culminates in a detailed evaluation of results which forms the basis of the Earnix solutions report.

The project extended over an eleven month period: data preparation required two months, risk modeling required four months, retention modeling required three months and an additional two months was needed for scenario optimization and pricing. The field test finished with excellent results, achieving a significant increase in earnings equivalent to close to 1% of GWP, with no change to the retention rate.

The result was as expected as the optimization scenario implemented had tight restrictions on the price differential to the non-optimized scenario and so a cautious implementation was desired. Based on the excellent results of the field test the company can open up the restrictions in the future to gain even more benefit.

Challenges and Solutions

1) Revising modeling data

For risk modeling, the company previously used risk modeling data that contained claims data with little development, in some cases less than one month. Many of the claim amounts had an identical automated initial reserve estimate. Therefore, the assumption of a gamma distribution for the claim amounts in the regression models on this data were not appropriate.

Earnix recommended that for risk modeling, the company use data that had a minimum of 6 months development for long-tail perils and 3 months development for short-tail perils. This made the assumption of a gamma distribution when running regression models more appropriate.

2) High inflation market with prices linked to car value

Since a proportion of the price of the motor insurance policy is linked to the car value, (as an index of inflation) the company required that the individual price change constraints also needed to be linked to the car value.

The Earnix solution has the functionality to implement flexible individual constraints which allows the company to define a base set of price increases for the monthly renewals (e.g. minimum of 1% increase and maximum of 5% increase) but these were set so that they could be dynamically adjusted if the car value adjusts. A demand based pricing scenario was agreed upon which respected the dynamic individual constraints.



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A full set of new pricing strategies were developed. This empowered the company to select the most appropriate pricing strategy to drive their future growth.

3) Volume modeling designed for specific renewal processes

The company had monthly renewal policies, however the renewal invites were sent to customers every three months containing the price for the next three monthly policies.

4) Changes to the environment

After the pricing committee met to approve the Demand Based Pricing scenario, there was a three month delay in order to allow the integration of the Earnix software with the companies' core systems. The Earnix software immediately allowed for the generation of relevant scenarios so that they could be implemented when the company's IT department was ready for implementation.

Business Results

The Earnix Professional Services team worked closely with the top echelons of the company's product and pricing teams. The following are the key benefits from the project:

1) New pricing strategy

Several individually Demand Based Pricing strategies were developed and presented to the company, accompanied with the predictive ramifications of each pricing strategy. This empowered the company to select the most appropriate pricing strategy to drive their future growth.

2) Integration of Earnix Insurance in the production environment

The integration allowed the company to quickly implement pricing strategies. This means that strategies reviewed in pricing meetings can be quickly implemented as Earnix provides an easy interface to deploy a pricing strategy from the analytical environment to the online environment.

3) Validity and performance testing can be performed from Earnix Insurance Solution

The customer IT department did not have a flexible testing process. Earnix Insurance Solution provides the customer with an option to create validity & performance tests so that new pricing strategies can be quickly tested in a testing environment before being deployed to the production environment.

4) Cloud environment

Having the analytical environment on the cloud allows Earnix to give immediate support for technical issues. For example, additional external data was acquired after the project was completed and Earnix assisted the company in reviewing how the new data could be integrated into the risk models.



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New pricing strategies can be quickly tested in a testing environment before being deployed to the production environment.

3) Earnix successfully met the company's business goals within the given constraints

After running a field test, the actual field test results were very close to the predicted figures, thus achieving the expected economic benefit of the project.

4) Observed uplift in the field test

of about 1% of GWP, hitting the target goal set by the insurer under its strict constraints. The potential for much higher gains was also verified, should the insurer decide to ease its self-imposed constraints



About Earnix

Earnix provides advanced analytics solutions designed for the financial services industry, which deliver significant results by integrating data-driven decision-making into the business process. We enable financial institutions to better compete in a new environment of highly personalized services by using advanced analytics to determine pricing and other offer components. Our integrated technology platform provides users with the most comprehensive set of tools, including machine learning capabilities, and is often connected to real-time production systems. Earnix has extensive experience providing solutions to the most sophisticated insurers and banks around the globe, and has a track record of empowering executives to act quickly and confidently, making a direct and measurable impact on their key performance indicators.

For more information visit

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