SAS Predictive Claims Processing

Detecting Fraud, Increasing Recovery and Optimizing Workflow through Analytics

THE POWER TO KNOW.

Stephen W Swenson, MBA – SAS Insurance Development Executive

Agenda

- Current Economic Market Issues
- Fraud & It's Impact on Loss Costs
- Claims & Insurer Profit Implications
- Predictive Claims Processing
- A Hybrid Approach to Fraud
- Customer Business Case
- Question & Answers

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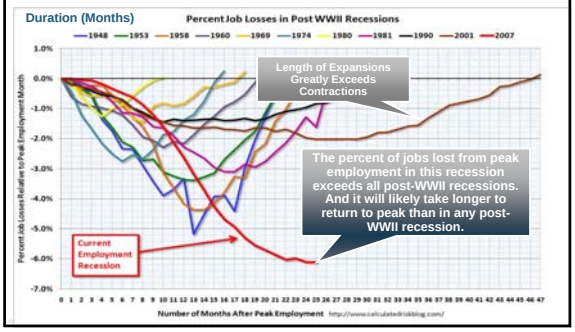
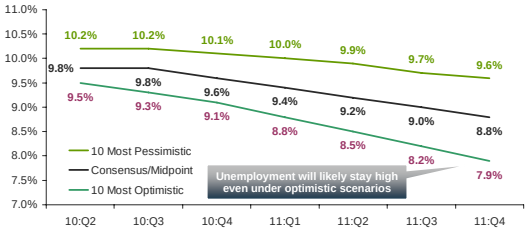
Current Economic Market Issues – Job Losses

Percent of Job Losses from Peak Employment in Post-WWII Recessions



Current Economic Market Issues- Unemployment

US Quarterly Unemployment Rate Forecasts



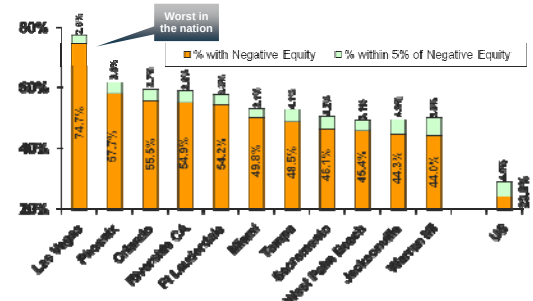
Persistent high unemployment will expose insurers to higher fraud propensity

Sources: Blue Chip Economic Indicators (3/10); Insurance Information Institute

5

Current Economic Market Issues – Negative Equity

Dozen CBSAs* w/ Highest Percent of Homeowners w/ Negative Equity, Q4 2009

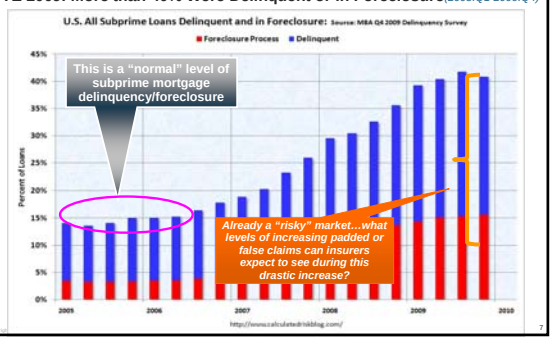


*Core Based Statistical Area. A **Core Based Statistical Area** is the official term for a functional region based around an urban center of at least 10,000 people, based on standards published by the Office of Management and Budget (OMB) in 2000. Source: FirstAmerican CoreLogic.

6

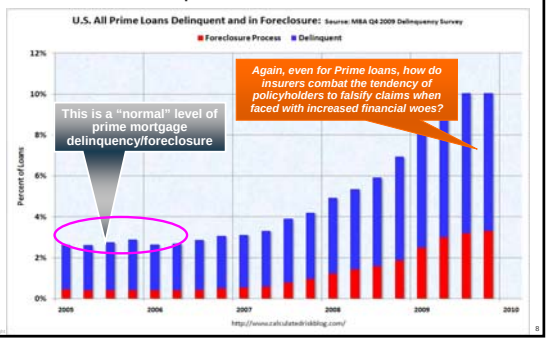
Current Economic Market Issues- Subprime Loans

YE 2009: More than 40% Were Delinquent or in Foreclosure *(2005:Q1-2009:Q4)*



Current Economic Market Issues – Prime Loans

YE 2009: Percent Delinquent and Foreclosure Reached 10%



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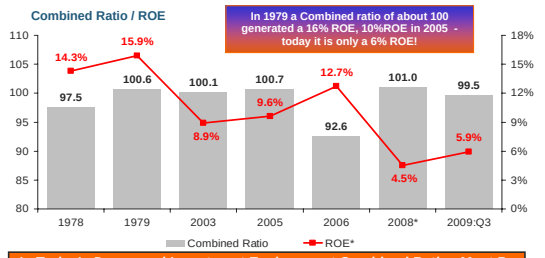
Claims & Insurer Profit Implications – Combined Ratio

A 100 Combined Ratio Isn't What It Once Was: Currently about 90-95

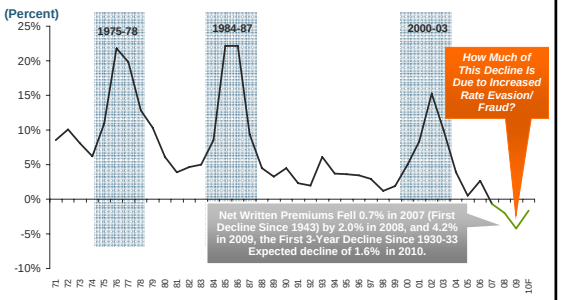


In Today's Depressed Investment Environment Combined Ratios Must Be Lower to Generate Risk Appropriate Returns…how to get there??

* 2009 figure is return on average statutory surplus. 2008 and 2009 figures exclude mortgage and financial guarantee insurers
Source: Insurance Information Institute from A.M. Best and ISO data

Claims & Insurer Profit Implications – NWP Growth

Year-to-Year NWP Growth is Weak in Recessions: Rate Evasion?



Shaded areas denote "hard market" periods. Sources: A.M. Best (historical and forecast), ISO, Insurance Information Institute; Jeff Reynolds, "Evasive Maneuvers," *Best's Review*, March 2010

Claims & Insurer Profit Implications

Operational Challenges Facing the Claims Industry Executives…

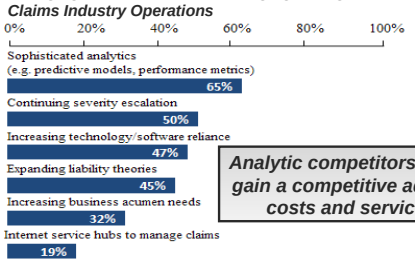
- Attracting/Retaining top talent – 82%
- Effective use of data and analytics – 52%
- Technology optimization – 50%

Claims executives view these issues as immediate challenges requiring more attention than traditional claims goals, e.g., customer service, overall costs.

Source:2008 Towers Perrin Claims Officer Survey

Claims & Insurer Profit Implications

Emerging Issues and Trends Bringing Change to Claims Industry Operations



Analytic competitors can rapidly gain a competitive advantage in costs and service levels

Source:2008 Towers Perrin Claims Officer Survey

Claims & Insurer Profit Implications

- Claims Operations – low number of predictive analytical models deployed in claim lifecycle
  - Legacy system infrastructures continue to hold insurers back from reducing costs and creating operating agility
  - Only ~30% of insurers operate a new generation claims transaction system – creates more flexibility of claims operations
  - Workflow improvements derived from basic claim file-type routings; statistical process control methodologies not applied
  - Minimal "real-time" integration of predictive analytics into claims lifecycles

Given the operational constraints, how can insurers expect to aggressively manage total loss costs?

Claims & Insurer Profit Implications

- *"Negative premium growth for 2009…marks the first three-year sequential decline in premiums written since the Great Depression."* Dr. Robert P. Hartwig, CPCU
- P/C Insurer Loss and Loss Expenses approximate 73% of total costs
  - Example - A $5bl insurer with a 73% Total loss ratio is $3.65bl!!
- Technology is a disruptive market force
- Future Combined Ratio implications are not bright
  - 2010 P&C combined ratios are anticipated to exceed 100%
  - Declining premiums
  - Increasing Loss costs and LAE

Remember the "burning platform" analogy??

Claims & Insurer Profit Implications

- *Business Opportunity: Negative Premium Growth*
  - *Keep current customers longer(claims satisfaction); know them at a deeper level*
- *Business Opportunity: Increasing/constant loss expenses*
  - *Integrate predictive analytics into claims lifecycle for improved:*
    - ✓ *Fraud detection across all lines of business*
    - ✓ *Enhanced customer claims experience via new treatment strategies*
    - ✓ *More aggressive medical payment management*
    - ✓ *More precision reserving to leverage greater capital impacts*
    - ✓ *Increase probability for recovery through subrogation/litigation*

Is this the new imperative for insurers(actuaries)?

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Fraud & It's Impact on Loss Costs

Does insurance fraud = financial crime?

- Research conducted in July 2009 showed that
  - 16% of adults would not rule out making an exaggerated claim
  - 44% believe that it is acceptable or borderline behavior to exaggerate an insurance claim
  - 30% stated that it was acceptable to overstate the extent of damages being claimed
  - 18% expressed that it was acceptable to add other items to a claim

Source: Survey by Assn of British Insurers

Fraud & It's Impact on Loss Costs

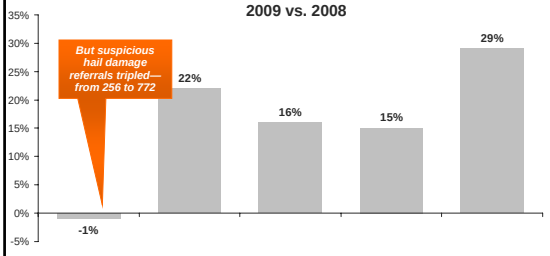
P&C Insurance Fraud Landscape

- **1 in 5 US** adults believe it is acceptable to defraud insurers under certain circumstances. (*Coalition Against Insurance Fraud*)
- Fraud accounts for 10% of the P&C insurance industry's incurred losses and loss adjustment expenses, or about **$30 billion a year**. (*Insurance Information Institute*)
- A 2009 report shows an increase in **opportunistic fraud**, where a policyholder has a legitimate claim but pads it to produce a larger payment. (*National Insurance Crime Bureau*)
- NICB reports **double-digit growth** in questionable claims submitted from 2008 to 2009 in every line of business. (*National Insurance Crime Bureau*)

Fraud & It's Impact on Loss Costs

Change in NICB Referrals of Questionable Property Claims

2009 vs. 2008



Source: NICB ForeCast Report, January 25, 2010

Fraud & It's Impact on Loss Costs

A growing business?

- **10% - 15%** of workers are misclassified by their employers, causing excess risk for insurers and resulting in millions in lost premium. (*Coalition Against Insurance Fraud*)
- Bogus slip-and-fall injury claims and related costs amount to nearly **$2 billion a year**. (*National Floor Safety Institute*)
- Fraud and buildup in personal auto claims alone added **$4.8 to $6.8 Billion** in excess payments to auto injury claims in 2007, a 13 – 18% increase over 5 years. (*Insurance Research Council*)
- Auto insurers lost **$16.1 billion**, due to premium rating errors in private-passenger premiums in 2007. Fraud accounts for a significant portion of these losses. (*Quality Planning Corporation*)

Fraud & It's Impact on Loss Costs

Assumptions: **$1.76bl Multi-Lines Insurer**

LOB	Loss Ratio	Loss Costs
Commercial NWP	59.0%	87,806,750
Personal NWP	59.0%	950,863,470
	Total	$ 1,038,670,220

Possible Fraud: **Industry Averages Range** **Current Detection Est.**

		Fraud = 5%	Fraud = 10%	Detection = 5%
Commercial		4,390,338	8,780,675	439,033
Personal		47,543,174	95,086,347	4,754,317
Total		51,933,511	$ 103,877,022	$ 5,193,350

Net Additional Lift $$ using 5% Current Detection Rate

	Vs. Current	Fraud = 5%	Fraud = 10%
Commercial	20% Lift	878,068	1,756,135
Personal	20% Lift	9,508,635	19,017,269
Total Lift $$		$ 10,386,702	$ 20,773,404

Loss Ratio Impact

Fraud = 5%	Fraud = 10%
58.41%	57.82%
-0.59	-1.18

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Future State – Predictive Claims Processing

Integrate analytic models and predictive insights into claims transaction systems…

- Integrated run-time analytic engine to deliver predictive insights for:
  - Fraud detection
  - Claims routing and assignment for special handling
  - 'Fast-track' or 'light-touch' settlement decisions
  - Precision case reserving
  - Recovery and subrogation detection
- Optimize workflow & workload management
- Integrated model development and maintenance tasks

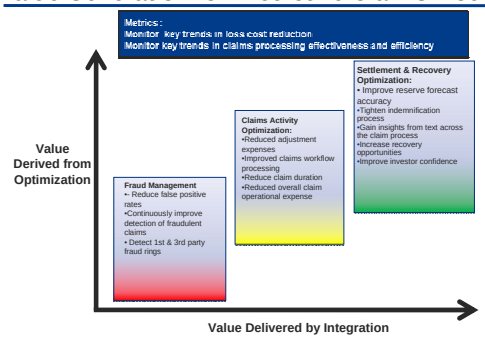
Predictive insights around multiple claims process events support adjuster's decision making and workflow, combined with dynamic business rules based on predictive modeling results.

Applied analytics to improve combined ratio

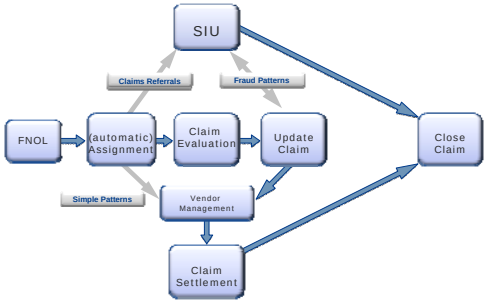
ROI is achieved through a combination of model development and model integration into the claims business process…

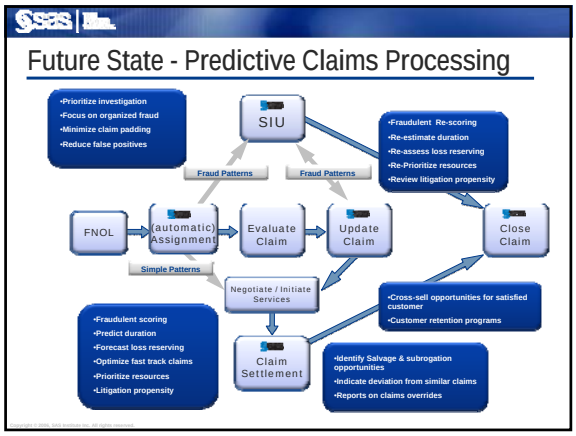
Analytics ROI	Hard Metrics	Soft Metrics
Reduction of fraud	▪ Loss Cost Reduction ▪ Conserve loss adjustment expenses ▪ Reduce resource drain and SIU expenses	▪ Reduce fraud driven anti selection bias
Adjustor efficiencies	▪ Conserve allocated and unallocated loss adjustment expenses ▪ Claims adjustment / efficiency metrics	▪ Work force retention ▪ Reduce claims management overhead
Precision loss reserving	▪ Reduce reserve write-downs	▪ Reduce surplus volatility ▪ Improve investor confident ▪ Appropriate surplus allocation ▪ Controlled Enterprise Risk
Improved customer satisfaction/retention	▪ Policy survival /retention ▪ Sustained year-over-year NWP and PIF	▪ Competitive Differentiation based on Claims Service ▪ Increased agent satisfaction

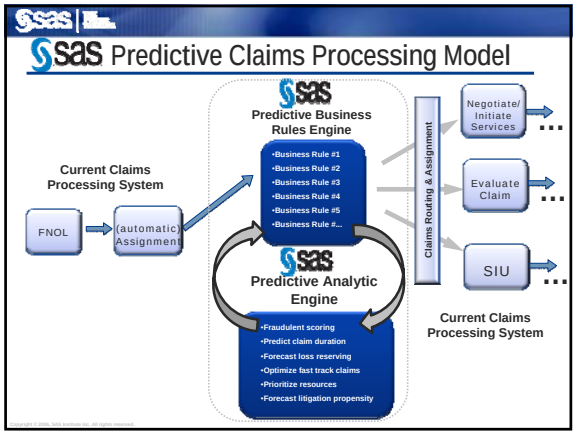
Value Generation for Predictive Claims Model

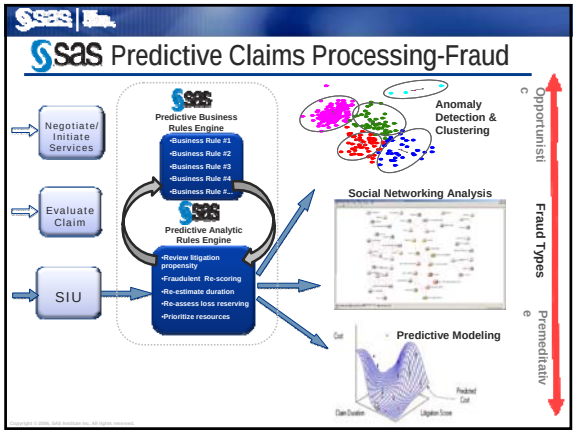


Typical Claims Processing Model *(illustrative)*









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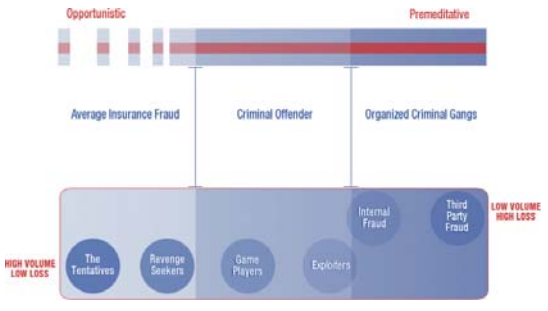
SAS History of Fraud Detection

Enterprise wide capabilities span more than 30 years across many verticals, leveraging multiple statistical disciplines and detection methodologies

- Thousands of global SAS customers spanning multiple industries and functions, e.g.,
  - Financial Services(insurance/banking) – Claims, payment fraud - credit card/check/debit, anti-money laundering
  - Health & Life Sciences – Provider, patient, networks
  - Retail – Credit/card, employee
  - Manufacturing – Warranty analysis & early detection
- Customers benefit from the multi-disciplined experience

Key learning – fraud is a dynamic, ever-changing business issue, requiring an agile and comprehensive

Types of Insurance Claims Fraud



33

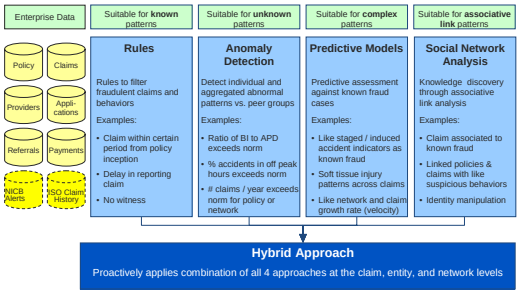
PoV for Fraud Approach in Insurance

Enable Multiple Analytical Techniques...

- Prioritized business rules (red flags)
- Database searching – internal & third party
- Exception reporting
- Query and analysis
- Text mining
- Unsupervised analysis (e.g., anomaly detection, clustering)
- Supervised analysis (e.g., predictive modelling)
- Social Network Analysis

SAS® Fraud Analytics

Using a Hybrid Approach for Fraud Detection



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Customer Business Cases

Does analytical fraud detection scoring work?

Insurer 1

Estimated $9.5m+ of savings

70% cases identified now fraudulent

Insurer 2

Major national fraud ring broken

Multi $m of savings

Insurer 3

$1.3m+ of savings in first phase

Hit rate improved from 27% to 60%

Insurer 4

Estimated annual savings $18.2m per annum on auto book using data and text mining

Significant increase in hit rate.

Customer/SAS under NDA - real cases where the customer has asked us not to share their name.

Customer Business Case

Worker Compensation – Case Study

Highlights

- 100% of WC claims processed
- 46% correct hit rate on flagged claims(combined)
- Over $6.5 Million additional savings in Top 1%
- 4 years of historical data from 4 data sources

Business Problem

Large U.S. commercial insurer was incurring significant fraud losses across their lines of business. The insurer **engaged SAS in a pilot** to determine the solution that would provide the most lift over their current rules and models and enhance effectiveness of the triage and fraud investigation teams.

SAS Approach

SAS subjected **4 years of historical data** from 4 different data sources (including claims, medical bill payments, claim payments, and fraud case data) to the predictive capabilities of the SAS Fraud Framework. Client investigators evaluated the solution results during a **3 week validation** period to identify incremental fraud detection at the claim and network levels, reduction in false positives, and enhancements to investigative efficiency.

Results

The pilot resulted in a business case and deployment roadmap for full implementation,

- **False positive reduction: 46% correct hit rate**
- **Over $6.5 Million additional saving in Top 1% of claims identified**
- **67% of networks identified as fraudulent activity**
- **Investigative efficiency: Over 30% increase**

Fraud Proof of Concept Approach

Approach: Evaluated 800,000 claims covering a 4 year span with data from multiple systems

- Build predictive models for Workers Comp & General Liability lines of business
- Provide a list of 400 claims (200 GL & 200 WC) chosen via a random sample of the top 1% highest scored claims, removing all KNOWN previously referred claims
- SAS also to provide up to 15 "social networks" for evaluation

Results:

- **67% acceptance rate for Social Network Analysis**
  - 10 out 15 network based cases accepted
- **57% acceptance rate for Workers Compensation**
  - 113 out of 200 WC claims were accepted
- **33% acceptance rate for General Liability**
  - 66 out of 200 GL claims accepted
- **42% acceptance rate projected for production**

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P&C Industry Trends

- The overall state of the economy and a soft pricing market limits top line growth
- Declining sales and payroll from commercial businesses deteriorates premium
- 2010 P&C combined ratios are anticipated to exceed 100%. Controlling loss costs is critical.
- Litigation and medical costs are rising
- Economic pressure provides incentive and justification for insureds and claimants to commit insurance fraud

Fraud & It's Impact on Loss Costs

"In this economic environment, both businesses and individuals are more tempted to commit fraud."

Steven Nachman,
Deputy Superintendent NY State Insurance Dept.

Source: "Hard-up Investigators Battle Against Rise in Comp Fraud," *Business Insurance*, November 9, 2009.

Fraud & It's Impact on Loss Costs

Cost effective insurance fraud detection

- Estimated that 'fraud' adds an additional 5 to10% to final premiums paid worldwide
- Main argument against is 'cost effectiveness' of insurance detection
  - Can be an expensive process 'proving fraud'
  - Need to 'warn off' potential fraudsters
  - Early mover advantage
- For low cost frauds - automate
  - 'Firm but fair' letter
  - 'Refer' list

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