Cost of Not Investing in Fraud Control Measures for Insurers

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"The beauty of any first time is that it leads to a thousand others"

- Pico Iyer

The cost of fraud management shouldn't be seen only as saving of the initial loss, rather as the cost of multiple, untraced, exponential, mastered events, before it becomes too big to eradicate. The article depicts the psychology of fraudster -

- *Fraud?? No!! It's my ROI.*
- *Isn't it just a victimless crime? A "low hanging fruit" or*
- *Deep pockets of insurers' won't even know!!*

and insurer's dilemmas -

- *How to pick a fraudster?*
- *Isn't it "cost of doing business"?*
- *Monitoring the utility of fraud management*

The article presents case studies and mathematical models, for a prudent and economical view on this topic.

Introduction

One of the major ambitions of some individuals is to make "easy" money, and that too in a 'jiffy'. It may initially start with an inconsequential sum but by habit snowball into large amounts within a short time. However, the easy money so earned is more often ploughed into the grey business areas posing serious threat to the economy of the country and society at large. Against this background, having a basic knowledge of the fraud industry can lead to a better understanding of its effects and cost to the insurance industry.

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Fraud/s can be committed by:

- Increasing the premiums even for the honest insured client.

- Introducing hurdles into the otherwise smooth claim payment process/system.

- Reducing the competitiveness towards the preferred audience.

- Reducing the trust in the company in general and industry as a whole

- Reducing the profits of the stakeholders; downgrading the general outlook of the industry

- Hindering the introduction of innovation or technology

- Litigation costs and hidden costs / repercussions - The "Tip of an Ice-berg" theory.

What is a Fraud and Who is a Fraudster?

'Fraud' usually means wrongful activities such as theft, conspiracy, bribery, money laundering, corruption, embezzlement or extortion. Although it is defined differently in different countries, the basic essence of a fraudulent act remains the same. The only difference being the levels of its acceptance or toleration – a kid's simple act of stealing some change to buy chocolates to major financial offences worth billions are all acts of fraud. Whatever be the form or size of the fraud, the outcome is always the same – unfair disadvantage to an honest stakeholder.[1]

Although it is true and fair to assume that majority of the people are law-abiding citizens, yet it does not discount the fact that many in society would not pass over an opportunity for an easy win without repercussions. Blame it on human nature! As per Clarke (1990) there is a hypothesis that some of the soft frauds are actually due to genuine errors of innocent stakeholders. Practically speaking, if one is placed in a situation, which offers the opportunity of any of the two enablers for committing fraud – i. e. 'motivation' and 'rationale' – one will succumb to the occasion; and conversely, if given the opportunity, one will surely find the rationale and motivation to commit the fraud till such time the repercussions of getting caught is within the ethical/moral tolerance levels. And this paradigm defines the different levels of fraud; hence, different people tend to commit a variety of frauds, while they are placed in the same situation/s.

Keeping the insurance industry in mind, the understanding of the problem will be incomplete without evaluating the **excuses that individuals give to commit a fraud.** The "justifications" that trigger frauds can be listed as follows:

- **Dis-satisfaction** with the employer (in the case of internal frauds) or insurers (in the case of external frauds)

- The perception that it is their **privilege** to be justly compensated as they have paid a good amount of premium.

- Perceived **peer-confidence** – everyone is doing it; so, why should I pass up the opportunity provided.

- Internal **grape-wine** about the involvement of the senior management in some or the other fraudulent activity.

- No-one is the loser from this activity, as this is apparently a **victimless crime.**

- The general perception that insurers are "**big pockets**", hence none will be affected by a small fraud committed by one individual.

- Dissatisfaction with the **previous claim settlement** as higher premiums are being charged.

- **Emotional factors**, like the satisfaction obtained from the mastery of a situation, boosting one's ego, prestige, pride or revenge in deliberately defrauding the insurance company as a sport with the belief that insurers can afford; These rationalizations make the insurers a socially acceptable target.

- Marginally inflating claims is a usual method of recovering past premiums paid or **compensating deductibles.**

Based on these "justifying" pointers or rationalization, fraudsters can be classified into the following general profiles:[2]

- **An Occasional Opportunist** is an otherwise honest individual who finds him/her self in a situation of opportunity to commit a fraud. In such cases, generally, the quantum of his/her fraud being small would invoke the ethical justification that it won't affect the insurance eco-system greatly. In fact, the perception is that the premium being charged already provides for provisions for such leakages. In the case of internal frauds, the example could be: inflating the expenses or costs and compromising the books to one's benefit.

- **The Organized Professional Hunter** is an individual who is a repeat offender, who professionally defrauds the insurers and expects this as normal source of income. Such frauds / leakages keep happening until questioned or caught, and, generally reveals itself as a syndicate of professional fraudsters who commit such offenses regularly in an organized manner. Thus the complexity of such misdeeds

increases and in-turn the costs of detecting them also mounts. The involvement of professionals makes it clinically a perfect case to go incognito for a long period of time. This self-complacency in many cases leads to other criminal activities as well, threatening the society at large. Determining the costs and duration of such frauds is complex as well.

The insurance industry, by its very nature, is especially prone to fraud. Insurance being a combination of Uberrima fides (Utmost good faith) and caveat emptor (buyers' beware), asymmetry in information will always dominate the system architecture of insurance. This leads to opportunities where the individuals or groups involved have an economic reward attracting them towards perpetrating criminal acts. It can either be an unplanned on the spur of the moment or a pre-meditated and well-planned deliberate act, making it a "low hanging fruit for the picking" or "low risk and high reward", white-collared game, similar to a ransom, theft or trafficking.

Although there are specifically laid down investigation plans and laws with checks and balances for investigating many of the other frauds, insurance does not as yet have a set of specific legislation or regulations on insurance frauds. This appears to be the situation even in the most matured insurance markets. Even in those markets where the regulations are in place, either the sentencing is not sufficiently severe compared to other frauds, or there is a lack of persistent efforts on the part of insurers, courts or regulators to control or stop the menace. Effectively, this lacuna encourages the professionals to proliferate their frauds. Added to the problem is the lack of proper channels for mutual communication between the insurers themselves. This encourages and empowers the fraudsters to simply replicate the same acts with multiple insurers with impunity thus diversifying the insurers' risk further. By the time insurers wake up, fraudsters would have vanished blissfully. It is a no-win situation!

The more compelling reason is that it does not take long before this possibility of victimless crime converting itself into major frauds involving serious causalities as more professional criminals enter into the fray. A study of 'closed' claims reveals approximately **12,000 bodily claims** and around a quarter of that number with **non-fatal injuries** all over India. We have ample number of cases of insurance frauds where innocent people have got murdered just because of the insatiable greed for money. .

Insurance frauds can be classified as:

- **Internal vis-a-vis External**

- **Underwriting vis-a-vis Claim -** The major concern with a claim fraud is that it

profits the fraudster but ultimately results in increased premiums for many honest stakeholders of similar risks.

- **Soft vis-a-vis Hard - A** "Soft Fraud" is mostly associated with unwanted opportunistic conduct of otherwise an honest customer. However, a "Hard Fraud" is the collateral damages inflicted, which follows with it, as many a times an innocent victim becomes the causality of the fraudulent act. The economic rewards of hard frauds are considerably higher than soft frauds as well, although the frequency will be lesser compared to the softer ones due to the repeatability factor.[3]

Value of Fraud in Insurance

As per regulatory reports, frauds have caused a whooping INR 45,000 crores loss to the Indian insurers in 2019 alone. In terms of percentages, almost all insurers lose between 10 to 15% across all lines of their business, with health insurance frauds leading the list, which alone touch an average of 35%. Further analysis leads to an observation that about 90% of motor vehicle claim "frauds" are due to padding of claims (effectively inflating damages, injuries or phantom passenger causalities). The remaining 10% of the motor claims are broadly attributed to organized claim staging. In the life insurance segment, majority of the frauds are noticed where the sum assured is between Rs. 2 lakh to 12 lakh where the turn-around time for settling claims is usually shorter than other claims.

The scenario is not very different in matured markets as well. According to the US FBI, insurance fraud drains more than US$ 50 billion from insurers each year and costs the average US family between US$ 400-700 in the form of increased premiums. As per Insurance Europe, the estimates established can be summarized as given in Table 1:

Table 1 : Country-wise Insurance Frauds per Class of Business

Country	Class of Business	Per cent Amount of claim as per loss cost of claim
Germany	All classes of businesses	10
Australia	All classes of businesses	10
Canada	All classes of businesses	10 to 15
Spain	Motor	22
Great Britain	Personal lines	7
Scandinavia	All classes of businesses	5 to 10
United States	Motor	11 to 15
United States	All classes of businesses	10

The comparison of frauds in life and non-life Insurance sectors is summarized in Table 2 as per the observations of Indiaforensic (2012) – 6th Annual Anti-Fraud Conference.[4]

Table 2 : Life Insurance and General Insurance Frauds

	%	INR-billion		%	INR-billion
Frauds in Life Insurance	**86**	**261**	General Insurance	**14**	**43**
Misselling	36	94	Falsifying documents**	70	30
Fake Documentation**	33	86	Other Frauds	30	13
Others	31	81			

**Further analysis of the "Falsification of documents" can be seen in Table 3.

Table 3 : Falsifying Documents

		Per cent	INR-billion
1	Medical bills certificate	31	9
2	Driving license	16	5
3	FIR	13	4
4	Others	40	12

The table represents the % of frauds which were pursued and established after due legal process. General Insurance frauds, which are often seen as victimless crimes and mostly are not pursued to bring the offender under the books, but rather they are closed with claim repudiations. This can be the reason behind lesser number of frauds in general insurance, however any general insurance professional will definitely agree to the notion that this figure is just "tip of the iceberg."

As per WNS DecisionPoint data (released by the National Association of Insurance Commissioners (NAIC), the Estimated Annual Losses (EAL) in general insurance business due to fraudulent claims in 2014 is as follows.

Graph (a) : Cost of Frauds in INR Crores

	Cost of Frauds In INR Crores
Product Efficacy	3,066
Fire	3,829
Marine Inland	3,934
Allied Lines	7,399
Crop	1,498
Financial Lines	1,568
Product Liability	2,443
Health & PA	3,864
Medical PI	3,934
Others	6,244
Commercial Lines - Motor	10,227
Commercial Lines - multiple perils	14,840
Employee Liability	19,831
Workmans' Compensation	23,303
Householders' Package	31,388
Auto ID	36,106
Auto Liability	61,740

Legend: ■ Combined Lines ■ Commercial Lines ■ Personal Lines

Source : WNS DecisionPoint Report

The extent of insurance fraud varies between countries. Detected and undetected frauds are estimated to represent up to 10% of all the claims shell out in Europe. These figure differ between countries and lines of insurance businesses due to various factors like the market size, the regulations, the investigations conducted, the general attitude of insurers and the prevailing knowledge of the particular line of business in the local area. Even within the European Union (EU countries), the approaches to identify the insurance risks are different. Some countries treat the importance of accurate estimate of detected and undetected frauds as a vital parameter, whereas in other countries the focus is on reducing the amount of known frauds rather than making efforts to detect the undetected frauds. But in a nutshell, the idea remains the same, i.e. reducing the known fraud losses and preventing the un-noticed losses. The corroboration details are as follows:

The United Kingdom

Figures from the Association of British Insurers (ABI) show that:

- Around £1.9bn (€2.2bn) of fraud goes undetected each year.

- The value of detected fraud in 2011 rose 7% to £983m (€1 148m) from £919m in 2010.

- In 2011 insurers' uncovered 138,814 fraudulent insurance claims - equivalent to 2,670 claims every week – up from 5% in 2010.

- The value of savings for honest customers from detected frauds represented 5.7% of all the claims, compared to 5% in 2010.

Germany

A study by the insurance association (GDV) observed that around 50% of all the damages to smartphones or tablets / PCs could have been fraudulent in nature as they were not justifiable practically.

Sweden

Figures from Insurance Sweden (Larmtjänst) reveal that:

- Detected frauds worth a total of €40m..

- Around 10-20% of all the fraudulent claims were for losses arising from pseudo-events that never occurred and around 80-90% of all fraudulent claims were padding losses where the claim values were exaggerated.

- In a particular case, it was observed that there was prevalence of vehicle arson. There were at-least one motor arson case reported per day in the south of the country, where almost all the vehicles were more than 10 years old and the ownership was for a period less than three months. The modus operandi was to purchase the vehicles cheaply in online auctions and register them with fictional owners and set them ablaze.

France

FFSA, an insurance association, reveals that around 35,042 fraudulent claims were documented in 2011, resulting in payment of €168m to dishonest individuals.

The above observation helps us to confirm on the cost of insurance loss to be around **10-15% of GWP** on an annual basis, and thus it is a major outgo, which needs to be stopped and probed. As per the survey conducted by RGAin Investigating Life Insurance Fraud and Abuse: Uncovering the Challenges Facing Insurers, the challenges by fraud types observed are as depicted in Graph (b).

Graph (b) : Challenges by Fraud Type
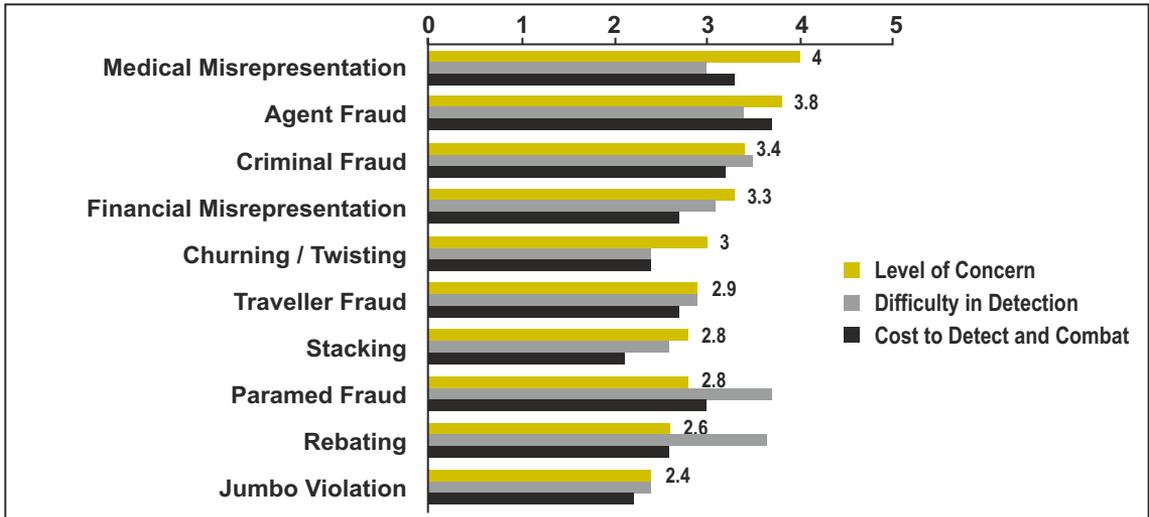
Source: Survey conducted by RGA

A survey carried out with 200 insurance professionals in Europe has classified, in descending order, the challenges encountered by insurance companies in their fight against fraud - Graph (c)

Graph (c): Challenges in Fraud Control

Source: Insurance Fraud Survey 2016 ; Insurancenexus

Once a fraudster is apprehended, anyone can say, "how easily we have caught the fraudster", but no one gives a further thought! The saying is, "Fraud is always obvious to the fraudster's colleagues but only after the event and after he's caught". So let's find the utility/benefit of fraud from the mistakes they made and what led to their arrest. For a company it may look impossible; but no matter how strong the measures adopted, it is never impossible. The UK report of PwC's survey looked at the method of detection of the most serious frauds within organizations. The results are given in Graph (d).

Graph (d) : How Frauds Got Detected?
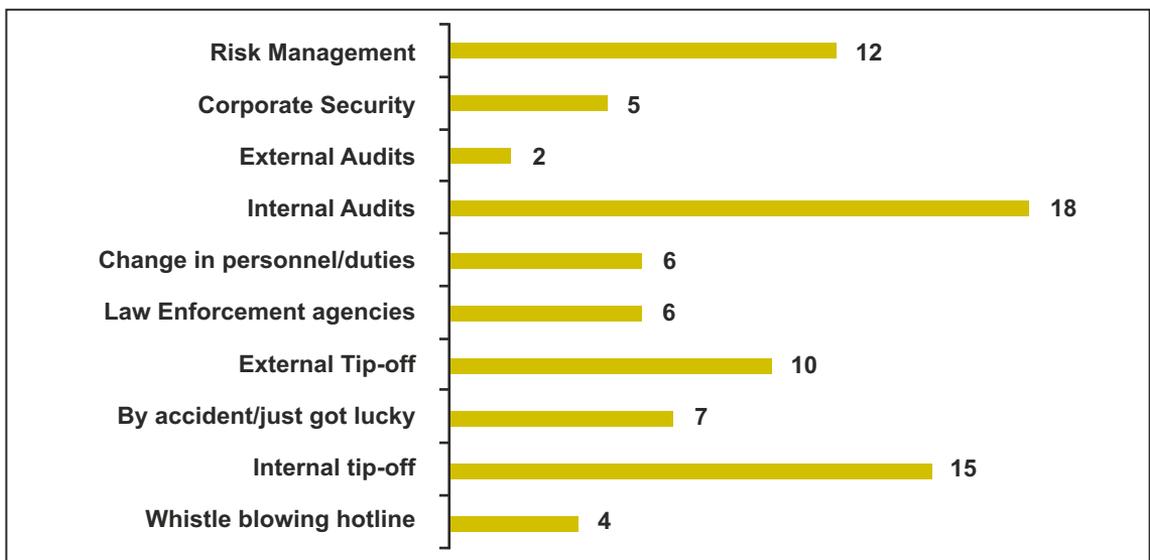
Source : Economic Crime : People, Culture and Control, PWC, 2007

Why does it Cost to Manage Fraud

Fraud is not self-revealing : The intention of a fraudster is to pass through the volume of claims as per normal process without raising any flags / suspicion. Hence, we have to discover the fraudster and be on the hunt for him/her and for fraud per se. For this we have to be investigative and see the unexposed factors – with speed and minimum cost of investigation. If the cost of investigation is more than the loss itself, it would be counterproductive for the insurers unless it sets a benchmark for future incidents.[5]

Figure 1 : Data Sources for Fraud Detection
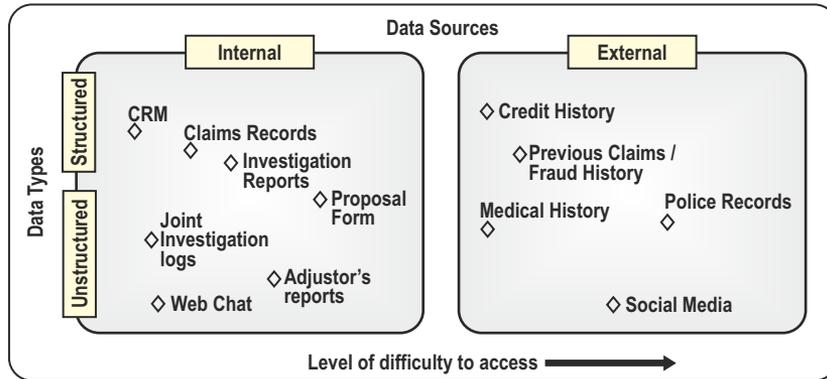
At the same time, being too stringent on the honest insured client will make him/her shy away at the time of renewals leading to adverse selection problem. The solution to this can be the use of robust technology effectively and efficiently. The sources can be diverse and is left to the imagination and resourcefulness of the insurers. With the advent of Big Data, we have procedures to verify a risk from the structured and unstructured date sources shown in Figure 1. Many insurers can 'smell a fraud' from the social media posts of the fraudster and has led to the arrest and prosecution of the culprit. It is important to note that once the payment is made, one can't chase a fraudster until s/he comes back for another tryst.[6]

Proving Fraud Legally is Difficult

Prejudice always puts the blame on the insurer and the law treats everyone equally. Simple suspicion of fraud does not prove the act or act as a legal proof. The red flags can trigger suspicion to some extent, but can it be definitive to prove the actual fraud? Insurers, being in the business of risk mitigation and not investigation, mostly try to reject suspicious cases at the time of underwriting the risk but this luxury is not available at the time of claim processing. Thus, insurers contemplating a legal course of action have to be prepared to invest good amounts of money both in specialized legal consultation and investigation to actually win the case legally. This actually proves to be the hurdle for the insurer rather than the fraudster. And, mostly insurers calculate the cost-benefit and are likely to choose the less costly option of negotiating out of court or simply pay the claimant out, if the claimed amount is moderate rather than take an aggressive stance at the risk of being 'prejudiced'.

Fraud is a Dynamic Phenomenon just as Fraud Control is Dynamic, not Static

Fraud breeds within the business itself, like a parasite. It blossoms on the complications and dynamism of the business environment and professional fraudsters learn swiftly and capitalize on the latest opportunities in a more structured manner rather than the insurers, as a matter of fact. Therefore, in order to avert a fraud, insurers have to be extra vigilant and visualize the emerging fraud risks. The problem is accentuated also due to the asymmetric information. What the claims adjusters know, the criminal enterprisers knows twice – they are two steps ahead always.

Case Study
The Fraudsters' Toolkit

A former leader of a successful and sophisticated fraud enterprise that operated in San Diego, Los Angeles and San Francisco in the US revealed that his top seven tips – "Toolkit" – that insurance fraudsters used was as follows:

- **Target insurers that offer medical expense coverage** – Insist that the insurance company provides med-pay coverage (coverage for reasonable expenses to treat accident-related bodily injury.) As the payment is linked to the vehicle claim, claims of passengers in the vehicle will be covered as well. Theoretically, claimants can be indemnified for the loss and medical expenses, which are easy to bluff, and also leads to double the pay with the same efforts.

- **Aim for the companies just starting up** – It's better to go to the smaller company or companies, which are not into the core insurance business and make money by the time they actually realize the loss. These companies usually pay more, while the big companies usually pay a little less, because of their experience.

- **Know the red flags** – The fraudsters know the red flags better - clean driving records, owner driver licenses, age-band limits, shouldn't be an early claim (Policies to be active for four to eight months before the staged collisions), values of the loss to be within the modest level. "I know insurance companies have about 25 red flags," said one respondent. "What the claims adjusters know, the criminal enterprise knows twice", he added.

- **Risk Diversification** – If one has to day 30 staged accidents a month, diversify the risk to different insurance companies, surveyors or adjusters so that each case is with a different stakeholder who will be visualizing it as a smaller moderate one-off incident rather than a series of repetitive events. It's very difficult for the insurance company to catch people in this situation.

- **Take care of the details** - Private investigators have caught fraudsters because they caught the fraudsters unaware at the time when they were not prepared for an investigation.

- **Keep your stories straight** - When one runs a number of frauds, there has to be a track of the stories and not confuse them, as there is possibility of raising the alarms if things don't fall perfectly in the first go.

- **Build-in protection for everyone** - The network has to be within a trusted professional so that the same is kept under cover and is not exposed by any of the parties. The network has to include the truck owners, drivers / doctors, investigators, lawyers, consultants and if possible the employees of the insurance company and the surveyors.

- **Never buck down** - The fraudsters believe that all insurance companies are bound by law to pay, and, even though they have a lot of resources to fight, eventually they have to pay something. Maybe more, maybe less, but eventually they have to pay something.

Any News about Fraud is Forever a Bad News

Fraud control is not only a complex matter; it is particularly hard to convince the management, because it is actually a miserable business. Failure to detect fraud is bad news but discovering a fraud is equally bad news. The very existence of fraud is a humiliation to insurers and to their managements. The experience of companies, that have publically accepted a fraud, have not been successful in regaining the customer confidence. Hence, insurers still seem to prefer not to be associated with fraud in any respect, be it as a victim or a crusader. However, one cannot forever remain like an ostrich with its head buried in the sand!

Return on Investment is Hard to Quantify

Quantifying the benefits of fraud control is very difficult, but assessing it is a necessary backbone which preserves the health of the book. It is an investment and not a cost as the returns may not be realized or quantified in year-on-year basis. The methodology to measure its efficacy and efficiency is a challenge, and, if not taken seriously it can prove to be cancerous for the industry.

Will it Hamper a Company's Strategy?

The following strategic goals are often seen to be in conflict with fraud control:

- *Image building* – Asking too many questions at the time of underwriting can lead to a negative perception for the insured and can be counter-productive to the point of suspiciousness. The insurer can be seen to be too cautious and give the impression of being overcautious – the image of fine-print applier on policy.

- *Adding up to the response time* – Customers want everything instantly – Insurers have a limited timeframe to respond, while following their process efficiencies. Hence there is only a tiny window for insurers to carry on with the lengthy fraud control process, or at underwriting or claim settlement.

- The industry is yet to mature and right now it is being driven by the top line rather than the bottom line. The fraud control mechanisms make the insurers less competitive.

- Also, going on a solo fight against fraud can act as impediment to one's image and reputation in comparison with the competitive arena they are operating in.

We can copy the Leader; Why become the First Mover in Fraud Control

The exercise of fraud control cannot be publicized as a USP with the customers and hence it is seen as an exercise in futility and efforts by the insurers to prevent his books from closed. The exercise is also quite easy to be replicated by others and hence we do not have a first mover's advantage in fraud control. This lead to the question – why should I invest in designing a fraud control mechanism when we can actually copy the leader or simply study the best of the industry practices and replicate that, at a much lower cost. So it is like piggybacking on another instead of being a market leader.

The Math behind Calculating the Utility[7]

Utility of Fraud Management is a tricky business and to introduce the mathematical models behind it, we will try to find the co-relations analysis as well as the mathematical game theory. As per the research, Perceived Ethicality of Insurance Claim Fraud: Do Higher Deductibles Lead to Lower Ethical Standards? **increasing deductible only lead to increase in the claim amount in the reality.** As per the co-relation, there is a direct correlation between the tendency of claim padding and the social ethical standards. Attitude toward the ethicality of others is likely to influence one's own ethical actions given a similar future situation. The same is depicted as follows:[8]

Graph (e): Perceived Ethicality of Insurance Claim Fraud
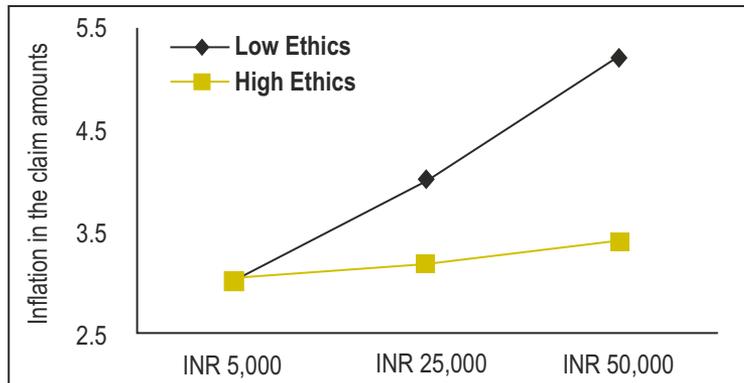
The Game Theory

In their research work, using the game theory, M. Martin Boye and Richard Peter created a model in the competitive insurance market where policyholders privately have information about the probability of accident – post-policy signing (ex ante) – and predicts the experience post loss (ex post). The results are collaborating, as follows:

- Insurance fraud hampers the insurer's zero profit condition in an ideal condition, which can lead to dropping off risk of the low-risks policy holders and the high-risk insured staying on in the books.

- Best-case scenario, however, involves allocating of low risks, which raises their probability of fraud and their success rate when committing it.

- As a result, adverse selection increases fraud in the economy.

- The results highlight that adverse selection and insurance fraud interact in nontrivial ways and have the potential to aggravate each other. Hence, the investments on fraud control actually have to be seen as investments towards better underwriting profits as well and not only towards fraud control.

- Chiu and Madden (2007) show that a punishment that ***depletes initial wealth makes criminal activities less desirable for a risk-averse and prudent individual.*** Again, the ***penalty and the risk of getting caught need to be amplified to prevent a fraud from aggravating.***

The theory is defined as follows:

The assumption that, there are ***n*** ≥ 2 risk-averse insurers who compete for risk-neutral

customers and offer them risk coverage. Agents' preferences over consumption are represented by an increasing and concave utility function *"u"* of final wealth *W*; that is *u'(W) > 0* and *u''(W) < 0.*

Agents have an income *Y* and are subject to a potential loss of size *A<Y*. The risk differs in the probability of accident, which is either p_L for **low risks** or p_H for **high risks** so that **0 <p_L<p_H<1**. The share of high risks in the economy isl . All these parameters are universally known, but risk details are only known to the insured or to the agent, who are observing the case privately. An insurance contract specifies a premium a_i ³ *0* and indemnity b_i ³ *0* with i Î *{L, H}*. Subscripts indicate that contracts are geared toward a specific risk type.

During the claiming game, agents observe privately, whether an accident occurred and communicates their insurer about the state of the world (i.e., "**loss**" or "**no loss**"). Upon receipt of the message, the insurer decides whether to verify a policyholder's claim by conducting an audit at a cost c, (that is, "**audit**" or "**no audit**"). The insurers' auditing technology is perfect and reveals whether an accident has actually happened or not. If it has, the insurer compensates the policyholder by paying him the specified indemnity. If the agent is caught committing fraud, no indemnity is paid and he incurs a penalty **k** and accordingly the policy payoffs are disbursed.

Consider a type i individual with insurance contract *(*a_i*,* b_i*)* i Î *{L, H}*. If an accident occurs, he would never decide not to report it. If no accident happens, he might decide to report a loss to benefit from the indemnity in case he does not get caught. Let h i be the probability that he reports a loss although none has happened, and let n i be the probability that the insurer audits claims originating from contract *(*a_i*,* b*i)*. Then the pricing model will be as follows:

$$\alpha_i = \pi_i \, \beta_i + \{(1-\pi_i) \, \eta_i \, (1-\upsilon_i) \, \beta_i\} + \{c\upsilon_i \, [\pi_i + 1-\pi_i) \, \eta_i]\}$$

Simplifying it, the same can be represented as :

Premium =	**Expected indemnity**	+	**Indemnity which can be extracted by filing a fraudulent claim**	+	**Insurer's cost of auditing the claim**

This pricing rule assumes that **competition makes profits fall to zero and works on break-even rates**. The fraud-induced loading factor increases the cost of audit but reduces the indemnity payment.

As a major factor of insurance underwriting - we need to understand – the effects of adverse selection of risk act as a factor as well, and then the equation changes due to asymmetry in information about the risk type and the actual risk which will include the factor of moral hazard in the risks as well. Based on this factor, the solution to the game theory results in the following:

1. If the cost of auditing is sufficiently small, low risks are rationed between the cost of audit, **c** and the optimum indemnity for the low risks b_L, which will depend on the company's appetite to take the risks.

2. But this leads to a reduction of coverage for the low risks to balance the adverse selection factor increasing the efforts of risk aversion and not selection, which should be the actual principle of insurance.

3. However, this is not leading to reduction in the associated premium under rationing a_L thus making the insurer less competitive in the low risk category.

4. Rationing of low risks increases the total amount of fraud in the economy.

Therefore, practically the best-case scenario will be to **cross-subsidize the cost of audit for low risks with that of high risks,** which will lead to the **reduction of fraud** by :

(a) high risks under decreasing absolute risk aversion.

(b) low risks.

(c) the total amount of frauds under constant or decreasing absolute risk aversion.

The model illustrates the results with the help of a comprehensive numerical example with the following considerations: $Y = 11$, $A = 10$, $p_L = 10\%$ and

$$p_H = 50\%, \quad c = 5\% \text{ and}$$

$$k = 100 \text{ (penalty when caught committing fraud)}$$

Table 4: Game Theory Outcomes for Various Scenarios

Outcomes for Various Scenarios for Target of 95% Utility				
With only adverse selection and no fraud (Impractical)				
	Indemnity	*Premium*	*Expected Utility*	*Fraud*
Low Risk Cases	6.16	0.308	95.31	0%
High Risk Cases	10	1	95	0%
Average			**95.16**	**0%**

With fraud only and no adverse selection (Impractical)

	Indemnity	*Premium*	*Expected Utility*	*Fraud*
Low Risk Cases	12.37	1.03	95.05	3.57%
High Risk Cases	12.29	2.07	93.96	7.62%
Average			**94.505**	**5.60%**

With adverse selection and fraud (Partially Practical)

	Indemnity	*Premium*	*Expected Utility*	*Fraud*
Low Risk Cases	6.68	1.32	94.31	15.60%
High Risk Cases	12.29	2.07	93.96	7.62%
Average			**94.135**	**11.61%**

With adverse selection and fraud along with cross subsidy and practical considerations

	Indemnity	*Premium*	*Expected Utility*	*Fraud*
Low Risk Cases	10.008	1	94.52	5.25%
High Risk Cases	12.35	2.07	94.52	7.56%
Average			**94.52**	**6.41%**

From the findings, it may be concluded that:

- Incidence of insurance **frauds will become more prevalent unless insurers resort to a sufficiently high level of cross-subsidization between risk classes.**

- Adverse selection and insurance fraud complement each other. This fact highlights the principle need of eradicating adverse selection as well, and, therefore **the cost invested in the fraud control systems will actually lead to be better underwriting and reduction in adverse selection.**

This realization will be useful in all aspects of real-world situations, like capturing the data before underwriting, setting limits under insurance and deciding red flags at the time of claim settlements.

Conclusion

Fraud is definitely not a cost of doing business. The objective of investing in fraud control measures by insurers, though a complex process, should not be considered as an expense in itself but as an investment to help insurers benefit from the following aspects:

- Optimize the process and help in better control of the risks underwritten.
- Eradicate unwanted surprises in the books to ensure better controls by the management.
- Ensure use of technology which will help not only in fraud control management but also having better control and transparency in the system.
- Eradicate adverse selection and help clean the books.
- Provide exact data pointers so that the solutions can be provided accordingly.
- Fix competitive premium/s with the best possible factorizing of costs
- Eradicate bureaucratic red tape and ensure a smooth claim processing system
- Help build trust in the company in general and industry as a whole
- Enable innovative measures and employ them for betterment of the executive processes

Therefore, the systems put in place should be to quantify the unknown, which can be realized through the implementation of a better fraud control mechanism. The effort and expense may not yield results overnight but will definitely prove beneficial in the long run. The purpose of fraud control is not only in the saving of the first loss but rather in detecting thousands of such errors which could have occurred in the absence of an intelligent strategy laid down for fraud control within the system as precaution and for prevention.

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