PREDICTIVE ANALYTICS OF THE FRAUD PREVENTION AND DETECTION AT ASF LEVEL

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Abstract: A need for greater rigor, which is felt by insurance companies in order to guarantee the fundamental balance of their financial sources, led to intensification of the concerns for preventing and combating fraud. The scope of the controller's mission is variable and its limits are set by the control program which has been established. In assessing the fair price of the caused damage, the essential role of the controller is to put a stop to the fraud and to avoidearly damage coverage.But information is required in order to accomplish this.The predictive analytics, of those processes necessary to prevent and combat fraud, is a way of passing from a retroactive and intuitive process to a proactive one, that is oriented according to the information possessed. Based on this approach, insurance companies can build models, to predict the risk of fraud, in order to reduce their financial-cost impact.

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1. INTRODUCTION

For a long time the subject of fraudulent statements and risk of loss in insurance was considered a marginal issue. The need for greater rigor felt by insurance companies to guarantee fundamental balance of their financial sources led to intensified concerns on fraud prevention and combat.

Fraud is a social phenomenon and it affects all sectors. Therefore as any other sector insurance is not avoided, it is even more an obvious victim.

Moreover, we note that, the desire to obtain easy money as well as the financial crisis have encouraged the development of some forms of fraud, which must be combated. Insurance fraud is a voluntary act committed by the insured, with the purpose to draw from its insurance contract an illegitimate profit. At the same time, in order to be a fraud, the insured must be dishonest, namely of bad-faith. We cannot

speak of fraud if the insured has acted in error or erred, believing that he did not commit any offense.

The contractual relationship between insurance companies and policyholders refers only to the cash transfers, e.g. for a premium insurance, the contract guarantees a pay compensation for damages. The amounts obviously depend on the declarations given by the insured when signing the declaration of risk, or when signing of the damage declaration. Undoubtedly, the insurance industry faces an important part of fraudsters trying to gain illicit gains.

The scope of the controller's mission is variable and its limits are established by the control program that has been established. In assessing the fair price for the caused damage, the essential role of the controller is to be a brake in front of fraud and to avoid early damage coverage.

Through experience and due to his knowledge of the insured psychology, the controller can criticize each and every fraud indication. Once a first fraud indication identified, he should seek if there are others and inform the insurer as fast as possible, exposing to the manager all the contradictions and anomalies that were discovered.

However it is imperative for the insurance companies to direct their attention to default fraud problems and to create a rigorous climate of relations between the insurer and the insured.

Often, the above desire lies on the border between the insurer and the insured regarding the payment of the premium or claiming compensation. That's why the insurer has an interest of establishing a broader dialogue with the insured, who must be directly informed of the dangerand the consequences of fraudulent conduct.

In particular we must ensure a good understanding of guarantees, benefits, exclusions and, in particular, the sanctions arising from fraud. On the other hand, it is mandatory for all insurers to disclose any information relating to fraud because centralizing them, all the insurance companies will benefit from more complete and effective information.

2. THE CONCEPT OF FRAUD AND ITS CHARACTERISTICS

We all know that fraud is an ancient, but still lively recurrent phenomenon, and it continues to adapt itself to the evolution of our societies. The term fraud is difficult to define because it covers a lot of notions and misconceptions. Thus, we often think of tax evasion, fraud in insurance, consumer cheating and other illegal business which are widely publicized.Fraud is shown theoretically for the first time in the fourteenth century as a certain willful type of cheat, with the specific purpose of deceiving another person, in order to get an unfair advantage from that person, and to determine it to give up legal rights.

But, in order to address such a phenomenon we must understand how it works, and its features. A first distinction we make is that you can not equate fraud and tax evasion. But we must distinguish between the concept of legal tax evasion and fraudulent or unlawful evasion, also known simply as fraud, in order to avoid the pleonastic tinge of the concept.Generally, by "legal" tax evasion, we mean the taxpayer's bypassing the law by resorting to an unforeseen combination of the laws, and therefore a "tolerated" combination, according to the unwritten principle that states "if the law does not prohibit something, then it allow it". This form of evasion is possible only when the law is incomplete and / or presents inaccuracies. Speculating these legislative vices, the taxpayer places himself in the most favorable position in

relation to taxation, in order to benefit as much as possible from it, thus succeeding in "escaping" from taxation of assets or income, in a smaller or larger degree, according to his own ability to manipulate law.

This is possible due to the way in which tax regulations decide on taxable objects. But, this form of tax evasion can be also considered a way of tax optimization, as partial or whole avoidance of paying taxes, duties and other amounts owed to the state budget, if performed within legal requirements, may constitute an end in itself.

In complete opposition stands tax fraud, which is that intent of the taxpayer to flagrantly defraud the government, in order to evade the payment of taxes, contributions and any other amounts due to the state budget. Whether it is done in the form of dissimulation of the taxable object, the undervaluation of taxable or by any other means of evading the payment of taxes, the common denominator for these facts is the intentional violation of the tax regulations, in order to avoid the fulfillment of legal obligations.

Although this distinction between tax evasion and legal tax avoidance is universally accepted, in legal practice, it is noted that "drawing a border between the two forms of tax evasion is relative and arbitrary, because there is continuity between them, and the line is extremely fragile, very often it is artificially and conjectural drawn" and, we would add, in a direct relation to the increasingly more acute need of bring money to the state budget.When referring to the dictionary, fraud means "a cheating and dishonest act committed by someone, usually to achieve a material profit infringing the rights of others, thievery".

Quoting a French dictionary, O.Gallet (2014) points out that fraud is "an illegal act, consisting of the induction of deliberate error in order to get one's money against their will or intentionally falsifying a document, which violates the rights or interests of others ".

ISA 240 explains the notion of fraud as "an intentional act committed by one or several more members of the management, owners of governance, employees or third parties using deceptive maneuvers in order to obtain an unjust or illegal advantage." IAIS (International Association of Insurance Supervisors) referring to fraud shows that this is "a deliberate act or omission committed in order to get dishonest or illegal benefits, by those who defraud or other interested parties ".

Applied to business, the concept of fraud is placed within professional enterprise. In 2016 ACFE (Assiciation of Certified Fraud Examiners) uses the term "occupational fraud" defined as “the use of one's occupation for personal enrichment through the deliberate misuse or misapplication of the organization's resources or assets.” In this context, ACFE distinguishes between three categories of fraud that characterizes: the financial environment; corruption; misappropriation of assets, the fraud resulting from misappropriation of assets being the most frequent, but the less expensive of the financial situation.

No matter how we define fraud, and no matter how we structure it, when it comes to organizational fraud, there are three main components worth talking about:

- intention, which differentiate it from error;
- covert will (cheating);
- operation style.

There are so numerous and varied frauds, so that when we refer to insurance, they can be classified according to the nature of the different scenarios, such as:

- exaggerating the damage that can occur in all cases of insurance. The insured person deposits false documents or uses falsified evidence to prove the presence of the disaster (theft, fire, damage, etc ...) for non-existent goods or goods unaffected by the disaster
- car-arson, aspect found with firms facing financial difficulties or difficulties in selling some unmarketable goods;
- false statements regarding windshield breaking, vehicle repair / maintenance work, all these being in direct connivance with the mechanic issuing the false invoice;
- fake burglary, the insured person stages a theft in its company in order to obtain the equivalent sum of money for items that he does not actually possess;
- fake vehicle theft, in order to obtain reimbursement of uncovered damages, major repairs reimbursement, to cope with high rates of credit reimbursement or obtain the equivalent of a vehicle difficult to sold;
- actual damage reported at a false date. In this case, the victim or other uninsured author of a damage signs a contract or an additional security policy and then declares the damage as having occurred at a later moment in time;
- fake traffic accidents, that allow the insured party to avoid the payment of a compensation of a damage caused by him, or to repair his damaged vehicle;
- false statements regarding insurance on injury, illness or life.

This involves: interruption of working time and payment of insurance claims; false medical certificates on real disability degree, in order to obtain undue compensation; the insured person's omission to declare a previous medical condition; false declaration of death of an insured person having several insurance contracts;

In 2015, F. Almăjeanu highlights the fact that insurance fraud has been introduced and is defined as a distinct offense in the Criminal Code starting 1 July 2013, according to title 245 "the destruction, degradation, bringing into disuse, concealment or alienation of good that has been previously insured against destruction, degradation, wear, loss or theft, in order to obtain for himself or for another, the sum insured shall be punished .... "

Given the question "what can be done to hold as much control as possible on activities?" We believe that preventing and combating fraud as a result of knowing their characteristics and establishing an effective control on activities and factors involved, is the only answer that can be given.

3. ANALYSIS OF THE ENGAGEMENT OF INTERNAL CONTROL REGARDING FRAUD DETECTION AND PREVENTION

Internal control allows organizations to detect any slippage in due time of profitability objectives of the organization and to limit the hazards (risks) . It also helps to promote efficiency, protect assets, to ensure the reliability of financial statements and compliance with laws and regulations. If the organization is facing problems (theft, fraud, error, etc ..), the internal control will be considered as a solution of the problems having occurred. In addition, if the management decisions will be respected and implemented, performance and operational efficiency will be improved, the financial statements will be sincere and give a true image of the operations, the financial position and company assets.

Talking about internal control techniques and procedures that allow verification of the performed tasks so that to limit potential errors or fraud, it is necessary to define

the mission of the control between fraud detection and prevention which in turn are internal and external. In this context we are faced with four distinct possible control missions, namely:

- Internal fraud detection mission (mission control risks inherent in accounting and financial procedures to ensure the quality of its accounts);
- Mission of external fraud detection;
- The mission of preventing internal fraud;
- Mission of external fraud prevention;

Analysis of the engagement on internal control in fraud detection and prevention, based on questionnaires, revealed the following:

a) The involvement of management of the insurance companies in the internal control activity (Figure No. 1) shows that 61% of the managers of insurance companies are engaged in the work of the Internal Control, while 34% of managers are not involved in this activity.

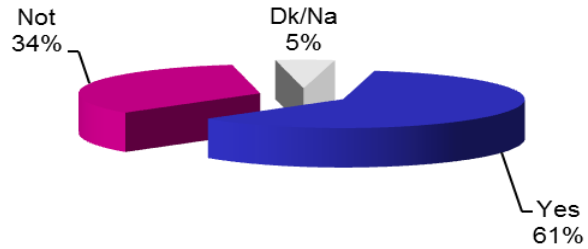

Figure No.1. The involvement of insurance companies management in the internal control activities

The conclusion is that the first responsibility for preventing fraud detection rests with those charged with governance and management of enterprise and may vary from entity to entity. It is important to create a culture of honesty and ethical behavior based on a set of core values communicated and implemented by management and those tasked with governance thus providing a model of how the entity conducts business.

b) risk assessment analysis of the sales cycle, phase of the analysis of the internal control was based on a questionnaire applied to the managers of the control department of the insurance company, with particular focus on the prior verification of clients, numbering sequential bills, check on approval of any cancellation billing, integration of accounting items into management etc., the responses being summarized in Figure No. 2.

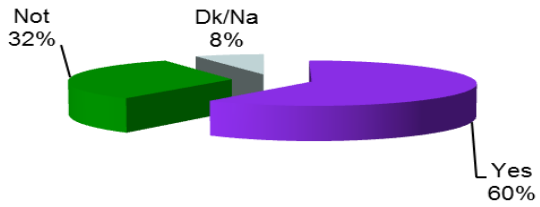

Figure no.2. The involvement of insurance company's management in the risk management activity

The graphical representation shows that a third of managers of insurance companies or managers of small companies are not engaged in the business of risk management in the express desire to earn as many customers, a counterproductive strategy if we consider the risks the insurance companies are facing with.

c) Risk assessment in the payroll cycle. Presenting the image of a culture of honest and ethical behavior involves creating a working environment, recruitment, training and promotion of competent staff personnel to request confirmation of its commitment to take the necessary measures to prevent and combat fraud.

The question is, how motivated is the personnel employed in the insurance companies to fight against fraud? For this, the fourth questionnaire consisting of five questions, was released and was addressed to employees.

The analysis revealed that employees perceive only the of legal / administrative aspects regarding employment and attendance at work, but have less knowledge related to corporate governance and their involvement in this direction, which is a particular risk factor in preventing and detecting fraud.

d) Financial risk assessment. The concept of information management is a tool to improve the mechanism of collecting information on the existence of certain irregularities, these being in the scope of responsibility of the financial management.

That is why last questionnaire was addressed to the leaders of finance and accounting departments of the companies, branches and as well as insurance agencies. Doing the descriptive analysis of the responses received by the procedure: Analyze → Descriptive Statistics→ Descriptives, data in Table 1,

Table no. 1 Descriptive statistics in the financial field

Descriptive Statistics

	N	Range	Minimum	Maximum	Mean	Std. Deviation	Variance
VAR00001	3	142,00	,00	142,00	47,3333	81,98374	6721,333
VAR00002	3	76,00	15,00	91,00	47,3333	39,24708	1540,333
VAR00003	3	128,00	,00	128,00	47,3333	70,20921	4929,333
VAR00004	3	137,00	,00	137,00	47,3333	77,69384	6036,333
VAR00005	3	127,00	,00	127,00	47,3333	69,39981	4816,333
VAR00006	3	118,00	5,00	123,00	47,3333	65,68358	4314,333
VAR00007	3	138,00	,00	138,00	47,3333	78,54510	6169,333
VAR00008	3	115,00	,00	115,00	47,3333	60,13596	3616,333
VAR00009	3	140,00	,00	140,00	47,3333	80,25792	6441,333
VAR00010	3	96,00	,00	96,00	47,3333	48,01389	2305,333
Valid N (listwise)	3						

We note that the average is the same for all the questions which reveals that the opinions are somewhat convergent and verifying the assumption of normality.

Moreover, financial-accounting is a regulated activity, subject to legal charges, it is more rigorous and yet it permits fraud.

Given the limitations encountered in the prevention and fraud detection in insurance companies, we believe that certain measures are still needed in this direction, including:

- providing a higher autonomy of the financial management across agencies, by delegating specific responsibilities and providing the means to achieve specific objectives;
- creating an internal audit management and management control across agencies and their brokers;
- line duplication of staff training to raise the quality of customer service and establish greater vigilance in developing insurance contracts;
- create a system of internal control at all levels to deter potential fraudsters or, at least, to detect malpractices committed;
- establish a formal code of conduct and communication with all staff;
- establishing an administrative and accounting procedures manual that describes in detail the functions and procedures for each of the company's business cycles;
- monitoring personnel using appropriate periodic inspections;
- better protection of accounting and non-accounting documents to prevent loss or reuse;
- continued modernization of IT systems, including accounting;
- improving communication between decentralized units (branches, subsidiaries, agencies) and the central treasury so that to have reliable and accurate information on the company's cash position. This can be achieved through effective acquisition of technical means; strengthening the powers of audit department within the company to assess the internal control system within it.

4. PREDICTIVE ANALYTICS PROCESSES TO PREVENT AND DETECT FRAUDS ASF

Since the fraud techniques are continuously and quickly changing, it has become very complicated, if not impossible, to reduce their financial impact by relying solely on manual procedures or human judgment. Predictive analysis processes to prevent and detect fraud in the ASF was conducted at two levels, namely the insurance companies and broker level.

4.1. PREDICTIVE ANALYTICS AT THE INSURANCE COMPANIES LEVEL

According to the ASF report, on 31 December 2015, on the insurance market in Romania only 35 insurance companies worked, 20 companies practicing only general insurance activities, 8 practicing only activities of life insurance and 7 practicing combined insurance business (life and general). Astra was excluded from the study as starting 26 August 2015 its functioning authorization was withdrawn and it was pronounced bankrupt.

To analyze the correlation between gross written premiums (PBS) and allowances (IBP), as means of prevention and detection of fraud in insurance, we consider the data published by ASF for 2012-2015 on PBS media, media RTB (gross technical reserves) media IBP, the average damage rate and expenses and combined ratio

What we notice is that IPB depends on PBS, on the other hand, the costs being somewhat steady, the combined rate increases in the same direction with the loss ratio, but its size is superior because it includes the expenses ratio

For the analysis that we propose using SPSS 18.0, we chose three variables, namely PBS, IPB and average damage ratio.

For a meaningful analysis we chose to perform test "t" for the selected sample in order to test the mean difference of each indicator against a constant reference. The procedure used for the test, based on the difference between the average value of each indicator proposed for analysis and the 100% constant reference is as follows: Analyze → Compare Means → One Sample T Test ... through which we obtained:

a) PBS and the average correlation of the damage

Table no. 2 descriptive picture of the variable PBS

One-Sample Statistics

	N	Mean	Std. Deviation	Std. Error Mean
VAR00001	5	2,6328E9	2,30418E9	1,03046E9

Table no. 3 Test results on PBS variable

One-Sample Test

	Test Value = 0					
					95% Confidence Interval of the Difference	
	t	df	Sig. (2-tailed)	Mean Difference	Lower	Upper
VAR00001	2,555	4	,063	2,63281E9	-2,2820E8	5,4938E9

b) the average correlation IPB and damage

Table no. 4 Descriptive picture of the variable IPB

One-Sample Statistics

	N	Mean	Std. Deviation	Std. Error Mean
VAR00003	5	1,6480E9	1,65995E9	7,42353E8

Table no. 5 Test t results on variable IPB

One-Sample Test

	Test Value = 0					
					95% Confidence Interval of the Difference	
	t	df	Sig. (2-tailed)	Mean Difference	Lower	Upper
VAR00003	2,220	4	0,91	1,64803E9	-4,1307E8	3,7091E9

The conclusion drawn is that the damage rate is closely correlated with IBP. An analysis of UNSAR the MTPL insurance market in several European countries revealed that the combined rate on RCA in Romania was among the highest in Europe

in 2013. Moreover, the loss ratio and the combined RCA had in 2013, very high values of 84.4, 130.9% respectively.

Therefore, the claims rate in this segment indicators or damage rate and combined ratio, highlights the need to strengthen the MTPL segment underwriting activity so that third parties injured to be compensated according to law. MTPL represent almost half of all insurance sold in Romania, with underwritings amounting to RON 1.39 billion in the first half of 2014 (43.61% of the insurance market). However, in terms of claims paid, RCA generated 40% of claims paid on life insurance line in the first six months of 2014.

Also, in terms of the average claim paid in this sector, Romania is among the countries where this indicator is approaching 1,400 euros, which represents an average value between the countries analyzed.

Frequency damage also placed our country among those with a large number of claims, 6.88%, which translates into the fact that, on average, nearly 7 out of 100 cars insured damage caused by. The analysis also showed that average premiums charged in 2013 on motor vehicle liability insurance segment in Romania continued to remain at a low level compared with other countries.

The average premium for class level RCA in Romania was equaled in 2013 to 114 euros. By comparison, the same indicator was 201 euros in Croatia, 141 euros in Portugal. Values lower than in Romania but were recorded in Poland (103 euros) and Hungary (65 euro).

However, in Italy, a country comparable to Romania in terms of the level of compensation paid on average for personal injury, the average was amounted to 436 euro in 2013. In terms of average claim recorded on the MTPL market, it has continued to widen from EUR 1,252 in 2011 to 1,385 euro in 2013. The increase was due to compensation for injury and death that came last year to hold a share of 19.16% of the total compensation paid by insurers Romanian, flush with the Italian market amid a number of requests increase together with an uneven practice of the courts.

Lower values of the average claim was found in Poland (1,287 euros) and Latvia (1,070 euros), while in countries like Hungary, Portugal and Croatia they have exceeded the threshold of 1,500 euros. Frequency damage remained around 7%.

In Romania, RCA damage frequency oscillated in the past three years, around 7%, reaching at the end of 2013, to 6.88%. Compared to other countries included in this analysis, the percentage is quite high, being surpassed only in Turkey (8.2%), UK (10.1%) and Cyprus (12.1%). On the other hand, in Hungary or Latvia, this indicator was 3, and 4% respectively. According to data for the year 2013 in Romania, the insurers paid an average of 88.37 lei damages for each 100 lei subscribed as insurance premium. In the first six months of 2014, the loss ratio increased to 99% RCA, according to figures ASF, from 82% in the first six months of 2013.

However, the indicator measuring the profitability of a best insurance segment, namely the combined ratio, recorded the highest value of all countries surveyed, 130.8% respectively. The combined rate includes, along with damage claims paid and to be paid, the other expences related to a certain operational class of insurance.

So, considering these figures, Romanian insurers have paid 130.8 lei for each 100 lei subscribed.

Moreover, in most countries included in the analysis, the RCA indicator of the combined ratio exceeded 100%, which highlights the lack of profitability of this type of

insurance. However, there were also countries where the combined ratio was stood below 100%: 94.02% Portugal, Italy or Croatia 88,1% 74,7%.

Uncontrolled levels on the line of loss ratio on compulsory insurance of civil car liability can generate significant turbulence for the entire insurance system, because they hold significant shares in RCA Romanian market. Evolution claims in the first six months of 2013 further strengthens this claim. RCA-level market, the average claim paid rose by 16% to 6.894 lei to 5.933 lei in 2013. The amount of compensation paid was also growing, reaching one billion lei (+ 5%). Also, compensation for injury and death 27% of the total amount of compensation paid by insurers Romanian RCA in 2014 (277.06 million lei), an increase of 70% compared to the same period in 2013. More than two thirds (70%) of compensation damages paid are (non-material).

Although insurers have streamlined business processes in recent years, high costs of compensation, especially those related to personal injuries, shows that the profitability on the MTPL segment is far from being achieved and requires efforts from players in the market bring balance to this business segment.

4.2. PREDICTIVE ANALYSIS AT BROKER LEVEL

The insurance mediation activity represented by insurance and / or reinsurance is not less risky.

According to data centralized on 31.12.2015, a total of 603 insurance brokers and / or reinsurance operation had authorization, of which a total of 428 brokers have submitted reports up to the date of this analysis.

At the end of 2015, the premiums mediated by the insurance brokers were in the amount of 5,205,134,153 lei. Compared to the same period of 2014 the sum increased by 14.31% of the mediated premiums for both insurance types.

- sold life insurance premiums were in the amount of 5.076.101.596 RON (with 14.32% more than in the previous period) and intermediation degree was 73.17%;
- premiums, brokering life insurance policies, amounting to 129 032 557 13.89% more than in the previous period) and intermediation degree was 7.11%.

Analyzing the structure of premiums charged by insurance brokers on insurance classes, it is shown that at the end of 2015, a significant share in total mediated premiums for insurance are hold by the following classes, the amount of 4,331,959,716 lei being distributed as follows :

- Class X. vehicle liability insurance (RCA + CMR) represents 53.71% (2.726.257.975 RON);
- Class III. Land vehicles insurance (Casco) represents 23.30% (1.182.966.810 RON);
- Class VIII. Insurance against fire and other natural disasters represents 8.33% (422 734 931 lei) ;
- other classes of insurance share accounts for 14.66% (744 141 880 lei) of total mediated premiums insurance.

Analyzing the structure of premiums charged by insurance brokers for life insurance classes, it is shown that at the end of 2015, the largest share is held by the following classes:

- Class AI "Life assurance, annuities and supplemental life insurance" in the amount of 109 489 824 lei, i.e. 84.85% of total mediated premiums for life insurance category;

- Class AIII "Life insurance and annuities, which are linked to investment funds (unit-linked): 10,478,084 lei, i.e. 8.12% of total mediated premiums for life insurance category;
- other classes of life insurance accounted for 7.03% of total mediated premiums for life insurance.

Analyzing the proceeds of insurance mediation, as it is clear from the reports submitted by insurance brokers, we note that on 31.12.2015, it recorded a value of 939 042 720 lei, 8.25% nominal growth over the same period since 2014 (867.613.517 RON). However, fees due their broker-decreased in 2015 compared to 2014 from 17.3% to 16.4% on RCA, from 12.5% to 12.4% on Casco and 21, 1% to 19.9% on housing, something that indicates a prerequisite fraud risk that the brokers can produce.

5. CONCLUSIONS

The purpose of this article was to measure the perception, on the possibility of preventing and detecting fraud using internal control, that the insurance companies have. The research aimed to measure the types of fraud that can occur, their existence and to investigate whether routine assessment of internal control, responsibility delegation, and effective supervision impact fraud discovery. Theoretical study took into account two aspects, namely: on the one hand, the concept of fraud and characteristics of that which generated the question "how big and sophisticated is insurance fraud?", On the other hand we sought to position internal control mission concerning insurance fraud.

Fraud, whether such be defined or grouped view is that it should be seen as an illegal act of three components, namely:

- intention that differentiates it from;
- covert will (purpose of cheating);
- operation mode.

The phenomenon of insurance fraud is quite large (about 10% of gross premiums earned) and only 2% -3% is detected. A big problem, that affects the extent of fraud is that the subject is almost taboo for insurers and the detected cases are not made public.

Although we talk of two broad categories of fraud in underwriting and claims, they have in their turn a lot of subcategories which we have tried to outline, so that to highlight the scale and complexity of fraud in insurance, thus creating a cartography that must stand to attention of the control system.

Doing an overview, our conclusion is that the safety of the internal control system has certain limitations. We must be aware that there is a risk that two dishonest people working together to overcome even the best possible control system.

Given that fraud techniques are continuously and very quickly changing, it became very complicated, if not impossible, to reduce their financial impact by relying solely on manual procedures or human judgment.

Studying this problem through an international approach, it has been revealed that new directions are required that can help a better fraud risk management, regardless of the type of organization.

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