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## Article

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Contemporary Economics

## Provided in Cooperation with:

University of Finance and Management, Warsaw

*Suggested Citation:* Kawiński, Marcin; Szumlicz, Tadeusz (2023) : Insurance under- and over-performance: The case of comprehensive car insurance in Poland, Contemporary Economics, ISSN 2300-8814, University of Finance and Management in Warsaw, Faculty of Management and Finance, Warsaw, Vol. 17, Iss. 4, pp. 443-455,  
<https://doi.org/10.5709/ce.1897-9254.521>

This Version is available at:

<https://hdl.handle.net/10419/297643>

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Primary submission: 03.09.2023 | Final acceptance: 02.11.2023

# Insurance Under- and Over-performance: The Case of Comprehensive Car Insurance in Poland

Marcin Kawiński<sup>1</sup> and Tadeusz Szumlicz<sup>2</sup>

## ABSTRACT

Insurance is based on specific assumptions, including a “perfect performance” model. The principle of indemnification, mentioned in almost all insurance textbooks for non-life insurance, is nevertheless far more complicated than economists’ perception. This complexity is a consequence of actuarial fairness and legal rules often being violated in practice. Thanks to the development of the methodology, the assumption of perfect performance has never been closer to reality. If we add the consumer’s perspective, the outlook of insurance performance becomes interesting. The paper examines assumptions related to the performance of insurance contracts made as part of economic insurance models, namely the legal indemnification principle and the theoretical concept of uncertain indemnity, both seen from a consumer’s angle. The discussion further relates to the concept of probabilistic insurance. The main goal is to measure under- and overperformance of insurance coverage. This paper invokes many qualitative and quantitative studies performed since 2012 to find evidence of the subjective perspective of under- and overperformance and full performance, within non-life voluntary comprehensive car insurance. Detailed research on comprehensive car insurance in Poland revealed the simultaneous presence of full performance, under- and overperformance. This phenomenon is known to practitioners, but its scale is unknown. A statistically significant difference exists between the more likely underperformance and the less likely overperformance. Underperformance is an outcome of inadequate coverage. Furthermore, the research outcomes suggest that uncertain indemnity should not be considered “random” as there is an asymmetry toward underperformance, at least from the subjective perspective of policyholders.

## KEY WORDS:

insurance performance, user’s perspective, user’s perception.

## JEL Classification: G22.

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## 1. Insurance performance: Introductory Remarks

Insurance performance is a concept that is understood differently, being looked at from diverse perspectives. There are three main views on insurance performance:

- the insurer’s and insurer shareholder’s perspective focusing on the business outcome (Cummins & Weiss, 2000);
- the regulator’s and supervisor’s perspective focusing on the provision of stability within economic

and social relations on the macro-level, also known as the public policy perspective (Rejda, 1966) and

- the user’s (micro-level) perspective is an element of personal finance and household risk management (European Commission, 2017). Examining certain issues (e.g., consumer protection) is guided by multiple perspectives, as specific areas are often interconnected in certain ways. In this paper, we principally assumed the user’s perspective.

The “user” category is much broader than a “policyholder” entering an insurance contract with an insurer. A user should be understood as a poli-

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cyholder, an insured (whose life, assets, and rights are covered), and a beneficiary (a person entitled to an insurance benefit). Generally, regulators recognise the categories of households and their members (e.g., consumers), micro and small companies (or non-commercial entities, e.g., NGOs), and medium and large companies. Regulations group users more and more frequently according to their financial capability, which reflects the asymmetry of awareness, knowledge, skills, and ability of active decision-making. That is why regulators differentiate between retail and professional users, and the regulations of the insurance market attempt to manage this asymmetry, increasingly frequently imposing the retail perspective on the insurance industry.

From the user's perspective, the aim of insurance (on the micro-level) is to fulfil an individual's insurance needs rather than the performance of an insurance contract. Focusing on the insurance contract alone leads to a myopic viewing and possibly disregarding wrongly designed products and mis-selling issues. The fulfilment of a household's insurance needs is a part of the fulfilment of the needs related to household risk management (the holistic risk management process described, e.g., in ISO 31000). According to the risk management theory, insurance covers the risk by financing a loss and changing an unpredictable and potentially large insurance loss into a relatively small and certain premium – the financial loss (Friedman & Savage, 1948, p. 279). It differs from risk avoidance and controlling techniques.

The existing optimal insurance theories mostly refer to the utilitarian function, Pareto condition, and game theory as meanings to achieve the optimal level of insurance coverage, deductible, and premium (Arrow, 1974; Borch, 1990; Raviv, 1979; Szpiro, 1985). However, theoretical assumptions notwithstanding, demand for insurance is an indirect measure of insurance performance. That is why insurance models often present insurance performance through demand and, as (Schlesinger, 2000, p. 131) put it, “[t]he theory of insurance demand is often regarded as the purest example of economic behaviour under uncertainty”. The demand for insurance generally depends on the perception of,

and attitude towards, risk. With the development of demand insurance models, more attention is paid to characteristic (practical) features of insurance, such as partial coverage and deductibles (Mossin, 1968), background risk, default risk, and uncertain indemnity (Lee, 2012). The notion of insurance demand includes many aspects of insurance performance seen from a user's perspective, not only partial coverage and deductibles but also the reality of coverage (default risk, uncertain indemnity, background risk). Accordingly, the most prevalent approach to modelling insurance demand is based on expected utility/wealth. Improvements in modelling allow for increasing the number of factors analysed, which include attitudes to risk (awareness, perception) and satisfaction with present and past performance based on others' experience (Schlesinger, 2000).

Insurance performance is a crucial feature shaping the demand for insurance coverage. However, people are persuaded to purchase insurance without a direct (or any) link to insurance performance by factors such as the obligation to obtain insurance or behavioural aspects (risk perception, acceptance of the default option). Insurance demand alone cannot provide a good general measure of insurance performance. Furthermore, models of insurance demand cannot easily identify the impact of particular factors linked to performance. Such an approach further assumes that the utilitarian function for each specific risk is known for every single household or member of a household. It is unrealistic or – at least – impractical due to prohibitive costs.

Another theoretical approach to insurance performance originates from philosophy: performance is a key subject of praxeology (Ostrowski, 1968). Efficiency and effectiveness, two measures derived from praxiology offer two perspectives of performance, including insurance performance, which are often employed in economics. Efficiency is a diverse concept divided into many different types by economics scholars: allocative and productive efficiency, technical efficiency, “X” efficiency, dynamic efficiency, and social efficiency). However, all approaches are associated with outcome and cost ratios. The concept of insurance efficiency has already

been well-developed. For example, the combined ratio (the formula: the sum of claim-related losses and expenses divided by earned premium) is an example of a measure of insurance efficiency viewed from a macro perspective. Insurance efficiency from a micro (policyholder's) perspective may be measured with the use of the formula of the actuarially fair premium increased by loading costs (including distribution costs, potential decent profit, and others), known as the "final premium".

The second measure, effectiveness, is considered by praxeologists as the primary measure preceding efficiency (Ostrowski, 1968). Less popular than efficiency, it reveals the level of fulfilling an aim. From an insurance end user's perspective, it fulfils insurance needs. The realisation of insurance needs depends on the design of an insurance product and governance (coverage, conditions, and pricing), distribution of the insurance product (adjustment to needs), and finally, the performance of the insurance contract (the fair loss adjustment process, financial soundness). For that reason, it is possible to distinguish the effectiveness of insurance product adjustment (the performance of the insurance product and distribution), adequacy of insurance coverage, the effectiveness of the insurance contract, and the reality of insurance coverage within a broader concept of insurance performance. Adequacy of insurance coverage depends on the manufacturer of the insurance product and distributor, both active in the pre-contractual phase. In the post-contractual phase, the reality of insurance coverage depends mostly on the provider of the insurance contract (responsible for the contract performance). Adequacy and reality of insurance performance allow for identifying insurance's pre- and post-contractual phases.

The simultaneous application of both criteria can show the interconnection between effectiveness and efficiency. It allows for identifying the optimum level of insurance coverage, as more coverage may be sub-optimal due to substantial costs. The qualitative studies described below show that the praxeological perspective is closer to the customer's perception.

Based on the division of the insurance process into the pre-contractual and post-contractual phases,

the above approach is in line with the regulatory and operational perspectives. Those phases are often managed and assessed separately as two different sections of the business line. [Qualitative studies prove that point; see the National Science Center Grant Insurance forethought in the change of the social security system (No. UMO-2013/11 / B / HS4 / 02160)]. Empirical research proves that customers recognise the role of the actors mentioned above (product's manufacturer, insurance distributor, and provider of the insurance contract) and phases and assess them differently. For example, the key actors considered by customers of motor insurance (both auto-casco and mandatory motor third-party liability – MTPL) are the insurance company, insurance distributor, and the workshop where repairs are made. Most often, the customers contact only an insurance distributor but claim all three parties handle the settlement process. If there is a dispute between a customer and the service provider, even more parties may be involved, like an insurance ombudsman or an Alternative Dispute Resolution (ADR) scheme. However, the pre- and post-contractual phases are not treated symmetrically, and a much greater regulatory effort has been devoted to the pre-contractual phase [European Union legislation includes a separate directive on distribution (IDD). Still, it is yet to adopt specific regulations on the loss adjustment process]. Most insurance theories referring to insurance (and the insurance contract) do not follow the division into pre- and post-contractual phases.

As shown above, the performance of an insurance contract depends on three elements:

- the level of premium (efficiency),
- the adequacy of insurance coverage (design and distribution of an insurance product) and
- the reality of insurance coverage (fulfilment of required compensation according to an insurance contract in a restricted time framework).

All the above elements influence end-user performance as they are at least of some importance. The value of insurance premiums is the key factor guiding decisions to terminate or choose a specific type of coverage. In this paper, We assume that the subjective acceptability/efficiency of the premium is met when customers purchase the policy, in full

cognisance that this assumption is valid for voluntary insurance only. Consequently, the efficiency criterion (the acceptable premium level) is met.

An assessment of insurance coverage is required to review its adequacy. Insurance needs can be translated (transformed) into insurance coverage shaped by the scope (specific risks) and level of protection (policy amount). Insurance coverage can be measured with potentially negative consequences of insurable risks, i.e. the policy amount. The “insurance gap” concept serves as an alternative (Schanz, 2018).

Regarding adequacy, insurance coverage resulting from insurance contracts should be confronted with objective or subjective insurance needs. Objective needs are the outcome of risk management procedures aiming to identify risks that insurance can or should address. Subjective needs are personal opinions on required insurance coverage. Both approaches assume using techniques other than those related to insurance risk management. Insurance products often include deductibles reducing the compensation ratio. However, such a reduction does not lower adequacy, provided it remains in line with the risk management theory or individual expectations. The standard adequacy does not have to influence the outcome if uncovered risks have not materialised. Potential adequacy can be measured before the inception of an insurance contract. In any case, mapping insurance needs – both objective and subjective ones – is a complex task.

How an insurance contract is performed is reflected in reality, regardless of adequacy. If both adequacy and reality are considered the outcome, it is possible to recognise final performance (under- and overperformance). In this paper, We focus on underperformance and overperformance that is noticed in the case of loss or when an insurance company is financially liable for performing the contract. The exception is when the contract does not provide insurance coverage for the whole period of the insurance contract, mostly due to the company's insolvency.

In insurance coverage, an insurance contract can underperform, provide full coverage, or overperform. The reality originating from the insurer's insolvency can be based on regulatory measures, e.g.

Solvency II (Directive 2009/138/EC of the European Parliament and of the Council of 25 November 2009 on the taking-up and pursuit of the business of Insurance and Reinsurance). Nevertheless, reality factors such as the results of the loss adjustment process require consideration of the claims settlement and complaints procedures. The effectiveness of loss adjustment processes differs between business lines and an average reckon does not give a good outlook. Also, certain individuals refrain from submitting a complaint for various reasons. Furthermore, data collected during the complaint process provide no information about overperformance that may occur when compensation or benefits exceed those anticipated under an insurance contract, a general principle of law, or more detailed regulations.

Based on the above discussion, adequacy measures how coverage fulfils insurance needs. While 100% fulfilment is an optimum scenario, lower and higher levels are also possible, albeit suboptimal. However, according to the prospect theory (Kahneman & Tversky, 1979), a higher level is less damaging from a subjective perspective, as it results in a higher premium cost. A lower level of compensation results in much higher subjective losses.

The reality of insurance contracts reflects how compensation covers losses according to insurance contracts as a percentage of contractual coverage. In the case of risk materialisation, both measures give a final performance for a beneficiary which can exceed 100%. The insurer thus pays more than it should, according to the contract.

This paper refers to probabilistic insurance (Wakker et al., 1997). However, widening the scope covers not only under- but also overperformance. Hence, it follows Lee's (Lee, 2012) concept of uncertain indemnity, i.e., that can vary both ways. According to Lee, this dispersion is random. However, the aim is to verify the existence and measure insurance's subjective under- and overperformance based on adequacy and reality.

There are two major reasons for choosing the subjective perspective. First, subjective performance directly affects demand for insurance, a major measure within economic models. Second, the comparison between subjective and objective

performance, potentially relevant due to the counterintuitively of the insurance concept (Kunreuther, Pauly and McMorro, 2013, pp. 3–8), shows areas with a potential: financial education, changes in products, changes in selling practices, regulatory or supervisory interventions. The objective perspective does not have to be considered superior or primary. Furthermore, obtaining an objective outcome, also in the context of the insurance contract, is becoming increasingly challenging. The expanding complexity of insurance products and socioeconomic reality forces contracting parties to seek the objective ‘truth’ within the judicial process, as finding certainty in interpretation is nearly impossible for everyone.

Further analysis of insurance performance is based on comprehensive motor insurance (accident and theft insurance, motor hull insurance), commonly named “auto-casco insurance” in Poland. This type of insurance was chosen for several reasons: it is relatively common and covers only property. Accordingly, no claims under motor policies relate to injuries or death, types of loss that are difficult to assess. Motor insurers also operate well-operationalised claims-handling processes. Additionally, insurers employ different loss adjustment procedures within a single insurance contract. This may increase the possibility of under- or over-performance.

Comprehensive car insurance pays for damages to, and loss of, a motor vehicle, including those caused because of the policyholder’s fault, by natural forces, or by an unknown perpetrator. The product penetration of comprehensive car insurance is diverse across Europe; mostly, it depends on the value of the country’s car fleet and the development of the local insurance market expressed by spending per capita (Insurance Europe, 2019). In Poland, auto-casco is less popular compared to other developed markets due to the age structure of the vehicle pool and the degree of development of the local insurance market. Only about 22% of vehicle owners buy this type of insurance (in the year of the main research – 2017, Insurance Guarantee Fund in Poland).

Structurally speaking, auto-casco products are quite similar in all carriers of that type of insur-

ance. However, customers are frequently given multiple options, with different type of peril scope, which can make the outcomes different for specific insureds. Individual coverage can differ in the types of spare parts (genuine, OEM, OES, or aftermarket) paid for under the policy. According to qualitative research, IDI, with an insurer’s CEO, spare parts costs reflect 60% of claims. Furthermore, the method of loss adjustment affects the value of the claim and, in turn, that of compensation. There are four different methods of calculating compensation payable under auto-casco policies:

- the invoice-based method – payments made under the policy are based on invoices provided by the policyholder and later evaluated. Accordingly, the scope and value of repairs may be questioned. Compensation (in cash) is paid directly to the beneficiary (insured person);

- the simplified cost estimation method – the loss assessment is based on information provided by the policyholder, and no proof of actual repair is needed. Compensation (in cash) is paid directly to the beneficiary (insured person);

- the full cost estimation method – the loss is assessed during a review performed by an appraiser, and no proof of actual repair is needed. Compensation (cash) is paid directly to the beneficiary (insured person);

- the cashless claim settlement method – repairs are performed by designated repair shops that communicate with, and are paid by, the insurer directly; no payments are made by or to the insured person.

A rule known as the “total loss” rule is also relevant. “Total loss” is when the cost of repairs of a vehicle exceeds 70% of its value before the loss. The total loss calculation is based on factory-made spare parts and costs of repairs performed by shops authorised by specific car makers. If the condition for total loss is met, the insurance company pays compensation equal to the car’s value reduced by the value of any remaining parts of the car that can be sold. Finally, compensation can be reduced by deductibles or because of the insured person’s contribution to causing damage.

The coverage is uniform between insurers, and any differences that may arise are associated with the risks covered under optional add-on cover-

age. This optional coverage allows insurers to adjust their auto-casco products to consumers' needs but impose additional obligations on distributors. Furthermore, in auto-casco insurance, each payment of compensation lowers the policy amount. The brief presentation of the fundamentals of auto-casco insurance shows how complex this insurance product is.

Different actors engaging in this process have different ultimate objectives. It is thus possible to identify, at this point, several sets of principal-agent dilemmas. From the insurer's perspective, auto-casco insurance is a profitable product: its profitability ratio of technical activity (net of reinsurance) is 6.61% (according to 2017 data for Poland). For comparison, the mandatory motor third-party liability (MTPL) insurance ratio is 4.48% (Polish Financial Supervisory Authority). Compensation calculation methods result in divergent insurers' outcomes. Auto-casco insurers are aware of occurring fraud cases: 1% of payments under auto-casco policies are caused by known fraudulent claims (Majewski, 2018).

From the perspective of intermediaries, auto-casco coverage is a welcomed addition to mandatory MTPL policies, mostly due to higher commissions, which are at least twice as compared to MTPL sold as a stand-alone product. In almost all cases, auto-casco is bought from the same intermediary and from the same insurer. Auto-casco customers are more likely to buy other insurance products because of their better financial situation. Due to the complexity of auto-casco claims handling, intermediaries often guide customers through the entire distribution process and sometimes the loss adjustment process.

From a repair shop's perspective, repairs paid under auto-casco policies are different than those covered by MTPL policies due to diverse working-hour rates, higher in the case of auto-casco. MTPL claims are significantly more common but repair shops' margins are lower. Costs of spare parts can differ due to auto-casco policy option. In case of MTPL there is an expectation to restore the original state. In auto-casco customers tend to accept repair quotations provided they do not exceed the awarded compensation amount. Working-hour rates for

uninsured repairs are lower. Repair shops may resort to fraudulent practices regarding technology or spare parts used but this matter falls outside the subject of this paper.

## 2. Materials and Methods

Previous studies on the Polish insurance market have revealed specific tendencies and mechanisms important for the subjective perspective. Research by the Polish Association of Insurers identified experience as an important factor in insurance knowledge [the study on the activity of law firms handling insurance claims performed for the Polish Chamber of Insurance (6 IDIs held in April 2014; two waves of CATI omnibus carried out on a random sample of the 15+ Polish population, stratified sample N=2007, held on January 2014)]. On average, the general insurance knowledge is relatively low. It has not changed significantly over the last few years [A study on insurance knowledge (CATI, carried out on a random sample of the 18+ Polish population, stratified sample N=1000 people, held on March 2017; CATI, carried out on a random sample of the 18+ Polish population, stratified sample N = 1000 people, held on November 2021)]. However, expectations regarding insurance coverage are quite rational, as the low price can affect the scope of coverage. At the same time, the perception of peril depends on frequency [A study on the use of commercial insurance as an element of financial planning of households in Poland – Insurance forethought in the change of the social security system, the Polish National Science Center's grant (No. UMO-2013/11/B/HS4/02160) four focus groups; CAPI, carried out on a random sample of the 18+ Polish population, stratified sample N = 1063 people, held on 21-26 April 2017]. In-depth research on insurance literacy proves that insurance is a counterintuitive concept. It is much less understood as compared to concepts such as interest rates, inflation, or diversification of investment risk [Studies on insurance knowledge (CATI, carried out on a random sample of the 18+ Polish population, stratified sample N=1000 people, held on March 2017; CATI, carried out on a random sample of the 18+ Polish population, stratified sample N=1000 people, held in November 2021)].

Past studies identified that the performance of an insurance contract from the subjective perspective could be different from an assumed outcome, resulting in under- or over-performance. Although both – objective and subjective – perspectives may be distinguished, the subjective perspective is prevalent from a consumer's point of view.

H1: The subjective perception of performance allows both under- and over-performance within comprehensive car insurance coverage.

There are no available databases capable of confirming the existence of under- or over-performance of insurance. That is why theme-specific research on comprehensive car insurance in Poland was designed to verify the above assumptions. The research process was split into four major parts: the first was a qualitative study (IDIs) to reveal, in detail, the perspectives of parties to the claims settlement process; the second was a quantitative study aimed to investigate auto-casco claims; the third was a quantitative study to establish the incidence of under- and overperformance and determine their features (subjective performance); and the fourth was a qualitative expert analysis of claims documentation (objective performance).

In the study's first phase, several IDIs were held to obtain the perspective of particular parties to the claims settlement process. The diverse views expressed by respondents led to developing two minor hypotheses and improved the questionnaire.

The next phase was a representative survey (for Poland, N=4500, CATI, 3-7. July 2017) to identify the penetration of auto-casco insurance and the ratio of claims. Publicly available data did not allow to select policyholders' households regarding contracts and claims for the defined period. This study gathered a general opinion on Polish car owners' satisfaction with the auto-casco loss adjustment process.

The third and fourth phases were based on auto-casco claims reported within two years before the research data. The third phase used a targeted questionnaire for policyholders (CAPI, N=150, 11 August -16 September 2017). The sample size was determined based on the claims ratio from the previous survey (N=4500). During the fourth phase, claims documentation reported by the

policyholders surveyed in the third phase was analysed. The third and fourth phases provided data that enabled the evaluation of subjective and objective insurance performance.

### 3. Results

In the study's first phase, several IDIs were held to obtain the perspective of individual parties to the claims settlement process. The first IDI with the representative of an association of spare parts manufacturers proved the influence of the type of spare parts on car repair cost. According to the IDI, the CEO of the insurance company offering auto-casco insurance research team acknowledged that spare parts constituted approx. 60% of the car repair cost. This resulted in economic pressure on using aftermarket parts, or usage of spare parts other than original. The sale of spare parts other than genuine is allowed in Poland, however, there are countries like France it is not the case. In practice, calculations based on the simplified cost estimate method generally result in the lowest costs for the insurer. Repair shops' perspectives shed more light on the loss adjustment process and the attractiveness of total loss for insurance companies. Finally, an interview was held with experts from the Polish Financial Ombudsman Office to identify possible situations leading to detrimental consumer outcomes. The experts pointed out three major issues: incorrect car valuations at the inception of an insurance policy, deduction of VAT from compensation, irregularities, and detrimental simplification affecting the payment of compensation based on the simplified cost estimate.

The first phase of the study allowed the development of working hypotheses for the third and fourth phases of the study.

WH1: The subjective under-performance of comprehensive car insurance coverage results from the low adequacy of insurance coverage.

WH2: The subjective over-performance of comprehensive car insurance coverage results from a simplified loss adjustment process.

The above opinions were used to improve the questionnaire for the second phase of the research. The main goal of the second phase was to determine the penetration of auto casco insurance claims and the level of satisfaction. The standard representative sample for Poland is N=1013; however, a bigger sample was



**Table 1**  
*Outcome of IDIs*

Measure	Variable
A representative of an association of spare parts manufacturers	IDI proved that the type of spare parts affected the cost of car repair and revealed significant differences between the spare parts of the same type depending on a car's manufacturer.
CEO of an insurance company offering auto-casco insurance	The team acknowledged that spare parts represent ca. 60% of the repair cost. This caused economic pressure to use aftermarket spare parts [The sale of spare parts other than genuine is allowed in Poland]. In practice, calculations based on the simplified cost estimate method generally provide the lowest cost for the insurer.
Experts from the Polish Financial Ombudsman Office	During the interview, experts pointed out three major issues potentially detrimental for retail policyholders: imprecise valuation of a car at the inception of an insurance policy, deduction of VAT from compensation, irregularities, and detrimental simplification related to compensation based on the simplified cost estimate.
An employee of a car repair shop	The repair shop's perspective resembles that of retail policyholders, as their immediate interests are arguably, more similar. The total loss option is more attractive for insurance companies.

Source: own elaboration based on IDIs.

used (N=4500, CATI, 3-7 July 2017), as auto-casco policies are rarely purchased by households who seldom submit claims under such policies. 54.4% of respondents keep a car (all presented data are statistically significant; if not mentioned differently, 24.3% bought auto-casco insurance within two years directly preceding the survey, whereas 44.5% own a car. Most auto-casco policies were bought from a tied insurance agent (60.8%). Less commonly, such policies were obtained from a car dealer (14.7%), online (9.2%), from a multiagent (8.4%) and a bank (1.5%). 5.3% of the respondents indicated "other distribution channels" or gave the "I do not know" answer). Distribution channels proved to be statistically insignificant in the context of the performance of an insurance contract.

The level of satisfaction was relatively high. The average satisfaction level was 3.29, with "dissatisfied" answers scoring 1, "somewhat dissatisfied" – 2, "rather satisfied" – 3, and "very satisfied" – 4 ("I do not know" answers were disregarded). Interestingly, the respondents who made a claim in the two years preceding the survey ranked their auto-casco insurance higher than those without claims (3.37 and 3.26, respectively). The respondents' assessment with two claims was even

more positive (3.53 on average).

The difference in satisfaction among holders of auto-casco policies who engaged in different types of lost adjustment procedures was not statistically significant. Interestingly, satisfaction with an auto-casco policy (Table 3) was driven more by the performance of the repair shop (0.406) than that of the insurer (0.371). It suggests that the interests of policyholders are more similar to those of repair shops.

The third phase focused on the performance of insurance contracts. Satisfaction with loss adjustment processes operated by insurers reached the level of 3.28, slightly higher than in the study's second phase (3.25). In-depth analysis showed limited correlation with particular criteria of choice, the insurance company's brand, and confidence that the repair shop serves the customer's interests. In both cases, such factors increase satisfaction with loss adjustment.

Data revealed three possible outcomes: appropriate performance, underperformance and overperformance (85.0%, 8.3% and 5.3% of all answers, respectively, with 1.3% of "I do not know" answers). However, the further split based on the loss adjustment procedure did not provide statistically signifi-

**Table 2***Satisfaction with Auto-casco Policies and the Assessment of the Insurer's and Repair Shop's Activity - Cramer's V*

	<b>Independent variable name</b>	<b>Independent variable label</b>	<b>Value</b>	<b>Approximate Significance</b>
1	KOM13_1	KOM13. Please use a 4-point scale to assess the extent of your satisfaction or dissatisfaction with the loss adjustment carried out by the repair shop	0.406	0.000
2	KOM9_1	KOM9. Please use a 4-point scale to assess the extent of your satisfaction or dissatisfaction with the loss adjustment carried out by the insurer	0.371	0.000

Dependent variable ->KOM5 "KOM5. Please use a 4-point scale to assess the extent of your satisfaction or dissatisfaction with your auto-casco policy"

Source: own elaboration based on CATI (N=4500, CATI, 3-7. July 2017)

**Table 3***Linear Model Regression for Satisfaction with the Loss Adjustment Process Operated by an Insurer (From 1 to 4, the Highest)*

<b>Change Statistics</b>									
<b>Model</b>	<b>R</b>	<b>R Square</b>	<b>Adjusted R Square</b>	<b>Std. Error of the Estimate</b>	<b>R Square Change</b>	<b>F Change</b>	<b>df1</b>	<b>df2</b>	<b>Sig. F Change</b>
1	.334a	0.112	0.097	0.823	0.112	7.730	2	123	0.001

a. Predictors: (Constant), OC1c: repair shop serves my interests, OAC9. the brand of the insurance company determined my choice of the auto-casco policy

Source: own elaboration based on CAPI (n=150) 11 August-16 September 2017.

**Table 4***Coefficients for Satisfaction with the Loss Adjustment Process Operated by an Insurer (From 1 to 4, the Highest)*

<b>Model</b>		<b>Unstandardised Coefficients</b>	<b>Standardised Coefficients</b>	<b>Beta</b>	<b>t</b>	<b>Sig.</b>
		<b>B</b>	<b>Std. Error</b>			
1	(Constant)	2.334	0.312		7.489	0.000
	OAC9. the brand of the insurance company determined my choice of the auto-casco policy	0.414	0.166	0.215	2.500	0.014
	OC1c: the repair shop serves my interests	0.235	0.089	0.226	2.627	0.010

Source: own elaboration based on CAPI (N=150) 11 August-16 September 2017.

cant results (except for the loss adjustment procedures based on the cost estimate method). For the same reason, respondents' opinions on the level of under- and overperformance were irrelevant. Significant variables occurred related to the behaviour before reporting the loss: contact with relatives and friends or searching for information online (Table 6). Contact with relatives on average, decreases performance, whereas searching for information online has the opposite effect. Accordingly, the working hypotheses WH1 and WH2 have not been proved.

A possible reason for underperformance is low adequacy. Respondents were asked if they would change the scope of insurance after their experience with loss adjustment. Declarations on changing the scope of insurance after loss adjustment (Table 7) were a significant predictor of underperformance ( $\text{sig}=0.039$ ,  $\text{df}=3$ ), the binominal regression model did not prove to be significant ( $\text{sig}=0.109$ ) in this regard.

The fourth phase was not completed as less than half of the loss adjustment data were collected. This prevented the performance of a complete analysis. The policyholders participating in the third phase signed legal authorisations for the research team but most insurance companies refused to send claim documentation invoking a restrictive interpretation of data protection laws. The legal dispute over this matter lasted two years and failed to cause a change in the insurers' decisions, leading to a delay in the preparation of the paper.

#### 4. Discussion

The study proves the existence of perceptions of the loss adjustment process for auto-casco insurance vary depending on personal experience and are significantly higher for policyholders who recently made a claim. This suggests that loss adjustment processes have likely been improved. A number of claims greater than one meant higher satisfaction, most likely resulting from more extensive expertise, understanding of the claim process, and more realistic expectations. A similar situation was observed among customers in an earlier study on the activity of law firms handling insurance claims in Poland (Kawiński & Majewski, in press). Research on financial skills considered experience as an important factor (Awais et al., 2016). However, it is not only own experience, but also in-

tergenerational patterns (Tang, 2017).

Loss adjustment procedures based on the cashless settlement method were ranked as most satisfying (3.46), probably because of their convenience. A car is transported to a repair shop which contacts the insurer directly and informs the policyholder only about the most important issues. The policyholder collects the repaired car from the shop. The second best procedure, satisfaction-wise, was the one based on a simplified cost estimate (3.35), a method that limits the necessity to communicate with the insurance company and speeds up the payment of compensation. Statistical analysis showed two features to some extent capable of explaining the level of satisfaction: the assessment of the repair shop's performance and the recognition of the insurer's brand. Customers who thought that the shop served their interests manifested higher satisfaction. The same applies to situations where the insurance company's brand determined the choice of an auto-casco policy. This outcome echoes the research on satisfaction from other markets (Dodds et al., 1991; Wu et al., 2011).

The study did not verify the hypothesis that the simplified loss adjustment procedure is mostly responsible for the under- and overperformance of auto-casco insurance. However, cases of subjective under- and overperformance were identified. The statistical analysis identified variables linked to policyholders' behaviour directly preceding their claims' submission. The customers who searched for information online before reporting a claim noted better performance than those who made inquiries among relatives and friends. This suggests that digital and financial competencies are somehow correlated and remain in line with the findings of a study by (Lam & Lam, 2017).

The fourth phase of the study was not completed. Therefore, the hypothesis on under- and overperformance of auto-casco insurance from the objective perspective could not be verified. Data from the Polish Financial Ombudsman (Rzecznik Finansowy, 2017) and recommendations (Komisja Nadzoru Finansowego, 2022) issued by the Polish Financial Supervisory Authority revealed only situations of underperformance of financial sector that was proved in many researches (Ahmed et al., 2020; Flannery et al., 2013, p. 200).

**Table 5***Linear Model Regression for the Performance of Insurance Contracts (Compensation as % of Subjective Loss)*

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.302 <sup>a</sup>	0.091	0.077	0.356	0.091	6.414	2	128	0.002

a. Predictors: (Constant), SZK4\_4. Before reporting the loss I searched for information online, SZK4\_1 Before reporting the loss, I contacted relatives and friends

Source: own elaboration based on CAPI (N=150) 11 August-16 September 2017.

**Table 6***Coefficients for the Performance of Insurance Contracts (Compensation as % of Subjective Loss)*

Model		Unstandardised	Standardised	Beta	t	Sig.
		Coefficients	Coefficients			
		B	Std. Error			
1	(Constant)	1.982	0.034		58.337	0.000
	SZK4_1 Before reporting the loss, I contacted relatives and friends	-0.268	0.101	-0.224	-2.646	0.009
	SZK4_4. Before reporting the loss I searched for information online	0.304	0.139	0.185	2.188	0.030

Source: own calculations based on CAPI (N=150) 11. August -16. September 2017.

**Table 7***Satisfaction with Compensation vs. Scope of Insurance - Cramer's V*

	Independent variable name	Independent variable label	Value	Approximate Significance
1	DOD3_2	DOD3. I will change the scope of my insurance after my experience with loss adjustment	0.251	0.039

Dependent variable ->WW2 "WW2. Did the amount of compensation you received from the insurer cover in full the cost of your vehicle repairs?"

Source: own elaboration based on CAPI (N=150) 11 August-16 September 2017.

## 5. Conclusions

Policyholders' (subjective) perspective relating to insurance shows under-, full-, and overperformance. There is no proof of statistically significant relations between the price and satisfaction with an insurance policy. Hence, there is no (indirect) proof of the existence of probabilistic insurance.

Both under- and overperformance require further research to determine the existence of potential determinants.

At the same time, the study shed some light on Lee's concept of uncertain indemnity (2012). The study has not confirmed the random nature of insurance compensation, at least from the subjective

perspective of policyholders. A significant difference exists between the more likely underperformance and the less likely overperformance. There is also no proof that underperformance is an outcome of inadequate coverage. Hence, fixing adequacy does not guarantee a random outcome of indemnity.

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