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Deterioration in Trade Value of Passenger Cars

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Abstract:

The main aim of the article is to investigate the issues of deterioration in market value of motor vehicles, to determine its volume, measuring method and its consequences. The following article analyses the decline in trade value of vehicles that are currently in use. The study has been conducted into the loss of trade value of motor vehicles that have never taken part in road accidents. The case under analysis focuses on the decline in trade value of a motor vehicle generated by the operating automotive industry. The article draws upon information from trade magazines, and with regard to insurance products, from the general terms of insurance from a selection of insurance companies.

Keywords: insurance; auto-casco; trade value; deterioration in trade value; passenger car.

JEL Classification: D49; G22; L11.

Introduction

Auto Casco insurance of motor vehicles is voluntary and belongs to the second category of risks with a year-long insurance period. From the present-day practices with this type of insurance, it transpires that every insurance company modifies their terms of insurance on the basis of economic parameters and risk rating. Auto Casco insurance is a relatively expensive product as insurance premium totals approximately 10-12% of the sum insured. Hence, only about one-third of all vehicles is covered with this insurance. The common section of all general terms of all insurance companies regards liability for damage inflicted by forces of nature, road damage (i.e., crashing into objects), man-incurred damage (e.g., theft, devastation), poor maintenance of technical devices (e.g., fires). In addition, each of insurance companies applies a number of exclusions and restrictions stemming from past experiences with this product. Damage, within the sense of auto Casco insurance, is defined as defect, destruction or loss of a vehicle and its standard equipment as a result of incidents enlisted by general terms of insurance.

Nowadays on the automotive market there is a whole multitude of cars of various makes, useful life, at various prices, etc. Apart from that, the automotive market is governed by the laws of supply and demand, competition, and servicing[1]. Therefore, many factors are taken into account while calculating the sum insured. Very rarely insurance companies take notice of deterioration in trade value for cars older than 1 year[2]. The general terms of insurance infrequently have regard to the loss of market value of motor vehicles in use.

In result, the aim of this article is to investigate the issue of deterioration in market value of motor vehicles, to determine its volume, measuring method and its consequences.

1. Research Methodology

The following research paper analyses the decline in trade value of vehicles that are currently in use (excluding historical vehicles). The study has been conducted into the loss of trade value of motor vehicles that have never taken part in road accidents leading to any damage to the car body. Also, outside this analysis are vehicles operated by uniformed services.

The case under analysis focuses on the decline in trade value of a motor vehicle generated by the operating automotive industry. The automotive market includes factors like supply (the number of vehicles), demand (the need for vehicles) and the vehicle's price are the resultant of those two factors. The article draws upon information from trade magazines, e.g., *Motor*, *Auto-moto*, and with regard to insurance products, from the general terms of insurance from a selection of insurance companies.

2. The Concept of Deterioration in Trade Value of a Motor Vehicle

First of all, it is necessary to discuss the issues of decline in trade value of vehicles involved in road accidents. In the available literature on this subject, one can find the concept of deterioration in trade value explained within the definition of damage (Olędzka, 2012; Krupa-Lipińska, 2012).

Kowalewski (2011) states that for every buyer, a crashed repairable car has a lower trade value, even if repairing it made it roadworthy again. In turn, Celczyńska (2009) claims that since the year 2000 it has been noted that insurance companies have been satisfying claims for decline in trade value of motor vehicles following a road accident and the removal of its effects (Budzianowski, 2016).

In accordance with the art. 361 para. 1 of the Civil Code „Liable to pay compensation shall be held responsible only for the usual effects of actions or inactions which directly led to the damage concerned". Para. 2 adds that „In view of the above limitations, in the absence of opposing legal regulation or contract provision, redress of a damage involves incurred losses as well as the benefits that the claimant would have achieved if the damage had not been inflicted"[3].

On 17th of January, 2002 official guidelines (no. 1) for deterioration in trade value of motor vehicles were developed (Instrukcja, 2002). This set of instructions outlines how to establish a vehicle's value related to the first damage due to a road accident. Implementing these guidelines has provoked a great deal of controversy (new solutions were introduced in 2009, see Chmielowiec, 2012). Various attempts have been made to estimate the market value taking into account a number of adjustment factors such as the rate of wear and tear, modernity factor, demand-and-supply ratio and others (Jedliński, 2005). Following the Supreme Court's ruling of 12th October 2001, the insurer is obliged to compensate for the so-called commercial damage if due to a road accident and despite appropriate repair work, the market value of a vehicle is decreased (Skibińska, 2008) (ref. III CZP 57/01). Such a practice is commonly adopted in the EU.

By contrast, other authors try to determine the decline in trade value of a crash-damaged motor vehicle by means of limit values: mild decline, moderate decline and marked decline (Pytel, 2010). The proposed method is simple, transparent, and based on data drawn from widely available sources. In particular, this method is at the service of adjudicating bodies (courts of law). A weakness of this method is the subjective assessment of damage. In trade magazines the decline in trade value is analyses in relation to parameters such as the type and cost of petrol, servicing, mileage, technical condition (Sulowski, et al., 2015).

[1] It is assumed that the automotive market relies on lawful and fair competition.

[2] One can find a lot of information on that in many trade magazines, e.g., *Motor*, *Automoto*.

[3] So far it has been assumed that the motor vehicle had an accident, collision or was subject to damage on a massive scale. In further analysis, it is assumed that the loss of trade value involves motor vehicles that have never participated in any road incident leading to the necessity of its repair.

In this paper, the following definition has been adopted: a decline in trade value constitutes the difference between the purchase price of a new motor vehicle and its commercial (market) value if there was a need to sell or insure the vehicle one year after its purchase. This definition has been formed by observing the automotive market. It encompasses all kinds of motor vehicles regardless of their make, model, technical and practical parameters and technical condition. In line with the research methodology, the sold vehicle should not participate in any accident or road collision. The purchase price can be set by manufacturers, car showrooms, car dealers, car experts, debt collectors and others.

It needs to be stressed that both the selling price and the purchase price may change in real time (they are subject to negotiation). For many years Poland has had the supply of cars higher than the demand, which results in a decrease in car prices[4].

3. The Grounds for the Decline in Trade Value of Motor Vehicles

The decline in trade value of motor vehicles is affected by many factors. All of them can be divided into factors related to: market, production, social status and the car's buyer.

Market - related factors depend mainly on free market rules, namely demand and supply and their resultant price. On the automotive market, the leading role is played by western manufacturers' makes and their subsequent models. Moreover, car manufacturers are aiming at providing the market with specialist vehicles, e.g., vehicles for courier services, postal services, rescue and emergency services, and door-to-door sale.

Production factors include:

- There is a growing number of vehicles equipped with state-of-the-art electronic devices (e.g., wireless communication, satellite navigation systems, monitoring drivers' reactions, GPS) which facilitate driving (drivers' work), and increase safety,
- car manufacturers produce short series of different models[5],
- subsequent car models differ very slightly in their pricing;
- international competition between manufacturers on the automotive market (it concerns the activities of Japanese manufacture, Sobolewski , 2015),
- vehicles' age, selling time (Motor, 2009),
- the network of service stations for particular makes is expanding,
- after-sales period of warranty is frequently prolonged.

The picture of the automotive market in Poland is affected by the import of cars from abroad (for example in 2017 around 870,000 vehicles were imported). One can notice an increase in the number of registrations of motor vehicles, especially among corporate customers. Increasingly popular on the market are hybrid electric cars and the future will see more autonomous vehicles[6].

In order to reduce the emission of CO_2, more and more often CO_2 is being replaced with CNG, LPG, and hydrogen in future (Faryś, 2018). In the motorcar trade there are around 59,000 workplaces.

Many new solutions concern telematics (Nawrocki, 2018; Owsiański, 2018) or, in the near future, the Internet of Things (embedding the car with info sensors, and 'black boxes'). The current parameters of the car such as power, cost-efficiency, and safety treat the car as equipment or hardware, whereas the car's devices equipped with new sources of programs are perceived as software (Buczek, 2018).

Equally important is the development of road infrastructure which enables:

- to reach destinations more quickly,
- to increase the travelling speed,
- to transfer information by means of electronic media,
- to carry out numerous advertising (Sobolewski, 2018) and insurance (Motor, 2018) technical manipulations.

[4] It needs to be noticed that on the automotive market, there are many vehicles already in use or vehicles after accidents, which have been mentioned before. The complexity of various factors leads to new vehicles losing their value directly after they have been purchased. For the sake of the research – the decline in trade value of motor vehicles refers to new cars sold on the market. The starting point here is the manufacturer's price, car showroom's price, dealer's or supplier's price and so on.

[5] Research suggests that new models are released every 2–2.5 years.

[6] The demand for vehicles over 3.5 t of weight creates the demand for transport, export, import and lease.

The manufacturer's pricing policy plays a nontrivial role. Car models promoted by manufacturers associated with very attractive, open-access and long-lasting discounts reach lower values when resold than car models by manufacturers that use short-term low-price discounts or offer promotional packages for car equipment. It is common knowledge that at every life stage (releasing the product, regular sale, the end of production) the car may experience a different decline in its trade value.

From *a social standpoint,* some decisive factors are:

- society's wealth: the stronger economically the household is, the more expensive vehicles are purchased (many households possess at least one motorcar), and the society's wealth leads to customers buying newer generations of cars;
- the driver's and users' social status is often judged by the make (and model) of the motorcar they have bought;
- rivalry between households (so-called 'boasting' about one's possessions);
- unprofitability of car repairs, driving a car until the period of warranty expires and selling it on the secondary automotive market.

In their reactions, participants of the automotive market follow two trends. Following the first one, owners try to use the car to the fullest and accident-free. Then, after 2-3 years they sell it at a motorcar exchange. Besides, car owners are not willing to have their cars repaired. The second trend consists in awaiting customers who are eager to buy new second-hand cars. Moreover, this group of factors includes well-functioning bank car loans, short-term car rentals or leasing cars. Some characteristics of a decline in trade value of a car include: individual character depending on the vehicle, its make and model, it takes place gradually over the time of usage, it is almost always approximate in nature, it has a changeable rate. The most fundamental reasons for considering the decline in trade value are:

- for insurance purposes (comprehensive coverage, sum insured),
- for tax purposes and custom-duty purposes,
- in case of estimating a total loss,
- for banking purposes when taking out a car loan,
- in accounting debt collection,
- in case of a car theft.

From a customer's perspective, some factors that contribute to the decline in trade value of motor vehicles are: car appearance (a looked-after vehicle will always be assessed better), the car's mileage (Szewczyk, 2020) (as many as 80% of buyers pay attention to the fully documented mileage), technical condition (around 82% of buyers attach importance to repairs and overhauls), car age (most often bought motor vehicles come from western Europe and are over 9–13 years old)[7]. In other words, even the slightest technical detail may have an impact on the selling price. The customer's place of residence can be decisive too (Motor, 2019). Detailed calculations indicate that some models of cars incur a lower decline in the trade value, but higher maintenance costs. Reverse situations take place too (Grabowski, 2017).

4. Study cases regarding the decline in trade value of motorcars

The decline in trade value of a motorcar is time-based (see Table 1) and decreases over time.

Table 1. Average yearly decline in sale value of selected motorcars

Decline in trade value in subsequent years	Chevrolet engine capacity 796 cm^3 petrol engine up to 900 cm^3 [PLN]	Opel Astra 1.4 engine capacity 1364 cm^3 [PLN]
1	7,200	19,500
2	5,300	7,100
3	4,000	4,800
4	1,900	3,500
5	2,000	1,200
6	1,200	2,200
7	3,100	4,000

[7] That results from the analysis of data in CEPiK (2019).

Decline in trade value in subsequent years	Chevrolet engine capacity 796 cm³ petrol engine up to 900 cm³ [PLN]	Opel Astra 1.4 engine capacity 1364 cm³ [PLN]
8	800	3,500
9	800	1,600
10	500	1,100
Selling price (in 2011)	32,000	61,500

Source: Waśkiewicz et al. (2011)

From the data embedded in Table 1, it transpires that the longer the car is in use, the lower the decline in trade value becomes. However, there are periods when the decline is higher than in the previous year. Below, one can see the analysis of the decline in trade value in relation to basic technical parameters, see Table 2).

Table 2. Decline in trade value after 3 years in use

Description	Power [HP]	Transaction value of purchased car	Decline in trade value in PLN	%
Opel Astra, 1.6 CDTI, version Dynamic, hatchback, MT gearbox	110	82,400	36,079	43.8
SEAT Leon, 1.6 TDI, version Style, hatchback, MT gearbox	110	81,300	35,408	43.9
Kia cee'd, 1.6 CRDi, version M, hatchback, MT gearbox	110	69,540	29,834	42.9
Volkswagen Golf, 1.6 TDI, BMT, version Comfortline, hatchback, MT gearbox	110	85,730	36,588	42.7
Renault Megane, 1.5 Energy dCi, version Intens, hatchback, MT gearbox	110	79,600	33,956	42.7
Toyota Auris, 1.6 TDI, version Premium, hatchback, MT gearbox	110	85,900	36,051	42.0
Škoda Octavia, 1.6 TDI, version Ambition, hatchback, MT	110	84,800	25,588	42.0
Peugeot 308, 1.6 BlueHDi, version Active S&S, hatchback, MT gearbox	120	83,400	33,205	39.8
Hyundai i30, 1.6 CRDi, version Classic + BlueDrive, hatchback, MT gearbox	110	74,400	28,248	38.0
Ford Focus, 1.5 TDCi, version Trend Sport, hatchback, MT gearbox	120	83,140	31,143	37.5
Citroën C4, BlueHDI, version Trend Shine S&S, hatchback, MT gearbox	120	81,900	29,204	35.7
Opel Astra, 1.6 CDTI, version Dynamic, hatchback, MT gearbox	110	82,400	36,079	43.8

Source: Binkiewicz (2016).

The data collected in Table 2 do not suggest any correlation between the decline in trade value and, for instance, the engine power. The rate of year-by-year decline in trade value of the above-mentioned car models varies. Table 3 shows the decline in trade value of motorcars in the first two years of their useful life.

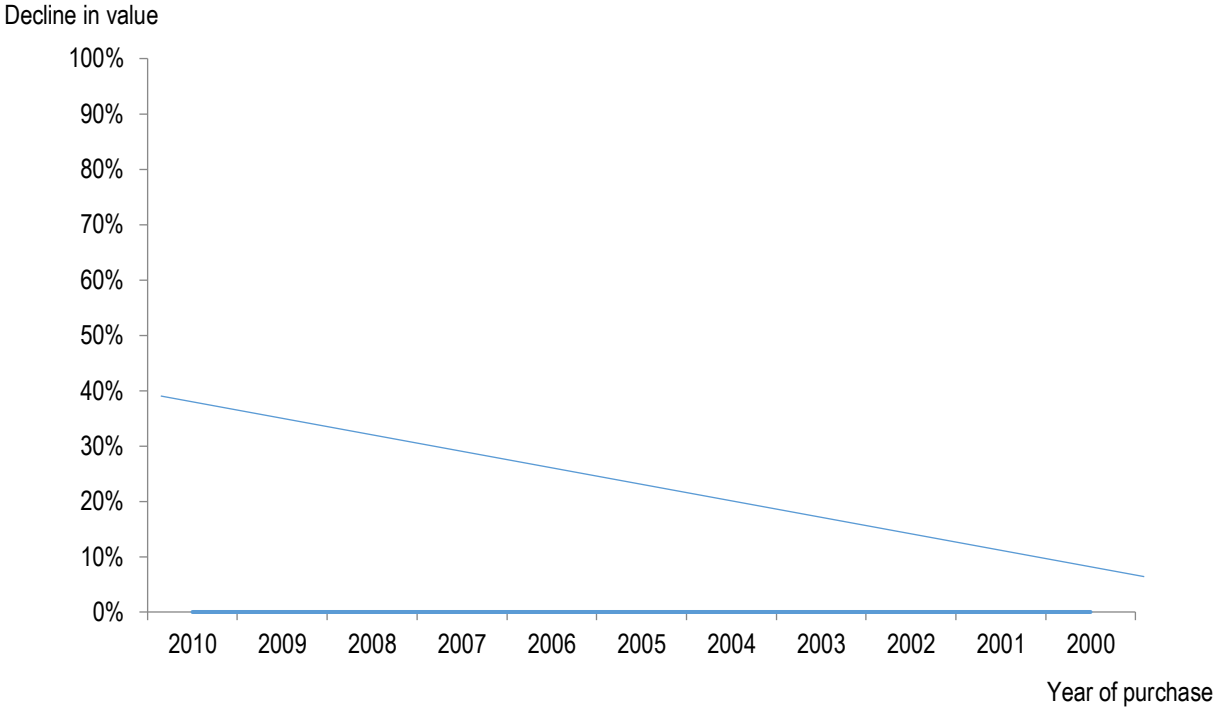
Table 3. Car models with the steepest decline of trade value (selected models)

Year	Toyota Prius II	Honda Civic IX	Seat Alhambra III	Mercedes class S (W221)	Skoda Rapid
2017	46,000	54,000	70,000	78,000	38,000
2018	40,000	45,000	60,000	64,000	31,000
Decline in value [%]	15.0	20.0	16.7	21.8	22.5

Source: Grabowski (2018).

As it can be seen, the decline in trade value after the first year varies from 15 % to 22.5% of the selling price depending on the make of the car. In general, the following graph shows a hypothetical trend of the decline in trade value of a motorcar (in percentage) in relation to its useful life (in years).

Figure 1. The decline in trade value of a typical motorcar, in %, approximation



Source: Motor (2020).

It is worth considering, here, what is the rate of the decline in trade value of motorcars.

5. Proposed Methods for Calculating the Rate of the Decline in Trade Value of Motorcars

An existing divergence between the vehicle's transaction price and its market value after some time leads to the issue of the rate of the decline in trade value. The rate of the decline in trade value can be calculated in four different ways. Applied symbols: *C* – initial cost of motorcar; *S* – motorcar's value at the time of sale or assessment; *n* – estimated number of useful live; *W* – decline in value (*W* = *C* – *S*); R_k – annual depreciation in value over *t* time; B_k – final value at the end of *k* year; *d* – annual discount rate. The straight-line method, which can be described with this formula:

$$R = \frac{W}{n} = \frac{C-S}{n}, \tag{1}$$

where: R stands for annual fixed depreciation in sale value and it remains invariable throughout the vehicle's useful lifetime. It is a very simple (simplified) method for calculating the depreciation in trade value.

The fixed annual discount rate method. The decline in trade value can be calculated as follows:

$$R_k = B_{k-1}d. \tag{2}$$

B_k is defined with this formula:

$$B_k = C(1-d)^t \Rightarrow \sqrt[t]{\frac{B_k}{C}} - 1 = \mathrm{d}. \tag{3}$$

Calculate the annual discount rate if after 3 years, a vehicle of the initial value of 60,000 PLN is estimated at 48,000 PLN. $d = \sqrt[3]{\frac{60\,000}{48\,000}} - 1$. The sum-of-digits method. In order to calculate the depreciation of sale value, one needs to make assumptions about the vehicle's expected useful life, e.g., *n* years. The total number of all the years (digits) is determined by means of a formula for the arithmetic progression, i.e.:

$$1 + 2 + \cdots + n = \frac{n+1}{2} \cdot n = \mathrm{N}. \tag{4}$$

To calculate the depreciation in the *k* year, the following formula is applied:

$$R_k = \frac{n-k+1}{\mathrm{N}}(C - S). \quad (5)$$

The initial value of a motorcar is 80,000 PLN, expected useful life is 7 years, and its final value is estimated at 20,000 PLN. Calculate the depreciation in the 3rd year of its useful life.

$$1 + 2 + \cdots + 6 + 7 = \frac{7+1}{2} \cdot 7 = 28$$

$$R_3 = \frac{7-3+1}{28}(80{,}000 - 20{,}000) = 10{,}714 \text{ PLN}.$$

Method of accumulated fund. An annual depreciation in commercial value can be calculated with this formula: $R = \left[\frac{C-S}{S_{\overline{n|}\,i}}\right]$, where $S_{\overline{n|}\,i} = \frac{(1+i)^n-1}{i}$ and *i* is annual interest rate.

We have the following values: *C* = 75,000, *S* = 15,000, useful life- 8 years, *i* = 0,03. Calculate the annual depreciation in market value: $\mathrm{R} = \frac{75{,}000-15{,}000}{S_{\overline{8|}\,0.03}} = \frac{50{,}000}{8.8923} = 5{,}622.82$. This method assumes an equal depreciation in market value at the end of each year of a vehicle's useful life and adopts a fixed interest rate[8].

On balance, the application of the above-mentioned methods is arbitrary. These methods can be applied, e.g.: by insurance companies when the general terms of auto casco insurance (AC) indicate a specific method for calculating the market value, by car rental corporations, which rent cars e.g., by means of lease, on the automotive market in buy-sell transactions, in enterprise accounting (asset's value), during customs procedures (Janowski, 2008), while calculating taxes (Matyszewska, 2009).

Insurance companies offering property and personal insurance adjust their general terms of motorcar insurance to suit individual needs.

6. Ramifications of Deterioration in Trade Value

Deterioration in trade value has numerous implications. First of all, one needs to notice that the fluctuations of motorcars' purchase prices have an impact on their manufacturers' reactions. Every manufacturer tries their best to sell the manufactured vehicle at the highest price possible as it affects the company's profit. A decrease in the sales of brand-new motorcars causes car manufacturers to develop research centers and carry out market research into the reasons for that state of affairs[9].

More and more often the production of motorcars makes use of the latest technologies, nanomaterials and technical and usable solutions. Apart from that, the more quickly new models come onto the market, the steeper the decline in commercial value of the cars produced previously. For car dealers, every change in car prices creates distortions in their sales despite extensive and costly advertising and promotional campaigns. All this contributes to making profits from sales.

It is not possible to claim compensation for depreciation in trade value because it is decided by market mechanisms. Prices, demand and supply – they all undergo changes that take place beyond sellers' and buyers' will. On the other hand, the car's buyer can be faced with the following consequences:

- non-returnable and common depreciation in trade value (unless a suitable car insurance contract is taken out),
- 'manipulation' of economic and technical factors that reduce the depreciation in vehicles' trade value is limited,
- self-evident losses on car maintenance costs; the more expensive cars are purchased and used, the sharper the decline in trade value.

Special attention should be paid to the issue of auto Casco insurance of vehicles. Insurance companies are searching for sum insured adequate for the given market value[10].

[8] This method requires the application of the sum of the geometric progression formula as well as the concept of compound interest.

[9] It is noteworthy to say that car manufacturers in their analysis of the automotive market pay attention to, among other issues, the commercialization factor (information on how well a given car make sells), technical costs factor, frequency of repairs, and failure rate throughout the car's useful life.

[10] In line with definitions adopted in *Słownik języka polskiego* (PWN, vol. 1, 1980) 'adequate' denotes„ compatible with something, corresponding to something". In *Wielka encyklopedia* (PWN, 1962) term 'adequate' is defined as characteristic of a proposition whose predicate refers to each and only those products whose names are present in the subject. In *Mała*

The amount of insurance for brand-new cars is determined by the purchase price of a vehicle. In practice, the amount of insurance is negotiable between the insurance intermediary (agent, broker) and a client. This amount is the top limit that an insurance company is obliged to pay in compensation (liability limit). Also, the amount of insurance is essential for calculating insurance premium and applying a bonus-malus system. The sum insured is a financial and calculable quantity. Because it is subject to negotiations, it may result in over- or underinsurance of a motorcar on signing a insurance contract.

The fixity of the sum insured, on the one hand, and variability of the decrease in trade value, on the other, may generate conflictive situations during damage liquidation. The phenomena mentioned above are unfavorable both for the insurance company and the insured persons.

Since auto Casco insurance is not obligatory, the car owner usually quotes the sum insured at the pleasure by taking into consideration the amount of premium that is bound to be paid. Among many aspects of insurance, one can consider different approaches to determining the sum insured. For instance, AC DAEWOO insurance policies introduce the terms of temporary real value[11] or referential value of a vehicle on signing the insurance contract, without defining these concepts further. From the analysis of the general terms of insurance offered by various insurance companies[12] it becomes clear that, on the one hand, they attach certain conditions to given sums insured, and on the other hand, to the market value of vehicles.

Insurance companies do not investigate the issue of depreciation in cars' trade value. Although terms for the sum insured are similar, terms for the market value are varied. Usually, the sum insured under auto Casco insurance is equivalent to the market value of the vehicle on the day when the insurance contract is taken out (The Aviva Insurance Company calculates the market value on the day of damage done).

Intuitive terms and descriptions refer to the essence of the market value. By the general terms of insurance, the market value of a vehicle is determined on the basis of current quotation on the market with regard to cars' certain properties (e.g., car make, model, type, manufacture year, technical condition, mileage, equipment version). In order to assess the car's commercial value, insurance companies refer to databases such as Info-Ekspert (e.g., Wiener, Warta), Eurotax (Allianz), Euroglass (Axa), Audatex (Allianz). Taking out an insurance policy for a brand-new car requires a receipt of purchase or a purchase invoice. If those documents are missing, insurance companies calculate the sum insured individually.

For example, the Axa insurance company introduces the concept of the guaranteed sum insured during the insurance cover period. And the Aviva insurance company, a change in the market value of a motorcar during the insurance contract period is taken into account while calculating the sum of insurance premium. Hence, 'during the insurance cover period, the sum of insurance premium is not changed regardless of the changes in the market value of the motorcar'. Considering the depreciation in trade value, it may affect the auto Casco insurance where the sum insured should be appropriately valuated.

At the moment of purchase, the depreciation in market value of a branded new car is the lowest. After six months its market value is lower than its purchase price. Taking depreciation in market value into account is – in the authors' opinion – the most necessary when: the insurance cover is shorter than one year (this may apply to car rentals) and the auto Casco insurance with the same insurance company is renewed.

The renewal of contract involves drafting and signing a new contract stating other parameters than the initial policy. The situation becomes complicated when e.g., a car loan was taken out due to the costs involved such as interest rates, commission and other charges. On the whole, with certain credit arrangements, it can be seen that, e.g., after 3 years due to the depreciation in trade value, a vehicle is worth less than the amount due to be paid off for the car loan itself. The depreciation in trade value of a vehicle clearly incurs a loss for the vehicle's buyer. Therefore, a large number of car owners decide to sell their vehicles just after driving them for two years so that they can minimize the losses. As for fleet leasing, the following correlation can be found: the smaller the difference between the price of a branded new car and its value after the lease period, the lower the cost of its long-term lease.

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encyklopedia prakseologii i teorii organizacji T. Pszczółkowski states that praxeology relates the concept of adequacy to the sphere of action and activity, and requires a decision, effort-purpose, intention-force. Philosophy claims that cognition is adequate when it is true and in line with reality.

[11] Applies to insurance policies taken out after 1 June, 1996.

[12] The analysis included the general terms of insurance of: Wiener TU SA Vienna Insurance Group Polska: Pakiet Auto; AVIVA TU Ogólnych SA, Polska: Pakiet Ubezpieczeń Komunikacyjnych, TUiR „WARTA" SA: Autocasco Komfort, PZU SA: PZU Auto, TUiR Allianz SA: Mój samochód, AXA Ubezpieczenia TUiR SA: Ubezpieczenia komunikacyjne, actual state in April, 2021.

In the case of cars under CFM (car fleet management) and company cars, their decline in trade value in the same period of time, is higher than the one for private cars because the former have done a higher mileage (Szaruga, 2009). One way of preventing losses related to the decline in trade value of vehicles is a unique GAP insurance (Guaranteed Asset Protection – insurance against financial losses). For instance, the following types of GAP insurance are offered (Jaworski, 2008)[13]: financial – covering the difference between the compensation payment on auto Casco insurance and the remaining sum of the car loan to be repaid; percentage- (indexation)-based; invoice-based (covering the difference between the compensation on auto Casco insurance and the car's initial purchase price). However, these types of insurance are rather expensive.

Credit Authorship Contribution Statement

Stanisław Wieteska: conceptualization. data curation. formal analysis. investigation. methodology. visualization. writing - original draft. (40%). Agata Szydlik-Leszczyńska - data curation. formal analysis. funding acquisition. investigation. resources. visualization. writing - original draft. (30%). Kinga Stęplewska - data curation. formal analysis. funding acquisition. investigation. resources. visualization. writing - original draft. (30%).

Conclusion

With regard to the aforementioned analyses, the following conclusions can be drawn:

- The depreciation in trade value is not a fixed quantity, but it changes over time and is dependent on numerous factors. First of all, it's including the mechanisms on the automotive market (car buyers and sellers in particular), but also production factors (e.g., adopted production policy, competitors) and social factors (e.g., wealth of society, competition between consumers).
- It is a necessity to publish online current data quoting the depreciation in market value of vehicles, which would facilitate and streamline the process of assessing the value of vehicles. Quick access to this type of information is important for customers of the automotive market (e.g., from the point of view of concluded AC insurance contracts), as well as for other subjects related to this market (insurance companies, car dealers).
- There is still ongoing search for adequate value of the sum insured on auto Casco insurance in relation to trade value of vehicle.

The subject matter that is raised in this paper has not been exhausted but only flagged up. Further research in this field is necessary.

Conflict of Interest Statement

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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