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PERSONALIZED TOTAL COST OF OWNERSHIP AND RESPONSIBLE CAR CHOICE: EXPERIMENTAL EVIDENCE

Master's thesis

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Tartu 2021

I have written this master's thesis independently. All viewpoints of other authors, literary sources and data from elsewhere used for writing this paper have been referenced.

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1. Abstract

Purchasing a car is one of the decisions that may have positive or negative impact on family's budget. Of course, buying a regular passenger car is always a cost, not an investment. General economic theory assumes that people are rational and make optimal decisions. But can a decision be optimal if not all the information is taken into account? When buying a car, are we willing to do all the necessary calculations to find out the Total Cost of Ownership (TCO) of each car we consider buying or only take purchase price or monthly leasing payment into account? This study investigates whether using a specially designed TCO application, that calculates personalized TCO of each new car model sold in Europe, can influence individual car choice towards more budget and environmentally friendly new car. The study documents that introducing better information into real-life car choice calibration does not have a positive effect on budget friendliness, quite the opposite. The reason might be due to peoples' subconscious comparison to the monthly costs of their current car, which is usually higher due to a lot better fuel efficiency of today's new cars. This may let them choose pricier car without increasing their current monthly budget. Similarly, people may have higher TCO expectations and be positively surprised when the actual TCO turns out lower than expected, as a result adhering to a more expensive option. Previous studies have been carried out as lab experiments with hypothetical car buyers. This research contributes to the literature by carrying out a field experiment and analysing real buyers' choices.

Keywords: Total cost of ownership, vehicles, car choice, sustainability, field experiment

2. Introduction

Bounded rationality, coined by Herbert Simon, states that people have limits on cognitive abilities to make an optimal decision (Kahneman, 2003; Simon, 1972). Buying a car is one of those expensive decisions people make in their lives and may have positive or negative effect on family's budget, as otherwise similar cars with similar functionalities can have different ownership costs. Today, 51% of new cars are bought with financing (Rehemaa, 2019), therefore people tend to focus only on monthly leasing payment and do not take into account operating costs. Those – like insurance, maintenance and fuel costs combined, can actually be even larger than leasing payment and may drastically differ between car makes and models. Total Cost of Ownership (henceforth, TCO) is regarded as a purchasing tool to understand the true cost of owning a product, a car for example (Ellram, 1995). Some authors (Danielis et al., 2019) divide TCO into consumer-oriented costs (cTCO) and society-oriented costs (sTCO), such as costs derived from air-pollution, traffic and noise. This paper considers only consumer-oriented costs.

This study contributes to the literature by investigating the causal effect of richer information on the costs associated with car usage on the consumer's car choice, specifically, their choice of cars for a test drive. I conduct a field experiment, using a specially designed web application, by providing the actual car buyers with either 1-month or 5-year information on either leasing payment only or complete TCO profile.

While the decision-making benefit from disclosing the 5-year TCO is straightforward, there exist several behavioural explanations of consumer's bounded rationality. The first behavioural driver is consumer's confirmation bias. As nowadays people gather most of the information from internet prior to visiting a showroom and very often the initial purchasing decision has already been made up in consumer's mind, therefore presenting fuel economy labels in showrooms may not be enough for optimum decision making. Buyers visit dealerships to take a test drive and affirm the decision. It has become common knowledge in behavioural economics that when decision has been made, people tend to seek only extra information to confirm the righteousness of their choice and disregard opposite data – confirmation bias (Nickerson, 1998). Therefore, it may be that consumers disregard future ownership costs if TCO information were presented too late in the decision-making flow.

The second behavioural bias is consumer's salience. It has been proved that people tend to focus on information that is more prominent and may ignore less so – salience bias (Tversky et al., 1974; Bordalo et al., 2010). This may lead to consumers taking into account only largely displayed monthly leasing payment cost and ignore other operating costs, even if the

information is presented somewhere with small print. The two aforementioned factors distort rationality of consumer decision as they tend to disregard the information that (i) undermines their initial decision; (ii) appears less pleasing. As a result, consumers intentionally focus on preferable information set, even if it is the poorly informative one, which yields an irrational decision. Furthermore, consumers with different financial constraints, i.e. different reference points, tend to react to the information differently. Following the prospect theory, relative weight of TCO information on car choice decision may vary depending on relative wealth of consumer and/or his budget for a car.

Along with purely behavioural drivers, there are merely technical reasons inducing consumer's bounded rationality in car choices. The major one is simple non-availability of complete, informative data on car TCO in a long run. Collecting and analysing TCO information is often a time-consuming process, requiring certain mathematical skill. Therefore, car buyers' decisions are often imperfectly calibrated with respect to own financial constraints and are strongly irrational (Codagnone et al., 2013; Nixon & Saphores, 2011; Greene, 2011; Kurani & Turrentine, 2007).

Standardized labelling may help to, at least partly, overcome the issue of poor calibration of car choices. European Union has brought into life fuel economy labels that have become mandatory to display in car showrooms in order to "enable consumers make an informed choice" (Directive 1999/94/EC). These labels are not required to be displayed on manufacturers'/dealers' websites or any other website that offers consumer vehicles for sale. Eurobarometer survey on "Attitudes of European citizens towards the environment" (2017) has found out that for 95% of EU citizens environmental protection is important personally, including decreasing air-pollution and using less fuel/energy, but only 6% of them have bought low emission car and 35% have personally done nothing to reduce their energy consumption. Greene (2011) argues that this can partially be related to loss-aversion combined with uncertainty – consumers are uncertain about the value of future fuel savings because they use neither lifetime discounting nor even simple payback calculations in evaluating car's fuel economy.

Previous research has come to mixed results on whether providing more detailed cost profile turns buyers to more budget and environmentally friendly choice (Dumortier et al., 2015; Codagnone et al., 2013; Nixon & Saphores, 2011). Calculating personalized TCO can be too difficult and time-consuming for an average car buyer without mathematical background. Previous studies have been carried out as lab experiments on hypothetical car

buyers. This research fills the gap by carrying out a field experiment and analysing real buyers' choices.

Advantage of field experiment, particularly in my research setting, is engaging the actual car buyers. Running the experiment in the field, compared to the laboratory setting, ensures that participants are unaware of being a part of experiment, they reveal their actual preferences and decision, free of the experimental demand effect (i.e. they do not feel the pressure of the experimenters, do not experience artificial lab environment). Moreover, the specific question of interest can only be studied with either actual car buyers, or general population faced with hypothetical car choices. Naturally, the latter providing vague measure of actual preferences, is drastically different from real decisions, in real environment, with real consequences. Running the experiment online via the specially designed application fosters even cleaner data collection procedure, since the web application appears as a regular car choice calibration device.

The experimental design allows to study several questions, which, to the best of my knowledge, are not addressed in the previous literature, or at least are not studies in the field experiment setting. The paper investigates the pure effects of leasing only vs. complete TCO profile on customer's car choice calibration. Secondly, I study a pure effect of the time frame, i.e. 1-month vs. 5-years, on customer's willingness to make more rational choice. These two research questions allow to suggest the information profile, which is the most effective in terms of customers' car choice rationalization.

The application used for this study was a Facebook Messenger bot designed specifically to help users choose the next car among all the possible new models offered in the market. Each user was presented with one car choice at a time. For each car, several exterior and interior pictures were presented together with make and model name, full price, option to view technical details and depending on treatment, leasing and/or TCO information. Relying on this information, user could express her choice whether she would buy this car or not. Throughout the process, each user was left with her top 5 most suitable cars she could take for a test drive.

The results of the paper suggest that more information may not lead to more rational car buying decision.

Common European Research Classification Scheme (CERCS) codes: S180, S264.

3. Previous Findings

Revealing Total Cost of Ownership (TCO) information allows consumers to make an educated decision and compare all the costs associated with owning of a product. TCO can be divided into consumer-oriented costs (cTCO) – everything from purchase price to all costs associated with using the product (Ellram et al., 1998), and society-oriented costs (sTCO), such as costs derived from air-pollution, traffic and noise (Danielis, 2019; Lebeau et al., 2013). Most of the previous behavioural studies on this subject have been carried out in lab environments and have not used personalized TCO information (personalized fuel costs relative to customer's yearly mileage, maintenance and actual insurance costs). They have also shown mixed results on consumers taking into account TCO information while considering car purchase.

Dumortier et al. (2015) have found on US data that for example stating 5-year fuel cost does not affect consumer decision towards more fuel economic cars (hybrid, or electric) but stating monthly TCO does affect. European studies on the other hand have found that bringing out 5-year fuel costs do nudge consumers towards more fuel-friendly car choices and although consumers tend to think that fuel economy is important for decision making, only few of them actually make the calculations (Codagnone et al., 2013; Nixon & Saphores, 2011; Greene, 2011). According to Kurani and Turrentine (2007) these calculations may prove to be too difficult for most consumers and therefore they make large errors in estimating fuel costs and savings.

Some earlier studies, reviewed by Kaenzig and Wüstenhagen (2010), have also found that providing TCO (in their case LCC or Life Cycle Cost) information increases the purchase likelihood of products with higher initial but lower operating costs. But the authors also bring out that this is more likely in case of expensive household appliances rather than cars. Codagnone et al., (2013) add that, in case of car purchasing, most consumers first choose a class of vehicle and environmental concerns come only after 10 other main attributes, like price, safety etc. Therefore, if the price of a vehicle was higher while offering long-term savings (lower TCO), this is not so important for most of the buyers. On the other hand, at least one research (Ungemach et al., 2017) has found that consumers with pro-environmental values tend to choose more fuel efficient vehicles no matter what. But for the general consumer, less fuel consuming car may be attractive as an idea (Commission, 2017), but if it did not fit their family of five, has not the preferred body type or costs significantly more, then environmental friendliness does not matter (Allcott, 2011). Consumers apply high discount rate on possible future savings and look more into the sum that they need to pay upfront (Loewenstein & Thaler, 1989) – first down payment of a leasing for example.

The advances in prospect theory, developed by Kahneman and Tversky (1992), aim to describe consumer regular behaviour (not optimal behaviour) where for example reference point (Tversky & Kahneman, 1974; Thaler, 1985), risk and loss aversion may play their roles. Buyers who have 50 000 € budget may be less sensitive towards TCO information than those who have 15 000 € budget, which is commonly known in behavioural economics as evaluating outcomes relative to the reference point. This may affect consumer's final choice regardless of information provided by the "seller". Thaler (1999) assumes, that consumers perceive outcomes of their decisions in terms of value function of prospect theory (Kahneman & Tversky, 1979).

Besides constructive processing used in decision making, researchers have proved that emotions influence human decision-making as well and should be taken into account in according models (Modi & Jhulka, 2021; Sanfey et al., 2003). Therefore emotions and the way consumers handle them during decision-making process have consequence for the outcome (Seo et al., 2007). Also the wording used can play an important part in the decision making: either "fuel efficiency" or "cost per mile" (Ungemach et al., 2017). Besides car buying being emotional, the decision making process is different for age groups, dependent on family size, income, personality and also travel patterns (Choo et al., 2004; Sprei et al., 2011). Heffner et al. (2006) have found that cars also have a symbolic value to the owner, and they signal who the owner is to other people. So, choosing next car may become overshadowed by being a status symbol nonetheless the TCO.

Salience bias (Tversky, 1974; Bordalo et al., 2012) is another factor that may influence making an optimal decision. Price, monthly leasing payment, low mileage or any other feature that stands out or has been made standing out deliberately among other characteristics in car classified ad, may incline consumer's choice towards salient attribute(s). As Taylor and Thompson (1982, p. 175) have put it "Salience refers to the phenomenon that when one's attention is differentially directed to one portion of the environment rather than to others, the information contained in that portion will receive disproportionate weighing in subsequent judgments". Bordalo et al. (2012) have shown in their model that especially in case of expensive, high-quality goods, salience of each good's attributes increases by showing irrelevant alternatives – the decoy and compromise effects, which are known violations of independence of irrelevant alternatives.

Various research about taxation has found that people spend more under tax-exclusive than under tax-inclusive prices (Chetty et al., 2009; Feldman et al., 2015) and they are less aware of toll tax if paid electronically, rather than in cash (Finkelstein, 2009). Similar situation

has been observed in lottery buyers' behaviour, where they tend to overweight information that draw their attention and to underweight information that does not (Bordalo, 2012). The same effect was documented in on-line shopping, where charging higher shipping costs at lower initial product price leads to increased overall sales and vice versa (Hossain et al., 2006).

Signalling theory, initially proposed by Spence (1973), can share some light to the vehicle buying calibration problem. It has been used for some time now to explain decisions made on stock market (Connelly et al., 2011), by consumers in general (Boulding et al., 1993) and on used car market (Kim, 2018; Akerlof et al., 2007) where one party has access to more and better information than the other. Stiglitz (2002) has explained this simply as "different people know different things". Consumers make decisions based on easily and publicly available information and on private information, which they need to gather or calculate themselves and which may even not be available prior decision making (initial purchasing decision is made before fuel economy label seen at dealership for example). Gathering private information may be too time consuming or require extra effort from the consumer. Making TCO information proactively available and signalling it to the consumer in real time may have an effect on the decision taken by consumer. Signalling game equilibrium predicts that the better the information, the more calibrated decisions are made[1]. Thus, in equilibrium, consumer's choice with full information is the most rational, with imperfect information – less rational.

Better information in this research means that personalized TCO information is fully available. Both parties, the agent a.k.a. "seller" and the "buyer" have disclosed their data. The first one about car's price, fuel efficiency, maintenance and insurance costs and the latter required car attributes, personal yearly mileage and budget. Agent becomes credible if it consistently provides accurate and valuable information. If this were the case, honest signalling and therefore equilibrium could be achieved (Sobel, 1985). Sobel states, that if the agent always provides honest information, this increases its reputation but only in the expense of immediate gain by duping "buyer".

4. Experimental Procedure and Design

The experiment was carried out in a specially developed application or software bot (the agent) that works in Facebook Messenger. Facebook Messenger or other chat platforms have been widely used in recent years in many areas, including educational (Holotescu, 2016; Smutny & Schreiberova, 2020) and business (Muron, 2019). However, Facebook Messenger

[1] Calibrated implies that the decision is profit-maximizing.

has not been used to gather similar data as in this study. Nonetheless, the platform was chosen because Facebook allows to limit age who can access the bot (over 18 in this case) and respondents can exit the application and return any time easily, which is not the case in a web page. The bot is just one of many contacts they have in their Messenger contact's list.

Users of the application (buyers) were presented by the agent with cards with pictures and information about one new car on their mobile phone screens (see Appendix A). The agent automatically asked the buyer to signal whether s/he would consider buying the car or not. The signal for "no" was to swipe the car card left, and for "yes" to the right. The pictures represented the car's exterior and interior. Information was given about car's technical details as well as specific cost information. The exact cost information varied across treatment groups and will be explained in detail later in this section. Most new car makes and models (total of 365 different) sold in Europe in April 2019 were represented in the application.

At first, each respondent was asked to choose preferred type(s) of car, e.g., sedan, minivan, hatchback, SUV etc. Then preferred gearbox (manual, automatic), engine (gasoline, diesel, hybrid, electric) and drivetrain (RWD, FWD, 4WD). This is in accordance with findings of Codagnone et al. (2013). The application filtered in only cars that matched user's criteria. If user skipped this part, all 365 cars were presented. The agent also asked buyer about his/her average monthly mileage in order to calculated personalized 1-month and 5-year fuel cost for each car and buyer's budget in the form of maximum preferable monthly leasing payment or maximum car price, if paid in cash.

If during the interest signalling process buyer favoured more than 10 cars, the application (agent) asked her to remove some of them so that only top 10 were left. Then the agent automatically provided specific guarantee terms (5 years, 100 000 km for example) for each top 10 cars. At this stage, the buyer was asked to remove further five cars and the agent offered to book a test drive with any of his/her top 5 cars.

As this study investigates consumers' car purchase decision making based on available TCO information, only consumer-oriented TCO is taken into account and investigated. Monetary operating costs such as leasing payments, maintenance, insurance and fuel/ electricity – all recurring monthly costs, as at least some dealers sell 5-year maintenance package that is added to initial car price at purchase. Some authors have also included vehicle tax, resale value and tire costs into their TCO (Letmathe et al., 2017). This research does not, firstly because vehicle tax is not applicable in Estonia, resale value is extremely difficult to predict as it depends heavily on usage and maintenance habits and tire costs are similar in-between car class plus depends on owner's preference (low-, medium- or high-quality tires).

Secondly, mental accounting (Thaler, 1985) suggest that people compartmentalize their spending and monthly car operating costs form one unified compartment. Resale value is seen more like one-time income rather than monthly depreciation cost from initial car price and tires need to be bought on average every 40000 km and is compartmentalized as one-time expense.

The TCO calculations were therefore based on the following model:

$$C_{TCO} = C_{LC} + C_{IC} + C_{MC} + C_{EC} \quad (1)$$

Where, C_{LC} is the annuity leasing payment cost (EUR) on finance lease terms and calculated with the formula (2) for 1-month period or multiplied by 60 in case of 5-year TCO.

$$Pmt = \frac{PV - \frac{FV}{(1+i)^N}}{\left[\frac{1 - \frac{1}{(1+i)^N}}{i}\right]} \quad (2)$$

Where,

- PV – is car retail price minus 10% first down payment.
- FV – is PV minus 20% residual payment;
- i – interest rate 2% per annum;
- N – 60-month period.

C_{IC} *is* comprehensive (casco) and mandatory third-party liability insurance costs (EUR). C_{MC} is 5-year 15000 per annum mileage maintenance costs (EUR) stated by manufacturers and divided by 60 in 1-month' TCO. C_{EC} is the energy consumption (EUR) derived from manufacturers stated New European Driving Cycle (NEDC) consumption of gasoline/diesel/ electricity, average according to retail prices in March 2019 in Estonia and individual user's stated average yearly mileage.

The respondent had to fulfil the following two criteria:

(1) be at least 18 years old (age stated to Facebook), and

(2) reach the top 5 cars when using the application.

During the online experiment carried out from May 2019 to December 2020, there were total of 1654 respondents. 995 that matched all two criteria were included into the sample.

The respondents were randomly assigned into eight treatment groups: the control group or base and treatment groups 1 to 7. The design was between-subject i.e., each respondent

participated was assigned to one treatment only. Table 1 visualizes the 2x4 factorial design of the experiment.

Table 1

Baseline and Treatment Groups

	Only leasing cost	Full TCO
1-month period	Base	Treatment 1 (T1)
5-year period	Treatment 2 (T2)	Treatment 3 (T3)
1m vs 5y	Treatment 4 (T3)	Treatment 5 (T5)
5y vs 1m	Treatment 6 (T6)	Treatment 7 (T7)

In the base treatment (control group), the respondents were presented with all the visual and technical information about a car and 1-month leasing payment cost. Treatment group 1 received all the same information than control group plus full 1-month TCO. Treatment group 2 received all the same information than control group plus 5-year leasing costs. Treatment group 3 received all the same information than control group plus full 5-year TCO. Treatment group 4 received all the same information than control group plus 1-month (default) vs 5-year leasing costs comparison. Treatment group 5 received all the same information than control group plus 1-month (default) vs 5-year full TCO comparison. Treatment group 6 received all the same information than control group plus 5-year (default) vs 1-month leasing costs comparison. And finally, treatment group 7 received all the same information than control group plus 5-year (default) vs 1-month full TCO comparison.

The experiment I run is somewhat similar to the signalling game, but in this case the only active participant is a "buyer". The "seller" is implicit (application) and the info (i.e. signal) it sends ranges from highly imperfect (1 month leasing cost only) to almost perfect (5 years, all costs). The focus is only on buyer's behaviour, therefor I am interested to elicit his/her response to the information provided:

- Base vs. T1 and T2 vs. T3 – pure effect of information amount on the car choice, keeping time frame constant.
- Base vs. T2 and T1 vs. T3 – pure effect of time frame on the car choice, keeping info amount fixed.
- Base vs. T3 – joint effect of longer time frame and full TCO on car choice.
- T4 vs. T5 and T6 vs. T7 – the effect on the info amount on the choice between two timeframes.

- T4 vs. T6 and T5 vs. T7 – the effect on the "benchmark" time frame, i.e. are people more prone to choose alternative time frame when they first get to know a short or a long one?

The last two treatment effects are rather supplementary. As data revealed, only 6,5% of respondents in T4-T6 used time frame toggle, so this was not further analysed (See Appendix B, Table 6).

The primary interest are the effects of information profiles on the rationality of car choice. The additional aspects help to better understand if it is sufficient to simply make the "best working" information profile available somewhere, or customers should be "forced" to see it, as otherwise they will not even bother to look or will intentionally avoid it, as suggested by salience bias.

5. Data and Empirical Strategy

The following data was extracted from the application's database. Respondent's unique ID, sex (Female/Male), treatment (Base, T1, T2 … T7.), number of family members (1, 2,…, 5 or >5), preferred car's body type(s), engine type(s) and drivetrain, annual average mileage in km, intension to use leasing financing (Yes/No) or cash payment (Yes/No), if possible monthly net income (in Euro), monthly existing loan payments (in Euro), maximum new leasing payment (either calculated on previous data or stated by the respondent, in Euro), maximum car price (in Euro), intension to buy new car in the next 6-month, respondent's top 10 cars' respective personal TCO (in Euro) and top 5 cars' personal TCO (in Euro). For the full list, see Appendix B. Total sample size was 995 which divided between treatment groups as stated in the following Table 2.

Table 2

Sample Sizes in Treatment groups

Treatment	Sample size
Base	160
Treatment 1 (T1)	179
Treatment 2 (T2)	109
Treatment 3 (T3)	108
Treatment 4 (T4)	102
Treatment 5 (T5)	96
Treatment 6 (T6)	108
Treatment 7 (T7)	133
Total	995

When using the application, respondents were related to their respective, randomly assigned treatment group via their unique ID. Users were not aware that they are participating

in an experiment or that there might be several data views available. These precautions ensure that the data is not affected by the experimental bias.

The main outcome of interest is the goodness of car choice calibration. Estimated respondents' budget was used as a benchmark for goodness of fit. The cars with TCO falling below the budget constraint are treated as well-calibrated choice, while those with TCO above the budget constraint as uncalibrated choice. Three empirical measures are used to assess the goodness of fit.

1. *Goodness of fit ratio* – based on 10 selected cars and computed as

$$GF = \frac{\overline{TCO}}{BC} \tag{3}$$

Where $\overline{TCO} = {\sum_1^{10} TCO}/{10}$ is an average total cost of ownership of ten selected cars and BC stands for a budget constraint, with $GF > 0$. The ratio tells as how much the average costs of selected cars deviate from the budget constraint. $GF \in (0,1]$ implies that $\overline{TCO} \leq BC$, i.e. the choice fulfills the budget constrain. $GF > 1$ implies that the $\overline{TCO} > BC$, i.e. the choice is above the budget constrain.

2. *At least one out of ten selected cars fulfil the budget constraint* – computed as:

$$I(TCO_{min} < BC) = I\{1\ if\ TCO_{min} < BC; 0\ if\ TCO_{min} > BC\}, \tag{4}$$

where $TCO_{min} = \min\{TCO_1, TCO_2, \dots, TCO_{10}\}$ is a minimal TCO recorded for ten selected cars.

3. *All ten selected cars are below the budget constraint* – computed as:

$$I(TCO_{max} < BC) = I\{1\ if\ TCO_{max} < BC; 0\ if\ TCO_{max} > BC\}, \tag{5}$$

where $TCO_{max} = \max\{TCO_1, TCO_2, \dots, TCO_{10}\}$ is a maximal TCO recorded for ten selected cars.

Empirical analysis includes three parts. The first part is focused on regression analysis of the goodness of fit ratio. Usual linear regression analysis is applied with a logarithm of goodness of fit ratio as a dependent variable. Full regression specification is as follows:

$$lnGF_i = \alpha + \beta_1 \cdot T1_i + \beta_2 \cdot T2_i + \beta_3 \cdot T3_i + \beta_4 \cdot Male_i + \beta_5 \cdot FC_i + \beta_6 \cdot Leasing_i + \beta_7 \cdot Next6months_i + \beta_8 \cdot Year_i + \varepsilon_i, \tag{6}$$

Where subscript i stands for an individual user; $lnGF_i$ is a logarithm of a goodness of fit index computed following formula (3); $T1_i, T2_i, T3_i$ are binary treatment variables; $Male_i$ is a male indicator variable; $FC_i$is a family car indicator variable; $Leasing_i$ is an indicator whether the user considers lease financing; $Next6months_i$ indicates whether the user plans to buy a car in the next six months; $Year_i$ indicates a year when data for given user was collected; $\beta_1, \dots, \beta_8$ are the corresponding coefficients; ε_i is an individual error term. Regression analysis with a stepwise inclusion of controls was performed.

The second and third part of the analysis focus on the users choosing all cars or at least one car below the budget constraint. The dependent variable is binary, therefore I apply probit regression of the similar specification as (6):

$$Pr(x_i = 1|C_i') = \alpha + \beta_1 \cdot T1_i + \beta_2 \cdot T2_i + \beta_3 \cdot T3_i + \beta_4 \cdot Male_i + \beta_5 \cdot FC_i + \beta_6 \cdot Leasing_i + \beta_7 \cdot Next6months_i + \beta_8 \cdot Year_i + \varepsilon_i, \quad (7)$$

$$\Pr(\mathrm{y_i} = 1|\mathrm{C_i}') = \alpha + \beta_1 \cdot \mathrm{T1_i} + \beta_2 \cdot \mathrm{T2_i} + \beta_3 \cdot \mathrm{T3_i} + \beta_4 \cdot Male_i + \beta_5 \cdot FC_i + \beta_6 \cdot Leasing_i + \beta_7 \cdot Next6months_i + \beta_8 \cdot Year_i + \varepsilon_i, \quad (8)$$

Where x_i is a realization of random variable X_i taking value 1 if $TCO_{max_i} < BC_i$ and 0 otherwise; y is a realization of random variable Y_i taking value 1 if $TCO_{min_i} < BC_i$ and 0 otherwise; $C_i'$is a vector of control variables listed on the righthand side of equations (6) and (7) for an individual i.

6. Results and Analysis

6.1 Descriptive Analysis

I analysed the aforementioned choice calibration measures across treatments Base, T1, T2, T3 and across several major user characteristics.

In Table 3 the average goodness of fit ratio shows that only in Treatment 2 the budget constraint is lower than the average TCO of chosen 10 cars. This is also the treatment group with the highest share of users (27%) choosing all cars below their budget constraint. For reminder, this is the treatment group who were shown 5-year leasing only costs. Respondents in all other treatment groups selected cars that had higher TCO than their stated or calculated budget constraints.

Women tend to choose more budget friendly cars in Base treatment and Treatment 2, which are the treatments with only leasing cost displayed, while men make better calibrated choice in Treatments 1 and 3, which are the ones disclosing a full TCO. However, a share of female respondents in treatment groups Base and T2 were too small (9 and 5 respectfully) to make definitive conclusions.

Table 3

Goodness of Fit Across Treatments Based on 10 Selected Cars

	(1) Base	(2) Treatment 1	(3) Treatment 2	(4) Treatment 3
Average goodness of fit ratio	1.04 (0.306)	1.23 (0.380)	0.97 (0.356)	1.22 (0.283)
Share of users with all cars below BC	0.17 (0.380)	0.12 (0.326)	0.27 (0.449)	0.08 (0.271)
Share of users with at least one car below BC	0.82 (0.386)	0.62 (0.487)	0.77 (0.425)	0.68 (0.468)
N	144	175	48	76

Note. Mean coefficients; sd in parentheses, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Table 4 reveals that goodness of choice varies across men and women with a consistent pattern.

Table 5 presents goodness of fit across treatments and car designation. Respondents who belong to Treatment group 2 and 3 and plan to buy non-family car models better met their budget constraints. This may be due to higher average price of family cars, as they tend to have more seating and be larger in size (mid-size, SUV, minivans).

Table 6 summarizes goodness of fit for users who plan and do not plan to use leasing. Respondents who did not plan to use leasing financing made better choices regarding their budget constraints in all treatments, as compared to users who rely on leasing. Notably, their average goodness of fit measures indicate that in all four treatments users who do not plan to use leasing choose cars below their stated budget constraint. This may show that when buying a car with own savings instead of using financing, people tend to estimate their budget better and make more budget friendly choices. In leasing financing small monthly payment may deviate people's attention away from the full price of the car, therefore unconsciously choosing more expensive models.

Table 4

Goodness of Fit Across Treatments and Gender

	(1) Male Base	(2) Male Treatment 1	(3) Male Treatment 2	(4) Male Treatment 3	(5) Female Base	(6) Female Treatment 1	(7) Female Treatment 2	(8) Female Treatment 3
Average goodness of fit	1.05	1.21	1.00	1.22	0.88	1.35	0.69	1.27
	(0.300)	(0.359)	(0.338)	(0.290)	(0.370)	(0.497)	(0.424)	(0.227)
Share of users with all cars below BC	0.16	0.12	0.21	0.09	0.33	0.14	0.80	0.00
	(0.371)	(0.323)	(0.412)	(0.286)	(0.500)	(0.351)	(0.447)	(0)
Share of users with at least one car below BC	0.81	0.65	0.77	0.69	1.00	0.36	0.80	0.62
	(0.396)	(0.477)	(0.427)	(0.465)	(0)	(0.492)	(0.447)	(0.518)
N	135	153	43	68	9	22	5	8

Note. Mean coefficients; sd in parentheses, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Table 5

Goodness of Fit Across Treatments and Car Designation

	(1) Family Base	(2) Family Treatment 1	(3) Family Treatment 2	(4) Family Treatment 3	(5) Non-family Base	(6) Non-family Treatment 1	(7) Non-family Treatment 2	(8) Non-family Treatment 3
Average goodness of fit	1.03	1.20	1.04	1.33	1.04	1.22	0.88	1.20
	(0.296)	(0.320)	(0.420)	(0.301)	(0.315)	(0.391)	(0.269)	(0.274)
Share of users with all cars below BC	0.16	0.05	0.29	0.13	0.18	0.16	0.27	0.07
	(0.370)	(0.215)	(0.464)	(0.352)	(0.390)	(0.370)	(0.456)	(0.250)
Share of users with at least one car below BC	0.80	0.57	0.58	0.33	0.83	0.65	0.95	0.77
	(0.404)	(0.499)	(0.504)	(0.488)	(0.381)	(0.480)	(0.213)	(0.424)
N	50	63	24	15	92	105	22	61

Note. Mean coefficients; sd in parentheses, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Table 6

Goodness of Fit Across Treatments and Leasing Option

	(1) Leasing Base	(2) Leasing Treatment 1	(3) Leasing Treatment 2	(4) Leasing Treatment 3	(5) No leasing Base	(6) No leasing Treatment 1	(7) No leasing Treatment 2	(8) No leasing Treatment 3
Average goodness of fit	1.08	1.31	1.07	1.26	0.88	0.83	0.80	0.86
	(0.321)	(0.360)	(0.393)	(0.267)	(0.168)	(0.155)	(0.193)	(0.169)
Share of users with all cars below BC	0.18	0.07	0.23	0.06	0.16	0.37	0.33	0.29
	(0.383)	(0.254)	(0.430)	(0.235)	(0.374)	(0.490)	(0.485)	(0.488)
Share of users with at least one car below BC	0.71	0.46	0.60	0.57	0.97	1.00	1.00	1.00
	(0.457)	(0.500)	(0.498)	(0.499)	(0.180)	(0)	(0)	(0)
N	113	145	30	69	31	30	18	7

Note. Mean coefficients; sd in parentheses, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.0$.

6.2 Regression Analysis

I start with analysing the goodness of fit ratio. Table 7 provides regression results following specification (6) with a stepwise inclusion of controls. Model (i) controls for treatment only; model (ii) adds gender; model (iii) adds car designation (family, non-family); model (iv) includes whether the user plans to use leasing financing; model (v) controls additionally whether the user plans to buy a car within the next six months.

Table 7

Goodness of Fit Estimates – OLS Regression

	(i)	(ii)	(iii)	(iv)	(v)
Treatment 1	0.17***	0.17***	0.16***	0.15***	0.14***
	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
Treatment 2	-0.09	-0.08	-0.10*	-0.05	-0.05
	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)
Treatment 3	0.18***	0.19***	0.19***	0.15***	0.15***
	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)
Year 2020	-0.01	-0.01	0.00	0.04	0.04
	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
Male		0.06	0.07	0.07	0.07
		(0.06)	(0.06)	(0.05)	(0.05)
Family car			0.04	0.01	0.01
			(0.04)	(0.03)	(0.04)
Leasing				0.30***	0.29***
				(0.04)	(0.04)
Next 6 months					-0.01
					(0.03)
Constant	-0.01	-0.07	-0.09	-0.35***	-0.34***
	(0.04)	(0.07)	(0.07)	(0.08)	(0.08)
N	443	443	432	432	428

Notes. Standard errors in parentheses. Ordinary least squares regressions. Dependent variable is a logarithm of the goodness of fit ratio (a ratio between average TCO of the selected cars and budget constraint). * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

The regression analysis shows that introducing better TCO information does not have a positive effect on choice calibration. On the contrary, T2 and T3 worsen the choice compared to Base treatment. Namely, providing full TCO information for 1 month (T1) reduces the goodness of fit index by 14 pp ($p<0.01$) in the full model specification (v), as compared to only leasing payment for 1 month (Base). Disclosing full TCO for 5 years (T3) decreases goodness of fit by 15 pp ($p<0.01$), as compared to Base treatment. Therefore, at least in the case of new cars, revealing leasing only costs lead to better calibrated choices. Among other controls,

leasing has a strong positive association with a goodness of fit and improves it by substantial 29 pp ($p<0.01$). This result goes in line with the estimates reported in Table 6.

Next, I investigate users' propensity to choose all cars below budget constraint, following specification (7). Table 8 employs probit regressions and presents marginal effects. Controls are included stepwise with the same order as in Table 7. The results reveal no significant association with propensity to choose all cars below budget for T1 and T2, however, T3 decreases the probability to choose all cars below the budget constraint by 47% ($p<0.1$) in the full model (v). Similarly to Table 7, those subjects relying on leasing financing have 53% ($p<0.01$) lower probability to choose all cars below a budget constraint. Additionally, men are by 43% ($p<0.1$) less likely to choose all cars below a budget constraint.

Table 8

Likelihood of Choosing All Cars Below the Budget Constraint – Probit Regression

	(i)	(ii)	(iii)	(iv)	(v)
Treatment 1	-0.23	-0.26	-0.28	-0.29	-0.28
	(0.17)	(0.18)	(0.18)	(0.18)	(0.18)
Treatment 2	0.32	0.30	0.37	0.26	0.26
	(0.23)	(0.23)	(0.24)	(0.24)	(0.24)
Treatment 3	-0.47*	-0.48**	-0.52**	-0.47*	-0.47*
	(0.24)	(0.24)	(0.24)	(0.25)	(0.25)
Year 2020	0.10	0.09	0.06	-0.02	-0.02
	(0.19)	(0.19)	(0.19)	(0.20)	(0.20)
Male		-0.36	-0.41*	-0.43*	-0.43*
		(0.23)	(0.24)	(0.24)	(0.24)
Family car			-0.24	-0.16	-0.15
			(0.17)	(0.17)	(0.17)
Leasing				-0.53***	-0.53***
				(0.18)	(0.18)
Next 6 months					0.04
					(0.16)
Constant	-1.02***	-0.68**	-0.52*	-0.05	-0.09
	(0.20)	(0.30)	(0.31)	(0.35)	(0.37)
N	443	443	432	432	428

Notes. Standard errors in parentheses. Probit regression, marginal effects are reported. Dependent variable is choosing all cars below a budget constraint. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Lastly, I investigate the users' propensity to choose at least one car below a budget constraint. Table 9 documents the probit regression results following specification (8) and present marginal effects. The results suggest that providing full TCO for 1 month (T1) and 5

years (T3) reduces probability to choose at least one car below a budget constraint by 58% ($p<0.01$) and 39% ($p<0.1$) respectively, as compared to providing only leasing cost for 1 month (Base) in full model (v). Moreover, users who are planning to buy a family car are by 34% ($p<0.05$) less likely to choose at least one car below a budget constraint. Coefficient of leasing is omitted in the model as nearly all subjects who use no leasing choose at least one car below a budget constraint.

Table 9

Likelihood of Choosing at Least One Car Below the Budget Constraint – Probit Regression

	(i)	(ii)	(iii)	(iv)	(v)
Treatment 1	-0.61***	-0.59***	-0.58***	-0.61***	-0.58***
	(0.16)	(0.16)	(0.16)	(0.17)	(0.17)
Treatment 2	-0.18	-0.16	-0.10	-0.26	-0.25
	(0.23)	(0.23)	(0.24)	(0.28)	(0.29)
Treatment 3	-0.43**	-0.42**	-0.48**	-0.37*	-0.39*
	(0.19)	(0.19)	(0.20)	(0.21)	(0.21)
Year 2020	0.05	0.07	0.07	-0.06	-0.05
	(0.16)	(0.16)	(0.16)	(0.17)	(0.17)
Male		0.30	0.20	0.26	0.28
		(0.21)	(0.21)	(0.23)	(0.23)
Family car			-0.40***	-0.35**	-0.34**
			(0.14)	(0.15)	(0.16)
Leasing				0.00	0.00
				(.)	(.)
Next 6 months					0.13
					(0.15)
Constant	0.87***	0.57**	0.81***	0.66**	0.57*
	(0.17)	(0.27)	(0.29)	(0.30)	(0.32)
N	443	443	432	346	342

Notes. Standard errors in parentheses. Probit regression, marginal effects are reported. Dependent variable is choosing at least one car below a budget constraint. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

6.3 Discussion of the Results

There are several rationales which may explain the findings. The results may indicate larger than expected confirmation bias in consumers' decision making as found in previous research (Nickerson, 1998). The user may interpret the cost information in a way that supports his or her personal car preference.

Previous research has also found that new car might be more emotional choice (Choo et al., 2004; Sprei et al., 2011) than we would like to believe and have a symbolic value to the

owner (Heffner et al., 2006) by signalling who the owner is to others. So, no matter the TCO, consumers might still prefer emotional value over economically rational choice.

Moreover, certain car attributes may be more important for the buyer. In line with this argument, Modi and Jhulka's (2021) findings suggest that family needs come before fuel efficiency and price of the car. Similarly, the subjects in the given study may have adhere to own valuation of different car attributes and prefer to buy certain car or a car with certain characteristics even if it comes at higher cost.

Another potential explanation stem from individual choice benchmark. According to Estonian Transportation agency, the average age of an Estonian car is 14 years ('Sõidukite statistika | Maanteeamet', n.d.). Older cars have generally lower fuel efficiency and higher maintenance costs. Most people know intuitively how much they spend monthly on average on their current car. When presented with full TCO of a new car they might choose more expensive one as the fuel and maintenance costs are lower compared to their current car levels.

Lastly, consumers might have had initial expectation of TCO which was higher than actual – the one provided by the application. Costs on fuel, insurance and maintenance might have proven to be lower than expected that lead to choosing more expensive cars, yielding self-calculated positive surplus as the actual TCO turned out lower than the expected one. This may explain the effect of T1 and T3 on choice calibration. However, future research is needed to study these mechanisms in detail.

7. Conclusions

Purchasing a passenger car is one of those expensive decisions that may have positive or negative effect on family's budget and on environment as well. This paper investigated the possibilities to nudge consumers towards better choice calibration by revealing the car's personalized Total Cost of Ownership (TCO) prior test drive decision. A field experiment was carried out using a specially designed Facebook Messenger bot, where users were allocated into base and seven other treatment groups. For each treatment group different levels of TCO information were revealed.

The results suggest that disclosing full personalised total cost of ownership in real-life car buying process does not nudge the consumer towards better choice calibration in terms of family budget and environment. Quite the opposite, better TCO information is associated with choosing more expensive cars. Especially men and those who plan to use leasing financing, are more likely to choose cars over their budget constraint. Consumers who plan to use own savings for car purchase tend to make more budget-friendly decisions. Females made better decisions in treatment groups where leasing only, but not full TCO, was revealed. Although

the logical conclusion would be that better information leads to better decisions, this research proves the opposite in case of car buying process. One reason explaining these surprising results may be that buying a car involves more than anticipated emotional factors and social status. Otherwise having no car at all or buying a cheap used car should be a logical choice. Another reason is that new cars that this study relied on, have become a lot more fuel efficient in recent years. Revealing full TCO may have created a positive surprise for respondents when they compared the monthly expenditure on fuel of the new car to their current car. This may have led to the conscious or subconscious decision to choose more expensive cars as initially planned. However, further research is needed to analyse the exact mechanism deteriorating goodness of car choice when complete TCO profile is disclosed.

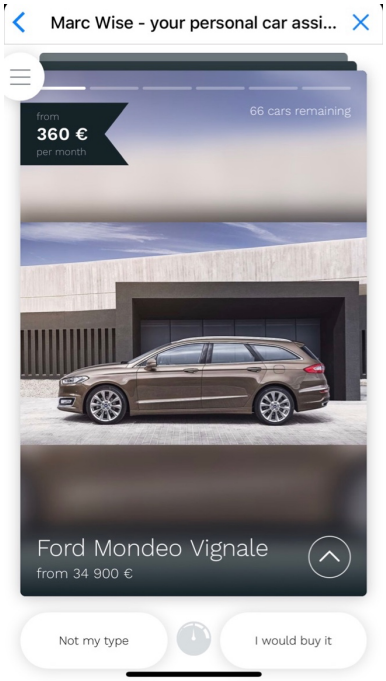
This research revealed that there might be gap between the results of lab experiments and real-life decision making. Majority of previous research that has shown TCO effect on choosing more environmentally and budget friendlier car has been carried out as lab experiments (Codagnone et al., 2013; Dumortier et al., 2015; Greene, 2011). People in lab environment might feel pressured to make more "socially acceptable" decisions – in current case choosing more environmentally and budget friendly car. Might be that governments' legislative pressure to decrease passenger car CO_2 level is the right course if the society as a whole decides to move towards lesser CO_2 levels in passenger transport. Moreover, the hypothetical car choice designed in earlier lab experiments tell very little about the real-life behaviour of car buyers. The given field experiment proved that individual decision-making process is more complex and deviate from the rational choice way more in the field experiment, when feeling unobserved, as compared to the artificial lab environment. This research shows that more field experiments are needed to come to a definitive decision whether revealing TCO does nudge consumers towards more economical choices or not.

8. Appendices

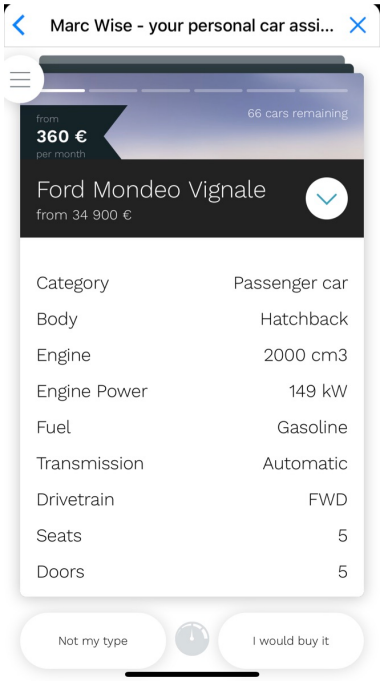
Appendix A: Treatment Groups' Visuals

Figure 1

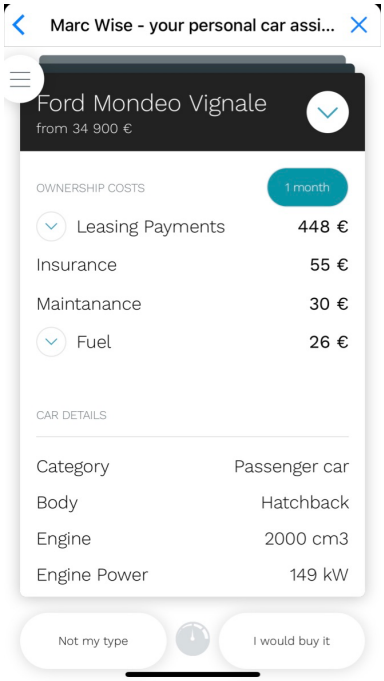
Visuals by Treatment Groups



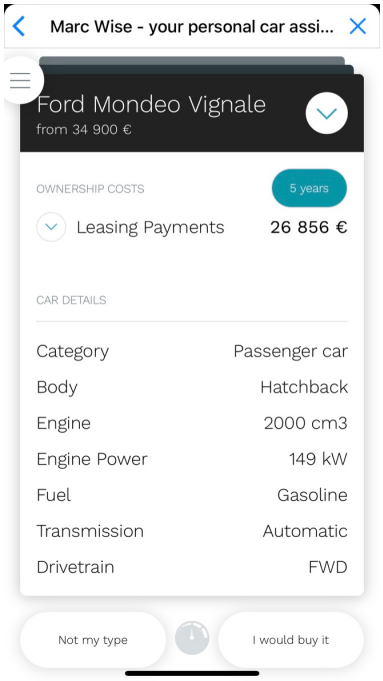
All treatments: Only leasing payment visible on car card. Details open on click on the arrow.



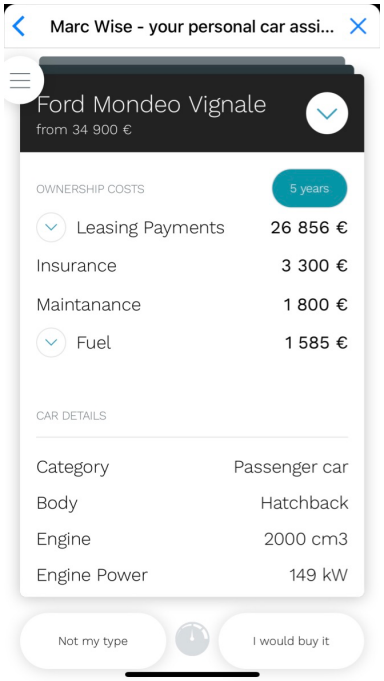
Base treatment, 1-month leasing only cost



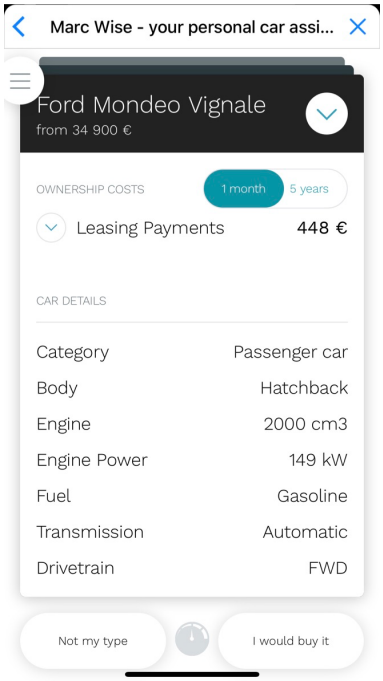
Treatment 1: 1-month TCO



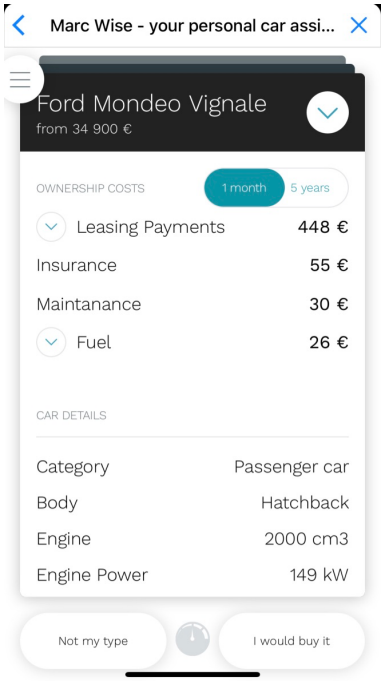
Treatment 2: 5-year leasing only costs



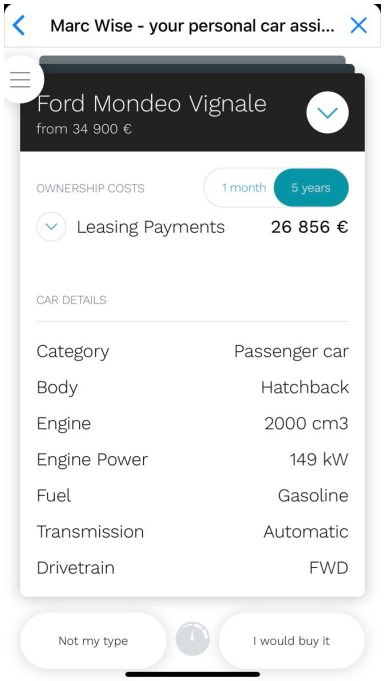
Treatment 3: 5-year full TCO



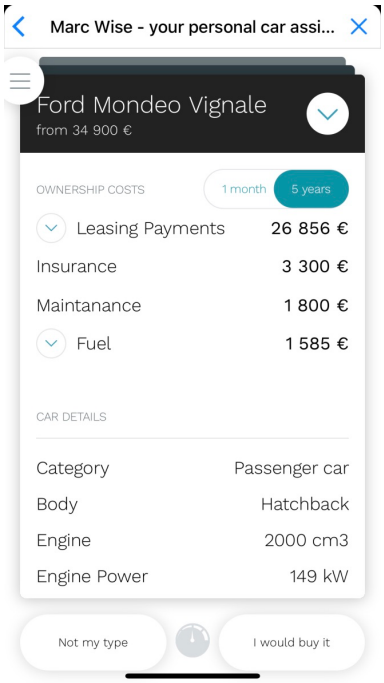
Treatment 4: 1-month (default) vs 5-year leasing only cost



Treatment 5: 1-month (default) vs 5-year full TCO



Treatment 6: 5-year (default) vs 1-month leasing only cost



Treatment 7: 5-year (default) vs 1-month full TCO

Appendix B: Data Structure

Tabel 1

Collected Data Structure

No	Field Name	Unit
1	Treatment	Base, T1-T7
2	Sex	Female, Male
3	Created	Date
4	Family car?	True/False
5	No of family members	2-5, >5
6	Leasing need	True/False
7	5Y budget constraint	€, calculated
8	Maximum monthly leasing payment	0 – >1000€
9	Calculate leasing	True/False
10	Maximum car price	0 – >100000€
11	Monthly net income	0 – 10000€
12	Monthly existing loan payments	0 – 5000€
13	No of dependents	0 – 3, >3
14	Calculated maximum payment	€
15	Intent to buy new car in the next 6 months	True/False
16	1M to 5Y counter	
17	5Y to 1M counter	

No	Field Name	Unit
18	TOP10_1_TCO	€
19	TOP10_2_TCO	€
20	TOP10_3_TCO	€
21	TOP10_4_TCO	€
22	TOP10_5_TCO	€
23	TOP10_6_TCO	€
24	TOP10_7_TCO	€
25	TOP10_8_TCO	€
26	TOP10_9_TCO O	€
27	TOP10_10_TCO	€
28	TOP5_1_TCO	€
29	TOP5_2_TCO	€
30	TOP5_3_TCO	€
31	TOP5_4_TCO	€
32	TOP5_5_TCO	€

Appendix C: Descriptive Estimates

Table 1

Sample Descriptive by Base and Treatments 1-7, in Euro

	BASE	TREATMENT 1	TREATMENT 2	TREATMENT 3	TREATMENT 4	TREATMENT 5	TREATMENT 6	TREATMENT 7
Sample size	160	179	109	108	102	96	108	133
Male	149	157	99	97	92	86	92	117
Female	11	22	10	11	10	10	16	16
Male %	93%	88%	91%	90%	90%	90%	85%	88%
Needs family car	56	67	43	15	61	14	28	12
Buying in next 6 months	78	107	89	72	62	49	75	85
Needs leasing	113	149	42	69	71	36	78	106
Needs leasing %	71%	83%	39%	64%	70%	38%	72%	80%

Table 2

Min, Max and Average TCO of TOP 10 Chosen Cars by Base and Treatments 1-7, in Euro

	BASE	TREATMENT 1	TREATMENT 2	TREATMENT 3	TREATMENT 4	TREATMENT 5	TREATMENT 6	TREATMENT 7
Min TCO	12970	14263	17068	25375	13388	17280	17663	17053
Max TCO	101698	140363	236984	249050	302848	163917	245998	245889
Ave. TCO	37580	38747	47442	50844	37311	47815	38680	45198

Table 3

Min, Max and Average TCO of TOP 5 Chosen Cars by Base and Treatments 1-7, in Euro

	BASE	TREATMENT 1	TREATMENT 2	TREATMENT 3	TREATMENT 4	TREATMENT 5	TREATMENT 6	TREATMENT 7
Min TCO	12970	14653	17068	25375	13388	17885	17663	17053
Max TCO	101698	140363	189748	249050	190601	155810	245998	245889
Ave. TCO	36320	37935	45531	51522	36167	47519	38880	45191

Table 4

User Set Monthly Payment by Base and Treatments 1-7, in Euro

	BASE	TREATMENT 1	TREATMENT 2	TREATMENT 3	TREATMENT 4	TREATMENT 5	TREATMENT 6	TREATMENT 7
Min set payment	200	200	300	370	250	350	230	350
Max set payment	1000	1000	1000	1000	1000	1000	1000	1000
Ave. set payment	520	551	574	613	437	525	502	766

Table 5

Calculated Monthly Payment by Base and Treatments 1-7, in Euro

	BASE	TREATMENT 1	TREATMENT 2	TREATMENT 3	TREATMENT 4	TREATMENT 5	TREATMENT 6	TREATMENT 7
Min calculated payment	265	270	288	398	287	280	350	276
Max calculated payment	2984	4500	4500	4500	2540	1500	1900	4500
Ave. calculated payment	844	698	801	787	814	661	611	675

Table 6

1 Month to 5 Year and 5 Year to 1 Month Trigger Counts by Treatments 4-7

	TREATMENT 4	TREATMENT 5	TREATMENT 6	TREATMENT 7
1M to 5Y	12 (11,76%)	16 (16,67%)	10 (9,26%)	16 (12,03%)
5Y to 1M	8 (7,84%)	9 (9,38%)	21 (19,44%)	26 (19,55%)

Note. Triggered by 65 different users (6,5%)

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10. Kokkuvõte

ISIKUSTATUD AUTOOMAMISE KOGUKULU JA VASTUTUSTUNDLIK AUTOVALIK: EKSPERIMENTAALNE TÕESTUS

Uue auto ostmine on üks selliseid suuri väljaminekuid, kus on vaja põhjalikult kaaluda sellega kaasnevaid pere-eelarvelisi ja keskkonnalaseid kulutusi. Võimalik on välja arvutada autoomamise kogukulu (TCO – Total Cost of Ownership), mis võtab lisaks auto hinnale arvesse kütusele, kindlustusele ja hooldusele kuluvaid summasid. Need on margi ja mudelipõhised ning iga auto puhul erinevad, mistõttu võib muidu sarnasena tunduvad autod omada erinevat kogukulu. Enamik autoostjaid siiski ei kuluta vastavatele arvutustele aega või puuduvad ka vajalikud matemaatilised oskused. Käesolev töö uurib autoostjate eelistuste muutusi vastavalt eelarvutatud autoomamise kogukulu erinevatele kuvamistele. Eksperiment viidi läbi Facebook Messenger platvormil spetsiaalselt selleks loodud autonoomses programmis (bot). Küsimuste ja valikute abil selgitati välja uue auto ostust huvitatud isikute autoeelistused ja eelarve, misjärel kuvati neile valikule vastavad Eestis müüdavad uue autod. Nende hulgast said nad ükshaaval valida 10 omale sobivaimat. Eksperimendis osalejad jaotati juhuslikkuse alusel kaheksasse erinevasse gruppi ja igale grupile kuvati erineva tasemega kogukulu – alates ainult 1 kuu liisingumakse näitamisest kuni 5 aasta täieliku kogukuluni, mis hõlmas lisaks liisingule ka kütusele, kindlustusele ja hooldusele kuluvaid summasid.

Kokku lõpetas eksperimendi 995 isikut. Andmete analüüsis selgus, et parema ja täpsema kogukulu eelarvestus ja teatavaks tegemine ei mõjuta inimesi tegema pere-eelarve ja keskkonna mõistes ratsionaalsemat valikut. Vastupidi, esitledes täielikku kogukulu informatsiooni 1 kuu kohta vähendab see lõppvalikute eelarvele vastavust 14% võrra ning 5 aasta kogukulu avaldamisel 15% võrra, võrreldes ainult 1 kuu liisingumakse avaldamisega.

Tõenäosus, et isik valib kõik kümme autot alla oma plaanitud eelarve, väheneb 47% võrra kui talle avaldada 5 aasta kogukulud iga auto kohta. Samamoodi väheneb 53% tõenäosus valida kõik autod alla oma planeeritud eelarve nende inimeste puhul, kes plaanivad autoostu finantseerida liisingu abil, mitte kohe välja osta.

Tõenäosus, et isik valib vähemalt 1 auto alla oma planeeritud eelarve, väheneb 58% võrra kui talle avaldada 1 kuu kogukulud ja 39% võrra kui avaldada 5 aasta kogukulud. Veelgi, inimesed kes vajavad järgmiseks sõidukiks pereautot, teevad 34% väiksema tõenäosusega plaanitud eelarvesse mahtuva valiku.

Auto ost võib olla suurema emotsionaalse ja staatuse näitamise väärtusega kui ratsionaalselt see võiks olla eelduslik. Selgub, et auto omamise kogukulu ei ole siin nii suur määrav näitaja kui majandusteooriast tulenevalt eeldada võiks. Kuna eksperimendis osalejad valisid uute autode hulgast ja Euroopa Liidu poolsete CO2 nõuete tõttu on viimase kümne aasta jooksul nende kütuseefektiivsus kordades suurenenud, võib siin see olla üks määrav tegur. Inimesed võrdlevad mõttes kütusekulu oma praeguse autoga ning nähes selle tuntavat vähenemist, valivad kallima sõiduki.

Võrreldes eelmiste, laboris läbi viidud sarnaste auto kogukulu uurimustega, tuli käesolev töö vastupidisele järeldusele – parem informatsioon ei vii ratsionaalsema valikuni. Vajalik on läbi viia täiendavaid uurimisi selgitamaks täpsemalt välja käesoleva töö järeldustes leitu põhjused.

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