

Discussion Paper Series – CRC TR 224

Discussion Paper No. 646
Project B 04

Drivers of Switching in Autoinsurance: Evidence from Observable and Exogenous Consideration Sets

Helena Perrone¹
Fabricio Valiati²

February 2025

¹University of Mannheim, MaCCI, helenaperrone@uni-mannheim.de
²HDI Versi Cherung AG, fabricio.gvaliati@gmail.com

Support by the Deutsche Forschungsgemeinschaft (DFG, German Research Foundation)
through CRC TR 224 is gratefully acknowledged.

Drivers of Switching in Autoinsurance: Evidence from observable and exogenous consideration sets *

Helena Perrone [†] Fabricio Valiati [‡]

March 2024

Abstract

This paper studies switching behavior and its determinants in auto-insurance markets using a dataset that includes information on policyholder choices and their consideration sets, including alternative contract prices. We show that disregarding consumers' consideration sets and the price of alternative offers, especially the premium offered by the previous insurance at renewal, leads to an overestimation of choice inertia and an understatement of consumer price responsiveness. We also find that previous claim history is a primary determinant of switching behavior, even after controlling for premium differentials and observed and unobserved characteristics of the contract and insurers. Our empirical evidence is consistent with choice inertia driven by learning about the true quality of the firm's service.

*Perrone gratefully acknowledges financial support by the Deutsche Forschungsgemeinschaft (DFG) through the CRC TR 224 (project B04).

[†]University of Mannheim and MaCCI, helenaperrone@uni-mannheim.de

[‡]HDI Versi Cherung AG, fabricio.gvaliati@gmail.com

1 Introduction

Switching costs are common and widespread, often estimated to be large in various markets. For example, Shum (2004) examined breakfast cereals and found that the cost of switching product brands was higher than the price of each product itself, Kim et al. (2003) studied bank loans and found switching costs of around 4% of the loan, and Ho et al. (2017) analyzed health insurance plans, finding that switching costs amounted to more than 1000 dollars per consumer in three years and 1.5 billion dollars for the government during the same period. These sometimes unreasonably large estimates prompted the development of an extensive literature on behavioral biases to try to rationalize the empirical findings.

However, although most research on consumer choice and switching cost estimation assumes that consumers make choices under full information, in several contexts, if not all, choices are made within restricted sets. Ignoring that consumers make decisions within constrained and heterogeneous consideration sets can lead to an underestimation of price sensitivity and, consequently, an overstatement of switching costs. Typically, consideration sets are unobserved, but recent literature, such as Barseghyan et al. (2021) and Abaluck and Adams-Prassl (2021), has developed structural methods to estimate these sets.¹ Our study provides empirical evidence supporting these efforts.

This paper investigates switching behavior in the auto-insurance market using a unique dataset where consideration sets are observable and exogenous to consumer search and switching costs. Unlike previous studies, we have access to data on both the signed contracts and the alternative offers received by policyholders.

Our study includes a map of consideration sets in auto insurance, examining premium dispersion within and across sets and policyholders and analyzing switching behavior. We explore what determines switching and pricing and how our conclusions about switching behavior would change if we only observed the chosen contracts, as is common in the literature. Additionally, we investigate whether firms price dynamically by leveraging potential switching costs.

We show that disregarding consideration sets and information on alternative contracts received by each policyholder results in an overstatement of choice persistence and switching costs. We also show that the offered premiums do not align with the “bargain-then-ripoff” dynamics expected in markets with high switching costs where firms compete and can personalize prices (Klemperer, 1995).

Honka: data from an insurance company shopping study by a large marketing research company. She observes a set of firms from which consumers got quotes and which firm was chosen. Also, observe prices of chosen contracts but not prices of alternative quotes. Therefore data provide information on the number and identity of the companies searched. but she goes through an elaborate process to reconstruct these prices. . We focus on the Brazilian auto-insurance market, where contracts must be actively renewed annually, and policyholders cannot contract directly with insurers. Our data come from a platform connecting brokers and insurers,

¹See Honka et al. (2019) for a review of the empirical consideration set literature resulting from search behavior.

and we observe all queries for insurance contract renewal made in that platform in a year. The data include comprehensive information on policyholders, vehicles, and all returned offers.

Our results indicate that characteristics of the consideration set, such as its size, correlate with other switching determinants, like the mean premium. Additionally, the offer from the previous insurer tends to be cheaper on average than other offers, showing no evidence of a bargain-then-ripoff strategy. Ignoring consideration sets leads to an underestimation of policyholders' sensitivity to premiums and an overestimation of the role of the previous insurer in determining current choices. Although a thorough test of the mechanisms behind consumer inertia requires longitudinal data, our empirical evidence suggests that learning plays a significant role, as making an insurance claim increases the probability of switching, consistent with the findings of Israel (2005).

Our notion of switching costs follows Klemperer (1995) and Dubé et al. (2010) and refers to choice inertia, where a consumer's previous choice of insurer significantly influences their current decision, i.e., a form of structural state dependence in choice. Several possible mechanisms lead to choice inertia. These include transactional costs associated with changing insurers, psychological costs or non-economic factors such as "brand loyalty," search and attention costs, and investment in learning firm-specific skills (e.g., learning how to file claims and obtain reimbursements with certain insurers).

Several papers study switching and its determinants in the auto insurance market. Important papers include Cohen (2005), who, using data from automobile insurance products, find that policyholders switching to new insurers have more claims than those who do not switch. Using individual-level panel data of insurance contracts at one specific insurance firm, Israel (2005b) studies the long-term relationships between consumers and firms in the U.S. auto insurance market. He shows that individual-specific histories of customers with their insurers are crucially informative about the likelihood of exiting that relationship over time. Using the same data, Israel (2005a) finds that the average consumer stays with the firm for more than six years before filing a claim. He finds a significant impact of filing a claim in the probability of switching insurers, even when controlling for other possible effects of filing claims, e.g., premium changes and increased search. The consumers who do not switch following a claim have a lower probability of switching than those who made a claim. The impact of a claim on switching is stronger with the first claim than with subsequent claims. His empirical evidence is consistent with learning, where the first claim brings more information about the firm's service quality than subsequent claims. Consumers with bad claims experience choose to switch insurers, and those with a positive one remain with the same insurer and become more loyal than those who never filed a claim. Honka (2014) analyzes the demand for auto insurance and the effect of search and switching costs on customer retention. She uses a comprehensive dataset that includes survey information indicating which other insurance companies consumers considered before making their final choices and survey data on consumer satisfaction. She finds that consumer search costs are the primary driver of retention rates in the U.S. auto insurance industry, having a larger effect than switching costs or customer satisfaction.

Other studies of switching in insurance markets include Leiria et al. (2022), who show that

aggressive price offers to attract new customers may increase contract cancellation in the future due to premium increases; Guillen et al. (2002) find that customers who have made claims, younger policyholders, and those facing substantial premium increases are more likely to cancel their policy; and Keegan et al. (2016), studying the health insurance market, find policyholder tenure is negatively associated with switching decisions, and that price sensitivity was strongly associated with policyholders' age.

Compared to these papers, ours leverage observable consideration sets exogenous to consumers' search costs and preferences. This allows us to examine the factors influencing switching behavior without imposing structure to infer or estimate what consumers observe before selecting insurers. Additionally, we can compare our qualitative findings regarding switching costs to cases with unobservable consideration sets, thereby advancing our understanding of how crucial it is to take consideration sets into account and how choice parameter estimates are biased otherwise. In particular, we show how neglecting consideration sets can lead to unrealistically high switching cost estimation, for example.

Therefore, our paper also relates to the literature on the relevance of considering heterogeneous choice sets when estimating consumers' preference parameters. We offer empirical support for that literature and the effort to develop methodologies that accommodate diverse specifications of what consumers observe prior to decision-making. Barseghyan et al. (2021) develop a discrete choice model for when consumers' heterogeneous choice sets are unobservable. They bring their model to data on the choice of deductibles in auto collision insurance. Their empirical specification allows for consumer heterogeneity in preferences and choice sets. They find that their data can be explained by expected utility theory with a distribution of risk aversion that has low mean and variance. This result contrasts with previous studies that reported unrealistically high risk-aversion estimates, prompting departures from expected utility theory. Our results are consistent with those of Barseghyan et al., showing that, when accounting for heterogeneous choice sets, consumers are more responsive to premium differentials across insurers, thus reducing measures of switching costs.

Conlon and Mortimer (2013) show how retail stockouts can induce heterogeneous choice sets due to variations in product availability. In their setting, the heterogeneity in consideration sets is exogenous to search and consumer preference parameters because it is a consequence of the firm's stocking decisions. The authors show that overlooking such variation in product availability can lead to seriously biased demand estimates. Several other relevant papers develop and apply methods for estimating demand when consumers have unobservably and potentially endogenous heterogeneous choice sets, e.g., Honka et al. (2017); Moraga-González et al. (2023); Sovinsky Goeree (2008). For a comprehensive overview of this literature, see Honka et al. (2019) and Crawford et al. (2021). These papers show that the preference parameter estimates resulting from a model that allows for restricted and heterogeneous consideration sets differ significantly from estimates implied by a perfect information demand model. Our paper contributes to this literature by confirming, without the need to impose structure on the data, that ignoring heterogeneous consideration sets severely biases estimated price responsiveness, leading to wrong conclusions concerning consumers switching costs and wrong policy implications.

2 Auto insurance in Brazil and the policy calculation platform

In many countries, motor insurance accounts for nearly half the total non-life insurance written premium (Gönülal, 2009). In 2022, the auto premiums in Brazil were equivalent to 44% of the total non-life insurance written premium². The Brazilian insurance market is regulated by the Superintendence of Private Insurance (SUSEP), which is responsible for supervising and regulating insurers, brokers, and other insurance-related entities, ensuring compliance with legal and technical requirements.

2.1 Coverage, Premium, Deductible and the Bonus-Malus system

In Brazil, motor third-party liability insurance, the DPVAT, is mandatory for all automotive vehicle owners registered and licensed under Brazilian traffic laws. This mandatory insurance is a tax that must be paid yearly at the moment of the vehicle license renewal, and it covers third-party death, permanent disability, and medical and hospital expenses reimbursement with limited amounts (Gönülal, 2009). A presidential provisional measure discontinued the DPVAT 2020. As of April 2023, DPVAT was not mandatory, though there have been ongoing discussions regarding its potential reinstatement.

Additional auto insurance is voluntary. Private insurance companies offer insurance contracts with varying levels of coverage that must be renewed annually. There are several types of coverage in the voluntary auto insurance market (SUSEP, 2006). The comprehensive insurance (“casco”) covers collision, fire, and theft or robbery. Motor third-party liability (MTPL) covers personal injury, including bodily or moral damage, and material damage to third parties, including payment of lawyers and court costs. Passenger accident (PA) covers personal injuries to all passengers in the insured vehicle, such as death, permanent disability, and medical and hospital expenses. The Fully Comprehensive auto insurance policy provides the most comprehensive coverage for auto vehicles and includes Casco, MTPL, and PA coverages. This policy typically covers the policyholder for all the risks associated with driving a vehicle. Insurance policies of any level of coverage can also include add-on options, such as coverage for accessories, radios, air conditioning, antennas, and other equipment. These additional options can vary depending on the policy and insurer.

Auto insurance policy premiums (price) depend on the policyholder’s characteristics and the characteristics of the insured vehicle. Insurers set premiums and deductibles based on these characteristics. Although insurers are free to decide how to set their premiums and payment method (SUSEP, 2006), it is common practice to set premiums according to traditional actuarial premium calculations and cost loading, making adjustments for market conditions through discounts and surcharges (Laas et al., 2016).

Brazilian auto insurance companies’ pricing decisions for initial contracts typically follow a cost-based approach based on calculating the propensity of a hazard built from the client’s

²Information retrieved in <https://www2.susep.gov.br/safe/menuestatistica/pims.html> Accessed on March 14th, 2022. “Ramos” with prefix 05 refers to motor insurance.

demographics and historical incident data within that demographic in the insurer’s database. Therefore, the propensity for hazards is contingent upon the insurer’s database composition, whereby insurers with a higher concentration of clients in specific geographical regions can offer more accurate estimates of risk probabilities for particular neighborhoods within these regions. Consequently, variations in insurers’ database compositions can lead to differences in prices offered to the same client by different insurers.

For prices offered for contract renewals, insurers adopt several statistical techniques to assess the probability of retaining their policyholders, given demographics, premiums, and other contract features. Insurers aim at a retention probability within a targeted range aligned with the insurer’s business model and objectives.³

Deductible refers to the amount the policyholder must pay the insurer in case of a claim. The insurer does not compensate the policyholder if the loss does not exceed the deductible amount. The deductible cannot be charged in claims with full indemnity or claims resulting from fire, lightning, or explosion, even if they involve partial indemnity. However, the policyholder will bear the deductible if a stolen vehicle is recovered and needs repair. In case of multiple claims, the policyholder will pay a deductible for each claim (SUSEP, 2006). Therefore, deductibles in auto insurance are a cost-sharing mechanism between the policyholder and the insurer, reducing the number of small claims filed by the insurer.

Insurers may refrain from presenting a premium offer for motor insurance calculation requests if insurers do not have enough information to assess the risk, the applicant falls into a high-risk category, the requested coverage falls outside of the insurer’s standard policy offerings or risk appetite, or the applicant falls outside of the insurer’s business strategy.

A Bonus-Malus system affects premium rates in the Brazilian auto insurance industry according to the policyholder’s claims record. This system discounts premiums for claim-free contract periods and increases premiums upon claim submission. Annually, the system adjusts the Bonus class based on the policyholder’s claims history, influencing the premium amount. The Bonus scale ranges from 0 to 10, with higher scores indicating better terms. Policyholders start with a bonus score of zero and accumulate points each claim-free year, and lose bonus points every year if there is a claim (but cannot fall below 0 bonus points). Remark, therefore, that a driver with bonus class 10 has at least ten years of experience, so there is a correlation between age and bonus class.

2.2 Renewal process and the auto insurance contract platform

In Brazil, auto insurance contracts are valid for a year, and renewal is not automatic, requiring action from the broker and the policyholder. Therefore, the renewal process happens once a year for each policyholder, each with a different anniversary date, so contract renewal happens throughout the year.

In Brazil, consumers cannot purchase insurance directly from an insurer; they must go

³We obtained this information from interviews with people responsible for pricing in auto-insurance companies in Brazil.

through a broker. The broker’s role includes activities such as assessing the risks faced by clients, identifying suitable insurance products, negotiating with insurance companies to secure the best coverage and rates, and providing ongoing support to clients in case of claims and contract renewals. Brokers also offer advice on insurance policies, coverage options, and risk management strategies (Casa Civil - Subchefia para Assuntos Jurídicos, 1964, 2022). The insurance regulatory agency, SUSEP, licenses and supervises insurance brokers to ensure they comply with the country’s insurance regulations. Brokers must undergo training and qualification before obtaining a license to practice (SUSEP, 2000). Insurers remunerate the brokers by paying a commission fee based on the type of insurance they sell and the volume of business they generate. The average commission rate for insurance brokers in Brazil ranges from 10% to 20% of the premium value.

When the auto-insurance policy is about to expire, the broker demands offer calculation requests by sending updated policyholder details to insurers, in our case, through the platform Level-Up. The insurers then use policyholder characteristics and vehicle details to estimate the costs of issuing a policy. Given each insurer’s tariffs and strategy, a proposal premium is offered and presented to the broker. The broker collects all returned offers and presents them to the policyholder, who chooses her preferred offer, initiating a new contract.

3 Data and summary statistics

Our data come from a policy calculation application and policy management platform that connects brokers to insurers. The company managing this platform, Leve-Up, specializes in providing centralized insurance policy and customer management solutions to brokers in the Brazilian insurance market. It allows brokers to manage renewals efficiently and other policy-related tasks, giving them greater control over their operations. Level-Up receives about 14% of calculation requests for auto insurance contracts in Brazil.⁴

We have information on insurance policy renewals for Fully Comprehensive contracts and their respective fully comprehensive offers. Fully comprehensive contracts represented 82% of the renewed contracts.

To conduct a meaningful premium offer comparison, we only kept fully comprehensive premium offers in the sample, as it is unlikely that customers renewing their insurance contracts will significantly change their degree of coverage. Instead, consumers are more likely to evaluate their current insurer compared to other firms based on the current contract and similar contract characteristics.⁵ Furthermore, optional changes in the insurance contract features, such as changes in the types of risk covered, may imply losing bonus classes and getting reassigned to class 0, which involves relevant monetary costs because premiums go up when the bonus class decreases.

⁴We use a fictitious name for the platform and label insurers as I1, I2, I3 ... to respect the non-disclosure agreement signed with the platform that supplied us with the data.

⁵The underlying assumption here is that consumers first decide the type of contract in terms of coverage that they would like to purchase and then search for the contract with the highest indirect utility, as in Honka (2014)

We use a sample of queries for policyholders whose insurance contracts were about to expire between September 2021 and August 2022. The dataset contains policyholders' and car characteristics. These include the policyholder's age, gender, marital status, demographic region, bonus class (for the previous and current insurance policy), whether she made a claim the previous year, age and value of the car, and the number of kilometers. The data also include information on the offers received by the policyholder in a query, such as the premium, the identity of the previous insurer, the current insurer's identity, and the contracts' characteristics (e.g., coverage and deductibles). We excluded from the sample queries where the policyholders received only one renewal offer because, in these cases, the policyholder did not have a choice between switching or not. We also dropped from the sample queries that did not include an offer from the previous insurer. These cases can happen for two reasons. First, the previous insurer indeed did not make a renewal offer. However, second, it could also be that the policyholder is new to the platform. Hence, we cannot identify her previous insurer (there is no offer flagged as an offer from the previous insurer). Our final sample contains 940,295 contract-level observations distributed over 81,389 queries/policyholders.

3.1 Summary Statistics

The upper panel of Table 1 displays sample summary statistics of the insurers' offers in a query and policyholder characteristic. We show the statistics separately for the subsample of queries that resulted in switching to another insurer at the moment of renewal (first two columns) and the subsample where there was no switching (two last columns). The two subsamples differ substantially in observable ways: all means are statistically significantly different across the two subsamples, except for the proportion of policyholders who are married. The mean premium among non-switchers is 570,42 euros, whereas the mean premium among switchers is 549,74 euros, but standard deviations imply relevant premium dispersion. In 72% of non-switcher queries, the previous insurer made the cheapest offer, whereas this proportion drops to 5% among switchers. The percentage difference between the premium offered by the previous insurer and the query mean premium is substantially higher among non-switchers than switchers: -57% versus -14%, respectively. The average number of offers per query among non-switchers is 6.4, whereas for switchers, it is 7.3.

The lower panel of Table 1 shows summary statistics for the policyholder, again for the subsample of non-switchers and switchers. The proportion of females and married policyholders who switch and do not switch is the same. Switchers are slightly younger on average than non-switchers. The average bonus status is higher for non-switchers; accordingly, the proportion of claimants is higher among switchers.

Table 2 shows insurer-level data on market shares (in the number of policies in our platform), switching rates, conversion rates, and the proportion of times each insurer showed up in a query ("Considered"). The switching rate is the proportion of queries in which policyholders decided to switch from the line insurer to a new insurer. The conversion rate is the proportion of queries in which the policyholders chose to switch from their previous insurer to the line insurer. The largest insurer is I7, with 20% of the market, and the second largest are I2 and I9, with 13%

Table 1: Summary Statistics – Offers and Policyholders

	No Switch		Switch	
	mean	sd	mean	sd
<i>Offers per query</i>				
Premium PI is the lowest	0.72	0.45	0.05	0.22
Mean Premium	570.42	378.46	549.74	324.77
% Premium PI - mean premium	-31.06	46.40	-7.34	28.47
Number of Offers	6.36	2.56	7.28	2.31
<i>Policyholder</i>				
Female	0.41	0.49	0.43	0.50
Age	52.25	13.65	50.62	13.32
Married	0.78	0.42	0.78	0.41
Current Bonus	6.67	3.43	6.07	3.57
Claimant	0.04	0.20	0.07	0.25
Observations	57,118		24,271	

(i) Switch and non-switch refer to the subsample of consumers that switched insurers or not at the moment of renewal. (ii) Number of offers refers to the number of insurers that returned a premium offer to the policyholder in a given query. Mean Premium is the weighted unconditional mean premium in each query/consideration set. % Premium PI - mean is the relative premium distance in percentage points between the premium offered by the previous insurer and the mean premium offer in the query. The mean and standard deviation for Average Premium are weighted by the number of offers. Nominal monetary values in Euros. (iii) Current bonus refers to the current bonus class of policyholders. *Claimant* equals 1 if the policyholder has filed a claim with the current insurer and 0 otherwise, that can vary from 0 to 10.

Table 2: Insurance firms: market shares and switching and retention rates

Previous Insurer	Market Share	Share in Platform	Switching	Conversion	Considered
I1	0.01	0.02	0.21	0.40	0.23
I2	0.13	0.23	0.25	0.20	0.80
I3	0.07	0.08	0.37	0.36	0.60
I4	0.07	0.15	0.32	0.20	0.68
I5	0.06	0.03	0.4	0.55	0.49
I6	0.01	0.04	0.34	0.16	0.16
I7	0.19	0.19	0.37	0.09	0.80
I8	0.03	0.03	0.36	0.28	0.50
I9	0.12	0.20	0.21	0.23	0.79
I10	0.02	0.03	0.35	0.60	0.32
Others	0.28	-			

Note: Market Share (1) calculated using Gross Written Premium from 2022. Information retrieved from SUSEP in <https://www2.susep.gov.br/menuestatistica/SES/principal.aspx>. Market Share (2) is calculated based on the total number of policies to renew in our platform. Conversion Rate refers to the share of accepted quotes originating from policyholders who were not previously insured by the insurer. The considered Rate refers to the share of policies to renew the previous insurer’s presented premium.

Table 3: Switching

Variable	n (%)
Switch=1	24,271 (0.298)
Previous insurer is cheapest =1	42,353 (0.52)

and 12% of the market, respectively. The insurers with the largest conversion rates are I10 and I5, with 60% and 55% conversion rates, respectively. The insurers with the lowest switching rate are I1 and I9, with a 20% rate. Most firms have switching rates of 30% and more up to 40%.

Figure 1 shows the mean premium per query and the number of offers in a query. The figure indicates a negative correlation between the mean premium and the number of offers.

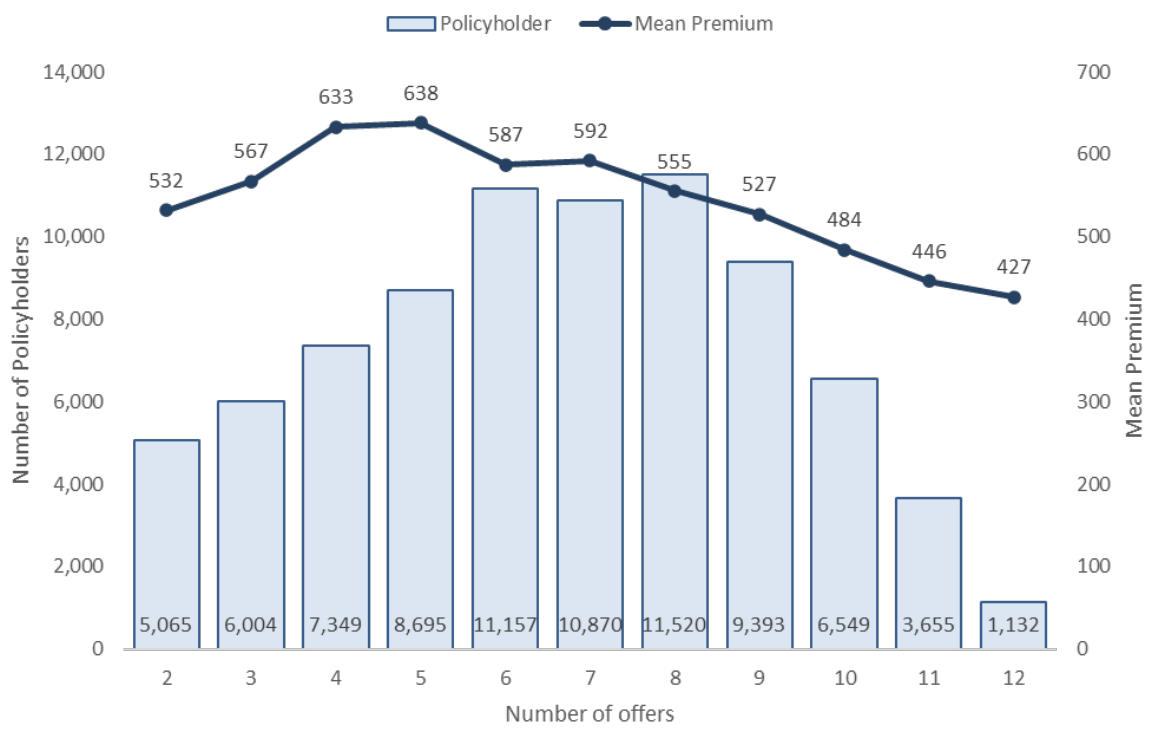
4 Switching

Figure 2 depicts the probability of switching insurers conditional on the number of offers presented upon renewal. There is a positive correlation between the number of offers and the switching rate. The probability of switching is 10.0% among policyholders who receive 2 offers and 42.1% among those who receive 12 offers.

The probability of policyholders switching insurers upon renewal, conditional on the identity of their previous insurer (I), is depicted in Figure 3. The graph displays the probabilities in descending order, with Previous Insurer 5 (I5) exhibiting the highest switching rate at 39.7%, while Previous Insurer 9 (I9) shows the lowest rate at 20.8%. These findings suggest an insurer effect that may influence the policyholder’s decision to either renew their existing policy with her previous insurer or switch to a competing insurer.

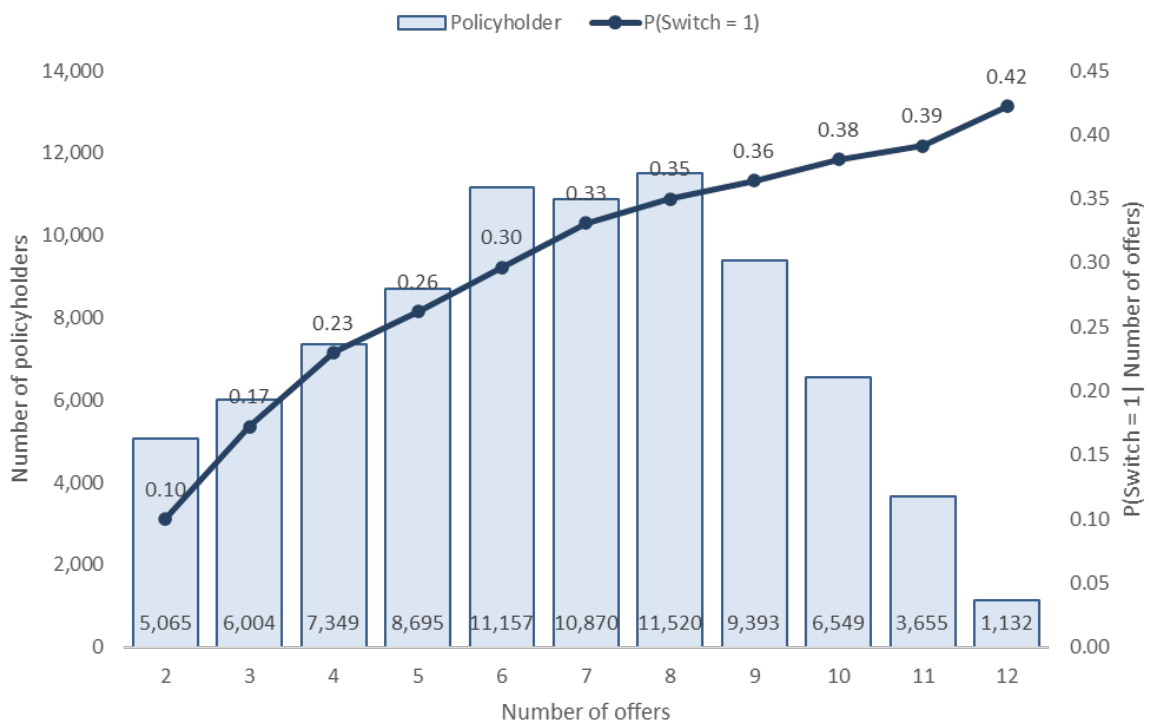
The probability of policyholders switching insurers, conditional on the premium distance

Figure 1: *MeanPremium* | number offers



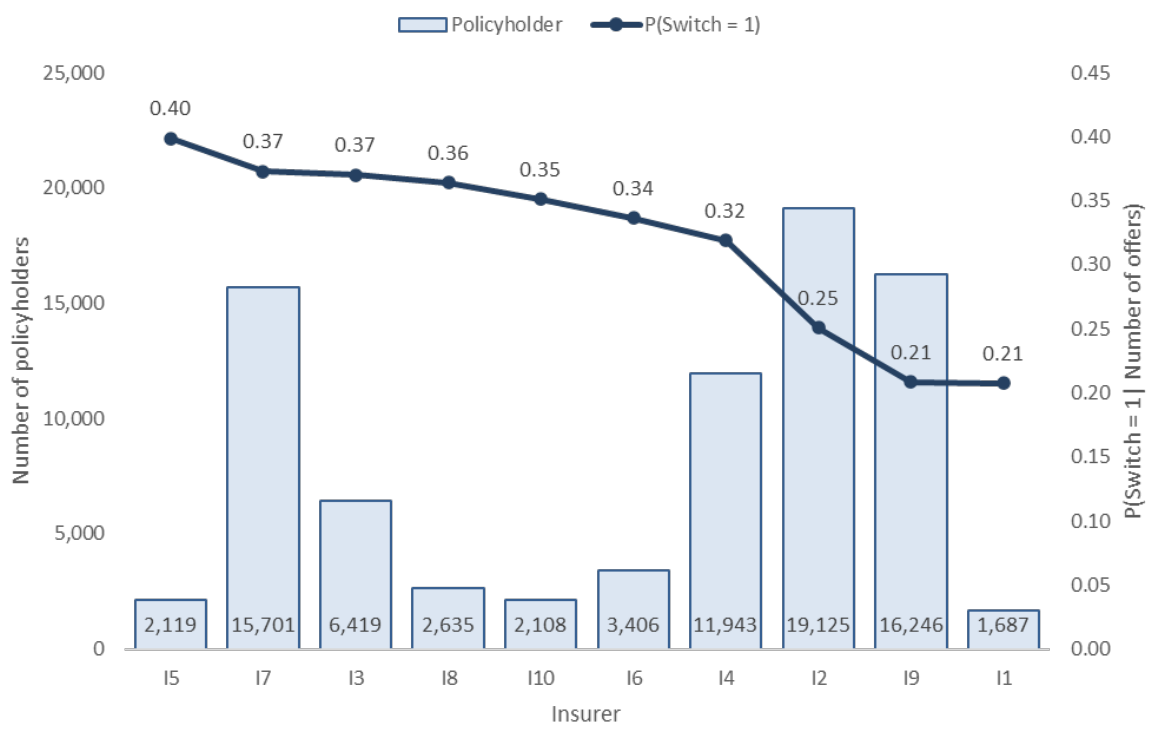
Note: The bars represent the number of policyholders that received a given number of offers, whereas the line represents the mean premium.

Figure 2: *Switch* = 1 | number of offers



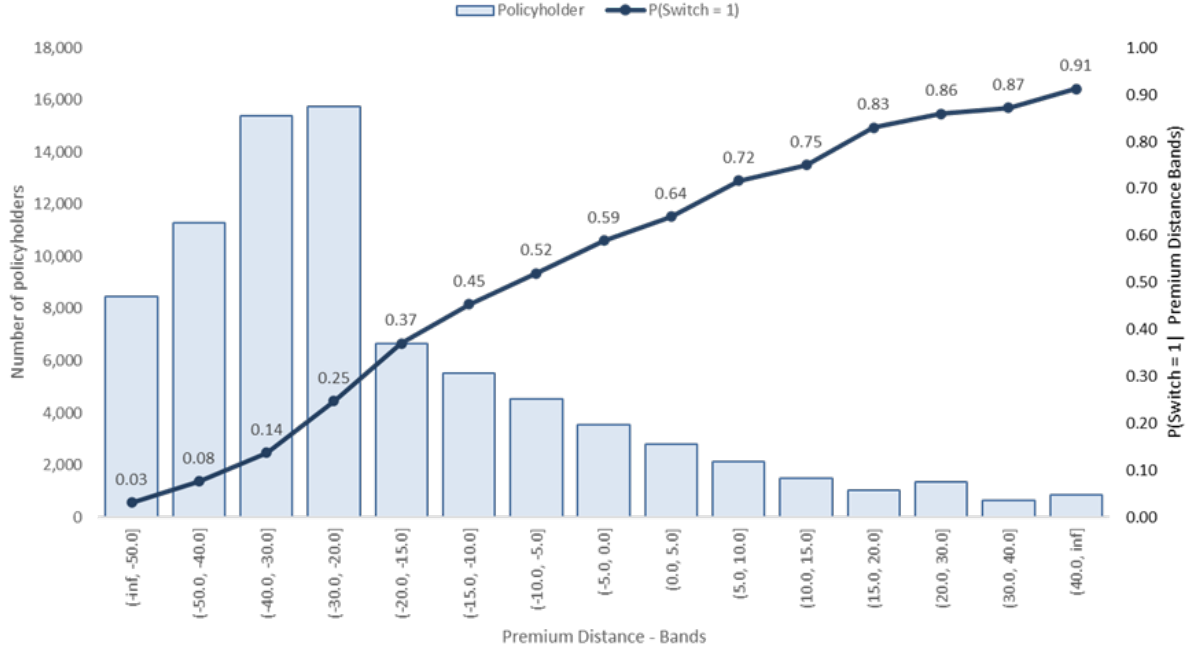
Note: The bars represent the number of policyholders that received a given number of offers, whereas the line represents the probability of switching.

Figure 3: *Switch = 1* | previous insurer



Note: Previous Insurer labeled as I1, I2, ..., I10. The bars represent the number of policyholders that were insured by a given insurer, whereas the line represents the probability of switching.

Figure 4: $Switch = 1$ | Premium Distance



Note: Premium distance is the percentage difference between the premium offered by the previous insurer and the mean premium in this query. PD bands were created arbitrarily to present a graphical representation of switching probabilities. The bars represent the number of policyholders whose premium distances fell within each band, whereas the line represents the Probability of Switching equal 1.

bands is represented in Figure 4. The graph illustrates the various bands of PD, with the first band encompassing policyholders whose premium distance fell within the minimum value of up to 50 percentage points of premium distance, exhibiting a switching probability of 3.1%. The second band includes policyholders whose premium distance fell within the range of (-50%, -40%], showing a switching probability of 7.6%, and so forth for subsequent bands.

When a policyholder switches insurance provider, how much do policyholders save relative to what they would have paid had they accepted the offer from their previous insurer? The saving rate is calculated as in 1 and presents how cheap the accepted premium is compared to the previous insurer offer (incumbent).

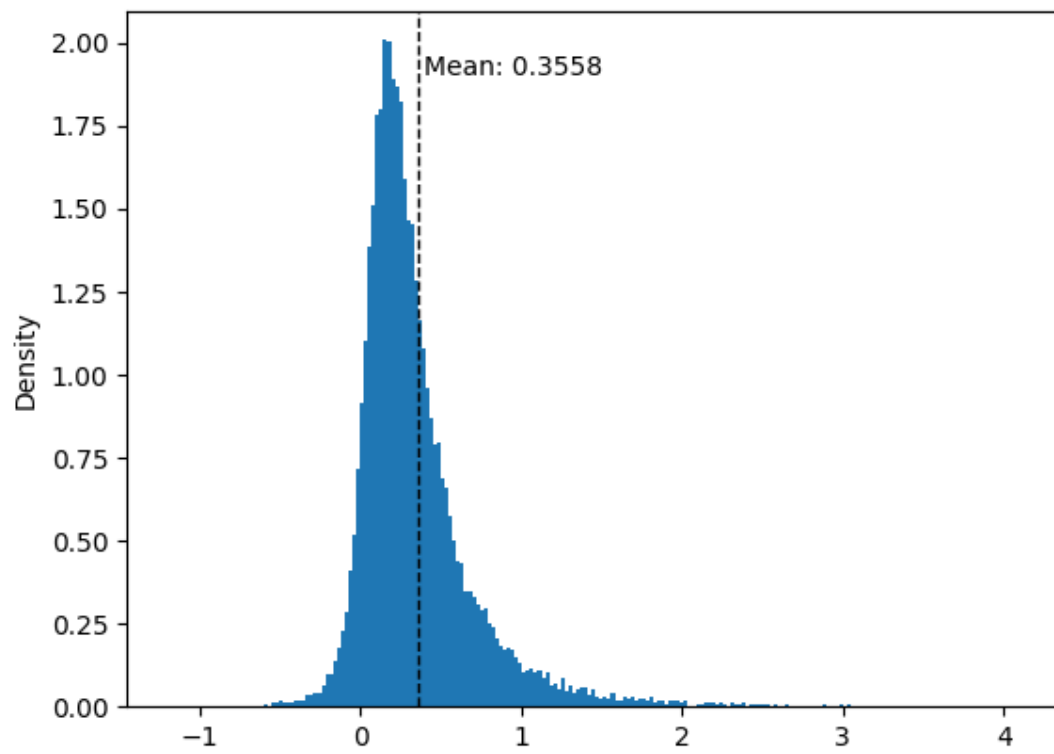
$$Saving_i = (P_i^{PI} - P_i^A) / P_i^A \quad (1)$$

Figure 5 illustrates the saving rate distributions across customers who switched insurer providers relative to what they would have paid had they accepted the offer from their previous insurer.

Conditional on not Switching, how much do policyholders give up on savings compared to the cheapest offer? What is the monetary cost, if any, of not switching?

We observe 63,547 policyholders who did not switch insurance providers at the renewal of their contracts. For those who did not Switch, 16,040 (25%) had a cheaper premium offer from another insurer. Figure 6 depicts the distribution of the cost rate for choosing to stay with their

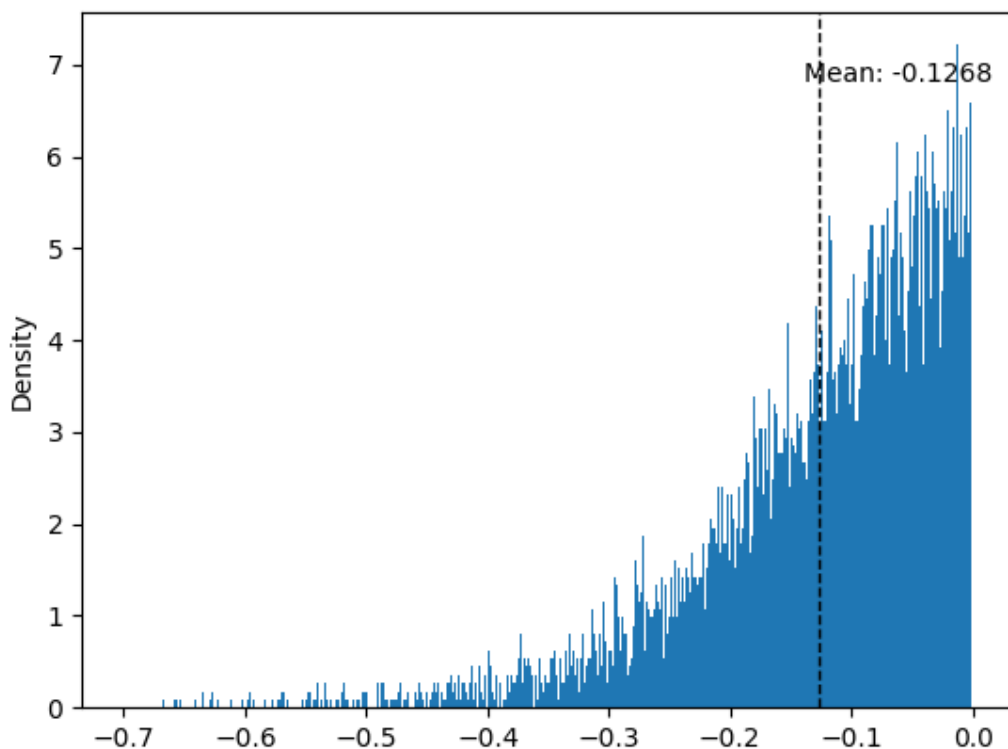
Figure 5: Saving rate distribution conditional on switching



previous insurer despite a cheaper offer being presented.

$$Cost_i = (P_i^{min} - P_i^{PI})/P_i^{PI} \quad (2)$$

Figure 6: Cost rate distribution conditional on not switching



What could explain this huge proportion of policyholders who did observe a cheaper offer and decided to remain with the previous insurer? Figure ?? shows the proportion of policyholders who observed a cheaper offer but decided to remain with the previous insurer. Almost half of I9’s policyholders observed a cheaper premium than I9’s offer and decided to remain insured by I9 anyway. Additionally, the cost of staying at I9 is 14.72%, which is slightly above the overall observed mean. In the figure, we present the switching rate by insurer. I9, the market leader in auto insurance in Brazil, has the lowest switching rate. They are renowned for having an excellent claims-handling process.

4.0.1 Determinant of switching

To control for observed and unobserved differences between policyholders and insurance contracts that can affect the decision to switch, we also run regressions of the probability of switching on various characteristics of the policyholder and of the offers received at the moment of

the insurance renewal decision. Table 4 shows odds ratios resulting from logit regressions.

In the first column, we regress the probability of switching on a variable that we would observe in more standard datasets that include only information on the policyholder and their choices but not information on alternative premiums and the consideration set. In the second column, we also include the premium of the previous insurer, and finally, in the third column, we include the number of offers in the consideration set and whether the previous insurance premium offer was the lowest one. The difference in estimated premium responses is striking across columns, underscoring the importance of controlling for premiums offered by alternative insurers, especially the previous insurer: when we regress switching on accepted premium only, the hazard rate estimated is very close to one (column 1), seeming to indicate that offered premium plays no role in determining switching (which could lead to the conclusion of high inertia/stickiness in the market, unresponsiveness to price). However, when we include the premium offered by the previous insurer for renewal (column 2), the relevance of the premium increases: controlling for the premium of the previous insurer, a marginally lower premium (measured relative to the mean premium) increases the probability of switching by 14 percentage points. Also, a marginal increase in the premium offered by the previous insurer increases the probability of switching by 5 percent.

Notably, one of the main drivers of switching is whether the policyholder had a claim the previous year: in column 3, we see that filing a claim increases the probability of switching insurers by half. Remark that this is due only to the filed claim, as we control for premiums and also a current bonus, as well as the identity of previous and current insurers. Why is having filed a claim such a strong determinant of switching? The fact that having filed a claim increases the probability of switch is also consistent with learning about the insurer’s true quality: policyholder may make choices with limited information about the quality of the service provided by the insurance company and be too optimistic about it, and then get disappointed with the claimant experience (Israel, 2005a).

5 Pricing

In this session, we investigate the determinants of pricing. In markets with high switching costs, firm competition, and personalized pricing, firms should offer a low entry price to attract new customers, followed by higher prices to existing customers locked in due to switching costs. We examine whether empirical evidence aligns with this pricing dynamic. Specifically, we regress the log of the offered premium on the characteristics of the policyholder, firm and time period fixed effects, and whether the firm making the offer was the policyholder’s previous insurer. If the pricing follows a “bargain then ripoff” dynamic, then controlling for other characteristics of the customer, firm, and common shocks, the premium offered by the previous insurer should be lower. Table 5 shows the results. The first column presents estimated coefficients from a regression, including the policyholder’s observable characteristics, and the second column includes estimates from a regression that incorporates policyholder fixed effects. We find that the previous insurer offers lower premiums than other insurers, contrary to what would be

Table 4: Determinants of switching

		Odds ratio	
% Premium - Min Premium	1.00	0.91***	0.89***
	(0.00)	(0.00)	(0.00)
Premium PI is the lowest=1		0.01***	0.03***
		(0.00)	(0.00)
% Premium PI - mean Premium			1.04***
			(0.00)
Claimant=1	1.39***	1.50***	1.62***
	(0.06)	(0.08)	(0.10)
Current Bonus		0.95***	0.93***
		(0.00)	(0.00)
Female	1.00	0.93***	0.87***
	(0.02)	(0.02)	(0.02)
Month and Region FE	No	No	Yes
Insurer and Previous Insurer FE	No	No	Yes
Marital status	No	No	Yes
Nb of Offers	No	No	Yes
N	75405	75405	75405

Odds ratio from logit regressions; the dependent variable is binary and equals to 1 if the policyholder chooses to switch insurers at policy renewal.

expected in markets with high switching costs.

6 Conclusion

We study switching behavior and its determinants in the auto insurance market, exploiting a unique dataset that includes policyholders' consideration sets and final contract choices. Our findings underscore the importance of considering not only individual characteristics and previous claim history but also premium differentials and choice sets in understanding switching behavior. Ignoring alternative premiums and the other offers considered by the consumers leads to an overestimation of the relevance of switching costs and premium unresponsiveness. We find evidence consistent with brand loyalty.

The propensity to switch is also heavily influenced by whether a policyholder filed a claim in the previous year. This is consistent with consumers learning about the true quality of the service provided by their insurance through the claims experience as in Israel (2005a). Brand loyalty could also stem from positive claim-holding experiences from previous years with the same insurer. We intend to study the effect of claims on brand loyalty in future work using longitudinal data.

Table 5: Determinants of pricing

	Log or premium offered	
	OLS	Policyholder FE
Previous Insurer	-0.32*** (0.00)	-0.35*** (0.00)
Current Bonus	-0.04*** (0.00)	
Age	-0.01*** (0.00)	
Age Sq	0.00*** (0.00)	
Male	0.04*** (0.00)	
Claimant=1	0.16*** (0.00)	
Policyholder FE	No	Yes
Month and Region FE	Yes	No
Marital status	Yes	No
Car characteristics	Yes	No
Offer characteristics	Yes	Yes
N	906160	940295
r2	0.542	0.175

References

- Abaluck, J. and A. Adams-Prassl (2021). What do consumers consider before they choose? identification from asymmetric demand responses. *The Quarterly Journal of Economics* 136(3), 1611–1663.
- Barseghyan, L., M. Coughlin, F. Molinari, and J. C. Teitelbaum (2021). Heterogeneous choice sets and preferences. *Econometrica* 89(5), 2015–2048.
- Casa Civil - Subchefia para Assuntos Jurídicos (1964). Law no 4.594/1964 - insurance brokerage law.
<http://www.planalto.gov.br/ccivil03/leis/l4594.htm>.
- Casa Civil - Subchefia para Assuntos Jurídicos (2022). Law no 14.430/2022.
<http://www.planalto.gov.br/ccivil03/ato2019-2022/2022/Lei/L14430.htm>.
- Cohen, A. (2005). Asymmetric information and learning: Evidence from the automobile insurance market. *Review of Economics and Statistics* 87(2), 197–207.
- Conlon, C. T. and J. H. Mortimer (2013). Demand estimation under incomplete product availability. *American Economic Journal: Microeconomics* 5(4), 1–30.

- Crawford, G. S., R. Griffith, and A. Iaria (2021). A survey of preference estimation with unobserved choice set heterogeneity. *Journal of Econometrics* 222(1), 4–43.
- Dubé, J.-P., G. J. Hitsch, and P. E. Rossi (2010). State dependence and alternative explanations for consumer inertia. *The RAND Journal of Economics* 41(3), 417–445.
- Gönülal, S. O. (2009). Motor third-party liability insurance in developing countries: raising awareness and improving safety.
- Guillen, M., J. Parner, C. Densgsoe, and A. Perez-Marin (2002). Customer loyalty in the insurance industry: a logistic regression approach. In *II Conference in Actuarial Science and Finance on Samos, Karlovasi-Samos, Greece*.
- Ho, K., J. Hogan, and F. Scott Morton (2017). The impact of consumer inattention on insurer pricing in the medicare part d program. *The RAND Journal of Economics* 48(4), 877–905.
- Honka, E. (2014). Quantifying search and switching costs in the us auto insurance industry. *The RAND Journal of Economics* 45(4), 847–884.
- Honka, E., A. Hortaçsu, and M. A. Vitorino (2017). Advertising, consumer awareness, and choice: Evidence from the us banking industry. *The RAND Journal of Economics* 48(3), 611–646.
- Honka, E., A. Hortaçsu, and M. Wildenbeest (2019). Empirical search and consideration sets. In *Handbook of the Economics of Marketing*, Volume 1, pp. 193–257. Elsevier.
- Israel, M. (2005a). Services as experience goods: An empirical examination of consumer learning in automobile insurance. *American Economic Review* 95(5), 1444–1463.
- Israel, M. (2005b). Tenure dependence in consumer-firm relationships: an empirical analysis of consumer departures from automobile insurance firms. *RAND Journal of Economics*, 165–192.
- Keegan, C., C. Teljeur, B. Turner, and S. Thomas (2016). Switching insurer in the irish voluntary health insurance market: determinants, incentives, and risk equalization. *The European journal of health economics* 17, 823–831.
- Kim, M., D. Kliger, and B. Vale (2003). Estimating switching costs: the case of banking. *Journal of Financial Intermediation* 12(1), 25–56.

- Klemperer, P. (1995). Competition when consumers have switching costs: An overview with applications to industrial organization, macroeconomics, and international trade. *The review of economic studies* 62(4), 515–539.
- Laas, D., H. Schmeiser, and J. Wagner (2016, January). Empirical findings on motor insurance pricing in germany, austria and switzerland. *The Geneva Papers on Risk and Insurance : Issues and Practice* 41(3), 398–431.
- Leiria, M., E. Rebelo, and N. deMatos (2022). Measuring the effectiveness of intermediary loyalty programmes in the motor insurance industry: loyal versus non-loyal customers. *European Journal of Management and Business Economics* 31(3), 305–324.
- Moraga-González, J. L., Z. Sándor, and M. R. Wildenbeest (2023). Consumer search and prices in the automobile market. *The Review of Economic Studies* 90(3), 1394–1440.
- Shum, M. (2004). Does advertising overcome brand loyalty? evidence from the breakfast-cereals market. *Journal of Economics & Management Strategy* 13(2), 241–272.
- Sovinsky Goeree, M. (2008). Limited information and advertising in the us personal computer industry. *Econometrica* 76(5), 1017–1074.
- SUSEP (2000). Circular susep n° 127.
<https://www2.susep.gov.br/textos/circ127.htm>.
- SUSEP (2006). Guia de orientação e defesa do segurado. Rio de Janeiro.