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ARE WE (UN)CONSCIOUSLY DRIVEN BY FIRST IMPRESSIONS? PRICE DECLARATIONS VS OBSERVED CINEMA DEMAND WHEN VAT INCREASES

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Abstract

The aim of this research is to shed light on how people's self-declared price perceptions could be affected by external factors other than real prices. Also, we analyze if these perceptions, particularly when inaccurate, determine later economic behavior. We study how a rise in the Spanish Cultural VAT triggered changes in actual prices, price perceptions and cinema demand. We find that price declarations in survey responses, as they are based on intuitive thinking, are affected by other features than prices. These factors, which are different for attendants and non-attendants, include promotion research costs, differences between implicit and explicit costs, interpretation of prices according to prior expectations, the influence of other channels such as mass media or word of mouth, recall of the latest price paid and, finally, protest responses, as in our case the origin of the price change is a tax increase. Moreover, for those who are more affected by these external factors, we find that declared valuations of prices are not consistent with observed consumption decisions. Behavior involves a more reflective and deliberative way of thinking that helps set aside external factors and places the focus back on real prices. Therefore, the real behavior is more consistent with rationality than are price declarations.

JEL classification: D12, D91, Z11

Keywords: price declarations; consumer behavior; heuristics and biases; tax changes; survey responses; cinema

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1. INTRODUCTION

Most of the classical microeconomic models are based on the assumption that representative individuals behave rationally. Consumers are considered utility-maximizers constrained to their available budget who, always *consciously,* balance the costs and benefits of their decisions. People are supposed to have the ability to compare products properly and to make purchasing decisions according to their *correctly calculated* relative prices. But, what happens if individuals are not good enough to, for example, evaluate and compare prices accurately? Are not we subject, as posited by Loewenstein (2000), to the current state of our "*passions*"? Are Economists neglecting *immediate emotions* at the time of decision-making?

Since earliest research on consumers' price perceptions, it has been questioned whether individuals are able to simply perceive price changes (Gabor and Granger, 1961). Certainly, consumers have difficulties when trying to recall prices properly (Evanschitzky et al. 2004) and they have also been shown to be limited in noticing and weighing price changes (Dickson and Sawyer, 1990). It has even been found that price changes' perceptions are frequently based on feelings and general knowledge rather than on solid facts (Christandl et al., 2011) due to the biased use of price information and the selective distortion of memory. Even in the case of repeated purchases, the learning process is usually incomplete, and also individuals with experience have inaccurate beliefs about price distribution (Matsumoto and Spence, 2016). Moreover, consumers are highly dominated by their recent memory plus their myopia. For instance, individuals tend to be biased towards the last purchase made, which, since being the most recent one, it is also the easiest to recall (Glanzer, 1972; Glanzer and Cunitz, 1966). What is more, individuals tend to evaluate prices as more expensive after having recalled buying something that is not worth the money paid for it. As Gärling and Gamble (2006) point out, with the worthless acquisition in their recent memory, the perceived value of money changes and the willingness to pay is negatively affected. Similarly, the simple act of thinking on specific price changes makes individuals recall the most

extreme ones they have experienced and, then, they tend to report higher inflation expectations (Bruine de Bruin et al., 2011).

This paper analyzes the possible bias in prices evaluation, confronting it with individual's declared behavior. In particular, we focus on the cinema market in Spain. We take advantage of a tax rise which triggered a stream of unpopularity in the mass media. This was followed by several price discount campaigns launched by the supply side to offset the subsequent decline in demand. In line with previous evidence on inaccurately assessed prices, this chain of events could have led to an (in)appropriate evaluation of overall cinema prices, and changes in the individuals' behavior to adapt to the new circumstances. Thus, the aim of this research is twofold. First, to analyze the effect of price changes on the formation of price perceptions and individual valuations of them, including how cognitive biases could affect these judgments. Second, to study if these considerations do have an impact on individuals' behavior.

For this purpose, we benefit from the rise in the Value Added Tax (VAT) for cultural products that took place in 2012 in Spain, between two waves (2010-11 and 2014-15) of the Survey of Cultural Habits and Practices (SCHP). Using self-declared relevance of ticket prices as a limit for cinema participation, we compare individuals' stated main reason why not to attend more frequently to the cinema prior to the VAT increase with the declaration after the tax modification. Due to this change in taxation, in the second wave of the survey, the majority of people stated that prices were the main limit for cinema consumption, in contrast to the period before, when lack of time and interest were seen as crucial too. Probably due to the new price menus, people focused on them when stating which was the principal limit for their participation, although the average ticket price slightly decreased. In fact, notwithstanding this stream of awareness about ticket prices, the observed cinema demand remained almost stable, in line with Wichman (2014) who found that people respond to average prices, regardless of price perceptions and price tariffs.

There are two issues to analyze when explaining this event. On the one hand, there is the survey response, whose effect could be split into two as it contains both voluntary and unintentional deviations from the truth. Individuals' answers

include perceptions that can be influenced by heuristics, biases and external factors, but respondents could also adapt their answers to their will. On the other hand, there is the consequent public behavior, i.e. how individuals really understand the overall price and behave.

Consequently, besides the importance of the price change itself, how it is presented to citizens, where it comes from and how mass media interpret it play an important role too. Hence, it is of great interest to analyze how prices are judged by consumers, and how it affects observed behavior within a scenario of tax adjustments and supply modifications. Following Kahneman et al. (2011), immediate perception of prices, as it is intuitive, it is also strongly connected to the use of heuristics and, thus, highly influenced by cognitive biases. However, these misperceived prices may not imply consequences further than giving *unintentionally* prejudiced answers to surveys. These quickly driven answers could be rapidly set aside and forgotten when making economic decisions. As real purchases entail real consequences, it looks like deliberative reflection may emerge thus explaining why individuals' behavior fits better the demand of classical economic models. Hence, it is also meaningful to examine the divergence between surveys' responses and real behavior.

The paper is structured as follows. Section 2 gives a brief overview of the literature. Section 3 focuses on the contextual framework of our analysis. Section 4 describes the methods: data base and methodology. Section 5 provides the results obtained. In Section 6 we discuss the main results and conclude.

2. LITERATURE REVIEW

The assumption of individual rationality underlies most economic models. Also, rationality has important normative implications, as in the absence of externalities rational maximizing individuals produce efficient results for the whole society (Laibson and Zeckhauser, 1998). But the classical theory of rational behavior, based on the expected utility theory, started to crumble when

Daniel Kahneman and Amos Tversky exposed the flaws in the basis of rationality and the several classes of choice problems in which preferences systematically violate the axioms of the expected utility theory. Kahneman and Tversky (1977) showed that *non-rational* behavior can be not only identified, but also predicted. Originally, they explored the heuristics people use in order to simplify decision-making and the biases to which individuals are prone when using heuristics (Tversky and Kahneman, 1973; Kahneman et al, 1982).

Human behavior is often driven by a whole set of heuristics, i.e. mental shortcuts that usually involve focusing on one aspect of a complex problem and ignoring others in order to simplify complicated probability judgments (see Lewis, 2008; Harris, 2007; Nevid, 2008). Thus, these heuristics can deviate individuals' behavior from the theoretically perfect rationality. The use of heuristics depends on the mode of thinking, which in turn is related to the type of choice. Kahneman et al. (2011) analyzed two different ways in which people process decisions depending on the mode of thinking: intuitive and reflective. In intuitive thinking, impressions, associations, feelings, intentions and preparations for action flow naturally, allowing us to do things simultaneously without paying special attention to each action separately and without consciously focusing on how to do them. On the contrary, reflective thinking is slower, effortful and deliberative, requires focusing intentionally on the issue and it is activated when the risks are high, when the decision is relevant or when deep reasoning is required. Most of the time, without being aware, intuitive thinking rules. It develops a narrative that suppresses alternative understandings of reality, and this can lead us astray. Cognitive biases are an example of inaccurate stories made up by intuitive thinking. In sum, people use heuristics in making daily choices, often ruled by intuitive thinking, which is strongly influenced by cognitive biases i.e. imprecise ways of perceiving reality.

Researchers have tried to understand not just how prices affect consumers' behavior, but also the effect of price *sensations* on their decisions. Divergences between prices and their interpretations tend to arise when individuals make choices under conditions of price changes. Customers make choices not only according to daily real prices but also taking into consideration their subjective beliefs about inflation (Armantier et al., 2015). It has similarly been found that

price trend perceptions are affected by expectations, even if real prices remain stable (Greitemeyer et al., 2005). What is more, the perception of higher inflation is associated with negative attitudes towards inflation (Del Missier et al., 2016). Gathering all this, apart from the official information, there are several influences on citizens' perceived changes in prices, such as experiences of previous price changes, expectations on inflation, social amplification of price changes and personal and social attitudes towards inflation (Ranyard et al., 2008).

In what follows, we review the literature that supports our investigation and the adequacy of the database chosen.

2.1 Where intuitive thinking brought me

If individuals are ruled by intuitive thinking when they are evaluating prices, their perceptions and judgments will be probably influenced by several biases. In our case of study, the anchoring bias, conservatism bias, recency effect, bandwagon effect and illusory truth effect, that are discussed below, seem to be the most powerful in explaining individuals' declarations on cinema ticket prices.

Anchoring bias (Tversky and Kahnemann, 1974) is based on the observation that people solve problems by setting a starting point and then adjusting from it to generate the final decision. There is a human tendency to anchor first-sight information or to rely too much on the first piece of information given to make the following decisions. Once the anchor is set, the remaining judgments are made by adjusting away from that anchor and additional information around the anchor is usually inaccurately evaluated. This results in insufficient adjustments that end up giving the initial anchor a higher weight than it really deserves, and the answer is biased toward the starting point (Laibson and Zeckhauser, 1998). This links with conservatism bias (Edwards, 1968), in which individuals over-weight prior information and under-weight the new evidence when revising their beliefs. Additionally, the serial-position effect (Zechmeister and Curt, 1984; Ebbinghaus, 1913; Gershberg and Shimamura, 1994) refers to the fact that recall accuracy varies considering order position. There is a human tendency to recall the first and last items in a series best, and the middle items worst. It is particularly relevant for our analysis to consider the recency effect (Deese and

Kaufman, 1957; Murdock, 1962; Baddeley and Hitch, 1993), in which individuals tend to begin recalling the end of the list and recall those items best.

The bandwagon effect refers to a phenomenon in which the rate of approval of some belief increases as it is already accepted by others, so that the probability of individual adoption increases with the proportion who have already done so (Colman, 2003). As a result, part of individuals' choices have their roots in information, accurate or not, gathered by others. Such behavior explains why some people ignore their personal preferences and adopt other people's ones, so that the individual preference for a product increases as its purchases rise (Leibenstein, 1950). This bias could also be connected to the illusory truth effect, i.e. the general tendency to believe information to be true when stated repeatedly, what makes it more likely to be realistic (Lynn et al., 1977).

2.2. What is in the public eye comes fast to my mind

Another source which may influence individual's declarations is the cause of the price change. One of the most relevant cases is when it is originated by fiscal adjustments. It comes as no surprise that people dislike paying taxes. Tax aversion behavior could imply even making choices that reduce overall individual's wealth with the only purpose of reducing tax payments (Blaufuss and Möhlman, 2014). Individuals show a stronger preference to avoid tax-related costs than equal costs not related to taxation (Sussman and Olivola, 2011). Besides that, tax changes usually trigger important mass media campaigns against them on the news. Furthermore, mass media tend to pay special attention to bad economic news, thus negatively affecting public perceptions (Goidel and Langley, 1995). In addition, price sensitivity is higher for price changes above the price of reference (Caputo et al., 2018). Since people could take as reference ticket prices before fiscal changes, they might compare them to standard prices afterwards, neglecting to consider discounts, thus reacting adversely. It is interesting to account for the general effect that media and word of mouth have on price perceptions (Ranyard et al., 2008), and also the specific effect arising from negative changes in economic indicators (Soroka, 2006). Finally, as pointed out by Gärling & Gamble (2006), individuals' socio-economic features also have an influence on price perceptions.

2.3 What I think it is versus what I say it is

When prices' valuations are drawn from surveys' responses, some biases tend to arise, given that surveys are not conducted in a vacuum, as suggested by Caputo et al. (2018). One source which unintentionally deviates surveys' responses from actual behavior is the inaccuracy of memory. When answering, people are supposed to be able to recall prices based on previous experiences or knowledge. However, this recall is imprecise both because of the limited capacity of memory storage and the complexity of price ticket tariffs. When answering surveys, misreporting information is also affected, for example, by satisfaction level as in hedonic recall bias (Prati, 2017), so dissatisfaction with current pricing could lead individuals to over-estimate the importance of prices. Simply the mood of the respondent, as in the *affect heuristic* (Finucane et al., 2000), can deviate responses both upwards or downwards. Even depending on the wealth of the consumer, price recalling is substantively affected, as in Petar and Mirjana (2013). Other sources affecting price responses are the heuristics which individuals usually use when evaluating price changes. For instance, price *opinions* are often influenced by the *availability heuristic* (Caroll, 1978) and associativeness, accordingly, different individuals could relate the price rise to their previous experiences of inflation or to recent economic turbulences. As drawn from a sample survey, declared responses might be also influenced by several systematic deviations. As noted by Bruine de Bruin et al. (2012), simple question wording produces relevant biases on consumer's reported inflation expectations. There is an important attractiveness in default options (Rooij and Teppa, 2008) this is, to choose options just because they are already selected by default, as in organ donation (Davidai et al. 2012) or electricity products (Kaenzig et al. 2013). In fact, individuals have the tendency to take the path of least resistance (see, for example, Baker et al. (2007)).

Results could be intentionally altered in order to adjust towards social desirability (see, for example, Brenner (2011a, 2012), Shepard (2003)) exaggerating positive behaviors and downplaying negative ones, as individuals try to manage the impression they cause on others. In this sense, even respondent's perception of the interviewer could define the bias of their

response (Brenner, 2017). In stated preferences methods, consequentiality is found to positively affect voting as being essential for incentive compatibility (Vossler and Watson, 2013), but whether individuals find the survey used for this research consequential or not remains to be tested. Affective and moral considerations do have an influence too, in some cases materializing in protest responses (e.g. in contingent valuation, Sawe (2017)). Furthermore, taxes cause an especially high number of protest responses (Meyerhoff and Liebe, 2010).

2.4 What rules my real behavior

Concerning behavior in a price-changing framework, we could assume that individuals make their purchasing choices taking into account both *effective ticket prices* and *people's feelings* about them. Firstly, there is a shock on demand coming from real price changes noticed by consumers when they are going to purchase the good. Afterwards, individuals' *judgment* of the new prices also matters. Consequently, behavior could be positively or negatively affected depending on factors such as the context in which the price change takes place, the public opinion in press and media, previous external information, the source which originates change and the overall personal interpretation of it.

The analysis of these two aspects, *effective ticket prices* and *people's feelings* about them, are the main objective of this paper.

2.5 Where I am searching for evidence about this problem

Between the two Survey of Cultural Habits and Practices (SCHP) conducted in Spain in periods 2010-11 and 2014-15, a tax rise in the cultural VAT took place, which triggered a chain of supply reactions in terms of price discrimination policies. Apparently, due to this fiscal adjustment, the main reason why individuals declared they do not attend more frequently to the cinema in the second period of the survey, 2014-15, was mostly price. At first sight, given that the Cultural VAT increased, declaring prices as the central problem for participation might seem reasonable. If prices increase too, it would lead to a decrease in demand. However, the truth is that on average, due to different

price discrimination policies, cinema prices slightly dropped. According to it, effective cinema demand was recovered by 2015, being the declared cinema attendance equal in 2010-11 and 2014-15. A possible explanation for this event is that people's *sentiment* was that prices increase, thus they declared it. On the contrary, average ticket prices remained similar and people's *behavior* responds to it.

We argue that people stated immediately *price* as the main reason why not to attend more often to the cinema due to the forehead mentioned use of intuitive thinking, which led them to use heuristics, thus being more prone to several cognitive biases. Recency, anchoring and conservatism effects led people to anchor to the idea of 'high prices', to which they were constantly exposed, as it was the fastest and easiest idea to recall, thus not revising appropriately their beliefs with other information they might have. Moreover, people tend to believe information just because stated repeatedly, as in illusory truth effect, and it seems that everyone is repeating that prices are 'the big problem' of cinema. Just as being the simplest way to answer, people jump into the (band)wagon of stating what they usually hear. Also, the real *inconvenience* of new prices, in terms of the consciousness of searching makes them straightforwardly to recall, therefore easy to choose as the main limit for cinema attendance. Furthermore, as the source of price changes is an increase in the VAT, its negative impact in press and media along with the general dislike of paying taxes, could generate more unpopularity and a greater number of protest responses. As coming from a survey, responses could also be unintentionally biased because of the limited capacity of memory and the complexity of price tariffs, simply question wording, default answering, dissatisfaction with current prices or even the mood of the respondent. On the contrary, when it comes to behavior, people's behavior reacts to average prices in line with Wichman (2014), regardless of price perceptions and price tariffs. As average prices remained almost stable, both real and declared attendance fit better on the behavior that would be forecasted following standard rational economic theories.

3. BACKGROUND

In order to bring light on the effect of price changes on price perceptions, how cognitive biases affect these judgments, and their impact on individuals' behavior, we focus on cinema participation in Spain between periods 2010-11 and 2014-15 using the respective waves of the SCHP. Particularly, we analyze how cinema prices' evaluations changed between these two waves of the survey. Changes in price sensitivities should be related to all factors that affected the average and dispersion of cinema prices between these periods. Once differences in price declarations are controlled for, we assess their effect on cinema demand. In what follows, we discuss the main characteristics of the Spanish cinema sector relevant to our analysis.

In contrast to other sectors, cinema prices are not correlated either with the quality or with the cost of the product, i.e. movies. In general, ticket prices are similar for all movies on screen at the same session, since they barely change depending on the film, but they could be different conditional on the day or the hour of the projection. This strategy is common in many countries and allows reducing congestion during the most demanded hours and attracting spectators to the less appealing ones. Hence, price dispersion is lower than movie heterogeneity.

Cinema prices suffered several changes between 2010 and 2015. One important impact took place in 2012 when the VAT for cultural products such as cinema, theatre or concerts, rose from 8 percent to 21 percent. This VAT increase generated a huge mass media coverage and important public attention. It should be taken into account that most mass media groups are also involved in movie production and distribution. Consequently, they were really concerned with the possible negative repercussion of this tax change. Also, actors and other cinema professionals were publicly claiming against it. Therefore, individuals were constantly exposed to information regarding the large rise in the Cultural VAT.

In any case, the 13 points of VAT rise itself would lead to a direct effective increase in the standard price lower than 1€ per ticket. Besides that, cinema

consumption is complementary to other leisure activities, such as the purchase of popcorn, refreshments, having dinner or the cost of transport. Therefore, the ticket price is only one component of the implicit cost of *going to the cinema*. All expenses considered, the total effect of the tax change on the price of the whole activity would be even lower. Indeed, as we can see in Table 1, the average price of cinema tickets has been steadily falling since 2010, so individuals managed to pay, on average, less than before the VAT rise.

Table 1. Average cinema attendance and prices

Year	Spectators	Price
2010	101.06	6.95 €
2011	98.20	6.70 €
2012	93.35	6.59 €
2013	76.77	6.44 €
2014	88.15	5.87 €
2015	95.04	5.99 €

Note: spectators in millions. The real price paid has been calculated as the ratio between the total amount of box office and the number of spectators.
Source: *Boletín informativo sobre Cine, Recaudación y Taquilla, Ministerio de Educación y Cultura, Gobierno de España*.

This reduction in average prices paid is only explainable through the number of customers who benefited from price reductions. In the years following 2012, exhibitors and distributors implemented a wide range of price discrimination policies to cope with the new taxes and the successive drop in attendance.[1] These measures resulted in a noteworthy increase in the choice set, so that individuals could adjust their demand, in a context where prices are characterized by having higher standard deviation than before. In order to

[1] In fact, the initial impact of the Cultural VAT increase was in terms of participation. Although attendance had parsimoniously fallen since 2010, it suffered a sharp decrease between 2012 and 2013, that was mostly recovered by 2015.

evade the new regular price (higher due to the increase in the VAT), cinema consumers had to engage in a *time-consuming* search of discounts. For instance, subscription fees, group packages, reductions during weekdays, the "spectator day", "cinema festivals" or cheaper time slots became more frequent. However, much of these discounts cannot be applied automatically once at the box-office. They often require planning in advance, for instance, purchasing, downloading and printing a coupon from the Internet, and others are accessible only by doing a registration in some platform.

Table 2. Cinema participation, fee type and price declarations

			Ticket's purchase (1)	Price problem (2)
2010-11	Attendant	Free	0.6%	35.6%
		Discount	5.7%	47.0%
		Full price	41.2%	39.4%
	Non-attendant	-	52.5%	15.9%
	All sample	-	100.0%	27.5%
2014-15	Attendant	Free	0.7%	65.0%
		Discount	14.0%	75.1%
		Full price	39.1%	68.0%
	Non-attendant	-	46.3%	41.0%
	All sample	-	100.0%	56.5%

Note: 'Ticket's purchase' refers to whether or not the individual benefited from a discount when purchasing the cinema ticket. 'Price problem' refers to whether or not the individual declares price as the main reason for not attending more.
Source: Survey of Cultural Habits and Practices (SCHP) in Spain, periods 2010-2011 and 2014-2015.

Comparing years 2010-11 and 2014-15, Table 2 displays cinema participation and, for cinema-goers, whether they benefited from a discount (column 1). It also shows, for all, the proportion of people who declared price as the main reason for not attending more often to the cinema (column 2). While, in the first period, 27.5 percent of the respondents pointed to price as the main participation problem, in the second one it reached 56.5 percent. Additionally, the proportion of individuals who benefited from discounts in 2014-15 was more

than twice that of 2010-11. This increase responds, on the one hand, to a growth in participation and, on the other hand, to a deviation from attendants who paid the full price in 2010-11 but, afterwards, benefited from some price reduction. Similarly to the effect found by Roos and McKenzie (2014), there was a redistribution of demand reducing weekend cinema attendance due to price promotions.

Despite the popularization of discounts, in the second-period price awareness as the main attendance limit more than doubled for the full sample. What is more, this increase was particularly important for those enjoying discounts. But regardless of the negative impact on price statements, average cinema demand remained almost stable. Particularly, declared average attendance, for the whole sample, was 1.10 times each 3 months in 2010-11, 1.09 in 2014-15. Accordingly, when comparing registered data on cinema attendance, in Table 1 we can see that the number of spectators pretty much recovered from 2013 to 2015.

All in all, the increase in regular ticket prices combined with the spread of price reductions led cinema fans to devote their time and effort in the search of discounts that fitted better in their preferences. Nevertheless, this *hunt for bargains* entails being excessively conscious of the high regular ticket prices, which could have been one driver of the concern about them, even in a context where, on average, they actually fell.

4. MATERIAL AND METHODS

4.1 Data base

The database chosen is the Survey of Cultural Habits and Practices (SCHP) conducted by the Education and Culture Ministry of Spain, which covers the most relevant areas of cultural consumption, such as cinema, concerts, theatre or museums. We use two successive waves from periods 2010-2011 and 2014-2015. During both periods, in each trimester of the 2 years, a random population sample was interviewed, which resulted in a total of 14,486 and

15,154 respondents, respectively. The final sample is representative of the Spanish population in terms of education level, employment status, family responsibilities and region of residence. This database is the most suitable for our purpose as it includes information regarding participation and intensity of cinema consumption.

Individuals were asked how many times they had attended the cinema within the last three months, as well as which was the main reason why they had not attended more frequently. From the choice set, individuals could select prices[2]. Choosing this category might be motivated by different reasons. It is true that referring to high prices may sound more convincing to the interviewees, or that other categories sound even less plausible to them. Nevertheless, as mentioned before, the proportion of people declaring prices more than doubled between waves, at the expense of lack of time and interest alternatives. Given that the declared interest on cinema and labor and family responsibilities barely changed between 2010 and 2015, pointing price as the main reason for not attending cinema more frequently is not just a question of mere plausibility. Accordingly, we understand that declaring price is an appropriate proxy for individuals' judgment about cinema ticket prices. An inflated price perception is the most likely reason to explain the large change in declaring prices.

Table 3 presents the summary of descriptive statistics of the two samples. It can be observed that the main socioeconomic characteristics remained almost the same. It is noteworthy that there is a slight decrease in the average age and that individuals in the second sample have a higher educational level.

[2] All possible answers are: (1) price, (2) it is difficult to get tickets, (3) scarcity of supply, (4) little information, (5) preference for television, (6) video or the internet, (7) difficult to understand, (8) lack of time, (9) lack of interest, (10) lack of company.

Table 3. Descriptive statistics

Variables	2010-2011 (1)	2014-2015 (2)
Male	0.48	0.49
	(0.500)	(0.500)
Age	52.22	49.14
	(19.102)	(18.827)
Primary education or less	0.25	0.18
	(0.432)	(0.388)
Secondary education	0.45	0.47
	(0.497)	(0.499)
Vocational training	0.14	0.15
	(0.342)	(0.356)
University	0.17	0.19
	(0.376)	(0.395)
Employed	0.45	0.45
	(0.498)	(0.497)
Unemployed	0.13	0.14
	(0.331)	(0.350)
Retired	0.20	0.21
	(0.399)	(0.406)
Disabled	0.01	0.01
	(0.078)	(0.093)
Student	0.09	0.09
	(0.292)	(0.290)
Housework	0.12	0.09
	(0.322)	(0.288)
Other employment status	0.01	0.01
	(0.091)	(0.091)
# Family members	3.12	3.06
	(1.340)	(1.354)
Living with parents	0.21	0.19
	(0.406)	(0.394)
No children on charge	0.47	0.48
	(0.499)	(0.499)
# Children 10-14	0.34	0.35
	(0.713)	(0.729)
# Children < 10	0.24	0.25
	(0.592)	(0.607)

Note: standard deviation in parentheses

4.2 Methods

To perform our empirical analysis, we estimate a model divided into two stages. In the first stage, two probit models are estimated in order to analyze the probability of declaring price as the main constraint for cinema participation, for the two SCHP waves. In the second stage, a zero inflated negative binomial model (ZINB) is estimated to analyze cinema attendance, pooling both samples, and controlling for the changes in price perceptions forecasted in the first stage. The analysis is implemented as follows.

4.2.1 First stage: analyzing differences in price problems declarations

To analyze the differences between the probability of declaring price as the main reason for not attending more frequently to the cinema between 2010-11 and 2014-15, we estimate two probit models, as follows:

$$Pr(\,Price\ Declaration_t) = f(Csoc_t, Clab_t, Cedu_t, Cgeo_t, i_{cine_t}, price_{theatre_t}, price_{popm_t}, price_{clasm_t})$$

Where t represents both samples and our dependent variable, $Pr(\,Price\ Perception_t)$, takes value 1 if the individual declared price as the main reason why he did not attend to the cinema more often in period t, and 0 otherwise. The underlying assumption is that this variable captures people's opinion on cinema prices. It is assumed to depend on the following independent variables.

First, $Csoc$ includes gender, age and its square allowing us to account for its possible non-linear effect. Concerning household features, we consider the number of members who live at home (*Number of family members*), whether the individuals are still living with their family (*Living with parents*), individuals not in charge of children (*Without children on charge*), individuals in charge of children between 10 and 14 (*# Children 10-14*) and individuals in charge of children under 10 (*# Children <10*), *other family situations* as reference category. $Clab$ includes dummies for labor status: *Employed*, *Unemployed*, *Retired*, *Disabled*, *Student*, *Housework* and other situations as the reference category. $Cedu$, comprises dummy variables regarding education levels including *Secondary education*, *Vocational training*, *University* being *Primary education or lower* the reference category. $Cgeo$ stands for geographical control variables, including a set regional dummies and a group of city size controls.

In order to enhance the predictive capacity of the model, we take advantage of price perceptions regarding other cultural activities. Thus, we include $price_{theatre}$, $price_{popm}$, and $price_{clasm}$, that capture price as the main reason for not attending more often theatre, popular music and classic music concerts,

respectively. Lastly, i_{cine} is the individual's self-declared interest on cinema, in a scale from 10 (great interest) to 0 (not interested at all).

After the estimation of the probit models, we get predictions of the probability of declaring price as the main problem for each wave. By evaluating 2010-11 and 2014-15 predictions, we can compare changes in price *readings* between the pre and post scenarios. This allows us to identify the effects that the VAT increase, the implementation of price promotion policies and other possible events that took place between the two surveys, had upon consumers' subjective judgment of the price as the main problem for cinema attendance.

4.2.2 Second stage: analyzing differences in cinema attendance

In the second stage, we study the effects that changes in price assessments, measured as the difference between predictions obtained in the first stage, might have had on cinema participation. In order to do so, we estimate a demand model pooling both SCHP samples.

As it is common in cultural participation, the data is characterized by over-dispersion and excess of zeros (around 50 percent of the sample declared not having assisted to the cinema in the last term) due to the unobserved heterogeneity of individuals' preferences. Following Ateca-Amestoy and Prieto-Rodríguez (2013) and bearing in mind the suitability of the estimation method with respect to the behavioral assumptions of cultural participation, we use a zero-inflated negative binomial model (ZINB). Furthermore, we use likelihood ratio tests (LR tests for nested models) and Bayesian information criteria (Akaike and BIC statistics for non-nested models) to assess the appropriateness of our specification.

In ZINB models, an individual first makes the binary decision of whether to participate or not and then, after deciding to participate, optimally determines the intensity of participation, in other words, the number of attendances. This implies that zero observations could belong to two different subpopulations: potential consumers, i.e. those who did not attend but could have attended

under other circumstances and never goers, i.e. those who did not attend, and would not do so in any case. Consequently, this model contemplates the fact that variation in price perceptions may affect differently effective and potential consumers, in contrast to never-goers. For example, alterations in taxes and price promotions might lead effective and potential consumers, to adjust their intensity of consumption, while never-goers might vary their probability to stay as non-attendants or to start participating.

Therefore, this model allows us to separate two different data-generating processes. One determines the probability of attending a positive number of times whereas the other describes the probability of being a never-goer, taking into account that some zeros have a non-zero probability of being attendants. Belonging to either group is determined by a latent binary process and the behavior of the zeros and of the positive counts is ruled by a negative binomial process. The first process, the zero inflation regression, estimates the effect that each covariate has on the probability of being a never-goer, i.e. it explains the decision of whether or not to participate. The second process, the count regression, estimates the effect of each explanatory variable on the probability of showing a positive number of attendances, in other words, it explains the intensity of participation.

Following the standard specification in the literature, individuals' socioeconomic characteristics are the main determinants of cultural participation in general (Fernandez-Blanco et al., 2009; Falk and Katz-Gerro, 2016; Willekens and Lievens, 2016; Ateca-Amestoy and Prieto-Rodríguez, 2013) and, specifically, of cinema attendance (Fernandez-Blanco and Baños, 1997; Sisto and Zanola, 2010).[3] Consequently, we specify a model where the dependent variable is the number of times the individual went to the cinema in the last term, *Cinema Attendances*, which depends on the following:

$$\text{Cinema Attendances} = \text{f}\left(\text{C}_{\text{SOC}}, \text{C}_{\text{EDU}}, \text{C}_{\text{LAB}}, \text{C}_{\text{GEO}}, \text{Cult. equip.}, \text{Read. int.}, \text{F. P. valuation}_{2011}, \text{P. valuation}_{\text{CHANGE}}\right)$$

[3] Films' characteristics and releasing conditions are also relevant to explain movie demand (Gutierrez-Navratil et al., 2014) but we are concerned about the determinants of the cinema demand, as a whole, and not about a particular film.

where $C_{SOC}, C_{EDU}, C_{LAB}$ and C_{GEO} are socioeconomic features, educational level, labor status, and geographical controls, respectively. All of them are defined as in the first stage. Consumption of cultural goods is usually positively related to income (Prieto-Rodriguez et al., 2005) but, unfortunately, we lack household or individual earnings. To overcome this absence and following Fernandez-Blanco and Prieto-Rodriguez (2009) two independent Principal Component Analysis (PCA) were conducted in order to proxy cultural equipment ($Cult.Equip.$). We consider that the quantity of cultural equipment is highly correlated with household income and also with the propensity to spend such earnings on cultural activities. So, we conducted a first PCA with variables such as TV, DVDs, number of music albums, video player, camera, or video camera and another for informatics equipment, such as computer, tablet or access to the internet, in order to complement physical cultural capital. Moreover, a third PCA was carried out gathering variables related with reading habits ($Read.int.$), given that preferences for reading are strongly related with cultural interests in general (Fernandez-Blanco et al., 2017).

Since we are interested in the role of price perceptions and how they did change from 2010-11 to 2014-15, we have included forecasted variables concerning price perceptions derived from the first stage. On the one hand, using the coefficients obtained from the estimation of the probit model with data from the 2010-11 sample, we forecast for both samples the probability of declaring prices as the main reason of non-attendance, $F.P.valuation_{\ 2011}$, forecasted price valuation for 2011. This variable measures price perceptions if the scenario of 2010-11 (before VAT rise, the mass media campaign and other price policies) had remained stable, capturing individuals' baseline propensity to declare price as the main reason why not to attend to the cinema more regularly. On the other hand, we calculate another variable, $P.valuation_{\ CHANGE}$, price valuation change. For individuals in the 2014-15 sample, this variable is defined as the difference between the predictions coming from both probits (2014-15 minus 2010-11 predictions), being 0 for individuals in the 2010-11 sample. Thus, this variable allows us to proxy the differential effect of the VAT rise, the mass media campaign as well as of any

other change that affected cinema prices and their perceptions. In other words, it captures the differences between the 2010-11 and 2014-15 scenarios.

5. RESULTS

Since we cannot really observe cognitive biases regarding prices, we have to rely on the self-declared relevance of prices as a limit for cinema attendance. Comparing both periods, average prices show a little decrease. Therefore, we would expect a small decrease or, at least, a similar proportion of individuals declaring that prices are their main reason for lower attendance. However, as discussed above, the number of people surveyed in the 2014-15 wave who declare prices as the main problem more than doubled (see Table 2). The main objective of this section is to analyze the strong rise in the declaration of prices and which socioeconomic characteristics define people with larger variation. Hence, these people show a stronger signal of being affected by other effects apart from average ticket prices when declaring their key limit for cinema attendance.

Before proceeding with this analysis, we have to be sure that the differences in the replies between the two waves of the survey are not due to distinct features of the people surveyed in each sample of the SCHP. To test if those differences exist beyond the characteristics of the two samples, we calculate the nearest neighbor matching estimator (Abadie and Imbens, 2002). This estimator allows comparing price perceptions in both samples by matching individuals who are as similar as possible considering their sociodemographic characteristics. Thus, any significant variation in price perceptions could not be attributed to the sampling of both waves. We define the matching estimator requesting an exact match for gender, educational level, being employed, unemployed or retired. Matching over age, household members, cinema interest, price declaration propensity, civil status, disabled, housework and regional issues, was done using the nearest neighbor matching. Using this matching estimator, we find that, once we have controlled for the characteristics of the respondents, the likelihood of declaring price as the main reason for not attending more

frequently to the cinema is 22.5 points higher in 2014-15 than in 2010-11, with a standard deviation of 0.6. Thus, most of the observable differences in price perceptions between the two periods are attributable to changes in contextual factors but not to sampling.

5.1 Changes in price declarations over time

Given that the average price of cinema tickets was even lower in the second wave of the SCHP, any increase in the average declaration of price as the main attendance restriction would point to the existence of external factors influencing evaluations of prices apart from the real average price. Consequently, in order to analyze differences in price assessments, we estimate two probit models for both periods 2010-11 and 2014-15. Results are displayed in Table 4.

The main results comparing the coefficients of both probits can be summarized as follows. First, while, as in Del Missier et al. (2016), there is no gender effect in 2010-11, in 2014-15 men are more likely to declare price as the main constraint for cinema participation. Second, in 2010-11 the effect of age is negative and linear, whereas in 2014-15 it is quadratic. Third, in line with Oechssler et al. (2009, in both periods, it is less likely that highly educated individuals declare price constraints since they tend to present lower biases. Also, they usually have higher incomes, being other restrictions more relevant.[4] Fourth, as expected, unemployed individuals are more prone to declare price in both periods. Additionally, in 2014-15 students start declaring price too. We should bear in mind that students are a very common target for cinema price promotions. Since benefiting from promotions requires making the decision in advance (they are not applicable instantaneously), they are constantly aware of prices. This search activity can be considered a collateral unpleasant effect of promotions, thus it could be overestimated as pointed by Casey and Owen (2013).

[4] Also, as the price change is associated to a rise in the VAT, this result could be linked to individuals' moral tax, which in turn depends on education (Rodriguez-Justicia and Theilen, 2017).

Table 4. Probit estimations

	2010-2011 (1)	2014-2015 (2)
Man	-0.007	0.049**
	(0.026)	(0.025)
Age	-0.019***	0.004
	(0.005)	(0.005)
Sq Age	-0.004	-0.026***
	(0.005)	(0.005)
Secondary education	0.071*	0.048
	(0.037)	(0.035)
Vocational training	0.045	0.123***
	(0.048)	(0.045)
University	-0.133***	-0.082*
	(0.049)	(0.043)
Employed	-0.0628	0.084
	(0.135)	(0.129)
Unemployed	0.256*	0.428***
	(0.137)	(0.131)
Retired	0.108	0.096
	(0.142)	(0.133)
Disabled	0.116	-0.227
	(0.210)	(0.177)
Student	0.037	0.376***
	(0.142)	(0.138)
Housework	-0.018	0.141
	(0.141)	(0.134)
# Family members	0.008	-0.026**
	(0.011)	(0.011)
No children on charge	-0.011	0.007
	(0.034)	(0.032)
# Children 10-14	0.111***	0.072**
	(0.037)	(0.036)
# Children <10	-0.267***	-0.170***
	(0.041)	(0.039)
Interest in Cinema	0.047***	0.054***
	(0.005)	(0.005)
Price sensitivity	0.227***	0.253***
	(0.008)	(0.006)
PCA Cultural equipment	-0.002	-0.011
	(0.024)	(0.022)
Sq PCA Cultural equipment	-0.006	0.006
	(0.006)	(0.005)
PCA Physical cultural capital	0.009	-0.009
	(0.020)	(0.017)
Sq PCA Physical cultural capital	-0.025	0.006
	(0.017)	(0.015)
PCA Interest in reading	0.027	0.010
	(0.018)	(0.015)
Sq PCA Interest in reading	0.002	-0.005
	(0.006)	(0.005)
Constant	-0.493**	-0.455**
	(0.210)	(0.180)
Regional Dummies	YES	YES
N	14486	15154
LR (41)	3030.00	5089.27
AIC	14083.46	15748.94
BIC	14401.86	16069.24

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Fifth, the larger the family the lower the propensity to declare price barriers, although household size is only significant in the second period. Sixth, given that living with children generates cinema demand, it is interesting to distinguish households with children under 10 and between 10 and 14 years old. For the first group, it is probable that the main restriction has to do with time availability rather than prices, while for those with children between 10 and 14, as time restrictions become less relevant, prices start to play a more important role. Seventh, both *interest in cinema* and *price sensitivity*, present a positive effect that is larger in 2014-15. Finally, none of the PCA shows a significant coefficient, either separately or together. This result is coherent as individuals' perceptions do not depend on physical capital.

It would be interesting to assess the extent to which the changes between the two periods affected groups of individuals differently. To do so, we forecast, for all individuals in both samples separately, their probabilities of reporting price as the main reason for non-attendance. In Table 5, we display the average increase in the predictions from 2014-15 to 2010-11, conditional on belonging to each group.

Table 5. Predicted change in the self-declared price constraint

Educ level	Woman	Man
Primary	12.7%	15.0%
Secondary	16.9%	18.6%
Vocational	21.0%	22.8%
University	20.3%	21.8%
Total	17.4%	19.2%

Age group	Woman	Man
Under 25	14.4%	16.8%
25-44	19.9%	22.2%
45-64	20.5%	21.8%
Over 64	10.9%	11.5%
Total	17.4%	19.2%

According to t-tests, differences among groups are statistically significant. Since all values are positive, regardless of gender, age or educational level, all groups show in 2014-15 a higher probability of stating price as the main restriction in comparison to what they would have declared in 2010-11.

Regarding gender, in 2014-15 the increase in the probability of declaring price as the prior restriction is higher for males than for females, suggesting that

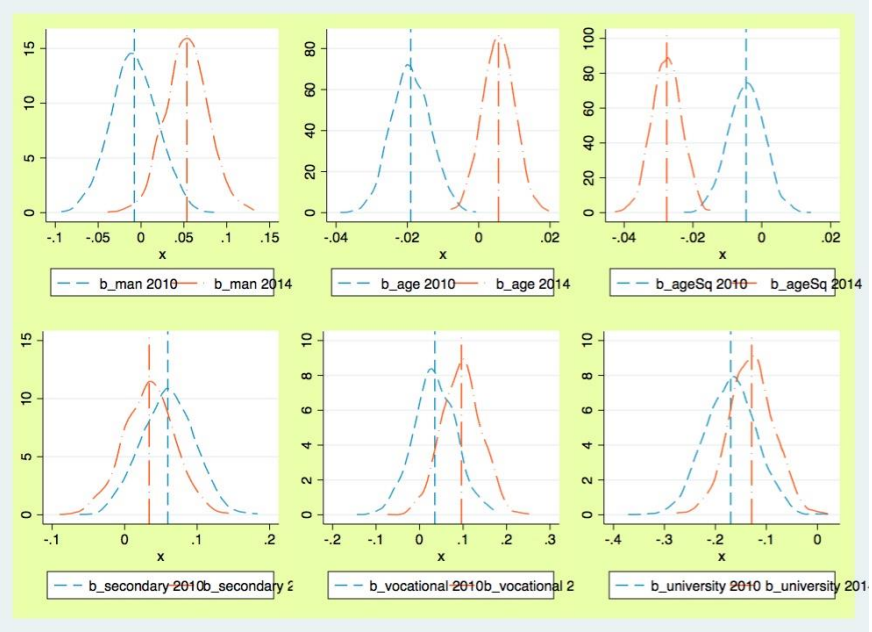
males are more influenced by external factors regarding prices. Education presents decreasing increments on the price perception change for both genders, with a decline at the upper level. One possible explanation comes from the role that mass media play on individuals depending on their education. On the one hand, low educated people have a higher demand for entertainment relative to that for information in the media and, consequently, were less exposed to mass media campaign on the VAT rise. On the other hand, more educated people, although more exposed to mass media, were able to disclose their messages and, thus, had a slightly lower increase in the price declaration (see, for instance, Oechssler et al. (2009) and Jackson et al., 2016)). In line with these results, age groups display an inverted U-shaped effect, since the youngest and the oldest present the lowest education. Furthermore, the lowest increase associated with people over 64 also responds to their low cinema demand.

We run a bootstrap analysis to assess whether a particular individual's characteristic, independently of others, is linked to changes in the reported probability of declaring prices as the main reason for not attending to the cinema more often. That is to say, if the observed changes in declarations fulfill the ceteris paribus condition.

In each trial of the bootstrapping procedure, a probit model for each period is estimated, bootstrapping the beta coefficients by resampling observations with replacement. This procedure was repeated 2,000 times. Graphs 1-4 display the densities of the estimated coefficients, both for 2010-11 and 2014-15 samples. If the distributions for a particular beta in both periods statistically differ this would imply that this characteristic alone can account for part of the total change in the price perceptions and, therefore, it can be associated to the existence of a cognitive bias.

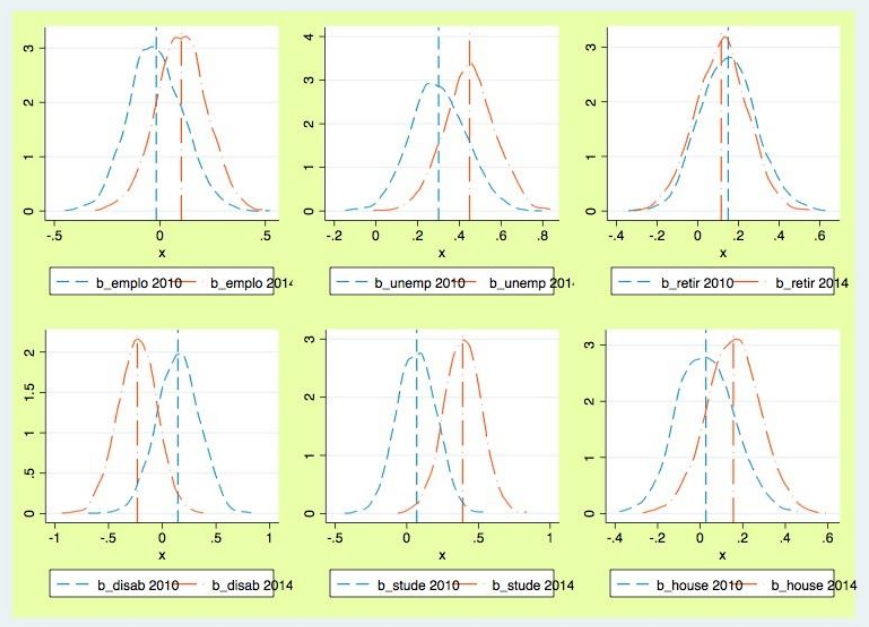
The results of this procedure can be interpreted graphically through the shift of the density function of each coefficient. Effectively, bootstrap analysis is consistent with our previous results.

Graph 1. Density of betas for gender, age, educative level



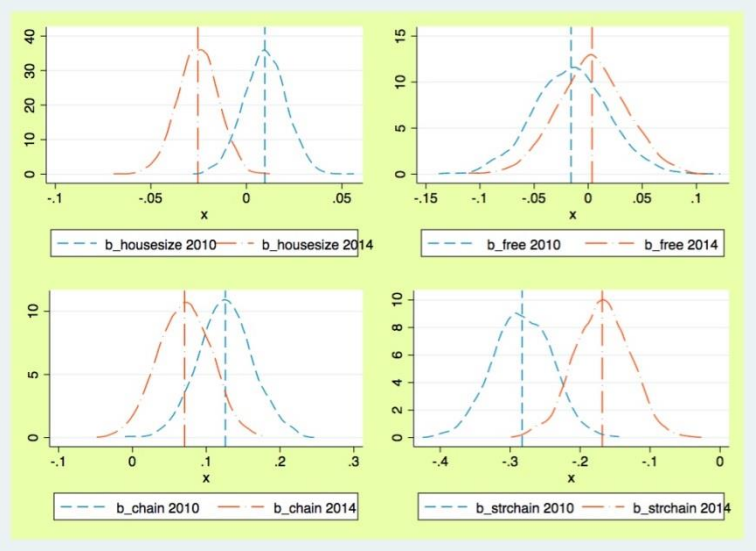
According to Graph 1, being a male and more educated are associated with larger changes in the probability of declaring prices between the two surveys, ceteris paribus the remaining individual characteristics. The effect of age is captured by including two coefficients in the probit model. The joint effect of these coefficients shows that older people were less affected by external information.

Graph 2. Density of betas for employment status



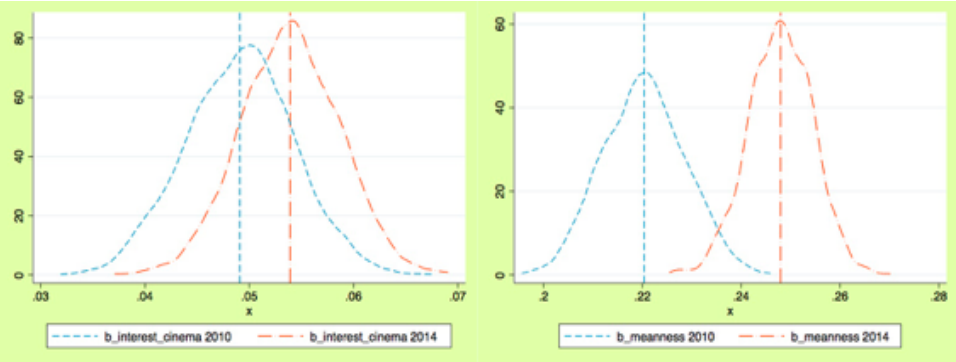
Moving to employment status, Graph 2 shows that active people, including students and housewives/househusbands, become more prone to price-declaration in 2014-15. This effect is particularly large for students and unemployed. On the other hand, no significant change is found for retired people, while the disabled reduce their probability of declaring prices as a problem.

Graph 3. Density of betas for household features



With respect to household characteristics, in Graph 3 we can see that the larger the number of family members the lower the likelihood to price declaration in 2014-15 compared to 2010-11. This is consistent with the fact that for larger families, the relative price increase was lower than for other groups, since these families could still benefit from the previous family discounts as well as from new ones that appeared with the implementation of additional promotions. Individuals living at homes with children between 10 and 14 years old reduce their initially high likelihood to declare prices, whereas households with children younger than 10 show a higher propensity to declare price in 2014-15, even though they are still not prone to this statement. Thus, regardless the age of the children at home, the gap in the probability to declare prices is smaller after the tax rise.

Graph 4. Density of betas for cinema interest and propensity to price declaration.



Graph 4 shows that even for individuals interested in cinema, the probability to see the price as the principal limit for attendance increased. As expected, this is also true for those more sensitive to prices in other cultural activities, such as theatre or popular music concerts.

5.2 Cinema participation

Since cinema demand is price elastic (Dewenter and Westermann (2005), Roos and McKenzie (2014), Fernandez-Blanco et al. (2013)), if behavior were ruled by the declared price, we should have observed a fall in cinema demand. But this expected decline in cinema consumption never took place. In spite of the important increase in the general concern about prices, the effective cinema participation remained almost stable, as average declared cinema attendance was 1.10 times in period 2010-11 and 1.09 times in period 2014-15, also according to registered official data (Table 2). There are six reasons that may underlie this result: (1) the recovery from the first impact of the VAT rise, (2) the gap between explicit and implicit costs, (3) the effect of new price promotions, (4) the way of thinking before behaving, (5) the prices which concern people's behavior and (6) the composition effect of different types of participants. In what follows, we discuss these six points.

First, since individuals tend to be myopic, price changes often have a bigger impact on people's decisions in the short term that fades away in the long term.

Therefore, although perceptions may remain high, demand recovers over time. Second, as the VAT of complementary activities such as popcorn, soda, parking or transport remained almost stable, the effect of the tax rise in monetary terms was quite small on the whole activity, being the implicit cost almost the same. Third, the set of new promotions let people adapt their demand to the new trade-off between prices and time slots, resulting in an overall stable demand. Fourth, when making economic decisions, as they entail real consequences, reflective thinking gets involved (leaving intuitive thinking apart), thus leading individuals to behave more rationally. Fifth, as in Wichman (2014), people's behavior responds to average (real) prices, notwithstanding declarations in surveys. Sixth, new price discrimination policies affected the rate of attendance of some moviegoers as well as the likelihood of participating of others. Since demand remained constant, changes in the composition of attendants tended to cancel out.

In this context of stable average demand with average prices declining, the issue why price declarations increased still remains. For some people, the price could remain the real problem for cinema attendance. Their answers could be considered our reference level. However, for others, the presence of external factors in evaluating prices when answering surveys could be the reason behind the rise in price declarations. The distinction between these two groups might rely on the observed differences in price declarations between the two periods. It is important to point out that our model specification might help to discriminate between both groups.

In order to distinguish this differential effect, we employ a ZINB model. On the one hand, the count equation explains the probability of higher counts among attendees. On the other hand, the inflation equation determines the probability of an individual being a never-goer. The two equations cannot be specified separately, as the high significance of the alpha coefficient indicates.

To identify the effect of price perceptions on cinema demand, we estimate two different specifications of the ZINB model. In Model A, we explain cinema participation without considering price perceptions, being this our baseline model. In Model B, we add price perceptions and their changes: *Price*

Declaration $_{2011}$ is defined, for the whole sample, as the predictions of the 2010-11 probit and *Price Declaration Change* is measured, just for individuals surveyed in 2014-15, as the difference between the predictions from the probits estimated for both periods, and 0 otherwise. As Model A is nested by Model B, if the effect of these two variables is significant, Model B will be considered as our reference. In fact, using the AIC and BIC information criteria, Model B is statistically preferred. Results are reported in Table 6.

Columns (1) and (3) display the count equation coefficients, i.e. the equation determining the probability of attending a positive number of times, whereas columns (2) and (4) show inflation equation coefficients, i.e. the equation determining the probability being a non-goer. Positive coefficients in the inflation equation indicate a higher probability of belonging to the certain zero attendance group.

According to results in columns (3) and (4), coefficients on *Price Declaration* $_{2011}$ imply that the more aware individuals are about the importance of prices as a restriction to attending cinema, the higher the likelihood to be a cinema goer. First, due to the significant negative coefficient on the inflation equation in column (4), it is less likely that these individuals do not attend at all. Second, as the positive and statistically significant coefficient in column (3) shows, if they decide to attend, they will do it more regularly than those who bear in mind other restrictions on attendance. Therefore, certain non-goers and low demand individuals are characterized by a higher probability of having other reasons than price as the limit for participating.

Table 6. ZINB estimations

	Model A		Model B	
	Count	Inflation	Count	Inflation
	(1)	(2)	(3)	(4)
Year 2014	-0.165***	-0.451***	-0.301***	0.423***
	(0.030)	(0.064)	(0.062)	(0.124)
Man	-0.010	0.025	0.011	-0.034
	(0.026)	(0.062)	(0.026)	(0.064)
Age	-0.024***	0.045***	-0.026***	0.037**
	(0.007)	(0.015)	(0.007)	(0.015)
Sq Age	0.029***	0.022*	0.034***	0.010
	(0.008)	(0.012)	(0.008)	(0.013)
Secondary education	0.209***	-0.700***	0.188***	-0.641***
	(0.058)	(0.084)	(0.058)	(0.086)
Vocational training	0.215***	-1.264***	0.189***	-1.138***
	(0.066)	(0.113)	(0.066)	(0.115)
University	0.370***	-2.036***	0.389***	-2.043***
	(0.063)	(0.111)	(0.064)	(0.114)
Employed	0.243*	0.066	0.290**	0.228
	(0.137)	(0.439)	(0.140)	(0.482)
Unemployed	0.119	0.581	0.075	1.122**
	(0.141)	(0.443)	(0.144)	(0.489)
Retired	0.234	0.361	0.267*	0.555
	(0.152)	(0.442)	(0.154)	(0.486)
Disabled	0.188	1.279**	0.245	1.178*
	(0.282)	(0.555)	(0.287)	(0.615)
Student	0.111	-3.234*	0.112	-1.925**
	(0.142)	(1.813)	(0.145)	(0.917)
Housework	0.015	0.431	0.064	0.643
	(0.154)	(0.444)	(0.156)	(0.487)
# Family members	-0.029**	0.119***	-0.025**	0.118***
	(0.013)	(0.028)	(0.013)	(0.029)
Living with parents	0.345***	-0.053	0.320***	-0.146
	(0.063)	(0.155)	(0.062)	(0.159)
No children on charge	0.114**	0.196**	0.104**	0.170**
	(0.047)	(0.085)	(0.046)	(0.086)
# Children 10-14	0.027	-0.169*	0.008	-0.144
	(0.046)	(0.096)	(0.047)	(0.096)
# Children <10	-0.209***	0.083	-0.155***	-0.046
	(0.048)	(0.110)	(0.049)	(0.109)
PCA Cultural equipment	0.018	-0.191***	0.015	-0.232***
	(0.021)	(0.052)	(0.021)	(0.054)
Sq PCA Cultural equipment	0.002	0.007	0.003	0.015***
	(0.002)	(0.006)	(0.002)	(0.006)
PCA Physical cultural capital	0.034*	-0.072*	0.031*	-0.114***
	(0.019)	(0.041)	(0.019)	(0.043)
Sq PCA Physical cultural capital	0.031**	-0.010	0.031**	-0.012
	(0.016)	(0.038)	(0.016)	(0.039)
PCA Interest in reading	0.033**	-0.228***	0.026	-0.200***
	(0.017)	(0.039)	(0.017)	(0.039)
Sq PCA Interest in reading	0.002	0.026*	0.004	0.023***
	(0.004)	(0.015)	(0.003)	(0.009)
Price Perception 2010			0.531***	-2.577***
			(0.097)	(0.282)
Price Perception Change			0.306	-3.844***
			(0.271)	(0.597)
Constant	0.496**	-1.866***	0.332	-1.023
	(0.224)	(0.658)	(0.230)	(0.681)
Regional Dummies	YES		YES	
Observations	29640		29640	
Alpha	1.1945		1.1757	
	(0.038)		(0.037)	
Wald	chi2 (44) 517.24		chi2 (46) 546.62	
AIC	71740.72		71313.59	
BIC	72495.74		72101.8	

One possible interpretation for these results is that movie aficionados may be aware of the standard ticket prices and consider them as the main restriction to attend more often. For this public, it is likely that time or interest constraints are not so relevant since they already have a high demand. Another possibility, as pointed by Christandl et al. (2011) and Armantier et al. (2015), is that movie fans already knew about the VAT rise and interpret price changes according to their expectations (i.e. confirmation bias as defined by Nickerson, 1998). As never-goers do not have price knowledge based on their own experience of real prices, if they declared prices as the limit, they would probably be influenced by other channels, such as mass media (Del Missier et al., 2016), or others' judgments (Gärling and Gamble, 2006).[5] This could imply that the formation of price opinions would be completely different for these two groups. In line with Bruine de Bruin et al. (2011), high demand consumers who tend to be well informed, are also more likely to be affected by the recency effect. For those non-goers declaring prices, declarations would be probably based on "hearsay" evidence and, thus, on information from publicly observable statements of other people (Meub and Proeger, 2015). In this line, as it was generally believed that prices were too high, the illusory truth effect could explain why some respondents declared that prices were the problem even when they were not. When amplified by mass media, they could also be subject to the bandwagon effect of declaring the same as others did. Additionally, since the change came from a fiscal revision, people could declare prices as a protest response (Meyerhoff and Liebe, 2010), as people dislike more paying taxes than any other equivalent cost (Sussman and Olivola, 2011). However, as people declaring prices tend to be goers, it seems more likely that they are subject to the recency effect and affected by research costs.

The estimated effect of the change on price declarations, which we assume is linked mainly to the VAT rise, the mass media campaign against it and the later price promotions, is consistent with these results. The negative and significant coefficient in the inflation equation, in column (4), indicates that increases in price declarations led to a drop in the probability of never attending cinema.

[5] These effects are especially relevant in the case of cinema since its demand is influenced by the word of mouth effect (Liu (2006) and Moul (2007)), opinions in informal social networks (Yamamura, 2016), as well as reviewer's scores (Basuroy et al. (2003) and Wallentin (2016)).

This estimated effect suggests, again, that effects alike those regarding serial position (recency effect) might underlie most of the price declaration changes.

The remaining considered variables are basically included as controls to ensure that the effects of price perceptions are consistently estimated. In general, these controls present the expected results. Starting with sociodemographic features, age has a negative effect since older individuals are more likely to be non-goers. Moreover, the older people are the lower their frequency of participation. Although cultural participation in highbrow activities is typically higher for women (Ateca-Amestoy, 2008), no significant gender effects are found in our case for cinema. Concerning educational level, in line with Ateca-Amestoy and Prieto-Rodriguez (2013), the higher the qualification the greater the likelihood to be a cinema spectator and the greater the degree of participation. With respect to labor status, as in Falk and Katz-Gerro (2016), unemployed and disabled individuals show a higher probability of being non-attendants. On the contrary, students have more chances to participate. Both employed and retired individuals have a higher rate of cinema attendance. Regarding household features, larger families have a higher probability of belonging to the certain zero group, and also attend less frequently. Individuals living with their parents display a higher level of attendance, in contrast to individuals with children under 10, who attend less regularly. Those individuals without children at home are less likely to be cinema spectators but, if they are, they attend more often. As pointed out by Fernandez-Blanco et al. (2017), reading is positively related to the likelihood of going to the cinema, although in a decreasing way. Concerning cultural equipment and physical cultural capital, in line with Sisto and Zanola (2010), both are negatively related to the probability of being a never-goer. Accordingly, physical cultural capital affects cinema participation positively.

6. CONCLUSIONS

According to the Economic Theory, prices are the main information tool for individuals in making economic decisions. However, individuals could be unable

to evaluate prices accurately as their price judgments are subject to some *noise*. Distortions might come from simply white noise, not affecting means, or from systematic errors, leading to biased price perceptions. Due to the influence of these price *misperceptions*, individuals may fail in making what we could define *fully rational* economic decisions.

We take advantage of a normative change that took place between the last two waves of the SCHP in Spain. In 2012, the VAT for cultural products changed, increasing cinema ticket prices. This policy generated, first, a negative mass media campaign that amplified public awareness and raised discontent among cultural agents. Second, following the tax rise, several adjustments in prices were implemented by cinema exhibitors and distributors through new discount policies. This price discrimination more than compensated the initial price increase, resulting in a slight decline in average ticket prices. Finally, despite the final slight decline in average prices, there were disproportionate declarations of prices as the main reason why not to attend cinema in the 2014-15 wave of the survey more frequently. This apparent inconsistency could be a signal of systematic factors affecting price declarations in surveys. Therefore, we might expect biases in individuals' behavior regarding cinema demand due to these declarations. However, what we actually find is that the observed demand fits the neoclassical economic model at least at its mean.

Specifically, in our case, we should take into account that tax rises tend to be very unpopular and associated price increases are perceived to be larger than they actually are (Blaufusand and Möhlmann, 2014). Moreover, when evaluating prices, consumers are typically exposed to mass media and their perceptions might deviate towards the general belief of others surrounding them. The consequent high social consciousness of expensiveness in cinema ticket prices could generate effects similar to the *bandwagon effect*. Also, it is likely that people declare prices just because they recall more easily the last ideas heard, thought or discussed with others. Given that high prices are of general concern, probably the last thing people had in mind could be related to excessive pricing, leading to a *recency effect*. Both effects would tend to increase the proportion of people declaring prices as the main restriction for

cinema attendance. An alternative explanation could be that standard cinema tickets (excluding discounts) were not affordable to many people. Although individuals might benefit from promotions, being eligible could be time-consuming and it often implies attending at the least appealing sessions. Therefore, when answering surveys, individuals are taking standard prices (instead of average prices) as their reference. Consequently, they might declare that high prices were the main limit for participating, even when average prices slightly decreased.

Additionally, it is important to note that our analysis is based on responses to a survey. Several systematic deviations from truth may arise as in any circumstance where instant responses are required. Immediate actions are often driven by intuitive thinking, providing the perfect conditions for the use of heuristics. These heuristics, in turn, lead to cognitive biases, *affect* or *availability* heuristics, word of mouth, protest responses or the *illusory truth* effect. That might explain why prices as the declared main limit to attend cinema more than doubled after the change of the cultural VAT. However, when individuals make the decision of going to the cinema, reflective thinking gets involved. The slower and deliberative thinking leaves less room for the use of heuristics and, consequently, economic behavior is less subject to the effect of other factors than real average prices. The minor drop in the average cinema prices and the observed recovery in cinema demand are consistent with this way of reasoning.

Hence, our main conclusion is that individuals' price declarations could be influenced by several external factors. Firstly, mass media or others' judgments, especially when price changes come from tax rises, could imply effects similar to the *bandwagon effect* and the *illusory truth effect*. Secondly, it is possible that people stress the importance of prices just because their last idea about them was related to expensiveness. This could be especially true for buyers and it would lead to effects like the *recency effect*. Thirdly, as we use an opinion survey, answers could be affected by the characteristics of instant responses, driven by intuitive thinking. For example, they could be influenced by the *affect* or *availability* heuristics. Fourthly, as people dislike paying taxes, survey's answers could also be in some sense *protest responses.* However, decision

making, that is to say, deciding whether or not to go to the cinema, involves reflective thinking. This mode of thinking is less subject to the use of heuristic shortcuts and less affected by external factors. As a result, our observations of individuals' cinema consumption fit better into what we would consider rational behavior.

Overall, when using information from surveys, we should be aware that answers regarding subjective beliefs and opinions can be subject to different biases, and therefore tend to be less reliable. On the contrary, we have found that responses to questions relative to behavior seem to be more consistent with the rationality assumption.

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