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# Unwillingness to Pay for Privacy: A Field Experiment

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## ABSTRACT

### Unwillingness to Pay for Privacy: A Field Experiment<sup>\*</sup>

We measure willingness to pay for privacy in a field experiment. Participants were given the choice to buy a maximum of one DVD from one of two online stores. One store consistently required more sensitive personal data than the other, but otherwise the stores were identical. In one treatment, DVDs were one Euro cheaper at the store requesting more personal information, and almost all buyers chose the cheaper store. Surprisingly, in the second treatment when prices were identical, participants bought from both shops equally often.

JEL Classification: C93, D12

Keywords: privacy, willingness to pay, field experiments

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## 1. Introduction

The economics of privacy is controversial. The Chicago School (Posner, 1981) argues that privacy protection harms efficiency. In contrast, it has been asserted that property rights over the private data of individuals lead to the efficient outcome (Shapiro and Varian, 1997). But this view is contested, too. First, privacy may lead to efficient equilibrium outcomes even if people do not appreciate it individually (Hermalin and Katz, 2006; Wathieu 2009). Second, many contracts involving personal data are incomplete or highly opaque, as they typically lack clear-cut information about secondary uses and sharing of personal information, thereby limiting consumers' ability to understand what their data are used for, even retrospectively. Up to now, economists have not systematically studied choices regarding privacy in such environments.

It has been observed that consumers express concerns regarding misuse of personal data yet continue to provide personal data on social networks and online shopping sites.<sup>1</sup> To understand this behavior, observations from a natural environment have the disadvantage that the (unobservable) cost of switching to another supplier affects choices. Relatedly, present-biased preferences have been put forward as an explanation of inconsistent privacy choices (Acquisti, 2004). In our experiment, we are able to control for both explanations as there are two competing online stores that differ with respect to the mandatory data collected, and buying at the more privacy-friendly store does not prolong shopping time nor does it affect delivery time.<sup>2</sup> Moreover, we do not draw attention to the issue of privacy as a whole (as in Tsai, 2007, where privacy ratings in search engines encourage consumers to choose more

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<sup>1</sup> See for example Acquisti and Grossklags (2005).

<sup>2</sup> In an experiment by Berendt et al. (2005) with a monopoly online store, present-biased preferences are a potential source of observed privacy choices.

privacy-friendly companies despite higher prices), but simply confront consumers with different data requirements at the two shops.

## **2. Experimental design**

Participants were given the opportunity to buy one DVD from one of two online stores, named “SilverDisc Frankfurt” and “SilverDisc Cologne”. SilverDisc is a multichannel retailer of DVDs selling through Amazon, its own online shop, and a local branch in Berlin. The two branches in Frankfurt and Cologne are fictitious, but were chosen (with consent from SilverDisc) to minimize any differences between the two stores. All personal data provided by participants were given to SilverDisc and to Amazon as part of the transaction to purchase the DVD; this was explained in the instructions. On the order form, participants ticked a box to confirm they agreed with the data protection regulations and general terms and conditions of SilverDisc and Amazon, which were available upon request from the experimenters.

A selection of DVDs was presented to the participants and listed on two order forms, one for “SilverDisc Frankfurt” and one for “SilverDisc Cologne”, that were presented side-by-side to minimize search costs.<sup>3</sup> Participants were also free to search via a desktop computer for other DVDs and print new order forms. Two treatments were conducted. In both treatments, the mandatory data items for the two online shops were kept constant. While last name, first name, postal and email address were mandatory for both shops, “SilverDisc Frankfurt” also required a date of birth and monthly income, whereas “SilverDisc Cologne” asked for the year of birth and favorite color as mandatory fields.<sup>4</sup> In treatment EQ, the prices at the two shops

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<sup>3</sup> Instructions and order forms are posted on <http://www.wzb.eu/mp/vam/publications/journals.de.htm>.

<sup>4</sup> Neither Amazon nor SilverDisc ask for income and favorite color. Thus, these data items had not been provided before by subjects who had already shopped at the online stores (75% with Amazon and 11% with SilverDisc).

were equal, whereas in treatment DIF all prices at “SilverDisc Frankfurt” were exactly one Euro less than the prices at “SilverDisc Cologne”. Thus, in DIF there was a trade-off between data requirements and prices as subjects found information on personal income more sensitive than on favorite color (see Section 3).

After subjects had made their purchase decision, they were asked to answer a post-experimental questionnaire. Apart from some general questions, we asked participants how willing they are in general to provide personal data such as income and favorite color as well as other items. And we asked those who made a purchase how satisfied they were with the chosen store regarding privacy and price.

All 225 participants in the experiment (students from the Technical University Berlin) received a show-up fee of 6 Euros which they received regardless of whether they made a purchase. In addition, all orders were subsidized by a discount of 7 Euros. The quoted price on the order form corresponded to the Amazon.de retail price plus the Amazon.de shipping costs (3 Euros) minus 1 Euro for “SilverDisc Frankfurt” in treatment DIF.

### **3. Results**

Of the 225 participants, 74 made a purchase.<sup>5</sup> Table 1 provides an overview of the results from both treatments DIF and EQ. In DIF, 39 of the 42 purchases were made at “SilverDisc Frankfurt” where prices were 1 Euro lower. Thus, participants predominantly chose the firm with the lower price and the more sensitive data requirement, indicating that they are willing to provide information about their monthly income and date of birth for a 1 Euro discount.

To establish a benchmark of privacy concerns in purchasing decisions, we conducted treatment EQ in which the two firms asked for the same price, but differed with respect to the

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<sup>5</sup> Less than 9% of the non-buyers mentioned privacy concerns or lack of trust as the main reason for not buying while the majority indicated the product or its price.

data items required for the transaction. In this treatment, approximately the same number of participants purchased a DVD at “SilverDisc Frankfurt” and “SilverDisc Cologne”. Thus, the more privacy friendly firm failed to attract more customers even though prices were equal at both stores.

The results of treatment EQ are surprising given the preferences over mandatory data items provided by subjects in the post-experimental questionnaire (Table 2). In treatment DIF, the fact that 32 out of 39 participants shopped with Frankfurt but reported a lower willingness to report income (required by the Frankfurt branch) than favorite color (required by the Cologne branch) can be rationalized with the price difference. However in EQ, 8 of the 15 customers of Frankfurt said they were less happy providing the data required by Frankfurt than by Cologne (with 6 being neutral and 1 preferring to provide the data asked for by Frankfurt).<sup>6</sup> In addition, we asked customers to rate their satisfaction with price and privacy policy of the chosen store (see Table 3). All Frankfurt buyers in EQ who responded to a question concerning satisfaction with the privacy practices of Frankfurt (13 of 15) were dissatisfied.<sup>7</sup> The results can be explained if participants (mainly students) are unconcerned about privacy issues. However, in the post-experimental questionnaire 75% of the participants indicated that they have a very strong interest in data protection, and 95% said that they are interested in the protection of their personal information. Thus, participants’ concerns were slightly higher than those reported in the Eurobarometer Survey (Gallup, 2008).

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<sup>6</sup> This is evidence against the hypothesis of private benefits or indifference when providing personal information, but collective costs in our setup (Wathieu 2009).

<sup>7</sup> Table 3 also shows that participants noticed the difference in data requirements and prices between the two firms. Those who shopped with Cologne in treatment EQ were significantly more satisfied with the firm’s privacy policy than those who shopped with Frankfurt. In treatment DIF, those shopping with Frankfurt were significantly happier with the prices than those shopping with Cologne.



Providing false information is one method of protecting personal information. But except for one student who did not indicate his income, all subjects provided values that were reasonable in magnitude.

#### **4. Conclusion**

The experiment demonstrates an unwillingness to pay for privacy as the vast majority of subjects provide their monthly income for a price discount of one Euro. Even without a price discount, only half of the subjects shopped with the more privacy-friendly branch of the DVD retailer. This result is surprising given that most subjects who provide sensitive information are dissatisfied with it. Thus, observed behavior can neither be explained by a lack of awareness of privacy issues, nor can it be rationalized as a resolution of the trade-off between price and data protection in favor of price.

Two interpretations are possible: either the stated dissatisfaction with data collection and privacy protection can be regarded as uninformative as it is uncorrelated with choices, or behavior in the experiment is not in line with revealed-preference theory. In the latter case, the results shed doubt on the view that pure assignment of property rights in personal information is sufficient to achieve efficiency.

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## TABLES

**Table 1. Number of purchases at the two stores per treatment.**

| Treatment | “SilverDisc Frankfurt”<br>(income/date of birth) | “SilverDisc Cologne”<br>(favorite color/year of birth) |
|-----------|--|--|
| EQ        | 15   | 17   |
| DIF       | 39   | 3  |

**Table 2. Sensitivity of mandatory data items.**

|           |           | Less willing to provide<br>data mandatory at |           |         |
|-----------|-----------|--|-----------|---------|
| Treatment | Bought at | Cologne                                      | Frankfurt | Neutral |
| EQ        | Cologne   | 0  | 17        | 0       |
|           | Frankfurt | 1  | 8         | 6       |
| DIF       | Cologne   | 0  | 3         | 0       |
|           | Frankfurt | 0  | 32        | 7       |

Note: This table reports on the answers to the question “When you are asked for data, how willing are you to provide the following items?” Income and favorite color were listed among a number of other items.

**Table 3. Absolute frequencies of satisfaction after purchase decision.**

| Treatment |         | Bought at | Satisfaction<br>High | Satisfaction<br>Low | Significance<br>(Fisher's Exact) |
|-----------|---------|-----------|----------------------|---------------------|----------------------------------|
| EQ        | Price   | Frankfurt | 2                    | 10                  | p=0.67                           |
|           |         | Cologne   | 4                    | 12                  |                                  |
|           | Privacy | Frankfurt | 0                    | 13                  | p=0.05                           |
|           |         | Cologne   | 5                    | 11                  |                                  |
| DIF       | Price   | Frankfurt | 24                   | 12                  | p=0.05                           |
|           |         | Cologne   | 0                    | 3                   |                                  |
|           | Privacy | Frankfurt | 10                   | 27                  | p=0.21                           |
|           |         | Cologne   | 2                    | 1                   |                                  |

Note: This table reports on the answers to the question "How satisfied are you with the chosen store regarding price and privacy?" (Satisfaction values z-transformed; missing data for participants exactly between high and low; p-values two-tailed).