

Cyber Security & Privacy EU Forum 2012, Berlin, Germany

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# Monetizing Privacy –

*Evidence from a study on privacy for  
ENISA*

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ENISA Project

Research Questions

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# I.

## Introduction

ENISA Project



ENISA P/34/10/TCD Project

*Monetizing Privacy – An Economic Model for the Pricing of Personal Information*

*(Report with A. Harasser and S. Preibusch)*



### **Motivation**

Scale and scope of collection of personal data on consumers

What is the effect on consumers & competition?

Personalization of services as well as behavior-based pricing

# I.

## Introduction

Research Question



ENISA P/34/10/TCD Project

*Monetizing Privacy*



**Question:** Do some people pay a premium for privacy? Does it pay for firms to differentiate along the privacy concern of individuals? Does product personalization lead to lock-in?

### **Project included:**

Duopoly model with privacy-heterogeneous consumers

Laboratory experiment

Hybrid & field experiment

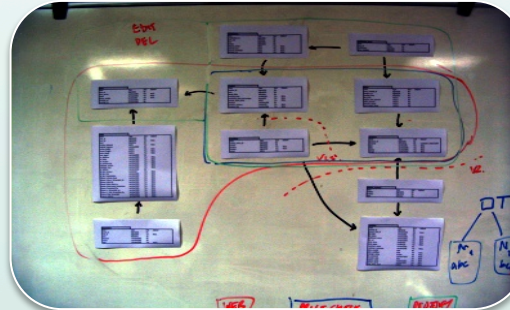
# I.

## Introduction



May – Sept 2011

- Lab experiment
- 440+ participants



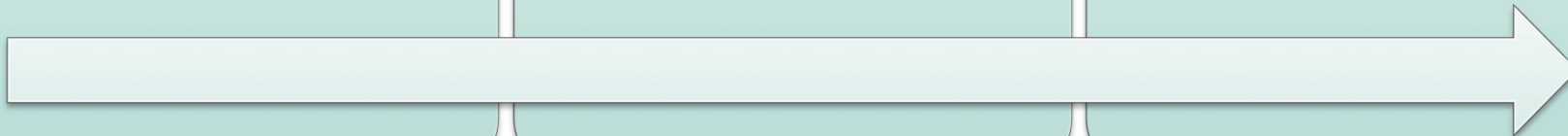
Early June 2011

- Field website design
- Consolidation



Sept – Dec 2011

- Field experiment
- Hybrid experiment



## II.

# Experimental Design

## Literature Background

Beresford et al. (2010) – DVD experiment

Feri, Giannetti and Jentzsch (wip) – Good/bad types selling personal data

Tsai et al. (2010) – Batteries & sex toy experiment

## Void?

No repeated purchases with personalization option.

## II.

# Experimental Design

### Decision Situation

- Consumers go on cinema portal [www.kinofix.de](http://www.kinofix.de), where they can compare offers of sellers of cinema tickets
- First they choose place of screening (Berlin, Munich, etc.), then the film, date and time
- Choice of one of two sellers of cinema tickets, offers differ according to different treatments
- Personalization (filled-in form) possible in case of return

The portal and the two firms were for real, as well as the cinema showings, online payment mechanisms and tickets.

## II.

# Experimental Design



The banner features the word "Kinofix" in large, glowing yellow letters. To the right, two yellow movie tickets are shown, one slightly overlapping the other. The tickets have "KINO" and "EIN TICKET" printed on them, along with some numbers. The background is dark with a film strip and light rays.

### Kinokarten jetzt online kaufen

Willkommen bei Kinofix.  
Hier vergleichen Sie Angebote für Kinokarten für ganz Deutschland und können Ihre Tickets direkt online kaufen.

#### In wenigen Minuten zur Kinokarte

6801 Vorstellungen in ganz Deutschland.  
Von „André Rieu Konzert Maastricht“  
bis „Zwei an einem Tag“.

#### Wo möchten Sie ins Kino gehen?

alle Kinos in Berlin

Ist das gewünschte Kino nicht dabei?  
Wir kümmern uns darum: [wunschzettel@kinofix.de](mailto:wunschzettel@kinofix.de).

#### So funktioniert's



TICKETS AB  
5 EURO

1. Wählen Sie das gewünschte Kino in Ihrer Stadt.
2. Suchen Sie nach Filmtitel oder Datum oder lassen Sie sich das gesamte Programm anzeigen.
3. Wählen Sie die gewünschte Vorstellung.
4. Füllen Sie das Bestellformular aus und bezahlen Sie.
5. Sie erhalten Ihre Kinokarte per Email. Bitte drucken Sie Ihre Karte aus.



# II.

## Experimental Design

### Kinokarten jetzt online kaufen

Bitte prüfen Sie Ihre Auswahl:

**Kino:** CinemaxX Sindelfingen  
**Film:** Kill the Boss  
**Vorstellung:** morgen, Mittwoch, 21.09.2011, 20:30h  
**Kategorie:** 1 × Normal

Kino ändern

Film oder Uhrzeit ändern

Für die gewählte Veranstaltung werden Karten von 2 Anbietern angeboten.  
Bitte wählen Sie unten, über welchen Anbieter Sie Ihre Bestellung abwickeln möchten.

#### Event Sales

**Name:**   
**Email:**   
**Geburtsdatum:**

**Gesamtpreis:** Parkett: € 7,50  
Loge: € 7,50

Ich stimme den [Event Sales AGB](#) zu.

Ich stimme der [Event Sales Datenschutzerklärung](#) zu.

zur Kasse

#### Cine Sales

**Name:**   
**Email:**   
**Geburtsdatum:**

**Telefon (mobil):**

**Gesamtpreis:** Parkett: € 7,00  
Loge: € 7,00

Ich stimme den [Cine Sales AGB](#) zu.

Ich stimme der [Cine Sales Datenschutzerklärung](#) zu.

zur Kasse

# II.

## Experimental Design

### Treatments

Treatment	Settings (Variations)
<b>1***</b>	Difference in data usage
	Difference in prices
	Privacy policy exists at both firms
<b>2</b>	Difference in data usage
	Same prices
	Privacy policy exists at both firms
<b>3***</b>	Difference in number of data items
	Difference in prices
	Privacy policy exists at both firms
<b>4</b>	Difference in number of data items
	Same prices
	Privacy policy exists at both firms
<b>5</b>	Same information items
	Same prices
	Privacy policy exists at both firms

Comparisons:

5 and 4

5 and 2

1 and 2

3 and 4

\*\*\* In these treatments, there are price differences.

## II.

# Experimental Design

## Lab Protocol

1. Invitation sent out to subject pool.
2. Subjects show up, take seat, and read the instructions, they sign a general consent declaration.
3. Entry questionnaire with comprehension test.
4. Subjects encounter a live website on which they can buy one or two cinema tickets. They can decide whether to buy a ticket or not from one of two suppliers, displayed simultaneously.

## II.

## Experimental Design

### Lab Protocol

5. Subjects may repeat the purchase. Once they conduct a purchase they fill out the purchase form with their personal data. They can decide whether their data is stored for the next period. The purchase form has to be filled out completely.
6. After the conclusion of the transaction, subjects receive an exit questionnaire. They also received payoffs and left.

## II.

# Experimental Design

Hybrid and Field Experiment

### **Hybrid experiment:**

Invitation to students in pool at TUB; at students in pool of ESMT;  
and students in pool at Heinrich-Heine-University Düsseldorf

⇒ These students knew they participate in a experiment, but not the purpose of the experiment.

### **Field experiment:**

No invitations, advertising on Google, VZNetworks, FaceBook,  
Yahoo and Bing

⇒ These people did not know that they participate in a experiment

# III.

## Preliminary Results

### Laboratory Experiment

Overview Statistics	Number	Percentage of total	Bought at firm 1 <i>(privacy-friendly)</i>	Bought at firm 2 <i>(privacy-unfriendly)</i>
<b>Participants</b>			(across periods, percentage of total)	
- Did not buy any ticket	251	56.66	-	-
- Bought one ticket	40	9.03	-	-
- Bought two tickets	152	34.31	-	-
<b>Total</b>	443	100.00		
<b>Two-time buyers</b>				
No. of two-time buyers	152			
- of which are loyal to same firm	142	93.42	59 (41.55%)	83 (58.45%)
* loyals who stored data			27 (45.76% of 59)	49 (59.04% of 83)
- of which are switchers	10	6.58	9 persons switched from firm 1 to 2; whereas one person switched from 2 to firm 1	
<b>Total</b>	152	100.00		

# III.

## Preliminary Results

### Laboratory Experiment - Overview of Buyers and their Purchases at both Firms: All

Treatment	Number of participants (no. buyers)	No. buyers	Total no. tickets sold	Firm 1 (tickets purchased)		Total no. tickets over two periods (firm 1)	Firm 1 % -share of all tickets sold (col. 4), rounded	Firm 2 (tickets purchased)		Total no. tickets over two periods (firm 2)	Firm 2 % -share of all tickets sold (col. 4), rounded
		Zero, one or two tickets bought		Period 1	Period 2			Period 1	Period 2		
(1)	(2)	(3)**	(4)**	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
1***	104 (51)	0 - 53 1 - 7 2 - 44	95	7	5	12	13%	42	41	83	87%
2	68 (32)	0 - 36 1 - 9 2 - 23	55	20	14	34	62%	10	11	21	38%
3***	80 (37)	0 - 43 1 - 6 2 - 31	68	12	9	21	31%	25	22	47	69%
4	69 (31)	0 - 38 1 - 4 2 - 27	58	26	22	48	83%	4	6	10	17%
5*	122 (41)	0 - 81 1 - 14 2 - 27	68	27	15	42	62%	13	13	26	38%
<b>Total</b>	<b>443</b>		<b>344</b>	<b>92</b>	<b>65</b>	<b>157</b>	<b>Avg. 50%</b>	<b>94</b>	<b>93</b>	<b>187</b>	<b>Avg. 50%</b>

Source: DIW Berlin. \* There is no difference between firms in treatment 5, in all other treatments firm 2 is the privacy-unfriendly firm. \*\* Column (3) adds up to the number of buyers in column (2). The column means that in treatment 1, seven buyers bought one ticket and 44 bought two tickets. Column (4) is based upon these numbers. \*\*\* In these treatments, price differences exist.

# III.

## Preliminary Results

### Field Experiment

#### Results:

- Field: 2,300 visitors, work in progress
- Hybrid: 750 visitors, 52 chose a firm including 16 buyers

#### Overview of Choosers at Firm 1 and Firm 2 in the Field & Hybrid

Treatment	No. of participants	All choosers		All loyal choosers	
		Chose offer of firm 1 (%, rounded)	Chose offer of firm 2 (%, rounded)	Chose offer of firm 1 (%, rounded)	Chose offer of firm 2 (%, rounded)
3 <sup>**</sup>	67	42	58	5	95
4	29	90	10	42	58
5 <sup>*</sup>	43	16	84	19	81

Source: DIW Berlin. \*There is no difference between firms in treatment 5.

\*\* In this treatment, price differences exist.



# III.

## Preliminary Results

Field Experiment

### Results:

Mann-Whitney U tests for differences between groups regarding number of purchases at firm 1 (privacy-friendly firm) across two periods (differences are sig.)

In treatments w/o price difference (5, 4, 2) the privacy-friendly firm snatches a greater share of the market

In treatments w price differences (1, 3) the privacy-unfriendly firm obtains a greater market share, but the share of the privacy-friendly firm stays above 10%

This is similar if only loyals are introduced; lab results are incompletely reflected by field results

Vielen Dank für Ihre Aufmerksamkeit.

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**Redaktion**

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