From: Price Discrimination
to: Data Transparency

... the tale and the vision for a Data Transparency Lab

Nikolaos Laoutaris
Telefonica Research

March 2016
BASED ON A TRUE STORY
Checking from SPAIN:

-- Hotel I******k
-- on H****s.com

... was quoted 150e / night

Checking from Sweden:

-- at the same time
-- for the same hotel
-- on the same web site
-- for the same days
-- and the same room

... was quoted 120e / night
Could it be Price Discrimination (PD)?

- Situation where two consumers are charged differently for the same product
- Based on how much are they willing to pay (reservation price)
Fixed prices is a “recent” thing
Could E-commerce backfire for customers?
Could E-commerce backfire for customers?

Privacy, Economics, and Price Discrimination on the Internet
[Extended Abstract]

Andrew Odlyzko

Digital Technology Center, University of Minnesota
499 Walter Library, 117 Pleasant St. SE
Minneapolis, MN 55455, USA
odlyzko@umn.edu
http://www.dtc.umn.edu/~odlyzko
Revised version, July 27, 2003

Abstract. The rapid erosion of privacy poses numerous puzzles. Why is it occurring, and why do people care about it? This paper proposes an explanation for many of these puzzles in terms of the increasing importance of price discrimination. Privacy appears to be declining largely in order to facilitate differential pricing, which offers greater social and economic gains than auctions or shopping
Would e-retailers do such a thing?

Robinson–Patman Act

From Wikipedia, the free encyclopedia

The Robinson–Patman Act of 1936 (or Anti-Price Discrimination Act, Pub. L. No. 74-692, 49 Stat. 1526 (codified at 15 U.S.C. § 13 et seq.)) is a United States federal law that prohibits anticompetitive practices by producers, specifically price discrimination. It grew out of practices in which chain stores were allowed to purchase goods at lower

Article 20.2 of the European Union

Directive 2006/123/EC on Services in the Internal Market (the “Services Directive”) prohibits discrimination based on grounds of the nationality or place of residence of service recipients
e-commerce dwarfs online advertising

- e-commerce market in 2012 > $1,000,000,000,000,000
- 10 x larger than online advertising ($100bn)

privacy erosion!
$sheriff
Detecting Price Discrimination

1. Select price

<table>
<thead>
<tr>
<th>Availability: In Stock</th>
</tr>
</thead>
<tbody>
<tr>
<td>Price: $200.50 $189.00</td>
</tr>
<tr>
<td>Ex Tax: $90.00</td>
</tr>
<tr>
<td>Price in reward points: 400</td>
</tr>
<tr>
<td>10 or more $105.40</td>
</tr>
<tr>
<td>20 or more $92.48</td>
</tr>
</tbody>
</table>

2. Check it

Jakub Mikians
UPC (now Amazon)

3. Examine differences

<table>
<thead>
<tr>
<th>Safari, Spain</th>
<th>$189.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>Firefox, Spain</td>
<td>$189.00</td>
</tr>
<tr>
<td>Liège</td>
<td>$155.99</td>
</tr>
<tr>
<td>São Paulo</td>
<td>$189.00</td>
</tr>
<tr>
<td>Tampere</td>
<td>$189.00</td>
</tr>
<tr>
<td>Berlin</td>
<td>$201.50</td>
</tr>
</tbody>
</table>
Demo
Which retailers?
Which products?
Which countries?

(b) www.amazon.com
More complex policies seem to exist

Websites Vary Prices, Deals Based on Users' Information

By JENNIFER VALENTINO-DEVRIES, JEREMY SINGER-VINE and ASHKAN SOLTANI
December 24, 2012

It was the same Swingline stapler, on the same Staples.com [SPLS +1.53%] website. But for Kim Wamble, the price was $15.79, while the price on Trude Frizzell's screen, just a few miles away, was $14.29.

A key difference: where Staples seemed to think they were located.

A Wall Street Journal investigation found that the Staples Inc. website displays different prices to people after estimating their locations. More than that, Staples appeared to consider the person's distance from a rival brick-and-mortar store, either OfficeMax Inc. or Office Depot Inc. [ODP -2.12%]. If rival stores were within 20 miles or so, Staples.com usually showed a discounted price.
What types of pricing policies do we see?

[MULTIPLICATIVE]

(a) www.digitalrev.com
What types of pricing policies do we see?

[MULTIPLICATIVE with an ADDITIVE TERM]

(b) www.energie.it
Ok location seems to play a role
Do we have price discrimination based on personal information?

A: Yes
B: No
C: Who cares ...
D: Need to do more work
sheriff_v2 1.2
by Costas Iordanou

sheriff - The price discrimination (PD) add-on. This is an experimental add-on for research purposes only. It measures the extent PD and what factors can trigger it.

Download Now

This add-on has been preliminarily reviewed by Mozilla. Learn more

Works with Firefox 4.0 - 57.* - View other versions
Detection of personalized PD

1. Collect some info

2. Do P2P checks
Prices DO vary within a country

Spain

France

United Kingdom

Germany

Price diff

Minimal product price

No results
Smoking gun
Ok enough with online price discrimination

LET’S STEP BACK A BIT
Network neutrality → Transparency → Data transparency

• Who is tracking me?
• How am I being tracked?
• How is the collected information being used?
  o Advertising
  o PD
  o Profile trading …
This is TOO BIG of a problem for me to handle (no matter how many brilliant PhD students, postdocs, interns I am given)
Birth of the Data Transparency Lab

Participants included: Northeastern University, MIT Human Dynamics Lab, Microsoft, Telefonica Innovation, Max Planck Institute for Software Systems, Mozilla, and more.

Downloads:
- DTL2014 Workshop Summary Report
- DTL Vision
- DTL Organization
What is DTL?

According to our web-site:

DATA TRANSPARENCY LAB

A community-based effort to reveal the flow and usage of personal data online, and to explore ways towards a transparent and respectful data trade in the future.

What we really meant:

-- understanding privacy leakage on the web

-- figuring out who is tracking us and how

-- empowering end users to “track the trackers”
Members

- MIT
- Microsoft
- ODI Open Data Institute
- News UK
- Mozilla
- Columbia University
- Northeastern University
Making the web economy sustainable

Online advertising
E-commerce / recommendation
Personalized analytics
Newspapers and TV used to be king
Initial Year Growth Comparisons—Internet Advertising vs. Broadcast and Cable Television

Annual $ Ad Revenue Growth—First 14 Years

Sources: IAB Internet Ad Revenue Report; PricewaterhouseCoopers LLP, Universal McCann
Tech or Greed behind the fall?
Can the web (economy) be dethroned?
PRIVACY seems to be the #1 threat for the web

What we search – The sites we visit – Who we befriend – What we buy … everything is tracked
Where is your **red thin line**?
Online tracking goes beyond advertising
Trackers are analyzing our web trace for signs of

<table>
<thead>
<tr>
<th>Question</th>
<th>Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alcoholism?</td>
<td>Yes. Absolutely.</td>
</tr>
<tr>
<td>Depression?</td>
<td>Certainly.</td>
</tr>
<tr>
<td>Psychiatric problems?</td>
<td>No question.</td>
</tr>
<tr>
<td>History of genetic problems?</td>
<td>Yes. Cancer, heart disease, you name it, down to the most rare and, and most unexpected maladies.</td>
</tr>
<tr>
<td>Sexual orientation?</td>
<td>Of course.</td>
</tr>
</tbody>
</table>
Horror stories keep piling up

Data brokers selling lists of rape victims, AIDS patients

By Melanie Hicken @melhicken December 19, 2013; 12:38 PM ET
We identified user typologies with different attitudes towards data

HIGH USER BENEFIT

LOW USER BENEFIT

LOW AWARENESS

HIGH AWARENESS

Laissez-Faires

Innocents

Pragmatics

Skepticals

Guardians
Users are reacting

and this will harm (kill?) the web economy
An impeding web “Tragedy of the commons”

Internet company in Web Economy … crossing red lines

The “commons”: consumer trust on the web and it’s business models

Garrett Hardin, 1968
No trust – No grass to graze – No Free services – No innovation

No traffic to carry
No jobs
No growth
No No No No ...
Are we going back to newspapers, or

IS THERE SOMETHING WE CAN DO?
“Sunlight is the best disinfectant.”

-LOUIS BRANDEIS

“Publicity is justly commended as a remedy for social and industrial diseases. Sunlight is said to be the best of disinfectants; electric light the most efficient policeman.”

The Data Transparency Lab

• **MISSION:** Save the web from a privacy Tragedy of the Commons

• **APPROACH:** Establish transparency to what happens to our digital trace

• **HOW:**
  1. By developing easy to use tools
  2. By releasing datasets
  3. By supporting research in the area
     ▪ Grants
     ▪ Infrastructure
     ▪ Shaping a research agenda
     ▪ Sharing results
Data Transparency Lab Call For Proposals
April 2015

The Data Transparency Lab is a collaborative effort between universities, businesses and institutions to support research in tools, data, and methodologies for shedding light on the use of personal data by online services, and to empower users to be in control of their personal data online. In order to support research in these areas, DTL will award research grants to academic institutions worldwide. Such grants come in the form of a lump sum of up to 50K euro that is awarded to successful applicants for pursuing DTL related research in any of the following topics:

Topics

Tools, Platforms, Measurements, and Methodologies for:

Reverse-Engineering Personal Data Usage in Online Services (e.g., advertising, recommender services, pricing and availability of goods & information):

-- Behavioral targeting
-- Context / Location-based targeting
-- Social graph-based targeting
-- Involuntary (or implicit) customization / targeting

Detecting Personal Data Gathering by Online Services:

-- Techniques for finger-printing and tracking users
-- In-app tracking and targeting
-- Information leakage from applications and platforms
-- Cross-platform/domain information/profile trading, aggregation, fusion

Privacy-preserving Personal Data Analytics/Management:

Proposal submission deadline: May 15, 2015

Download the Call for Proposals 2-pager ▶
Download the Grants Program Handbook ▶

Submission Website

This link takes you to the DTL HotCRP Website.
Tool curation program … coming
Thank you!
Let’s make the web economy sustainable!
To probe further

• Sheriff extension available at http://sheriff.dynu.com/views/home

• DTL at http://www.datatransparencylab.org/

• Publications

• Blog
  o Cows, privacy, and tragedy of the commons on the web