

# EMPIRICAL RESEARCH ON THE ECONOMIC EFFECTS OF PRIVACY REGULATION

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## INTRODUCTION

Currently the U.S. is deliberating whether there is a need for privacy regulations governing internet commerce, and if there is a need, what form it should take. This is a tricky issue: there are risks to consumers if companies have unfettered access to consumers' data, but there is also a risk that strict regulations could damage the ability of internet firms to support free services through advertising. Given this delicate balance, it makes sense to try to understand the effects that privacy regulation has had in other countries.

This short paper will describe research carried out by Avi Goldfarb of the University of Toronto and myself about how attempts by the European Union (EU) to protect privacy online have affected the performance of online advertising. There were three major findings:

- The EU's e-Privacy Directive was associated with a 65% decrease in the effectiveness of online advertising for the advertisers we studied;
- The negative impact was not equal across websites. Ads on

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websites devoted to commercial product categories (such as travel and baby websites) were not affected. Ads on websites that had less commercial content such as news websites were most affected as they needed external consumer data to target ads effectively; and

- The negative impact was not equal across ads. Ads that were flashy and obtrusive (such as ads that float over the webpage) were not affected. The ads that were affected were plain and unobtrusive small banner ads whose appeal depended on their being informative to their audience.

This is only one consequence of regulation, and there may have been other consequences to firms and consumers. However, on the basis of this evidence, it is reasonable to say that privacy regulation could have sizable effects for the advertising-supported internet. Crucially, the burden that regulation imposes on websites and advertisers will not be uniform. Instead, the burden will be borne most by websites that have content that is not obviously commercial and by advertisers who use less visually arresting advertising.

#### I. CONSUMER INTERNET DATA IS AT THE CORE OF INTERNET ADVERTISING BUT THIS RAISES PRIVACY CONCERNS

There are evident risks to consumers if companies have unfettered access to their data and firms do not have to be transparent about how they use this data and with whom they share it. However, nobody wants strong regulations to lead to adverse or unintended effects either. The advertising-supported internet is a huge and still rapidly growing engine of innovation, and represents a significant part of most users' internet experience. However, a policy issue arises because at the heart of this industry is the detailed collection, parsing, and analysis of consumer data, often without consumers' consent or knowledge. This data allows firms to *target* their advertising to specific groups who might be most interested in their advertising. This data also allows firms to *measure* how well the advertising then performs as they track the subsequent behavior of users who were exposed to an ad.<sup>1</sup>

Data on the online behavior of consumers has allowed companies to deliver online advertising in an extraordinarily precise fashion. For example, a Cadillac dealership can target advertising so that their ads are shown only to people who have been recently browsing high-end cars on car websites. Such behavioral targeting has obvious benefits to

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1. Avi Goldfarb & Catherine Tucker, *Online Advertising*, 81 *ADVANCES IN COMPUTERS* 289 (Marvin Zelkowitz ed., 2011).

advertisers because fewer ad impressions are wasted. Instead, advertisers focus their resources on the consumers most likely to be interested in the ads. For consumers, however, ads that are behaviorally targeted can appear unauthorized and even creepy.

Therefore, policymaking in the area of privacy regulation needs to be careful and fulfill the twin aims of protecting consumer privacy *and* ensuring that the advertising-supported internet continues to thrive.

Given these aims, it makes sense to look at and consider the outcome of other countries' attempts at privacy regulation. The paper I summarize studies how the European e-Privacy Directive affected advertising performance.

A. *We Used Extensive Data to Study the Effects of the European e-Privacy Directive*

We examined the effect of the EU Privacy and Electronic Communications Directive (2002/58/EC—sometimes referred to as the “e-Privacy Directive”) on online advertising in Europe. Specifically, we looked at how user response to advertising changed in Europe after the Directive came into place relative to changes in user response to advertising in the US and elsewhere.

Several provisions of the Privacy Directive limited the ability of companies to track user behavior on the internet and therefore limited the ability of these companies to use this data to target advertising.<sup>2</sup> These changes put certain roadblocks in the way of the ability of the Cadillac dealership, in the earlier example, to collect and use data about consumers' browsing behavior on other websites.

The interpretation of this e-Privacy Directive has been somewhat controversial and unclear as it relates to behavioral targeting. For example, it is not clear whether the provision, which requires companies that use invisible online tracking devices to use them only with the ‘knowledge’ of consumers, means that companies need explicitly to obtain opt-in consent. This is one of the reasons why, in the recent Telecoms Reform Package, the EU amended the current regulation to require a user's explicit consent before placing a cookie on a computer. Hence our analysis reflects both the actual provisions of the original Directive, and business responses when there is ambiguity over how privacy regulation should be interpreted.

To measure online advertising effectiveness, we used a large amount of data from a marketing research company that ran various tests

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2. David L. Baumer, Julia B. Earp & J. C. Poindexter, *Internet Privacy Law: A Comparison Between the United States and the European Union*, 23 *COMPUTERS & SECURITY* 400 (2004), available at [http://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=1823713](http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1823713).

of online display ads across the world over 8 years. The research company developed a straightforward methodology named an “a/b” test that permitted comparison of different advertising campaigns over time in order to allow advertisers to benchmark the effectiveness of different ads. In this a/b test, some randomly selected people were exposed to the ad for a certain product, while others were simply exposed to a placebo ad, usually for a charity. The market research firm then surveyed both groups about their likelihood of purchasing the advertised product. This allows a clean measurement of the effect of the ad: because these people are randomly selected, any increase in expressed purchase intent towards the product for the group exposed to the ad relative to those who were not exposed can be attributed to advertising. We use data on 3.3 million of these survey responses for 9,596 different online display advertising campaigns conducted on hundreds of different websites across many countries.

To summarize, we compared the differences in stated purchase intention in response to these surveys between:

- People who were randomly exposed to the ad and those who were not;
- People in the EU and elsewhere; and
- People who answered the surveys before and after privacy regulation was enacted in Europe.

*B. We Found that Privacy Protection Reduced Advertising Performance by 65 Percent*

In Europe, after privacy protection was enacted, the difference in stated purchase intent between those who were exposed to ads and those who were not dropped by approximately 65 percent. There was no such change for ad effectiveness for countries outside the EU. In other words, online advertising became much less effective in Europe relative to elsewhere after the regulation was enacted.

One possible explanation for this result is that our estimates reflect a change in attitudes attributed to how the change in law affected websites. To examine this possibility, we looked at the behavior of Europeans on non-European websites and of non-Europeans on European websites. We found no drop in ad effectiveness for Europeans browsing non-European websites and a substantial drop in advertising effectiveness for non-Europeans browsing European websites. The drop we measured does not appear to be simply a result of changing consumer attitudes in Europe. Instead, it suggests that, coincident with the timing of the enactment of European privacy regulation, advertising at websites in Europe became less effective.

### C. *The Negative Effects of Regulation Were Not Uniform*

The 65 percent drop in effectiveness was driven by two types of ads:

- Ads that were placed on websites whose content did not relate obviously to any commercial product, for example, CNN.com and Dictionary.com; and
- Ads that were small and did not rely on striking ad design to gain attention.

The following ads were not adversely affected by regulation:

- Ads that were placed on websites that had content that was easily relatable to demand for a group of products, such as tripadvisor.com or babycenter.com; and
- Ads that were large or that had rich-media features that were designed to gain attention.

This makes it likely that the adverse effect of any regulation is not uniform. Instead, the adverse effect will be borne most by websites that are, in a sense, less commercialized—that is, websites that have content that is not easy to match with a product category and advertisers that have so far shunned ‘highly visual’ advertising. In the long run, it seems likely that regulation could lead to incentives for websites to switch to content that is more easily matched to products (as they cannot use behavioral targeting techniques to match a consumer to a product) and for advertisers to use more highly visual and potentially distracting ads.

## II. THERE ARE OTHER APPROACHES TO PRIVACY REGULATION

There are potential effects (both positive and negative) of regulation that we did not study:

- Whether there were additional negative effects for advertisers because they were less able to measure the efficacy of online campaigns using customer browsing data;
- How consumers benefited;
- How many consumers were aware of the nature of the regulation;
- Our measures of advertising effectiveness are representative only of people who are willing to answer an online market survey; though in terms of demographics these people seem representative of the general population, they may be unusual in dimensions we did not observe;
- The campaigns we studied are representative of those launched by large firms who had the resources to place ads

on individual websites—we do not know how privacy regulation affected smaller firms or advertising networks; and

- We do not know whether the change in advertising effectiveness affected advertising revenues. Theoretically this would depend heavily on substitution patterns between online and offline media. If websites are forced to reduce prices to reflect the drop in effectiveness to prevent advertisers from switching to other advertising markets, then advertising-supported internet sites will bear the burden of regulation. If advertisers are unwilling to switch, they will simply have to pay more to achieve the same level of effectiveness as before.

### III. THIS MIGHT SUGGEST THE US NEEDS ALTERNATIVE APPROACHES TO PRIVACY REGULATION

In 2010, the Federal Trade Commission made the following proposal:

The most practical method of providing such universal choice would likely involve the placement of a persistent setting, similar to a cookie, on the consumer's browser signaling the consumer's choices about being tracked and receiving targeted ads. Commission staff supports this approach, sometimes referred to as "Do Not Track."<sup>3</sup>

Obviously this persistent "opt-out" is a different approach from the EU regulation that we study. However, our estimates do suggest that one could reasonably expect a large drop in advertising effectiveness for consumers who do choose to opt out of targeting. Therefore, the likely effects of the proposed regulation depend on the number of consumers who ultimately choose to opt out.

Crucially, the empirical findings of this paper suggest that any decline in advertising effectiveness that results from the new regulation will not be borne equally by all websites, and that the costs should be weighed against the benefits to consumers. In the long run, this may change the kind of websites and firms that prosper on the advertising-supported internet. Our results also suggest that advertisers may move towards more visually arresting types of advertising in order to compensate for their inability to target.

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3. FEDERAL TRADE COMMISSION, PROTECTING CONSUMER PRIVACY IN AN ERA OF RAPID CHANGE (Dec. 2010), available at [http://www.ftc.gov/os/2010/12/101201\\_privacyreport.pdf](http://www.ftc.gov/os/2010/12/101201_privacyreport.pdf).

The precise form of the new regulation will matter. Extensive efforts should be taken to collect data and encourage research that illuminates the burden that different forms of privacy regulation would impose on advertisers, consumers and websites. In particular, it would be attractive to test out elements of a “do not track technology” that would encourage consumer choice regarding their privacy. This is because my own research indicates that some forms of consumer choices regarding their privacy can actually improve the performance of advertising.

In another paper, I presented evidence that after Facebook introduced its new privacy settings that allowed more control over personally identifiable information click-through rates for personalized advertising actually increased.<sup>4</sup> This suggests that if consumers are given choices over how advertising is geared to them, there can actually be an improvement in performance. However, I want to emphasize that this is only one study, and that far more research is needed to determine how the US can both protect consumers’ privacy and the advertising-supported internet.<sup>5</sup>

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4. Catherine Tucker, *Social Networks, Personalized Advertising, and Privacy Controls* (MIT Sloan School, Working Paper No. 4851-10, 2011), available at [http://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=1694319](http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1694319).

5. Additional references relied upon include: Avi Goldfarb & Catherine Tucker, *Online Advertising, Behavioral Targeting, and Privacy*, 54 COMMUNICATIONS OF THE ACM 25 (2011); Avi Goldfarb & Catherine Tucker, *Privacy and Innovation* (National Bureau of Econ. Research, Working Paper No. 17124, 2011); Avi Goldfarb & Catherine Tucker, *Privacy Regulation and Online Advertising*, 57 MANAGEMENT SCIENCE 57 (2011); Amalia R. Miller & Catherine E. Tucker, *Can Health Care Information Technology Save Babies?*, 119 JOURNAL OF POLITICAL ECONOMY 289 (2011); Amalia R. Miller & Catherine Tucker, *Privacy Protection and Technology Diffusion: The Case of Electronic Medical Records*, 55 MANAGEMENT SCIENCE 1077 (2009).

