We are constantly reminded that we live in an ‘information age’—an era in which production, consumption, and everyday life are all dominated by the pervasive presence and flow of information made possible by the digitisation of society. Amongst the hype, one might be forgiven for believing that information is something of a panacea, to be embraced by all. However, closer inspection suggests that not all parties stand to benefit from universally improved access to information. Indeed, agents are often incentivised to explicitly engender information scarcity in order to increase their economic rent. Such behaviour may distort allocations and undermine the efficiency of market outcomes; if and when this will be the case is therefore an important issue for regulators and strategists. In this extended abstract I highlight some of the subtleties involved in considering such shrouding—both by consumers and by firms—and describe some recent results on a market solution to obfuscation in the case of advertising.

Consumer privacy: An obvious objection to the ever-expanding frontier of transparency comes from consumer advocacy groups that seek to protect the autonomy and privacy of consumers on-line. Such demands are often made on the basis of security concerns, or predicated upon the notion that personal privacy has some intrinsic value. A complete analysis, however, must ask whether there are economic grounds for consumers to protect their privacy or for firms to seek to undermine it—and what the effects of such actions are likely to be.

Firms have a long history of achieving market segmentation through ‘versioning’. Microsoft, for example, arbitrarily downgrades Windows 7 into a ‘Home’ version in order to separate personal and professional users (and extract more rent from the latter). The need for such measures stems from the inability to a priori identify the two groups, but such barriers are being reduced by the growing ability of firms to track and identify individual consumers. Amazon, for instance, famously experimented with price discrimination based upon the presence of a cookie on users’ machines, but were forced to apologise after a huge consumer backlash. More generally, Acquisti and Varian (2005) show that the circumstances under which firms can profitably use persistent consumer relationships to price discriminate are limited to those in which consumers are not sufficiently sophisticated to understand that their current behaviour may have consequences for future pricing, or are unable to anonymise themselves. It is hard to imagine such myopia persisting should price conditioning become widespread. Moreover, many consumers are aware of the threat to their privacy posed by cookies and other technologies, and are able to actively block such tracking attempts should they feel that it is in their interest to do so.

The technology, though, is continuously evolving; a recent development is the advent of device fingerprinting, whereby uniquely identifying combinations of characteristics of a computer such as the installed fonts, browser version, and screen resolution are compiled into a database that is then used to build a complete profile of each user. Such tracking is difficult to block or anonymise against, and is also passive so that it is much less likely that users are aware that any monitoring is taking place. Exploitation of consumers then becomes more feasible. A somewhat counterintuitive point is that, like most forms of price discrimination, price conditioning has the potential to increase the spectrum of consumers to whom firms cater and thereby increase total social welfare. Consumer attempts to block tracking technologies may therefore be sub-optimal from a societal perspective.

Another use to which consumer information is put is the targeting of advertisements. Targeted or behavioural advertising is a coveted prize for publishers (whom it permits to more effectively utilise ad inventory) and for advertisers (who make more efficient use of their ad budget). Targeted ads may also be of direct benefit to consumers by ensuring that pages are not cluttered with irrelevant ads. A more careful analysis, however, must also consider the indirect effects of targeting. One such effect is to increase the value of (marginal) ads to publishers and advertisers, which creates a strong incentive to increase the total volume of advertising. Authors including Johnson (2009) consider the consequences of this shift in incentives. The attractiveness of cheap, well targeted advertising causes consumers to be subjected to a kind information overload, whereby the volume of ads becomes so bothersome that
consumers take to blocking or ignoring them altogether. The consequence of this is that some useful or important ads don’t get through, which is economically inefficient. Johnson’s main result is that there may exist a kind of uncanny valley beyond which the improved matching effect outweighs the information overload effect—so that consumers opposed to incremental increases in targeting accuracy may benefit from large accuracy increases. Another point often made by content publishers is that advertising is important in funding the content to which it is attached. In Taylor (2010b) I show that better targeting is likely to increase content quality, but that quality is limited by consumer ad blocking so that the welfare effects of privacy (information scarcity) are again ambiguous.

The great challenge is, then, finding a means to weigh the economic value of information against the intrinsic value of privacy.

☐ Firm obfuscation: Amongst the Internet’s virtues is often cited its effects in facilitating consumer search and the comparison of competing products. However, as with the case of privacy, one must consider the equilibrium effects of such a shift. Tools such as search engines and price comparison sites make finding and comparing goods easier, but cast the firms that sell them into more direct competition. Standard economic theory implies that the result ought to be a reduction in firm profit margins. There is compelling evidence that firms are responding to such a dynamic by pursuing strategies to deliberately obfuscate consumer search—making comparisons more difficult. Such obfuscation is implemented using tactics such as bait and switch (consumers are attracted by low price, low-quality products, but sold high quality products), artificial stock-outs (consumers are attracted by low priced items that are not in stock), or drip pricing (the true cost of a product does not become apparent until late in the order process). Ellison and Ellison (2009) show that such obfuscation strategies increase mark-ups for high-quality computer memory modules to more than twice the level implied by a normal competitive model within the PriceWatch environment. Ellison (2005) and Ellison and Wolitzky (2008) provide formal models to explain such obfuscation practices. Further evidence of obfuscation is indirectly provided by the persistence of price dispersion in low-friction on-line environments such as price comparison sites. The issue of obfuscation is particularly grave because it implies not only that firms are incentivised to make the Internet a less useful tool for product search, but also that the resulting fall in competition will lead to increased prices and less socially-beneficial trade taking place.

☐ Obfuscation and the information content of advertisements: The advent of the mainstream Internet has had a dramatic impact on the advertising industry. The unique capacity of Internet publishers to monitor and track users’ activity has given rise to a number of novel structures for the pricing of advertisement facilities. These can largely be grouped into three classes: (i) Pay-per-click (PPC) in which advertisers pay each time a consumer clicks on their ad; (ii) Pay-per-impression (PPI) where advertisers are charged each time their ad is shown to a consumer, regardless of whether that consumer takes any further action; and (iii) Pay-per-sale (PPS) in which case an advertiser must pay for each consumer that clicks on its advertisement and subsequently decides to purchase. As of the second quarter of 2009, PPI pricing accounted for around 38% of online ad spending, with performance-based pricing (which encompasses PPC and PPS) accounting for a further 58% (IAB, 2009).

Advertisements themselves take many different forms: they may consist of words, pictures, sounds, or—increasingly—interactive elements. In the abstract, however, ads often amount to little more than ‘messages’ from their creator to consumers. The purpose of such messages is to communicate information about prices, product characteristics (and their superiority to those of competing products), product existence, brand image, and so on. In recent work (Taylor, 2010a) I investigate how variations in the fee-structure faced by advertisers on the Internet can facilitate or undermine such communication. Communication between two parties, a ‘sender’ and a ‘receiver’ requires not only that the sender says something meaningful, but also that the receiver is willing to listen. Thus, establishing an environment in which ads are informative also requires that consumers feel that they are able to trust the messages contained therein—in the absence of consumer trust, even honest advertisers are unable to influence consumer behaviour. To this end, the off-line world is characterised by the existence of regulators (such as the UK’s Advertising Standard Agency) that encourage advertiser honesty and consumer trust. Such enforcement becomes considerably more complicated on the Internet, where a huge proliferation of small publishers broadcast advertisements that transcend international boundaries and
jurisdictions. Large publishers may intervene to prevent obvious abuse of their advertising resource, but again the large and shifting volumes of advertisements handled by major publishers makes perfect enforcement impractical. Small, independent publishers are much less likely to have the resources or inclination to police their advertisers. Moreover, because both the size and types of audience delivered depend upon consumers’ interpretation of ads in a non-trivial fashion, it is not a priori clear whether publishers even stand to benefit from more informative ads at all.

This begs the question: can we design the advertising marketplace in such a way that transparent behaviour is effectively incentivised without direct intervention? At the core of the results in (Taylor, 2010a) is the following simple idea: a per-click advertising fee can serve as a disincentive to sending uninformative advertisements of general appeal by making it costly for an advertiser to attract visits from consumers with whom it is poorly matched. Indeed, since the per-click price is determined by competitive forces,\(^1\) attracting such consumers is optimal only when the advertiser attaches a higher value to attracting ill-matched consumers than its direct rivals do to attracting well-matched consumers. This kind of mechanism can also deter the kind of obfuscation strategies described above in a range on environments. Baye, Morgan, and Scholten (2004), for example, provide evidence that per-click fees induce honest reporting on price comparison site Shopper.com. By contrast, since a sale to a poorly matched consumer is as good as one to anyone else, firms that pay for ads on a per-sale basis have an incentive to attract a visit from weakly matched consumers that will purchase with positive probability. Likewise, once a consumer is shown an ad, the cost of that impression is sunk and firms that pay per-impression are incentivised to attract any consumer with some positive probability of purchase. This manifests as an incentive to make vague or inflationary claims (much as one might expect off-line absent the ASA). Such obfuscation by some advertisers—seeking to take advantage of a consumer’s trust—undermines that trust and causes advertiser-consumer communication to break down. The usefulness of advertisements as a means of product discovery/search is then reduced. I use the model to show that consumer welfare is necessarily harmed by such a breakdown in informativeness. However, for some specifications of search costs, reduced ad information content is beneficial for publishers and society as a whole. As an ancillary point, a PPS fee functions as a marginal tax on firm’s profits and distorts prices upwards, which serves to further damage consumer (and social) welfare.

References


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\(^1\)Many on-line ads are allocated using a generalised second price auction, which implements a Walrasian (competitive) outcome (Varian, 2007). Otherwise, it should be expected that ordinary market forces deliver such an equilibrium.