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Comment

Ashish Arora

The growth of the digital economy has also increased interest in the unauthorized use of digital goods. The existing literature has tended to focus either on the issue of whether a particular instance of piracy—unauthorized use—is a net social "bad" (e.g., whether it is a form of de facto price discrimination), or the efficacy of specific types of enforcement efforts. Some studies do provide estimates of the extent of piracy, but the results are not credible because the studies are linked to advocacy efforts and suffer from weaknesses in methods and implausible assumptions. The question has become more salient with the rise of broadband technologies that have apparently made it easier to distribute digital products, including pirated products. Athey and Stern have done an important service by providing a reasonable measure of the problem for an important product.

An important contribution of the chapter is its careful attention to measurement. Even with the new technology that allows Microsoft to discern whether the product use is based on an authorized key, matters are not straightforward. For instance, I know from personal experience that unless laptops are regularly connected to the network of the institution that purchased the license to the software, Microsoft policy is to incorrectly treat that use as unauthorized. Athey and Stern get around this problem by focusing

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on specific keys, and by attending to whether the machine eventually reauthorizes with a valid key.

Given the conservatism of the estimates, the results give one pause. The scale of the problem is large. Over a quarter of all copies of Windows 7 are unauthorized with significant variation across countries. My "back-of-the-envelope" calculations indicate that a 25 percent piracy rate for Windows alone implies $6.1 billion in lost revenue and $3.8 billion in lost operating income for Microsoft. These are consistent with the large estimates of losses due to piracy reported by advocacy organizations such as the BSA, but they assume a direct correspondence between the extent of piracy and the extent of the loss. One needs better estimates of the demand (for the authorized product and for the pirated one) to assess the validity of such estimates.

Premium versions of the software are more prone to the problem, implying that this is not a case of de facto price discrimination. Put differently, a common prescription in both IT and pharmaceuticals for combating piracy is for manufacturers to introduce lower-priced versions in poorer countries. The Athey-Stern results suggest that this prescription will not work.

They note another interesting result, albeit without comment. Although machines from smaller manufacturers tend to have a higher percentage of pirated software, the bulk of the pirated software is in computers produced by the leading manufacturers (OEMs). Further, these are also the manufacturers responsible for the keys that allow for unauthorized installations of Windows 7. Some obvious questions arise. Are Microsoft's contracts, or the enforcement of those contracts, with these OEMs at fault? Are the OEMs contriving to reduce their payments to Microsoft by shipping machines without Windows? What liability do OEMs face when a key given to them is leaked?

Athey and Stern instead focus on relating observed levels of piracy to country-specific institutions. They conclude that institutions associated with a greater respect for private property reduce piracy, even after controlling for how rich the country is. In plain words, the incidence of piracy is greatest in middle-income countries afflicted with corrupt governments or weaker capitalist institutions, or both. This finding could reflect greater moral acceptance on the part of buyers of pirated products or a greater profitability (for a given level of demand for pirated products) of supplying pirated products (or both). It appears that this is mostly a demand-side explanation because greater enforcement (e.g., shutting down Pirate Bay) appears to have little effect on the measured rate of piracy. More precisely, greater enforcement against suppliers of pirated products appears to be ineffective in reducing piracy.

If so, then producers of digital goods face an uncomfortable decision, namely, to coerce their customers to use authorized products only. Indeed, Microsoft appears to have moved in this direction, forcing users to regularly authenticate their software, and imposing modest downgrades of product

functionality. It appears that this is not enough to dissuade a significant number of buyers from choosing the pirated products, which are cheaper or perhaps even free.

Two sets of research questions arise. The first relates to pricing. In effect, countries with higher rates of piracy have a lower willingness to pay for the authentic product. If so, might the problem lie in how the authentic product is priced? It would be interesting to know if Microsoft has experimented with discounts and other ways of tweaking its price and what this tells us about the implied willingness to pay for pirated products. It may well be that Microsoft is already pricing optimally, given the ineffectiveness of supply-side enforcement efforts.

A second, and related, question is whether customers should be induced to eschew pirated products by downgrading the functionality of pirated products by denying updates and patches. Such a strategy may also be costly because some legitimate users may be incorrectly classified as using unauthorized software. Other possible costs include greater security risks for legitimate users (a larger fraction of unauthorized users may have compromised machines), legal liability, and reputation costs.

It is obvious that such an exercise requires estimates for the willingness to pay for the authentic product as well as the willingness to pay for the pirated product. More generally, sensible estimates of the demand would also help inform us about the magnitude of the lost revenue and profits. It is striking, though perhaps not surprising, that the chapter is silent on the issue. However, any such exercise must also take into account competitive conditions. It may well suit a dominant producer to have its product crowd out a possible competitor, be it an alternative operating system product (Linux) or a competing platform (Apple). Tolerating or even encouraging some level of piracy may be a way to keep competitors at bay. Thus, it would be interesting to explore whether countries with high rates of piracy also have higher shares of Microsoft Windows relative to alternate operating systems.

Regardless, this study makes an important contribution by carefully documenting the incidence of piracy across the world, and correlating it with the level of institutional development of the country.