

**Sponsoring Mobile Data: Analyzing the Impact on Internet Stakeholders**

**Abstract:**

As demand for mobile data increases, end users increasingly need to pay more for consuming data. Sponsored data is a new pricing model that allows content providers (CPs) to subsidize some of this cost. It potentially offers benefits to multiple Internet stakeholders: users can enjoy lower data costs, CPs can attract more users by subsidizing their data access, and Internet service providers (ISPs) can create new revenue streams by charging CPs for sponsored data. However, the distribution of these benefits between different users, CPs, and the ISP remains unclear. Although concerns have been raised that sponsored data disproportionately benefits larger, less cost-sensitive CPs, little attention has been paid to analyzing sponsored data's impact on end users. This paper does so by first formulating an analytical model of user, CP, and ISP interactions for heterogeneous users and CPs and deriving their optimal behaviors. We then show that while all three parties can benefit from sponsored data, sponsorship benefits users more than CPs. These disproportionate benefits are more pronounced for more cost-sensitive users when they receive sponsorship from less cost-sensitive CPs, indicating that sponsored data may help to bridge the digital divide between users who can afford the cost of mobile data and those who cannot. We then show that sponsorship disproportionately benefits less cost-sensitive CPs and more cost-sensitive users, exacerbating disparities among CPs but reducing disparities among users. We finally illustrate these results through numerical simulations with data from a commercial pricing trial.