

Research identifies benefits of the open source software market

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A forthcoming paper in *Marketing Science* by Columbia Business School Class of 1967 Associate Professor of Business, Brett Gordon, in collaboration with Vineet Kumar, Assistant Professor of Business Administration at Harvard Business School, and Kannan Srinivasan, Heinz College Professor of Management, Marketing and Information Systems at the Tepper School of Business at Carnegie Mellon University, finds that commercial open source software (COSS) results in high-quality products, and that despite the free-riding that is inherent in the industry due to information-sharing, the market creates spillover benefits for both consumers and producers. The study features a two-sided model of competition between commercial open source software (COSS) firms, which allows the research to determine the benefits of COSS.

Commercial [open source software](#) (COSS) products, which are privately developed software based on publicly available source code, represent a rapidly growing, multi-billion dollar [market](#). A unique aspect of the COSS market is that many [open source](#) licenses require [firms](#) to make certain enhancements public, creating an incentive for firms to free-ride on the contributions of others. In order to study the efficiency of COSS firms, the researchers created a model that consisted of two firms, a high-quality and a low-quality firm, competing in a vertically differentiated market, in which product quality is a mix of public and private components and a market for developers that firms hire after observing signals of their contributions to open source. The study's model has two interacting markets: a product market consisting of COSS firms that sell software products to consumers, and a developer market where firms

hire developers to create software products.

The model aimed to rationalize several puzzles observed in the industry, such as why Red Hat, a high-quality firm, contributes significantly more to Linux than any other firm and why a market with mandatory sharing can actually produce higher-quality products than a proprietary market.

Through their analysis, the professors found that in the shared features market, the high-quality firm creates additional open source features, whereas the low quality firm does not. Both firms also develop some degree of usability. The high-quality firm contributes to open source because the complementary nature of features and usability increases the value of differentiating on usability, and both firms appropriate the benefits from quality differentiation. As expected, the low-quality firm does not have as many incentives to contribute features, because the low-quality firm can free-ride on the high-quality firm and its marginal value of additional features is lower. Furthermore, diminished competition between firms in the developer market explains the higher quality present in the shared features market, in conjunction with production efficiencies created by mandatory sharing. In terms of overall social welfare, both consumers and the low quality firm are unambiguously better off. Consumer surplus is higher with free-riding because of increased price competition resulting from reduced product differentiation, given the sharing of common features.

Prof. Brett Gordon explains the relevance of the study, "Open source is becoming applicable to more industries – for example, open source has recently made the leap to mobile computing platforms with the release of the Google Android operating system. Overall, we expect the open source market to continue to attract attention, given its impact on product design, pricing, and firm strategy."

More information: <http://mktsci.journal.informs.org/>

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