The impact of open source software on the strategic choices of firms developing proprietary software

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Open source software (OSS) is now posing significant competition to proprietary or closed source software (CSS) in several software markets. In this paper, we characterize the response of a firm developing CSS to the presence of an OSS in its market. In particular, we look at the firm's choice of resource investments to improve quality and the firm's pricing decisions. We are primarily motivated by the following questions: Would a firm producing CSS produce higher-quality software when it faces competition from an OSS than when there is no OSS in its market? Would there be a change in the firm's response if the CSS faced competition from another CSS in addition to competition from the OSS? We show that the firm produces lower-quality CSS when it faces competition from an OSS than when it does not. Also, the quality of the CSS decreases as the quality of the OSS increases. This result holds true even if we consider network effects. When we consider competition from another CSS, in addition to competition from the OSS, then the quality of the CSS could increase or decrease as the quality of the OSS increases. The change in quality depends on how closely substitutable the two CSS are. We also extend our base model to consider: i) competition for resources, ii) uncertainty in resources available to the OSS, and iii) uncertainty about the software development process.