

# Platform Competition and Equilibrium Proportional Fee

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## Abstract

We study platform competition where each platform may charge its merchants in two possible ways: a proportional fee that is a fraction of the product transaction price, or a unit fee that is independent of the transaction price. Proportional fee is shown to appear in equilibrium on a platform that is more efficient than its rival, or when merchants compete in the Cournot fashion. While the equilibrium fee level may rise or fall as compared to unit fee, proportional fee always improves social welfare, and it always hurts competing merchants. Finally, an inefficient platform may successfully break into a market using a fee scheme that is advantageous than the one used by the incumbent platform, and such entry does not necessarily hurt welfare.

**Keywords:** platform competition, proportional fee, unit fee, discount effect, Prisoners' Dilemma

**JEL Codes:** D2, D4, L1, L4

## 1 Introduction

Many market intermediaries make money by charging merchants and consumers for the services provided, and the fee is often a pre-determined fraction of the transaction value. Such arrangement, referred to as proportional fee, is used in a wide range of economic activities such as payment settlement networks, the agency model in retailing, royalty calculation for patent licensing, and ad valorem taxes. In all these activities, an alternative charging method is a per-unit fixed amount of levy that is independent of the transaction price. Commonly known as unit fee, such fee scheme is used in, for example, platform economies, specific taxes, and the wholesale model of retailing.

In recent years, proportional fee has become increasingly popular among platforms for the sale of digital contents such as music, electronic books, hotel and airline booking, and cell phone applications. It is also at the center of some high profile antitrust lawsuits.<sup>1</sup> In most cases, merchants complained about the proportional fee level and, sometimes, the

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<sup>1</sup>Cases related to proportional fee include the ebook case in 2013, the Qualcomm case in 2013, *Ericsson Inc. v. D-Link Systems Inc.* in 2014, and the App Store case in 2018. See Gu et al. (2020) for some other antitrust cases.