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In-house publishing and competition in the video game industry ☆

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ABSTRACT

This paper analyzes two-sided competition in the video game industry. Video game platforms compete for software publishers and gamers and may invest into in-house publishing of own software (games) before they enter competition. Such investments affect the strength of the indirect network externalities between gamers and publishers in equilibrium. If publishers multihome, i.e., if they can release games for multiple platforms, and gamers singlehome, i.e., if they use only a single platform, in-house games reduce the profits obtained by platforms in equilibrium. Consequently, one may suppose that they refrain from investing into in-house games. However, the analysis reveals that an equilibrium where platforms credibly commit to do so cannot be sustained, transforming the game into a prisoner's dilemma. This no longer holds if gamers also multihome, granting monopoly power to platforms on both sides of the market. The benefit obtained by gamers and the level of social welfare are always enhanced with in-house publishing.

1. Introduction

Video games are software products published for use on video game consoles (e.g., Microsoft's Xbox 360, Sony's Playstation 3 or Nintendo's Wii). Video game consoles are platforms offered by hardware manufacturers dealing with software publishers and gamers. The industry exhibits strong two-sided indirect network effects. Both software publishers and gamers obtain value from interacting with each other. The publishers' incentives to port a game to a particular console increase with the number of gamers who use this console. Likewise, the wider the variety of games available on a console, the more attractive it becomes for gamers to use it.

All console manufacturers develop and publish own in-house games. Such 'first-party titles' attract more gamers, which, in turn, increases the value to software publishers of porting games to the respective consoles.[1] By contrast, independent publishers can choose between porting a game exclusively to a single console or to port it to multiple consoles. For example, Electronic Arts redesigned its *FIFA* video game series to make it compatible with multiple consoles, while there are other publishers which ported games exclusively to a single platform.[2]

This paper aims to analyze the importance of indirect network externalities in the provision of in-house games

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[1] The development and the publishing of games is not necessarily integrated in the traditional value chain of the video game industry. In reality, there are many small studios that develop games, while there is a much lower number of publishers in the market. Of course, this does not exclude the case where the development is carried out in-house by publishers (see, e.g., De Prato et al., 2010).

[2] Examples include Konami's *Dance Dance Revolution Universe* that was published as exclusive *Xbox 360* game or Natsume's *Afrika* that was published as exclusive *Playstation 3* game.

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and exclusive games in the video game industry in more detail. Video game console platforms engage in duopolistic competition in the spirit of Armstrong's (2006) two-sided market framework.[3] It is assumed that they can invest into in-house games before entering competition. Such investments allow a platform to gain a competitive advantage over its rival due to the presence of strong cross-group externalities between gamers and publishers. The model helps to understand the effects of in-house publishing on the strength of network externalities and the resulting price strategies of the platforms. It explores the implications for publishers, gamers and for social welfare in general. The paper also analyzes how the equilibrium outcome depends on gamer singlehoming, that is, it shows how the results change if not only publishers can deal with multiple platforms, but also gamers.

The model comprises three types of agents. Video game console platforms charge a license fee to publishers and a fee (i.e., the retail price for the console) to gamers. The platforms balance these fees to maximize combined profits from both sides of the market. The literature on two-sided markets (e.g., Caillaud and Jullien, 2003; Hagiu, 2006; Rochet and Tirole, 2003, 2006) emphasizes the importance of indirect network effects as driver of pricing decisions. The model provides a setting where console manufacturers can strengthen the indirect network externalities by investing into first-party titles before entering competition. Thereby, the paper contributes to the literature on investment decisions in two-sided markets. For example, Belleflamme and Peitz (2010) examine the role of network externalities in investment decisions in a model of platform intermediation between buyers and sellers. They assume that sellers can make investments (e.g., into innovation activities) before joining a platform and investigate the effects of for-profit intermediation on sellers' investment incentives. One further important determinant of pricing decisions in two-sided markets is whether agents singlehome or multihome (see, e.g., Armstrong, 2006; Choi, 2010). The model deals with this issue by differentiating between two market configurations. First, a set-up of duopolistic platform competition is provided where gamers singlehome, i.e., they use a single console, while publishers multihome, i.e., they may release games for both consoles. Given that the gamer market is covered and cannot be extended, this case represents a competitive bottleneck. This implies that a platform immediately captures demand from the rival by either decreasing the price or increasing the variety of games if the rival does not react to these changes. This business stealing effect is not present on the publisher side of the market. The decision of publishers to port games to a console is independent of the decision also to port them to the rival console. This form of multihoming implies a structure of overlapping market shares, granting monopoly power to platforms on the publisher side of the market. In the second configuration, the set-up is modified so that both sides of the market are allowed to multihome in this way. Regarding the video game industry, a scenario with multihoming gamers is particularly relevant for the recent console generations. The emergence of new digital services has made it easier for platforms to differentiate themselves from competitors and to induce gamers to access and use multiple platforms. Therefore, some gamers may choose to own more than only one console (see, e.g., Belleflamme and Peitz, 2010).

Turning to the results, the analysis reveals that platforms will choose a strategy of first-stage in-house publishing in both market configurations, leading to an increase in the level of both consumer surplus and social welfare. This result is noteworthy because platforms only benefit from offering first-party content if they have monopoly power on the gamer side of the market. If this is not the case, i.e., if gamers singlehome, platforms fiercely compete for them and investing into in-house games reduces platform profits in the symmetric equilibrium. Therefore, one might conjecture that platforms refrain from in-house publishing. However, this ignores the business stealing effect on the gamer side of the market resulting from the presence of the cross-group externality. As a result, an equilibrium where platforms credibly commit to refrain from in-house publishing is not sustainable because each platform would have a large deviation incentive. This transforms the game into a prisoner's dilemma.

This no longer holds if gamers can multihome. In this case, platforms have monopoly power on both sides of the market and investments into in-house games increase the gamer demand without stealing business from the rival. Consequently, first-stage in-house publishing is a profitable strategy for platforms. In addition, the aggregate surpluses of gamers and publishers and the social welfare are strictly increased.

The reminder of the paper is organized as follows. Section 2 briefly provides background information on the video game industry and discusses related empirical studies. Section 3 sets up the model and studies the duopoly with singlehoming gamers and multihoming publishers. Section 4 explores the model with multihoming on both sides of the market. Finally, Section 5 concludes.

2. Industry background and empirical evidence

This paper aims to analyze the effects of in-house publishing of software in the video game industry. The results suggest that indirect network externalities are an important determinant of the competitive environment in this industry. From this point of view, the paper is closely related to a handful of empirical studies.

A first empirical study analyzing the importance of indirect network externalities in the video game market is conducted by Clements and Ohashi (2005). They use data from the U.S. market in the period from 1994 to 2001 and estimate the effects of console price and game variety on the elasticity of demand over a console's product cycle. They find that the competitive effect of the strength of the indirect network externality is particularly important towards the end of the product cycle.

Regarding publishers, the trend in the industry is towards making games non-exclusive (Reimer, 2005). Clements and Ohashi (2005), state that only 17% of the

[3] In the market for handheld devices, there are indeed only two big players, i.e., Nintendo and Sony.