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Mobile application pricing

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ABSTRACT

This paper examines the pricing of mobile applications when application providers can either supply consumers directly or through a mobile platform (such as a smart phone or tablet). It is demonstrated that when platform access (i.e., purchasing a device) takes place in advance of application pricing, a non-trivial unravelling problem exists that rules out selling platform access at a positive price. Consequently, all platform revenues come from sharing application provider revenues. It is demonstrated that several restrictive conditions on application providers, such as most favoured customer clauses, can allow the platform provider to earn more profits and charge a positive access price increasing the likelihood the platform is provided.

1. Introduction

In the last few years, applications for mobile devices have become a fully-fledged market. While, previously, mobile carriers sought to sell applications with limited success, it was not until Apple introduced the iTunes application store that consumers with smart phones started downloading applications (or applications) in large volume. This was followed by similar endeavours by other smart phone manufacturers (e.g., RIM) and operating system providers (e.g., Microsoft and Google).

This paper examines the research question: what determines the structure of contractual and pricing arrangements between mobile platform providers (i.e., device manufacturers) and application or content providers? The analysis is motivated by terms that platform owners, Apple and Amazon in particular, have imposed on publishers of applications on their respective platforms. Specifically, there are three broad aspects of the terms platforms set for application providers:

- *Pricing control*: the platform may set the price to final consumers for the application or allow the application provider to do so.
- *Most favoured customer clause*: when the application provider sets final prices, the platform may restrict the ability of the provider to sell at a lower retail price either directly or on another platform.
- *Wholesale pricing structure*: the platform may require a unit price payment for applications from providers (or pay them a unit wholesale price if the platform sets prices) or, alternatively, may receive a payment based on revenue sharing.

At present, the terms are varied. Apple offers a very simple deal for application developers: developers can set the consumer price for their application and, in return, they pay Apple a 30% share of every sale. Apple applies the same price-setting and revenue sharing model to in-application sales (that is, additional purchases from within applications) and to subscriptions. The latter two come with additional restrictions imposed for publishers of digital content that will be outlined below.[1]

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[1] Apple has used the same revenue sharing model for its Mac Application Store for software on Mac computers.

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Amazon initially used a wholesale pricing model for its Kindle eBook pricing whereby publishers would set a wholesale price to Amazon for book sales while Amazon set the consumer price of a book. This is the same model that applies to the sale of physical books. But in 2010, Amazon began offering an 'agency model' similar to the one Apple offered for its new iBooks store on the iPad (and iPhone/iPod). While Apple gave publishers a 70% share of book sales and the ability to set their own price, Amazon offered a menu.[2] If you price below $9.99 for a book, Amazon's share will be 70% but if you price above $10, Amazon only returns 35% to the publisher. Amazon also charged publishers a delivery fee based on the book's size (in kb).

Both Apple, in its terms to digital content subscriptions, and Amazon, in its terms to publishers, also place restrictions on the price providers can set for their digital goods. While the details can vary, broadly speaking, the price on those platforms is not allowed to be higher than the price on any other platforms (including each other). Thus, each imposes a most favoured customer clause.

All of these terms and conditions represent a puzzle as they potentially restrict the incentives of application providers to provide applications on the platform rather than directly (say, through a website). As the provision of applications is a complement to the device or platform, restrictions on their provision may harm sales of those devices. While models and pricing structures appear to change regularly, to date, there has been no economic analysis of the likely equilibrium outcomes in pricing.[3] The contribution of this paper is to provide that analysis.

Highlighted here are two characteristics of those devices and platforms that are important that may allow us to make sense of why these practices by platform providers have emerged.[4] The first characteristic is the role of platforms in mitigating transaction costs for consumers. When consumers either use or purchase content through a web browser, they face costs in accessing that content and also completing those transactions. Application stores have allowed consumers to more easily purchase applications (with one touch) and have also provided security and other benefits that have reduced the transaction costs associated with application purchases. It is this that has made those platforms attractive to application publishers as they can potentially sell more to consumers who would otherwise face transaction costs that where prohibitively high.

The second characteristic is that platform access is usually provided in the form a device. That device is an upfront purchase for the consumer – they need it to access applications (especially to mitigate transaction costs) – and the costs they incur in that purchase are sunk. Thus, the device is a durable good and consumers will, therefore, have to anticipate application prices that will emerge in determining whether the device itself is worth purchasing.[5] It is demonstrated that these two characteristics of mobile devices and platforms combine to generate specific predictions about platform access and application prices.

The environment we model features two agents: (i) an application provider who provides applications with digital content (e.g., books, magazines, newspapers) and (ii) a platform owner who provides access to a platform (i.e., a device like an iPad, mobile phone or eReader) to supply applications. Both the platform owner and application provider potentially charge consumers for their products although the application provider can also potentially supply consumers independent of the platform[6] while the platform owner can impose terms on application providers.

In what follows a specific form of market unravelling is identified that can take place when a platform provider charges for access and then sets terms to appropriate revenue or influence prices by application providers. As noted above, the platform is viewed as providing transactional efficiency so that, without it, pricing of that digital content is constrained (downwards) as the marginal consumer faces transaction costs. When that consumer has already purchased access to a platform, that constraint is lifted and with it, the application price rises.

A non-trivial equilibrium existence issue emerges as a result of this: if the cost to the consumer of platform access is positive, the application provider will set application prices "too high" in the sense that not all consumers who purchase platform access will purchase the application on it. This is not sustainable as an equilibrium as those (marginal) consumers receive negative surplus. Consequently, the only equilibrium that exists involves the platform owner setting access prices at zero and demanding a share of application revenues. While this may not be a business or welfare issue when the costs of platform access are low, it may harm platform development when those costs are more significant.

The issue identified here is related to the 'hold-up problem' as studied by Williamson (1975), Grout (1984) and Hart and Moore (1990) amongst many others. In that situation, agents who make a sunk investment, find that the costs of that investments are not taken into account in subsequent bargaining over trade. This may mean those investments costs are not recouped and so investment does not take place even if both trading parties would be better off with such investment. Here, a similar mechanism is at work but it is the purchase of access to the platform that is a sunk cost for consumers. Once this is done, those costs are not reflected in the demand for applications. This

[2] Apple's pricing for interactive textbooks sold on the iBooks store (announced in 2012) offers the same price setting rights but only up to a point: textbook prices are capped at $14.99.

[3] Boudreau (forthcoming) describes some of the tensions platform owners face in encouraging application development focussing on control versus openness rather than pricing that is the focus of this paper.

[4] Note that economists have examined practices by firms who sell durable goods and then related complementary items in aftermarkets: e.g., printers and ink cartridges or cameras and film. See, for example, Carlton and Waldman (2010). However, in these cases, the durable goods and complementary good providers are the same firm. Here, it is the separation between platform providers and application developers that drives the results.

[5] This is similar to the durable technology analysed by Anderson and Gans (2011) although in their case the technology allowed access to a platform without paying a price.

[6] Chen and Nalebuff (2007) examine other situations where two complementary goods can be consumed independently while Carlton et al. (2010) and Gans (2011) examine situations where bundled goods can be consumed alongside non-bundled complements.