# Multi-homing in ecosystems and firm performance:
## Does it improve software companies' ROA?

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**Abstract.** Joining or leaving a platform ecosystem is a crucial strategic decision for a software producing organization. *Multi-homing* is strategy where a company participate more than one platform ecosystem. A decision to multi-home entails considerable impact for companies, as entering into a new ecosystem always requires investments in, e.g., developing, maintaining and marketing a platform specific extension. While a costly decision, it also opens new markets in domains where customers seldom multi-home, i.e., it is a reliable way to address new markets. Multi-homing strategies are infrequently addressed topic in the literature and their impacts on the performance of the companies are rarely analyzed. In this paper, we study how the decision to multi-home affects to the performance of Finnish game companies. Our results question previous assumptions that multi-homing has a positive impact on firm performance, as our study finds is unable to find support for the differences in performance for single- or multi-homing companies. This might be due to a development in which it is a norm in the market is to publish simultaneously for all ecosystem in order to consolidate their position in the market.

**Key words:** multi-homing, software ecosystems, strategic management, platforms, two-sided markets

## 1 Introduction

The main difference between artificial ecosystems, such as business ecosystems, and natural ecosystems is that the actors of the former are aware of their existence and can make deliberate actions [1]. The conscious action can be, e.g., the selection of the best fitting environment for an individual actor. The actors of the former—the famous lion and antelope from Moore's [2] metaphor—are not able to change the savanna to more suitable environment.

The actors have the capability to make conscious decisions, allowing them to select in which of the competing ecosystems to join. The actors can even decide to join more than one of the competing ecosystems — a behaviour that is referred to as 'multi-homing' [3, 4]. Multi-homing is a significant factor in the competition between ecosystems [4, 5, 6]. As an example, a mobile software developer is multi-homing when it is offering the same

or different products for Google's Android as well as for iOS. The opposite, participating only on one ecosystem is called 'single-homing' [3].

As each ecosystem has an entry barrier [7], the multi-homing strategy incurs new costs for the developing company. In the software ecosystem domain, entry barrier can be, for example, a fee of participation or ecosystem specific development tools or skills needed. For instance, there is a registration fee of USD 25 $ in Google Play[1] and the official development tool is Java-based Android SDK. A membership allowing publication in Apple's App Store costs USD 99 $[2] and iOS applications official development tool iOS SDK supports Swift and Objective-C languages.

In the software context, there are tools to reduce the cost of cross-ecosystem development [c.f. 8, 9, 10]; however, multi-homing is never free even in software domain. Cross-ecosystem development insures cost that are not only technology related, e.g., product management, maintenance, marketing. In addition, the technical cost of using different programming languages and environment used in the different ecosystems also increase the multi-homing costs [11]. Thus, the decision to contribute more than one ecosystem is balancing between gaining a potentially larger market share [5] as well as reducing dependency on a single orchestrator [12] against to the increased costs [13].

Interestingly, the impacts of multi-homing strategy for a company are rarely addressed topic [14]. Most, if not all, of the extant literature of multi-homing focuses on the ecosystem level analyses and bypasses company level investigations. Nevertheless, multi-homing seems to be an ever-increasing strategy due growing importance of ecosystems and platforms in the software business [15], and it will play an in important role in software companies' strategic actions. Therefore, this study takes an empirical approach to study how the multi-homing decision affects the performance of individual actors — posing the research question how does the multi-homing strategy impact the performance of a company? This approach differs remarkably from those of previous studies.

In this study, we analyze the performance of Finnish game companies based on their public financial information. The empirical sample is data of 208 Finnish game companies. We utilize the categorization of developed by Still et al. [16] that created four performance classes for Finnish game companies. In addition we gathered information on the companies' software products, if a company is developing products to the mobile domain and if so, do the companies single- or multi-home. We go on to incorporate additional financial data from Orbis database and analyze if multi-homing game developers differ from the population.

The remainder of the paper is structured as follows. Section 2 presents previous work of multi-homing of software companies. It is followed by a description of the research approach, sampling and research process in Section 3. The following section presents the results while Section 5 discusses on the findings. The final section concludes the study with proposals for future work.

[1] Android Developers – Get Started with Publishing. `https://developer.android.com/distribute/googleplay/start.html`

[2] Apple Developer – Choosing a Membership. `https://developer.apple.com/support/compare-memberships/`

## 2 Related work

In the forthcoming, we will go trough previous studies regarding multi-homing. The literature review is divided into two parts: 1) Surveys on multi-homing in software business domain. 2) Theoretical studies on multi-homing and its impacts.

### 2.1 Multi-homing surveys

The mobile application ecosystems have been a regular study object for multi-homing studies. Several studies have all analyzed multi-homing in these markets [c.f. 12, 15, 17, 18, 19] . However, all these studies have considered ecosystems at different life-cycle phases, making it difficult to compare the results. Boudreau [17] found that multi-homing companies were rare in his dataset of mobile applications during 1999–2004. A decade later, Hyrynsalmi, Suominen and Mäntymäki [15] found also small general levels of multi-homing: only 1.7–3.2% of applications and 5.8–7.2% developers were multi-homing. However, they showed also that from the most popular applications 41–58% and 42–69% from the most important developer were multi-homing. In addition, there seem to be an overall trend that more developers and applications are multi-homed.

In addition to the mobile domain, multi-homing has been studied in a few areas. For example Burkard et al. [20, 21] have studied multi-homing in SaaS CRM solution ecosystems, finding that a small level of developers multi-home in these market. In other industrial domains, a considerable amount of studies has also been published. For example, Rysman [22] has empirically analyzed multi-homing in payment card markets in USA. He showed that customers' concentrate their using on a single card whereas over 60% of the customer have several credit cards.

### 2.2 Theoretical analysis of multi-homing's impact

From theoretical point-of-view, multi-homing effects on the whole ecosystem and on the competition between the ecosystems have been addressed frequently [see 14, 23, for literature reviews]. Sun and Tse [24, 25], for example, presented that the fate of competing ecosystems depends on the single- and multi-homing patterns of the developers. If among competing ecosystems, most of the developers multi-home, it supports the existence of several competing ecosystem. If, however, the developers between competing ecosystems most often single-home, Sun and Tse [24] results suggest that one ecosystem emerges a dominant ecosystem — a monopoly. Hyrynsalmi [14], e.g., used their theory to forecast that several mobile application ecosystems — e.g., Apple's App Store and Google Play [26] — can survive and compete also in the future.

Sun and Tse's [24] theory also states that if the business segment is single-homing market, only one dominant ecosystem will survive. As an example, Microsoft Windows operating system and its dominance in the market can be considered. While competing operating systems have survived in niche customer segments, different versions of Windows operating system control over 90%[3] of the desktop operating system market.

[3] NetMarketShare – Desktop Operating System Market Share. `https://www.netmarketshare.com/operating-system-market-share.aspx`

Eisenmann, Parker and van Alstyne [13] as well as Cusumano [27] have continued this discussion by presenting the effects of multi-homing to the competition of different kinds of business ecosystem. For example, Cusumano [27] notes that customers' strategy to single-home was among the main reasons why VHS versus Betamax battle ended in the extinction of the alternative standard.

Landsman and Stremersch [23] have followed the same line of research. They studied the multi-homing in a game console market and showed that initially a multi-homing strategy hurts the sales of the hardware consoles but this effect melts away when the ecosystem ages. They also divided multi-homing into two different categories: 1) *Seller-level multi-homing* refers to a situation where the same producer works several ecosystem. 2) *Platform-level multi-homing* refers to a case where the product is offered for several ecosystem. While these two are naturally correlated, it is also possible that a produce offers different products for different ecosystem — and that the same product is implemented by different parties to different ecosystem. As an example of the latter, please consider Facebook application that has been produced to Google Play and Apple's AppStore by Facebook, Inc. whereas Microsoft Corporation is the publisher of the official Facebook application for Windows Phone.

As previously discussed, Hyrynsalmi et al. [15] studied multi-homing patterns in mobile application ecosystems. They showed that while overall levels of multi-homing are small, the most used applications are available in all competing software ecosystems and the most important software vendors multi-home. They called these kinds of domains as *multi-level two-sided markets* to depict the difference between the general level of multi-homing and the superstar products' multi-homing rates. They showed that the best performing applications are multi-homed whereas average perfoming applications often are not.

To summarize the literature review, studies empirically surveying multi-homing strategy of software companies are scarce. Furthermore, the multi-homing research often focuses on the ecosystem level by addressing the amount of multi-homers and single-homers [e.g. 12, 15, 23], and analyses on a company-level are rare. There have been previous studies focusing on structuring the impacts of multi-homing on ecosystem as a whole as well as on competition of several ecosystems. However, there seems to be a lack of company level studies analyzing the impact of multi-homing on company performance.

## 3 Research approach

In the following, we will present and motivate the research question of this study. It is followed by a short presentation about the Finnish game industry, which serves as a setting for our study. This section ends in a description of data collection procedures used.

### 3.1 Research objective

Previously, Hyrynsalmi et al. [15] showed that the majority of the most popular applications in the mobile application marketplaces are multi-homed. On the contrary,

they also showed that most of the applications that have not succeeded, measured by the number of downloads or revenue gathered, are single-homed. This leads us to our working hypothesis that *multi-homing companies perform financially better compared to single-homers*. The hypothesis, however, does not take a stance on correlation and causality. That is, in this study we do not assess whether multi-homing leads to a better performance or do well-performing companies decide to multi-home. To summarize, this study focuses on the question:

RQ *Does a multi-homing strategy impact the performance of a company*?

Finnish game scene has had a long tradition on studios publishing for video games for several different platforms from feature phones to game consoles. Only with the growth of mobile ecosystems have we seen a strong increase in companies developing to the mobile domain. It has been noted that the app economy is growing extremely fast, c.f. [14], and we expect this transition have led to higher performance of mobile game companies when compared to non-mobile ones. In addition, competition of mobile ecosystems has been tight, there have been several different ecosystem to which join (e.g. Nokia Ovi) and that multi-homing costs for a mobile application be assumed to smaller than, for example, for a console or PC game. That is, developing a game for several mobile ecosystems is assumed to be cheaper than developing a game for several console ecosystems. Therefore, we pay a special attention in the following analysis on the mobile game companies as we are expecting to see a higher level of multi-homing in this market.

As the second point we focus specifically on the impact of multi-homing. Previous studies have suggested that multi-homing companies would perform better than single-homing companies [15]. These finding are however based on an ecosystem level evaluation, leaving open the question if at a company level publishers that multi-home would perform better than single-homing companies. In this study, we analyze seller-level multi-homing — i.e., do a company work for several ecosystem with same or different products — and performance of multi-homing companies.

### 3.2 Industrial context — Finnish game industry

The game industry in Finland has been in the spotlight due to fast growing companies and even unicorns, technology companies valued over $1 billion, like Supercell and Rovio Entertainment. Dating back to the 1980s, game developers have been more noticeable in the Finnish industrial landscape through demo scenes and early video game developers, such as Remedy Entertainment Oy with its Max Payne series. Not only the international success of a few game developers, but the information technology industry has been the significant growth agent in the Finnish industrial landscape during the 1990s and 2000s. In this growth, the impact of Nokia was significant, not only creating mobile devices, but opening the way for mobile games. The first significant mobile game, Snake, was developed by Nokia and included into several early mobile phone models.

The advent of smart phones changed the digital distribution channels for third party content, with the introduction of application (App) stores, opening opportunities for game developers to create content to mobile devices. Early success stories, such as Remedy Entertainment and, more recent, Rovio Entertainment and Supercell have attracted

venture capital resulting in a strong increase in game industry, specifically companies developing game content to mobile devices.

The not-for-profit hub for the Finnish game industry, Neogames, estimates that the revenue of the Finnish game industry is in the range of 2.4 billion euros in 2015. This is a 33 percent growth compared to 2014. Neogames estimates that the majority of the revenues of the industry comes from exports.

The amount of foreign investment in the Finnish game companies has been significant. In 2014, 11 game studios received capital investment in the sum of 33 million euros and in 2015 Finnish companies receives 36 million euros divided into Eight game studios. In 2015 the Finnish game industry released a total of 150 commercial games, published in several platforms. To date, the Finnish game industry remains mobile driven, where Finnish companies have also resulted in the most successes. In addition to the mobile platforms, most significantly Apple and Android, Steam, the Internet-based digital distribution platform has received significant interest. In addition the Finnish game companies, taking to its roots, published 30 PC or console games in 2015. [28]

### 3.3 Data collection

For this study, we selected a population of a specific type: Finnish video game developers. The game developers were chosen due to two reasons: First, games are products that are frequently offered for several ecosystems. Thus, the video game industry should offer a good amount of information from both single- and multi-homing developers. Second, a crosscut of an industry allows us to see differences in different market domains.

The sample was constructed by downloading a list of all game producing organizations provided by Neogames Finland[4], the not-for-profit hub of the Finnish game industry. The list of companies was downloaded in the end of October 2016. The list contained 277 organizations categorized into the group 'Game development and publishing'. Neogames' list also provides a rough categorization in which market the company operates. As 197 (71.2%) of the companies in the list declares working in the mobile market, we pay a special attention in the analysis to the mobile application ecosystems.

The Orbis database was used to gather financial data for all companies. Companies were identified in the database by name, manually checking for possible miss-classifications during the search. For each company we retrieved; number of employees (last available year), Total assets (10 years), Operating revenue (10 years), Return on Assets (10 years). In addition we had control variables ISO country code and NACE rev. 2 Core industry classification code which were used to check that the financial data was from the correct company.

The companies were individually screened by the authors in order to evaluate each company's focus and strategic options. Each of the companies were checked by following an URL included into Neogames' list, companies were searched online to find publicly available news articles or other data that can highlight if the company is active and if so, whether the company has decided to develop their offering to only one or more than one ecosystem. Going through all of the companies, the authors we able to operationalize if

[4] Neogames – Operators. `http://www.neogames.fi/en/industry-info/operators/`

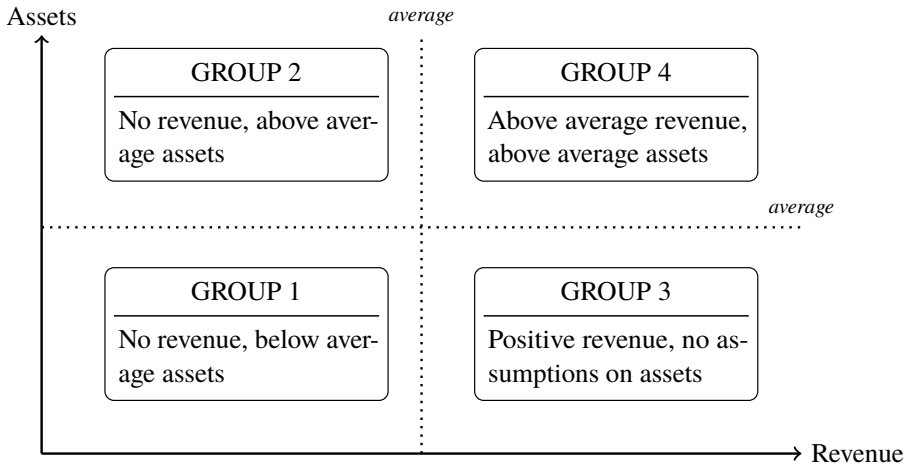


**Fig. 1.** Still et al.'s [16] taxonomy for Finnish game companies

the company was active in mobile, PC or console game market as well as in how many ecosystems.

Out of 277 companies in the list, only 208 were found to be active game developers. We excluded organizations that were closed down, acquired by another company, startups that have not published, yet, as well as companies that were not actually game producing organizations but rather, e.g., animation houses. For all of the 208 companies, we gathered information to which ecosystems they have published. Out of the 208 companies, 158 (76.0%) had published at least one mobile application for modern smart phone operating systems.

Finally, we classified all companies based on the taxonomy presented by Still et al. [16] for Finnish game producing organizations. They used classic fourfold table for their taxonomy: the vertical axis is the amount of total assets and the horizontal axis is revenue. The emerged four groups are presented in Figure 1. The taxonomy is used for allowing us to compare and study companies who are in different phases.

## 4 Results

In the following, we first presents descriptive statistics of the studied game development organization. That is, we illustrate rates of seller-level multi-homing. In the second subsection, we will focus on the performance of the multi-homing companies.

### 4.1 Seller-level multi-homing

Out of the all studied 208 Finnish game producing organizations, 114 (54.8%) has published game or games for more than two ecosystems. That is, a slightly larger population has adopted the strategy of relying on several ecosystems platform. From

**Table 1.** Used dataset and subsets

| Group | N | % |
|---|---|---|
| 'Game development and publishing' companies | 277 | |
| Active game development companies | 208 | |
| *Multi-homers* | 114 | (54.8%) |
| *Single-homers* | 94 | (45.2%) |
| Active companies with a mobile game | 158 | |
| *Multi-homers* | 105 | (66.5%) |
| *Single-homers* | 53 | (33.5%) |
| Active companies without a mobile game | 49 | |
| *Multi-homers* | 9 | (18.4%) |
| *Single-homers* | 40 | (81.6%) |

the 158 organizations who have produced a mobile game, a large majority (105, 66.5%) multi-homes. From 49 companies that have not published a mobile game, only nine (18.4%) multi-homes. Table 1 summarizes the result from the main dataset and the subsets used.

From 158 companies that have published a mobile game: 53 single-home, 70 companies multi-home to two ecosystems and 24 multi-home to three or more ecosystems. For single-homing companies, 35 of the 53 companies are releasing products through Apple's iOS ecosystem. Twenty developers launch products only through Google's Android ecosystem and the remaining eight publish through some other mobile ecosystem. For companies that are active in two ecosystems, 64 publish through Apple and Google ecosystems. Six companies have selected Apple or Google ecosystem and a third ecosystem.

From Orbis database, 272 companies out of the full list of 277 companies were found. Financial information was registered for only 162 companies. However, revenue information was found only for 142 companies. The average yearly revenue in this set is 13,873 k€. However, there is a single company in the dataset which revenue is more than 92 times bigger than the second biggest one. After removing this one, the average yearly operating revenue is 852 k€. The average total asset value is 12,004 k€ for all and 959 k€ without the biggest company. Median for current ratio is 4. There were only 41 companies with current ratio under 1; that is, these are companies that have more debt than assets. In the studied set, there were nine companies which book value equals or is lesser than its basic capital.

### 4.2 Financial performance

By focusing on the active 208 game producing organizations, we found financial data for only 110 companies. In the following analysis, we focus only on these. We apply Still et al.'s [16] taxonomy to the remaining companies. Group 1, Group 2, Group 3 and Group 4 have 34, 32, 72 and 9 members, respectively. The averages and standard deviations of total assets values and revenues of each group are given in Figure 2.

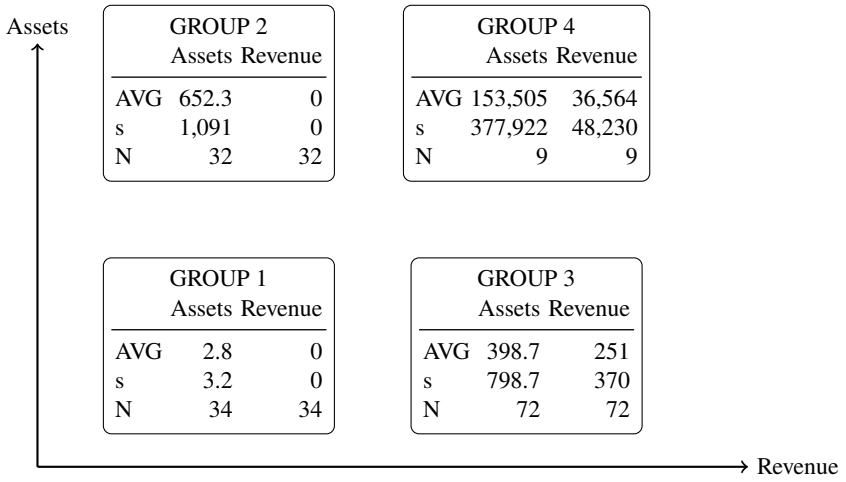


**Fig. 2.** Assets and revenue values (in thousands €) for Still et al.'s taxonomy's classes [adapted 16]

**Table 2.** Groups of non-mobile and mobile game companies

| Group | Non-mobile AVG | Non-mobile Count | Mobile AVG | Mobile Count |
|---|---|---|---|---|
| Group 1 | -20.88 | 10 | -12.46 | 10 |
| Group 2 | 12.79 | 12 | -22.34 | 11 |
| Group 3 | -5.42 | 32 | -4.78 | 26 |
| Group 4 | -15.77 | 5 | 18.45 | 4 |

Table 2 gives the averages of Return on Assets (ROA) for non-mobile and mobile developers, as well as the count of companies in each cell. The number of companies in the matrix has reduced by 41 due to missing data. Based on a qualitative evaluation, major difference are present in Group 2 and Group 4. In Group 2, companies with small or zero revenue but asset value, mobile companies have a negative ROA but non-mobile have a positive ROA. In the superstar Group 4, mobile companies have a positive ROA and non-mobile a negative ROA. For Group 2, we can question is metrics calculating the ROA practical. For Group 4, it seems that the impact of few high performing mobile developers is significant. We employed the Mann-Whitney U test to analyze if companies developing mobile applications differ from companies developing other game software products. We are unable to reject the null hypothesis.

Table 3 reports ROA values for companies that multi-home or single-home. Table 4 isolates the companies that multi-home to two or or more ecosystems. The tables also give counts of companies in each cell. The number of companies included in the table is smaller than the sample due to missing ROA data for several of the companies.

In Table 3, Group 1 seems to be relatively similar between multi-homing and non-multi-homing companies. Major differences are seen with Groups 2 and 3 where multi-homing companies in Group 2 have a negative ROA but in Group 3 a positive ROA,

**Table 3.** Results for single-homing vs multi-homing game companies

| Group | Single-homing | | Multi-homing | |
|---|---|---|---|---|
| | AVG | Count | AVG | Count |
| Group 1 | -10.24 | 3 | -13.41 | 7 |
| Group 2 | 8.86 | 4 | -40.17 | 7 |
| Group 3 | -28.43 | 8 | 5.73 | 18 |
| Group 4 | | | 18.45 | 4 |

**Table 4.** Results for multi-homing for several ecosystems

| Group | To 2 | | To 3+ | |
|---|---|---|---|---|
| | AVG | Count | AVG | Count |
| Group 1 | -15.64 | 6 | 0 | 1 |
| Group 2 | -41.47 | 6 | -32.35 | 1 |
| Group 3 | -1.31 | 10 | 14.53 | 8 |
| Group 4 | 28.15 | 2 | 8.74 | 2 |

but this situation is vice versa for non-multi-homing companies. All of the superstar companies multi-home.

For Table 4, the count of companies isolated to the different groups is relatively small. Specifically the number of companies that would multi-home to three of more ecosystems is extremely small. Interesting differences due exist for Group 3, where companies that multi-home to three or more ecosystems have a positive ROA, but for companies multi-homing in two the ROA value is negative.

We employed the Mann-Whitney U test to test if companies developing mobile applications to two or more ecosystems differ from companies developing products to one ecosystem. We are unable to reject the null hypothesis.

## 5 Discussion

In this study, we examined how a company's strategic decision to either single-home in one ecosystem or multi-home for two or more ecosystems affects the performance of the companies. The performance was measured with the ROA. This type of performance measurement was suggested by Iansiti and Levien [29] to evaluate the productivity of an ecosystem. Our key findings are:

- Multi-homing companies have a negative ROA, whereas single-homing companies have an average positive ROA.
- Multi-homing is far more frequent among mobile game developers (66.5%) than non-mobile game developers (18.4%).
- While the overall seller-level multi-homing rate is remarkable high (54.8%), it still lower than one could expect due to availability of plethora of different multi-ecosystem development tools.

The mobile and non-mobile game companies' ROA are rather similar with a few distinct differences (c.f. Table 2). First, interestingly, the mobile superstars average ROA is positive whereas the non-mobile superstars' average ROA is negative. Overall, as the 'App Economy' is now one of firmly growing business areas [30], the result is not a surprise. Second, there is a remarkable, opposite, difference in Group 2. We interpret that this result means noteworthy investments in mobile game companies while these companies have not yet been able to create stable revenue streams from their products. This observation is in line with the overall argumentation of a fast growth in the App economy. In contrast, the non-mobile companies have a positive ROA, that could suggest that these companies would have a higher expectation to revenue gains prior to investment — this in contrast to the pre-revenue venture capital drawn by mobile game companies.

For game publishers the cross-tabulation of groups and multi-homing patterns reveal interesting ROA averages. For Group 2, which is still nearly pre-revenue but has gained assets, companies who multi-home have a clearly negative ROA, whereas single-homing companies are able to produce on average positive ROA. For Group 3, companies that have revenue, the tables turn, as multi-homing companies have a positive ROA. This behaviour is to an extent surprising. One possible explanation is that companies who have gathered significant investment prior to revenue are expected to multi-home to increase the user base for their products, the benefits of this broad user base would then be visible as the companies move to Group 3 — by gaining revenues.

Our data for companies that multi-home to two, three or more struggles with the low volume of companies in the groups. The performance of companies seem similar, but interestingly by comparing Table 3 and Table 4 we identify that it is in fact the companies that multi-home to three or more than impact Group 3 difference between single- and multi-homing companies. More in depth qualitative analysis should look into the structure of these companies to identify specific reason in making the strategic choice of a multi-homing strategy.

Interestingly, the overall rate of seller-level multi-homing found in this study is surprisingly small. Only a small majority (54.8%) were found to publish more than one ecosystem. When we omit the mobile application developers, the multi-homing rate is small (18.4%). For the developers working with mobile domain, the seller-level multi-homing rate was a considerable higher (66.5%). While this is sharp contrast to the overall levels (5.8–7.2%) reported by Hyrynsalmi et al. [15] in the mobile application markets in the end of 2012, we were expecting to see a higher level of multi-homing in the end of 2016. First, mobile application ecosystems have matured during the previous years and maturation has been seen in growing number of multi-ecosystem development tool and method [10, c.f.]. Thus, multi-ecosystem development should be easier than four years ago. Second, we were focusing specifically on the game domain where one can expected that, e.g., brand value and game flow are far more important than in utility software such as e-mail or flashlight applications.

One possible explanation could be that the requirements of multi-ecosystem development are more more demanding in the game domain that in utility software domain. That is, multi-homing can be more challenging in the gaming due to, e.g., higher performance requirements on operating system and platform compatibility.

To summarize, there has been lots of discussion on multi-homing whereas this study is among the first one to take a look on the performance of multi-homing companies. Our results show that statistically multi-homing game companies do not perform better than single-homing companies. However, there are a few noteworthy limitations that should be taken into account. First, we focused only on the Finnish game companies and assumed that our sample is a convenient for the analysis as it contains new small companies, older ones as well as superstars. However, Finland's game companies might have some specific characteristics that differentiate them from the rest. This puts into question, to which extent the results from our sample is generalizable to the whole population. Second, the companies have been founded at different time points and we do not assess their maturity at all. This limitation should be tackled by a longitudinal approach that would give a more comprehensive picture of the impact of multi-homing. Third, we used quantitative approach that does not pay attention to the nature of multi-homed content. For example, an application vendor might have decided to stop supporting an ecosystem but their old products are still available there whereas the vendor has decided to publish the new games only for another ecosystem. In our dataset, this would still be treated as a multi-homer. Therefore, more qualitative work is need to support the findings of this study and pave a way for further inquiries.

## 6 Conclusion

This paper offers a company level analysis of the impact of multi-homing on firm performance. The study uses the Finnish game companies as the population. The dataset contains a variety of companies from pre-revenue start-ups to unicorns with million dollars yearly revenue. We show that most of the game companies multi-home whether they are well-performing superstars or not. These remarkably differ from the results of Hyrynsalmi et al. [15] who found that most of the superstars multi-home whereas the majority of the application developers single-home. Our findings open the avenue to further analyze the impact of multi-homing. Broadening the number of delivery chains, in the case of mobile companies, would increase the base of potential customer. Thus it would seem that it would be beneficial to multi-home if the entry barrier remains manageable. For further work, we propose that studies should consider the maturity of the company has a variable that might explain changes in the single- or multi-homing choices of companies. Furthermore, a qualitative longitudinal study on the impacts of multi-homing on a company would strengthen the arguments raised from the benefits and challenges of multi-homing.

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