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Finnish game developers' perception on public and private funding sources: a survey analysis

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ABSTRACT

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The aim of this study is to find out how game companies perceive the three traditional funding sources and how well their opinions and needs are reflected on the choices they make. To accomplish this, 20 game companies were questioned about multiple topics with the help of Tekes and Neogames.

The results of this study show that game developers clearly differentiate the three major funding sources and the public sector ends up being the most significant source of external funding. This study also points out that most game companies are indeed facing issues in acquiring funding as well as various other resources.

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Tutkimuksen tarkoituksena on selvittää kuinka pelinkehittäjät suhtautuvat perinteisiin rahoituslähteisiin ja kuinka paljon heidän mielipiteensä ja tarpeensa heijastuvat saadussa rahoituksessa. Tutkimusta varten vastauksia kerättiin useihin aiheisiin liittyen 20 peliyritykseltä Tekesin ja Neogamesin avulla.

Tutkimuksen tulokset osoittavat, että pelinkehittäjillä on selkeät käsitykset pankeista, pääomasijoittajista ja julkisista rahoituslähteistä, joista julkinen sektori osoittautuu myös merkittävämmäksi peliyritysten rahoittajaksi. Tulokset osoittavat myös, että lähestulkoon kaikki peliyritykset kokevat ongelmia rahoituksen ja muiden resurssien hankinnassa.

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1 Introduction

Finland is currently in a situation where it is forced to find and focus on the industries of tomorrow in order to keep up its current standards as a welfare state. One major factor that is speeding up change in Finland's economy is the decline in industries that made the nation what it is today, with the most notable one being Nokia's decreased market share.

There have already been numerous suggestions for what the future pillars of Finland will be and most of them seem to have one thing in common: they are mainly very knowledge intensive high-tech industries. So as it currently stands, Finland is in a rather good situation when it comes to laying the foundations for extending prosperity. This is due to one of our core strengths being excellent technological know-how and the layoffs from Nokia alone have released ICT experts to the job market in the thousands.

The impact that Nokia's troubles have had on the economy of Finland has taught us that instead of looking for a single cornucopia, we should be looking for multiple industries that we can rely on in the future. Some of these future mainstays of our economy are industries like clean technology, life sciences and mining. In addition to these there is also some focus on industries that are currently small but rapidly growing. A prime example of such would be the gaming industry. The turnover of Finnish gaming companies in 2011 was only about 165 million combined, but the compound annual growth rate from 2004 to 2011 was over 22 percent (NeoGames 2011). In addition to a respectable growth rate, the gaming industry has various benefits that make it worthwhile helping the industry getting off to a good start.

There have not been any major studies on the financing of Finnish gaming industry so far and the subject has also seen only minor attention globally. How we view the financing of gaming companies is mostly derived from

studies conducted on software or other high-tech companies and these findings have not been tested enough on the gaming industry. This leads to the purpose of this study, which is two-fold. The primary aim of this study is to test the unique aspects concerning high-tech funding on the Finnish gaming companies. The secondary objective is to deepen the understanding of problems and opportunities that gaming companies face when trying to procure funding.

The desired outcome of this study is to provide clear insight into the financing of gaming companies for both the public and private sector. For the public sector this means better designed measures and programs to ease the constraints on financing gaming companies. For the private sector additional insight should make the gaming industry more approachable as well as reveal what entrepreneurs expect and need from investors.

1.1 Study objectives

The purpose of this study is to find out how gaming companies view the available funding sources and what resources in addition to funding are the most needed. The study objectives are observed from the entrepreneurs' point of view, since there haven't been any previous studies on the matter. This will hopefully provide insight into the minds of gaming entrepreneurs.

The main questions that this study aims to answer are:

- How do gaming companies perceive different funding sources?
- Where do they feel like they need the most help with?
- Have they been able to utilize funding sources that fit them the best?

Secondary questions that this study aims to answer are:

- Are the answers in some way related to the characteristics of the entrepreneur or the company?
- How do challenges in funding a gaming start-up differ from funding a start-up company in software or a more traditional industry?

1.2 Study method

This study will be conducted by gathering information from Finnish gaming companies. The companies will be chosen by using NeoGames' register, which includes a large portion of Finnish game developing and game service providing companies. Information will be gathered via a survey. This should provide enough answers for the study and analyzing the results will be quicker than with interviews.

By using a survey to gather information, it should be possible to get basic information on various topics and thus getting comprehensive data about the gaming industry in Finland from the gaming companies' point of view. The downside to this would be that it is fairly difficult to get in-depth knowledge about their personal views on specific subjects. This leaves some uncertainty about whether it will be possible to truly answer the questions listed in the objectives of this study.

Despite the downside, this method could be the most beneficial one since there have not been many studies performed on the gaming industry in Finland. Hence gathering basic information about the financing situation would definitely serve a purpose.

The results from the survey will be compared to available international studies with similar topics. This should provide some answers to whether the financing situation in Finland is the same as the rest of the world or whether it is distorted because of anomalies, for example the heavy involvement of public sector and the small amount of available venture capital.

1.3 Structure of study

This paper is divided into six main chapters. The first one contains the introduction, what the objectives of the study are and how this study is carried out. The second one includes a short description of the Finnish gaming industry, the current problems that gaming companies face when acquiring funding, what the advantages for Finnish companies are and how the digitalization of distribution channels has affected the industry and made the barrier of entry much lower.

The third chapter consists of general theory about capital structures, corporate financing and different funding sources. This is meant to provide the reader with some understanding on what kind of different factors affect the financing of high-tech companies. This chapter could easily be longer since there are a lot of different aspects and theories regarding corporate finance. In order to keep this chapter compact, the focus has been on topics that are most crucial to gaming companies, for example external equity investments.

Description of the survey will be in the fourth chapter. This is meant to provide the reader with some insight into why certain questions were chosen and what purpose do they serve. The survey questions can be found in the appendices.

The fifth chapter contains the results of the survey as well as the analyses. The chapter begins with a description of the data, which includes some background information about the companies that answered the survey, such as size and age. The remaining results are grouped under certain narrow themes and a separate comparison to the software industry is performed after the individual analyses. The last chapter consists of a discussion on the main findings of the performed survey as well as some suggestions for future research.

2 Gaming industry in Finland

2.1 Industry statistics

Statistics about the Finnish gaming industry have been difficult to gather since it does not have a standard industrial classification of its own and it's easily combined with other software companies and ICT. The only reliable source for turnover, employment etc. figures so far has been NeoGames, which is the Finnish National Centre of Game Business, Research and Development. Reliability is derived from the fact that nearly every gaming company in Finland is also a member of NeoGames.

The global gaming industry is considered to be young and this is also the case with the Finnish gaming industry. This is obvious from the fact that the earliest reliable turnover figures from the Finnish industry can be gathered from 2004. This is mostly due to the fact that in 2010 out of the total 65 game companies operating, 46 had been established between 2006 and 2010. Only 2 currently operating companies have been established before the year 2000. This also explains to a certain degree why in 2010 only 22% of the companies exceeded a million in turnover and 46% had a turnover of 200,000 or less. (NeoGames 2011)

Table 1: Finnish gaming industry turnover 2004-2011, 2012 estimate, in millions (NeoGames 2011, Tekes 2012)

Year	2004	2005	2006	2007	2008	2009	2010	2011	2012e
Turnover	40	65		78	87	87	105	165	250

Even though the gaming industry is at the moment young and small, it can be expected to become a significant part of our national exports in the coming years for two main reasons. Firstly, the compound annual growth rate (CAGR) from 2004 to 2011 is 22,4% and if the estimated turnover of 2012 is correct, then the CAGR from 2004 to 2012 will rise to 25,7%. Secondly, out of the total turnover of the Finnish gaming industry in 2010 only mere 10% came from the domestic market, which makes it extremely export-oriented. (NeoGames 2011)

The Finnish gaming industry was estimated to employ 1264 people in 2011 and this does not include all subcontractors, freelancers and interns, which were estimated to total around 250. This means that in 2011 on average the industry employed 16 per company. Similar to the industry turnover, the growth in employment has also been noticeable, since in 2009 and 2010 the number of employed, excluding subcontractors, freelancers and interns, totaled between 1020 and 1079 and for 2012 the projected direct employment number is over 1500. (NeoGames 2011, Tekes 2012)

2.2 Private and public funding of the industry

The private venture capital in Finland is not in a position where it could meet the financial demands of the rapidly growing gaming industry or the remaining high-tech industries of Finland. Even though it invests annually approximately 400 million euros in Finnish companies, with the exception of 2007, the investments made in ICT have been around 10 percent of total investments (FVCA 2009, 2010 and 2011). The insufficient investments in ICT amongst other high-tech industries are partially explained by the equity investors' lack of knowledge and experience from those industries (MEE 2011). The absence of Finnish private equity has been to some degree substituted with the use of international private equity.

Finnish game industry companies have been somewhat frequently targeted by acquisitions and the lack of Finnish equity investors in the industry is definitely encouraging companies to accept the offers. The latest example of this is Supercell selling a majority share of the company to foreign investors (Reuters, 2013). Often in high-tech industries the targeted companies possess notable growth potential and the reason behind the acquisition is to gain access to the company's intellectual property (Laamanen, 1997). This can lead to situations where gaming entrepreneurs are forced to sell their companies prematurely due to the lack of available funding.

Due to insufficient private funding, the financing of gaming companies in Finland has significantly been on the public sector's shoulders. There are various reasons for this, since there are a lot of difficulties when it comes to funding the gaming industry. One of the biggest obstacles is the high risk nature of the industry, which usually rules out bank loans unless the company's founder can personally place collateral for the loan.

In addition of bank loans, venture capital has also been difficult for a company to obtain. This is because of the fact that there are not many venture capitalists that invest in the Finnish gaming industry. The absence of venture capitalists can be partially explained by their lack of industry specific know-how when it comes to the gaming industry as well as knowledge of high-tech industries in general. (MEE 2011).

Because of the problems that high-tech companies like gaming companies face when procuring funding, the public sector is in a position where it has to find ways to alleviate the situation. The main question is to what extent the government should intervene and what actions should it take.

The currently ongoing Tekes' program Skene is the third program by Tekes that aims to help the gaming industry in Finland. The previous two were Fenix and Verso, which included other high-tech industries in addition to gaming. Both Fenix and Verso lasted for four years, which can be considered a bit too short. For example Oakey (2003) criticized UK's

public sector's programs for being too short and not lasting for at least five years, which was what the companies needed.

The public sector has generally been active when it comes to helping high-tech companies, like gaming companies, grow faster. This has also been done on some occasions with the help of the private sector, which can be considered as one of their principles when it comes to aiding companies in their pursuit of growth. For example Tekes has with the help of the private sector started and followed through several projects that have aided the growth of high-tech companies, for example Vigo.

2.2.1 Public funding sources

The public sector in Finland has set up a pretty comprehensive selection of funding sources that despite the inherent risk of high-tech industries are able to some degree provide financing. The main public funding agencies are Tekes, Finnvera, Sitra, Industry investment, Foundation for Finnish Inventions (FII) and Centre for Economic Development, Transport and the Environment (CEDTE). These five agencies have managed to produce a well segmented net that covers the needs of companies in different stages from establishment to internationalization.

This segmentation of public funding agencies is also meant to provide all the services that a company needs in a specific stage from a single source, instead of having to deal with multiple organizations at the same time. For example FII's focus is on evaluating and developing ideas into businesses and in order to achieve this it provides both funding and consultation. CEDTE on the other hand provides assistance from establishing a company to recruiting the first employees. The largest public funding agency is Tekes, which annually provides financing worth around 600 million euros.

According to a report by the Ministry of Employment and Economy the problem with public funding is that it is slow and complex. Companies need financing quickly in order to continue their growth and operations instead of having to wait long periods of time for decisions. Another issue with it is that it usually focuses too much on research and development and less on what comes after it, for example testing the markets. (MEE, 2011)

Table 2: Major public funding agencies in Finland

Organization	Main focus	Services
Tekes	Research and development	Funding and consultation
Sitra	National economical growth	Funding and networking
Finnvera	Export Credit Agency and corporate funding	Loans, export credit guarantees, equity investments
CEDTE	Growth of SMEs in a certain region	Funding, consultation and education
FII	Commercialization of inventions	Evaluation and assistance in development
Industry Investment	Growth and internationalization	Equity investments in companies and funds

In addition to providing companies with funding, loans, guarantees, etc., the public sector is also an active equity investor. Public equity investments are done through more than one organization but the most

specialized one is Industry Investment, which invests directly into companies and also into venture capital funds, with an intention to remain as a minority shareholder.

2.3 Advantages of the Finnish gaming industry

Finland is considered globally to possess some of the best technical know-how in the world. Apart from a positive association this is a great advantage in an industry that regularly goes through substantial technological changes. These changes include things like going from developing a game to a single platform to creating a game that can be sold on multiple platforms, thus greatly increasing the number of potential customers. (NeoGames 2011)

The technical know-how is also heavily linked to the ability to innovate and create intellectual property that companies have to rely on in order to be successful. To strengthen the innovating capabilities the public sector, especially Tekes, has been actively supporting research and development projects done by start-ups and more mature companies.

The fact that Finnish gaming companies are relatively small and young means that they need to focus on creating games with lower budgets than so-called triple-A games. This proves to be a lesser hindrance to market entrance, since for example the mobile gaming business has been trending for some years. The reason why Finnish companies are able to target the mobile gaming markets is because creating games for mobile devices is less resource demanding. The downside to this is that the marketplace can get crowded and differentiating can become difficult.

2.4 The effect of digital distribution

Perhaps the most important change in the video game business has been the drastic evolution in distribution. The old model basically functioned in a way that all games were sold as physical copies through retailers. This meant that the value chain included five different parts: developer, publisher, distributor, retailer and customer. This model was estimated to leave the developer with around 10 percent of the profits and to be unfavorable to Finnish game developers due to their small size (NeoGames 2010). Even though this model is still used, it is continuously losing ground to digital distribution.

Figure 1: Traditional distribution model (NeoGames 2010)

The new model of digital distribution replaces both distributor and retailer with a distribution channel, which greatly cuts down the costs when combined with the fact that games are no longer sold as physical copies. Fewer middle men and lower production costs can directly be translated into a larger cut of the profits for the developer. The fact that developing and publishing games has become cheaper also means that it has become profitable to develop smaller games which is a significant factor in the growth of the Finnish gaming industry.

Figure 2: Digital distribution channel (NeoGames 2010)

The new distribution model is also a crucial part in the evolution of the traditional and mobile gaming industry. The fact that distributing games globally no longer require substantial investments means that the potential markets for games have grown in various different ways. First of all since games are not required to be physical copies, digital distribution channels are able to sell thousands of different games at the same time without being limited by shelf space. This also means that games are not thrown out of the catalogue when new and better selling games are developed, but instead the shelf life of games are drastically increased. This increased shelf life results in an effect called long-tail, which significantly prolongs the revenue streams from released games.

Another example of market growth is the profitability of niche games. In the old distribution model games had to sell large quantities to be profitable for the entire value chain. With the emergence of digital distribution games are required to sell a lot less to be profitable and the amount of consumers have increased, which in turn enables companies to develop products for niche markets.

3 Theory background

There are numerous theories regarding how companies manage their capital structures. In this section the focus is however only on pecking order theory, as it is has been studied the most with software companies. For example trade-off and market timing theories are not included in this section as their relevance to this study is not significant enough.

3.1 Pecking order theory

One of the most interesting capital structure theories that have been studied on high-tech companies is the pecking order theory. The reason behind this is that high-tech companies seem to be contradicting it.

The basic principle behind pecking order theory is that the best solution for a company is to use retained profits to cover all financial needs, since it is the cheapest source for funding. In a situation where using retained profits is no longer possible, the second most favorable choice for a company is to get a loan because it is the cheaper option out of the available two external financing sources. And as a last resort, when retained profits and loans are no longer options, a company is forced to acquire external equity.

External equity can also be gathered, instead of getting a loan, in a situation where the company feels like its stock is overpriced. This theory is based upon two assumptions: first of all, the managers understand their company better than outsiders (information asymmetry) and second, these managers act in the best interest of the current stockholders. (Megginson 1997, 315)

When it comes to high-tech companies, the pecking order theory is contested, since there seem to be evidence to both support and deny it. Hogan and Hutson (2005a) studied 117 Irish software companies and

discovered that they comply with the theory when it comes to using retained profits as a first option, but fail to do so when retained profits are no longer available. So instead of getting a loan as a second choice, they preferred to acquire external equity instead, thus being in clear breach of the theory. This finding is also supported by Hyytinen and Pajarinen (2005) in their study about the Finnish ICT-sector.

Supporters of the presence of pecking order theory amongst high-tech companies are Giudici and Paleari (2000). They conducted a study amongst Italian high-tech companies that showed only a minor use of external equity. The result can also be explained due to the fact that venture capital activity in Italy is relatively small so it has not been available for high-tech companies in that area. If the lack of national equity investors is a crucial factor, Finnish gaming companies might also appear to be following pecking order theory, even if that was not truly the case.

The fact that high-tech companies like gaming companies are choosing external equity over debt usage is a significant find that should also have an effect on how their financing situation is improved. And since it has been reported that there is a lack of Finnish equity investors in high-tech industries, the survey performed in this study will have equity investors split into three groups: business angels, Finnish equity investors and foreign equity investors.

3.2 Disrupting factors in financing

This chapter provides some insight into a few topics that have a negative effect on the financing of high-tech companies. The common denominator that can be seen in each of them is lack of information and to some extent control.

Most of the problems that game developing companies face when acquiring financing are related to the fact that there is a lack of

knowledgeable funding sources. This is naturally the case with high-tech industries in general, but the problem is especially present in the Finnish gaming industry due to it being young. Perhaps the biggest downside of this is the small amount of Finnish equity investors that actively invest in the gaming industry. This is especially relevant since equity investors are in general seen as best equipped to invest in high-tech industries.

3.2.1 Information asymmetry

Information asymmetry basically means that different parties do not have equal understanding in a situation and regarding corporate finance this means that managers of a company have the best knowledge of the company's current situation as opposed to other parties, such as stockholders. This knowledge can include risks that the company is currently facing and how serious they are, what the future potential of the company is and what the true value of the company is. This leads to a situation where different parties do not have equal understandings and thus it has a negative effect on for example finance negotiations. (Brealey et al. 2006, 490)

Information asymmetry is considered the most notable factor that causes problems to a high-tech company trying to get funding, and even more so if it's a start-up (Brierley 2001). A study by Hogan and Hutson (2005a) demonstrates this well. They asked software companies for example whether they feel like banks understand the business they're in and only 9,4 percent answered yes. This causes tremendous problems for high-tech companies operating in countries where private financing has traditionally come in the form of debt.

Hyytinen and Pajarinen (2005) noted that information asymmetry was a problem especially in industries that rely heavily on research and development. In their study they found that getting a loan was significantly easier for companies doing business in traditional industries than in high-

tech industries. Companies in high-tech industries faced for example higher loan margins or the loans they received were smaller.

3.2.2 Moral hazard

In a situation where an investor has invested in a company, there is a chance that the manager is tempted to use a portion of the received funds in a manner that benefits the manager more than it does the company. This is fundamentally the problem caused by moral hazard. As an example, an entrepreneur that has received an investment can use some of those funds to pay for research that he stands to benefit personally more from than the company.

Moral hazard is thus emphasized in a situation where the company that received an investment operates in a high-tech industry and invests in research and development. This is due to the fact that investors can lack needed know-how for them to be able to assess for example the potential benefits of different research and development projects. The problem of moral hazard can be alleviated notably by structuring the investment in a manner that gives the investor more control in a company and a better view of the daily activities, encourages the entrepreneur to maximize the value of the company and gives the investor a possibility to liquidate his investment. (Denis 2004)

The negative effects of moral hazard are enhanced when you compare owners that have invested equity in the company and banks that have provided loans. The banks, unlike owners, have a clear maximum profit that they can receive, which is determined by the interest on the loan. Thus the owners have a clear incentive to take on projects that have higher potential profits and risks, from which banks only inherit larger risk and do not benefit from the potential profits. (Hogan and Hutson 2005a)

3.2.3 Adverse selection

In addition to moral hazard, information asymmetry can also lead to adverse selection. This means for example that when negotiating a loan, banks have trouble judging which projects are profitable or which business plan is the best because they cannot evaluate properly for example a company's management's capabilities (Binks et al. 1992).

A study by Hyytinen and Pajarinen (2005) found that this is especially the case with industries that do a lot of research and development. They emphasize particularly that the managers always have a better understanding of whether the company will actually be able to go through with the project.

3.2.4 Agency theory

This theory was created specifically to explain what different factors drive managers' decision making, because earlier managers were seen as though they will always strive to maximize the value of the company and benefit all owners. Instead, agency theory describes managers as people that act according to their own benefit. The differences between priorities of owners and managers are usually decreased by using for example various compensation packages. (Megginson 1997, 17)

Holmström (1989) states that companies that do significant amounts of research and development face more problems related to agency theory than others. The problems are usually caused due to the fact that research and development is related to higher risk, because it's based on the assumption that it will provide profits in the future, which is uncertain when making the decision. The fact that research and development also consumes a lot of resources further reinforces the problem. One of the things this leads to is that it is difficult to construct an efficient

compensation package to combat agency theory in a company that does a lot of research and development.

3.3 Equity investors

3.3.1 Methods of investing

A common characteristic for equity investors is investing in a specific industry. This leads to an in-depth knowledge of that industry and thus gives a significant benefit in various situations where an investor needs to for example evaluate or monitor companies. The investors' need to monitor companies is underlined because of the fact that they usually have an option to follow closely companies that they've invested in. This option to follow a company's activities closely is usually due to a seat in the company's board of directors.

The downside to monitoring is that it is time consuming and thus costly to the investor, which can be seen from Lerner's (1995) study which states that investors monitor companies more actively and meticulously when they operate near the investor. Gompers (1995) supports Lerner's finding and adds that equity investors construct the investment in a manner that reduces costs that arise from monitoring and agency theory.

As stated, meticulous monitoring is another common characteristic for equity investors. Due to investors' need to monitor, investments are usually accompanied by various terms that aid them in getting an accurate view of the company and to diminish chances of different harmful outcomes. These harmful outcomes can arise for example from moral hazard which is alleviated by adding incentives for the managers. Other common terms for investments include a possibility for the investors to liquidate their investment, a chance to participate in the operational

activities of a company and a certain amount of decision making power. (Denis 2004)

The second clear benefit that equity investors achieve by investing in a specific industry is the ability to valuate companies more accurately. This is especially true for high-tech industries due to the fact that you have to have certain knowledge of the current technologies and product markets in order to be able to valuate companies (Dahlstrand and Cetindamar 2000). This trait allows equity investors to be able to evaluate companies much more accurately than banks, which is crucial in high-tech industries where companies own mainly assets that are notoriously difficult to evaluate accurately.

In addition to venture capitalists, this in-depth knowledge of a specific industry applies to business angels as well, since they usually make their investment capital in the same industry that they later continue to invest in. The industry specific knowledge of equity investors is supported by Hogan and Hutson's (2005a) study that compared software entrepreneurs' views on competencies of banks and equity investors. For example half of the entrepreneurs believed that equity investors understood the software industry where as only 9 percent believed that the banks did so as well. According to Hogan and Hutson entrepreneurs in high-tech industries do not feel as though information asymmetry is as problematic with equity investors as it is with banks.

Equity investors are also seen as investors that are more capable to find companies that will grow quickly; this is usually referred to as scouting. However, this is not unanimously supported, because some researches link the faster growth rate to the resources that equity investors provide in addition to funding. Colombo and Grilli (2000) state that equity investors are drawn to companies that have competent and growth oriented managers and thus already have prerequisites for a fast growth rate.

Empirical research on how owner's characteristics affect a company's chances to attract equity investors is limited. One of the few studies is

done by Kaplan and Strömberg (2004), according to whom equity investors focus clearly on the competencies of company's managers. Experience from a specific industry is significantly less important. Baum and Silverman (2004) state in their study of biotechnology companies that characteristics and traits that are linked to the company's success are not the same ones that affect the amount of equity the company is able to get.

In addition to finding competent entrepreneurs equity investors also seem to be the best suited to pick fast growing industries, which is crucial to every economy. According to Dahlstrand and Cetindamar (2000) in Sweden equity investors have been successful in finding the fast growing industries of the future and targeting their investments in them. It should be noted that according to them the public sector in Sweden has clearly failed to do so.

Even though the term equity investor contains different types of investors that have a lot in common, their differences should also be noted. This for example helps to illustrate that they do not compete with each other, but instead form a diverse financing source.

Firstly, investments made by business angels are on average smaller and made earlier than those by venture capitalists. Secondly, business angels are seen less aggressive, which means that they invest for longer periods and with a worse risk-reward ratio. Thirdly, business angels are keener to invest in companies in their vicinity even though if it means investing in different industries. Venture capitalists on the other hand tend to invest with a much more narrow scope. (Harrison and Mason 1992a, 1992b)

3.3.2 Non-financial contributions

It is naturally important for companies to possess competencies from different fields in order to succeed. This is especially true for small gaming companies, since it takes a lot of effort to successfully commercialize an

innovation. To do so, a gaming company that usually in a start-up phase only consists of a few people has to be able to come up with extensive marketing, customer service, management, continuous research and development and distribution. This can be considered a major obstacle for gaming companies, since either developing the needed skills internally or purchasing these from outside the company can be very demanding and costly. (Dahlstrand and Cetindamar 2000)

The differences between the methods of banks and equity investors come down to the applied financing instruments. Bank loans have a specified maximum yield where as equity investors do not. This encourages equity investors to use all available resources to guarantee the success of a company. In order to do this, equity investors rely on coaching, which can include an array of different activities that benefit the growth of a company (Colombo and Grilli 2010).

Hellman and Puri (2002) researched 173 companies that had received equity investments and found out that the investors had helped the companies for example to hire marketing and sales professionals and to adopt the use of incentive packages. The use of equity investors' resources to benefit the company seems to be without exceptions.

In addition to coaching, the term scouting is also commonly used with equity investors. This means that equity investors search specifically for companies that they can bring the most added value to with the resources available to them. Baum and Silverman (2004) noted this when they were researching the importance of scouting and coaching to biotech companies.

Madill et al. (2005) studied 33 companies that had received an investment from a business angel to see what the additional resources that equity investors provided the companies were. The most common answer (24 out of 33) was advice. The companies stated that they had received help in financial planning, marketing and strategic planning. The second most common answer (15 out of 33) was contacts. Most of these were contacts

to other companies in the industry, other investors, customers and government officials. 11 out of 33 said they had received help in their daily activities, for example acquiring and furnishing premises, negotiating, recruiting and making PowerPoint presentations. The fourth most common answer (7 out of 33) was that the business angels had helped by being a part of their board of directors. 7 out of 33 also said that the market and business intelligence that the business angels brought was a significant benefit in itself. As examples they mentioned that business angels helped them to recognize customer groups and to find partners for research and development. Lastly, 2 out of 33 mentioned that the presence of investors was a great asset in itself, since other investors would now take them more seriously. These results are similar to other corresponding research on the matter and show that these small companies can benefit greatly from equity investors additional resources.

Table 3: Non-financial resources received from business angels (Madill et al. 2005)

% of cases	Non-financial resource
73%	Advice
45%	Contacts
33%	Help in daily activities
21%	Board of directors
21%	Market and business intelligence
6%	Credibility

In their earlier study, Hellman and Puri (2000) studied whether having equity investors had a significant effect on the company's success in the markets. According to them companies with equity investors found their way to the marketplace faster than average. Equity investors had a

positive effect on the development of the company and they were able to pick companies that had valuable immaterial properties. The study also showed that equity investors favored companies that acted as innovators instead of being imitators.

A study by Colombo and Grilli (2010) shows that equity investors also have a significant positive effect on the company's growth. According to them the additional resources provided by the equity investors remove the effect that entrepreneurs' characteristics have as a growth driver. Entrepreneurs', which did not get equity investors, characteristics are closely connected to the success of their high-tech company. And later when these entrepreneurs were able to get an equity investor, the connection between their characteristics and the growth rate of the company disappears. It is worth noticing that the characteristics that attract equity investors are not the same ones that affect the growth.

Madill et al. (2005) researched how companies were able to provide these resources when they had not been able to get an equity investor. They found out that companies had three significant ways of procuring these resources. Firstly, the most common way was to produce them internally. This was especially the case when it came to business intelligence and networking. Second option was hiring new staff or a consultant. This was the most popular option when the company needed financial assistance. Although not available to all companies, the third option was the board of directors. This was most commonly utilized to provide strategic advice and to make financial connections.

Colombo and Grilli (2010) interviewed 22 companies that had received equity investments. A majority of them stated that after they had gotten an equity investor, it was significantly easier to obtain resources and talent and it was notably easier to work together with other companies. The reason behind this was because the presence of the equity investors acts as a certification and the investors' network of contacts made it easier to deal with certain matters.

3.3.3 Role differentiation

Private equity investors consist mainly of two different parties: venture capitalists and business angels. In comparison to venture capital, investments made by business angels are targeted at companies that need less funding and are in an earlier stage. On average investments made by business angels are less than half of those made by venture capital and they're targeted at companies that are 10.5 months old where venture capital invests in companies that over a year old (Gompers 1995). Another noteworthy distinction between these two is that in a study by Wong (2002) over two thirds of the companies that received an investment from their first business angel had not yet made any sales.

The relationship between business angels and venture capital is usually for this reason seen as complementary instead of being rivals. The investments made by business angels can be characterized as funding that the company needs in an early stage to survive to a point where it is capable of getting a bigger equity investment, for example from a venture capital fund (Denis 2004).

The synergy manifests also when venture capital funds invest in companies that need more financing than business angels could provide and the investments are timed to later stage (Freear and Wetzel 1990). According to Lindström and Olofsson (2001), regardless of the level of technical sophistication or the growth rate, tech companies consider business angels to be the most important external source of financing.

A study by Madill et al. (2005) illustrates well the connection between business angels and other equity investors. As much as 57 percent of companies that had received funding from a business angel were able to later get funding from other equity investors. Respectively, only 10 percent of companies that did not receive funding from business angels were later able to get funding from other equity investors. This relationship was

explained with five reasons. First, companies that want to attract business angels also want to attract other equity investors later on. Second, business angels are seen to be able to pick fast growing companies. Third, business angels help these companies to maximize their potential and thus make good investments later on. Fourth, equity investors see the presence of business angels as a positive sign and it helps to reduce problems arising from information asymmetry. And lastly, the resources provided by business angels are not enough to maximize the company's potential later on, and thus business angels seek to attract more equity investors.

The complementary relationship between business angels and venture capital has also been studied by Harrison and Mason (2000). They noticed that equity investors collaborated in four different ways. First, business angels and venture capital can invest in a company together and thus reduce risk. They can also time their investments in a certain order. Thirdly, business angels can invest through venture capital funds and lastly, they discuss potential investments between themselves.

In addition to the complementary relationship between business angels and venture capital, Chemmanur and Loutskina (2008) also discovered that there is a similar relationship between corporate venture capital and other equity investors. They based this on the finding that companies that had received corporate venture capital had had tremendous troubles raising funds from other sources. They also noted that it plays a significant part in financing new high-tech companies and research and development.

Corporate venture capital is used to describe a situation where a company that does not invest as its main activity makes an equity investment in another company. One of the main problems linked with CVC is that the investor has a clear motive to guide the company in a direction that benefits the investor instead of the company. For example this has been the case with Apple's CVC activity. (Hellman et al. 1995)

Dahlstrand and Cetindamar (2000) point out that corporate buyouts work also as a complementary part of the equity investors. Even though nearly a third of the buyouts in Sweden had targeted companies that had acquired equity investors, the fact that over two thirds had not received equity investments suggests that corporate buyouts are complementary. According to them in Sweden buyouts targeting especially small high-tech companies can act as a complementary funding source that also improves for example growth and some areas of expertise.

3.4. Owners

Especially in smaller start-ups the company's founder and owner is usually the most important person in the company. This is the case as well when it comes to the finance side, since the owner has all the authority. Even though there haven't been large amounts of studies on high-tech companies on this matter, what little has been done shows that there are significant differences between them and entrepreneurs from other industries.

3.4.1 Willingness to give up power

Hogan and Hutson (2005a) studied the financing of Irish software companies and noticed that the entrepreneurs' goals and motivations were different than those of other entrepreneurs. One major finding was that software entrepreneurs were willing to hand over decision making power and instead they seemed to appreciate the opportunities to innovate and maximize the value of the company for a potential sale. High-tech entrepreneurs' willingness to give up power has been studied also by Berggren et al. (2000) who stated that it was the case also with Swedish small businesses in the industry.

Studies on goals and motivations of entrepreneurs operating in more traditional industries have mostly deduced that the owners do not want to relinquish power in any instance. For example Poutziouris et al. (1998) noticed that half of the small businesses in the UK would not consider getting outside equity. This difference can become remarkable in a situation where a company needs considerable financing for investments and growth and is not able to procure funds from banks due to nonexistent tangible assets. The lack of assets that could be used as collateral for a loan can lead to issues where the company is not able to get a large enough loan or the loan margin is too high.

According to Hsu (2002) the willingness to relinquish power is easier when the entrepreneur is dealing with a more competent and renowned investor. In his study of 148 technology start-ups, Hsu noticed that the entrepreneurs chose investors that were the most competent over investors that gave the entrepreneurs the best valuation or offer. A study by Giudici and Paleari (2000) provided similar results from Italian technology entrepreneurs.

3.4.2 Owners' characteristics' influence on finance

In addition to a company's financial state, the characteristics of the entrepreneur influence greatly the usage of different funding sources, especially in a small company. When considering gaming start-ups, the operational cash flows needed to run the company are usually quite small and this makes it possible to use solely the entrepreneur's wealth as a funding source and thus making it the most important characteristic. Wealth can be either savings that are used as a source of income or assets like a house that can be used as collateral on bank loans. Especially the latter can be of great use to a gaming start-up that has hardly any fixed assets.

According to a study done by Scherr et al. (1993) in addition to personal wealth, entrepreneur's management experience affects the probability of getting a bank loan. The study also found out that on average the more an owner has entrepreneurship experience the more often the owner would try to get a loan and that the owner was prepared to tolerate higher amounts of debt.

The owner's age and work experience in general was reported to have a negative effect on willingness to apply for a loan. Colombo and Grilli (2007) discovered that management experience also affects the amount of the loan and that the number of founders has a positive effect on the company's starting capital.

However, according to Hogan and Hutson (2005b), management experience as well as start-up experience does not affect the probability of using venture capital. The only significant variable related to the founders' human capital was education level, which increased the chances of obtaining venture capital. They stated that the reason behind this was that educated founders were more growth-oriented and thus needed more capital to cover the costs.

Åsterbro and Bernhardt (2003) discovered in their study that the probability of applying for a loan was negatively related to the owners' education, work experience and personal wealth. This was mentioned to be due to the fact that more skilled and wealthier entrepreneurs want to finance their business through other means. Hogan and Hutson (2005a) noticed while studying Irish software companies that a majority of the entrepreneurs did not want any long-term debt. Only 26 percent said that they think it is a good way to cover their investment needs while nearly half said that it does not suit them at all. Hogan and Hutson stated that this was not because bank loans were out of their reach, but instead because high-tech companies think that equity investors are much more capable of helping them reach their goals.

According to Colombo and Grilli (2007) the significance of founders' wealth as a source for starting capital was clearly the biggest even with companies that could have gotten a bank loan. Their study also analyzed companies that had acquired some of their starting capital from banks or equity investors and noticed that equity investors had invested a much bigger share of the total starting capital than banks.

Founders of high-tech companies take into account non-financial benefits of funding sources while making financing decisions. The know-how of equity investors is commonly brought up, since it is clear to the founders where they could use assistance. Giudici and Paleari (2000) state that even though Italian high-tech companies were not particularly keen on taking equity investors on board, they still valued the added benefits they could potentially bring. This is especially the case with business angels and other professional equity investors. Hsu's (2002) research supports this as well.

In addition to finance decisions, owners' characteristics have a significant influence on the future of the company for example through indirect effects. One of these effects are that equity investors emphasize less the entrepreneur's capabilities to successfully commercialize or market products, since they themselves aim to be competent in areas that are not core functions of the business. A study by Colombo and Grilli (2010) concluded that equity investors invest in companies that operate in industries that the equity investors are experienced in and thus be able to act for example as advisors in operative and strategic planning.

According to a study by Giudici and Paleari (2000) Italian high-tech companies are not willing to give up shares of the company to financiers unless they are able to provide added benefits for example through know-how. The study also discovered that often when applying for a bank loan, the banks' lack of technical knowledge affected negatively the company's chances of getting a loan.

Table 4. Owners' characteristics' influence on debt financing according to literature (positive or negative)

Characteristic	Applying for debt	Receiving debt	Amount received
Wealth	-	+	
Entrepreneurship experience	+	+	+
Age	-		
Work experience	-		
Education	-		

The importance of debt financing can be significant for a high-tech start-up in regions where equity investments are sparse or nonexistent. In these cases the biggest benefit comes from the owner's previous entrepreneurship experience. Another clear advantage to actually receiving a bank loan comes from the owner's personal wealth that can be used as collateral. Although entrepreneurs seem to avoid debt financing if there is another way of procuring funds. This is especially the case when there's a chance to finance the business through personal wealth. The amount of personal wealth, and thus self-financing the company, is positively related to the owner's age, work experience in general and education.

3.5 Source of finance

3.5.1 Factors affecting the decision

Acquiring the needed funding from outside the company is difficult to a high-tech start-up regardless of the source. Applying for a loan is not an

appealing choice to entrepreneurs for multiple reasons, one of which is that said companies rarely produce enough profit in the start-up phase to be able to cover the costs. This is supported by various studies including Cassar's (2004), which points out that only 20 percent of the start-ups in his study had acquired long-term debt. Another example comes from Giudici and Paleari (2000) who studied Italian high-tech companies. According to them 76 percent of the companies thought that debt financing was dangerous during the start-up period of the company.

Public funding agencies are hindered by sluggishness, bureaucracy and in some cases short-sightedness, this leads to the entrepreneur not getting the needed funding when it's needed or for what it's needed. These shortcomings appear for example when a company has a product that needs to get to the marketplace. The first problem arises when the funding does not get to the company fast enough and there have been changes in the marketplace, for example another product has been introduced that is targeted at the same consumers. Another problem related to public funding is that in some cases companies are not able to get funding for certain purposes like getting to a marketplace or testing the marketplace. (MEE 2011)

Governments especially in countries that tend to invest heavily in research and development should focus on supporting the development of private equity investing instead of aiding companies via the use of debt. This would make it easier for high-tech companies to acquire needed funding. The main reason behind this is that debt is not the optimal way to finance innovations. (Hyytinen and Pajarinen 2005)

Financing a high-tech start-up through the entrepreneur's personal wealth or with the help of the entrepreneur's family and friends is common. This points out that an entrepreneur will have an easier time financing the company if he's well connected or belongs to a wealthy family (Cassar 2004). This highlights the importance of actions by the public sector to bring together entrepreneurial people for example with the help of universities or business incubators.

In addition to knowing the influence of the company's or the entrepreneur's characteristics on the use of different funding sources, understanding the influence of funding sources on the company is also a good idea. Whether a company acquires funding solely from the private or public sector, or from an equity investor or a bank, could have a significant impact on the development of the company. For example Cassar (2004) has linked the usage of different funding sources to the company's performance, bankruptcy risk and growth. Dahlstrand and Cetindamar (2000) noticed while researching Swedish high-tech companies that those who in their start-up phase acquired funding from the public sector were more likely to stay independent. This is explained partly due to the fact that the public sector focuses to a certain degree on industries where corporate buyouts are less frequent.

The problem that high-tech companies often face is that different funding sources do not have enough know-how from their industry. This is essential especially to start-ups that cannot prove their capabilities through merits. The problem manifests in two different ways: first of all, there are not enough equity investors that invest in the industry. Secondly, getting a bank loan is difficult since banks do not possess the needed technical know-how (Colombo 2007). According to Carpenter and Petersen (2002) high-tech companies rarely receive a bank loan and the loan tends to be too small. The insufficiency of bank loans is especially relevant for companies that invest heavily in research and development (Hyytinen and Pajarinen 2005).

A study by Hogan and Hutson (2005a) shows how Irish software entrepreneurs perceive banks as funding sources. 58 percent of them said that banks do not understand the business that they're in and only 9 percent said that banks had understood them. 53 percent thought that banks were not inclined to offer a long-term loan and 18 percent thought that banks were inclined to do so. The research also noticed a significant difference in the entrepreneurs' views between banks and equity investors. As much as 49 percent thought that equity investors understood

the business they're in whereas only 20 percent thought that they did not. Giudici and Paleari (2000) state that the lack of willingness the companies face from the banks is related to the company's size. According to them this manifests itself especially in situations where entrepreneurs think that the banks have not assessed their potential properly.

A survey done by Giudici and Paleari (2000) on high-tech entrepreneurs provided similar results. 96 percent criticized the banks knowledge on high-tech industries. 91 percent did not believe that the banks had evaluated their potential properly and 93 percent thought that the bank loans were too expensive. According to Giudici and Paleari the size and age of the company correlated with the amount of criticism and thus the problem was not tied to the high-tech industry in particular, but to all small companies.

According to Hogan and Hutson (2005a), another difference between banks and equity investors is how much they emphasize fixed assets and cash as an investment criterion. 18 percent of entrepreneurs that answered their survey thought that equity investors emphasize it and 78 percent thought the same about banks.

One significant factor that is affecting the decision of funding source is the fact that high-tech entrepreneurs seem to favor outside equity over debt and thus not following the pecking order theory. Hyytinen and Pajarinen (2002) linked this to the research and development that companies in the ICT industry invest in. In other words, the problems that high-tech companies face when applying for a bank loan are not related to the industry itself, but instead to the growth options that research and development provides. According to Hyytinen and Pajarinen costs arising from information asymmetry are linked only to growth options that are gained through research and development and not through other means. The problem essentially comes down to the banks not being willing to take these growth options as collateral.

3.5.2 How company's age affects funding

Multiple studies have shown that it's typical for high-tech companies to get initial funding from the founders where as equity investors are becoming more frequent in funding the later stages (Cassar 2004, Colombo and Grilli 2007, Bruno and Tyebjee 1985, Manigart and Stryuf 1997). Chemmanur and Chen (2006) also support this finding and emphasize the significance of business angels as source of financing for the early stages. According to Hogan and Hutson (2005a) the initial funding of Irish software companies is also mainly internally generated.

One of the reasons why high-tech companies do not use external sources for financing the early stages is the company's small size. In proportion to the needed funding, for example problems and costs arising from information asymmetry are notably larger than if the company was older and had experienced more growth. Hence due to things like small size, the funding that is offered to these companies is more expensive and smaller, which in turn makes it harder for companies relying on external financing to actually start up their business. The main rule seems to be that the bigger the company is at start-up, the bigger is the share of used external financing. (Cassar 2004)

According to Colombo and Grilli (2007) Italian high-tech companies mainly (84 percent) resorted to the use of owners' wealth when financing the start-up phase. The remaining companies divided evenly between the use of external equity and debt. Even though external equity and debt accounted for equal amounts, there was a significant difference between them: received debt was 47,000 euro on average whereas received equity was six times more than that. So even though the amounts were the same, 22 percent of the companies had used debt to some degree whereas less than 4 percent had received external equity. According to Colombo and Grilli entrepreneurs still thought that external equity was superior to the usage of debt, some of them just weren't able to attract it.

Receiving long-term debt is especially difficult for high-tech start-ups, but this gets easier as the company grows. For example Giudici and Paleari (2000) noticed that older high-tech companies received more long-term debt. According to them this was due to the fact that when a company grows, it accrues more fixed assets which can be used as collateral. Another finding was that the companies' preferences concerning financing do not change over time, more doors just become available.

3.5.3 How company's characteristics affect funding

One of the most significant reasons why high-tech companies such as gaming companies are not able to utilize every funding source is that it does not possess enough fixed assets. There is also a second problem tied to high-tech companies and fixed assets: the possibility that the acquired fixed assets consist of industry specific assets. The two main difficulties that arise from industry specific assets are that they may not be easily liquidated or that it does not corresponded with market value as well as for example properties. If a company's assets are largely industry specific, it could be a notable problem in a small industry like the gaming industry. (Harris and Raviv 1991)

According to a study by Cassar (2004), company's characteristics like company type and willingness to expand operations have a positive effect on the use of external financing, with the exception of bank loans. Cassar also noticed that companies are more inclined to acquire funding outside the traditional funding sources, when the portion of intangible assets out of all assets grows.

Dahlstrand and Cetindamar (2000) studied the difference between companies that provide services and companies that manufacture goods in Sweden. They came to a conclusion that service providers were more able to finance themselves internally, where as manufacturers relied on bank loans as often as they did on retained profits. The use of other

funding sources, such as equity investors and public funding agencies, was much more common with service providers. According to the study corporate buyouts targeted manufacturers more often, because service providers were more capable of using retained profits and when needed selling a minority of the company was enough.

Besides paying attention to gaming companies' characteristics, the industry possesses some noteworthy characteristics as well. One of the biggest issues that gaming companies have to face is that the changes in technology and product markets are rapid. This means that companies must be able to adapt quickly and develop new products for new niches, thus companies have a need for funding that is readily available.

Especially public funding agencies are struggling with slow finance decision processes (Giudici and Paleari 2000, MEE 2011). The length of the financing negotiations was also stated as a problem for Canadian new technology-based firms in a study by Carpentier and Suret (2006). According to Carpentier and Suret the difficulties are caused because high-tech companies operate with such short lasting opportunities.

According to Lindström and Olofsson (2001) these rapid changes in technology and product markets are increasing the problems that gaming companies face when trying to procure funding. Due to changes in technology, high-tech companies often have to be at the very forefront of progress, which makes it notably more difficult to get financing. Changes in product markets and trends also mean that gaming companies often have to introduce novelty products, which also hinders their chances to get funding in the early stages of development.

In addition to the industry's characteristics, some companies in the gaming industry also have to include the product's characteristics in their financial decision making. As an example, network effect can be a major part of a gaming company's product. These characteristics can have a big impact on the needed funding, since the network effect alone can significantly increase a company's financial needs in a short amount of time. A positive

network effect can quickly reveal costs that arise from insufficient bank loans. The possibility of a negative network effect increases the risks involved, since due to it, a company must draw enough users or it will fail in the long run. Since equity investors are more capable of dealing with risks, companies that have to deal with the network effect should favor external equity instead of debt. (Hyytinen and Pajarinen 2005)

4 Performed study

4.1 Research method

The empirical data for this study was gathered using an online survey. The first draft of the survey was created relying on previous studies and research, which was then at a later date adjusted according to Tekes' wishes. The survey was then on March 6th sent forward by Neogames to 45 game development companies in their register as a part of their newsletter. A month later the survey was sent to members of Play Finland, which is a group formed by Tekes and Finnish Game Developers Association.

The survey was closed after 20 companies in total had answered it. It is hard to accurately state what percentage this represents of the Finnish game developers as there is no reliable register. The closest thing to an industry register is Neogames', which is the largest game industry organization in Finland. Their game developer listing has currently 179 companies of which all are not actual game developers (Neogames, 2013). So the true amount of game development companies would be somewhere between one and two hundred.

The online survey was created using Webropol's online survey and analysis software. All of the questions were marked as mandatory, so that the companies had to answer all of them in order to be able to continue. The decision to mark all the questions as mandatory was due to the fact that there were only a small amount of questions in the survey and it was estimated to take around 7 minutes to complete.

4.2 Reliability and validity

In order to determine whether the results of this survey can be considered reliable, the validity and reliability of the study have to be assessed. This is based on the notion that a study must be carried out in a certain manner for the results to truly reflect reality.

Assessing the validity of a qualitative study is a priority since it determines whether the used methods and tests actually measure what is intended. Since this study is conducted via the use of survey, the main issue is whether the questions were understood correctly by all respondents. If this is not the case, then the results cannot be deemed reliable. (Hirsjärvi et al. 2001, 215-217)

In order to make it easier for the respondents to answer the survey, the questions were given in Finnish after checking with NeoGames that the recipients are in fact almost entirely Finnish. This guarantees that the recipients understand the questions better, especially since the questions contain a slight amount of financial terminology. A second beneficial factor is that the questions were simple and short and the themes were easily understandable instead of asking about subjects that require some financial knowledge. Thirdly, the respondents were guaranteed anonymity so they could answer the survey more openly.

Reliability of a study implies that the study can be performed several times over and the outcome would always be the same. In other words, the results of the study are not random. In a qualitative study where the number of respondents is low, this is hard to entirely guarantee. This is enhanced by the fact that most of the questions are linked to individual opinions. Because of this, reliability can only be improved by detailing the execution of the study. (Hirsjärvi et al. 2001, 215-217)

The reliability of this study is further enhanced by linking the results to either other similar studies or existing theory. Also the different stages of this research are discussed openly where needed.

4.3 Interview questions

The gaming companies were questioned mostly about their perception of public and private funding in order to find out where it could be improved, what should not be changed, which funding source they prefer, and so on. In order to accomplish this, I chose four themes from international literature that I decided to get opinions about from Finnish gaming companies. The survey starts however with questions concerning the company and the respondent itself. The gathered background information includes the year of incorporation, respondent's education and work experience, number of founders and employees, turnover from 2012 and the company's year one costs.

Firstly, I asked their opinion on how they perceive different Finnish funding sources understand their business model and the gaming industry. This is followed by questions regarding whether there are major differences between how banks, equity investors and public funding agencies emphasize the meaning of cash, fixed assets and work experience as investment criteria. The answers are given in an ordinary Likert scale with five levels ranging from strongly disagree to strongly agree.

Second part is about their attitude towards using retained profits, debt and external equity. Do they feel like long-term debt is a good way to finance their company or would they prefer using external equity instead? There are also a couple of questions regarding how important they feel owning a majority of shares in their own company is. The answers to these questions are also given in an ordinary Likert scale. The third theme is about where they feel like they need the most help with (marketing, recruitment, finance, etc.) and what different funding sources they have used so far.

Some of the survey questions have been taken from studies by Hogan and Hutson (2005a, 2005b) regarding software companies in order to

make it possible to compare the results between these two industries. This should to some extent show whether software and gaming companies suffer from similar financial restrictions and whether entrepreneurs from these industries view different funding sources in a similar manner. There are also two questions concerning the motivations of entrepreneurs', particularly about their desire to own a majority of their company, which should shed some light on the similarities or differences between software and gaming entrepreneurs.

5 Analysis of results

5.1 Description of respondents

The companies that filled the survey represent well the gaming industry, at least when it comes the age of the companies. Neogames' (2011) report showed that the majority of gaming companies were established after 2006, which also seems to be the case with the respondents of this survey. Only 30 percent of the companies that replied to this survey have been established before 2009, which means that 70 percent have been operating for less than five years. These happen to be the exact same numbers that Neogames' (2011) report had, which suggests that the sample could represent the industry particularly well.

Because of the young age of the companies, this survey should be able to gather opinions especially from game developers that have not been able to benefit from the positive effects that age has on funding. This could also lead to a situation where equity investors are mostly represented by business angels, since venture capitalists are considered to be more interested in matured companies.

But since this survey is heavily targeted on the opinions of entrepreneurs and not that much on gathered funding, this should not have a notable negative effect on the accuracy of this study. This is also supported by a report by Giudici and Paleari (2000) where they stated high-tech companies' preferences concerning finance is not related to the company's age, instead they seem to stay the same.

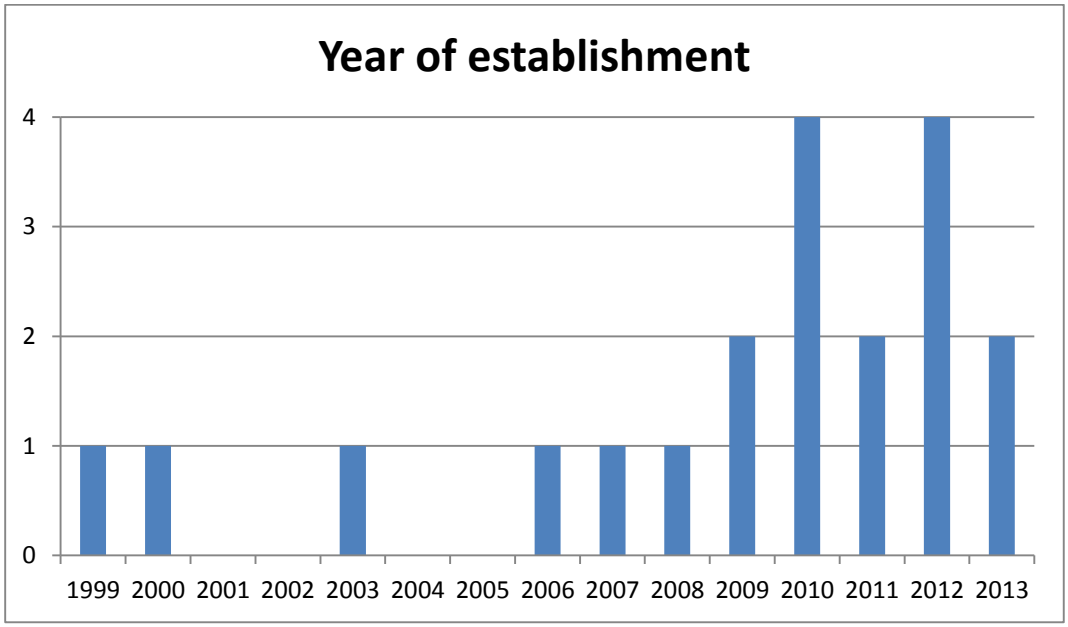

Figure 3: Respondent companies' year of establishment

One surprising finding related to the background information was the education level of respondents. There is no single degree that is represented above others; instead all the respondents are divided into four different degrees of which polytechnic degree is the least picked choice. Master's degree and matriculation examination are both picked by 35 percent of the respondents, whereas Bachelor's degree is picked by 20 percent and polytechnic degree by 10 percent.

This suggests that results of this survey should not be heavily influenced by the positive or negative effects that founders' education level has on financing. Instead this could lead to a situation where the effects of education cancel each other out since both ends are significantly represented.

When combined with the young age of companies, this could mean that venture capitalists are not often utilized as a funding source. The reason behind this is that Hogan and Hutson (2005b) noted a relation between the founders' education level and the chances of obtaining venture capital. High education level also has a negative effect on the use of debt, which

could mean that even though high-tech companies are generally avoiding debt, it could be in a more significant role in the results of this survey.

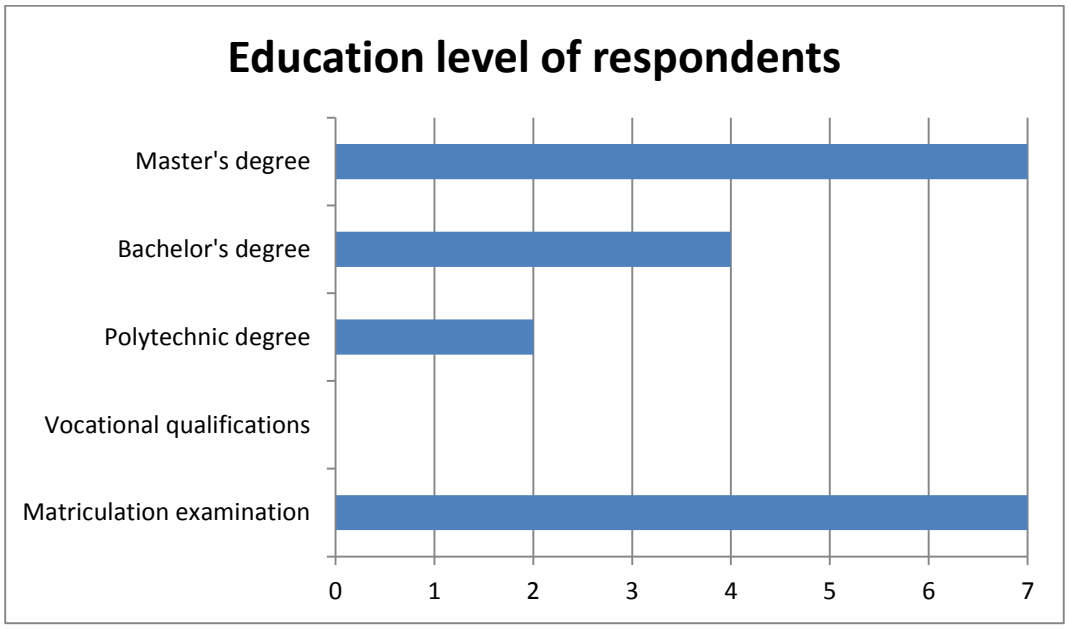

Figure 4: Education level of respondents.

Founders' previous work experience from the gaming industry, management and entrepreneurship also reveal some interesting results. The most notable thing is that work experience between the three categories is nearly the same. This could mean that some of the entrepreneurs have not worked for notable periods in the industry before starting their own companies. It would also seem as though they have not had previous management experience prior to establishing a company.

Table 5: Work experience of respondents (in years)

	Min	25%	50%	75%	Max	Average	Median
Industry	0	2	6	10	18	6,1	5,5
Management	0	2	6	10	15	6,05	5,5
Entrepreneur	0	2	5	10	19	6,6	4,5

In order to verify this, correlations between these three categories are observed. Since Shapiro-Wilk –test shows that the variables are normally distributed the Pearson –test is used to find out the correlations.

The only significant correlations between these variables are entrepreneurial experience's correlation with both gaming industry experience and management experience whereas management and gaming industry experience do not correlate. Out of the two significant ones, correlation is stronger between entrepreneurship and management than it is between entrepreneurship and gaming industry. Although both of these are very close to 0,5, which is considered the threshold between strong and weak correlation.

So even though the previous table suggested that the respondents could have nearly the same experience in each category, Pearson –test proved that this is not the whole truth. This means that gaming entrepreneurs have not as a majority started in the industry as an entrepreneur in a management position. Instead this supports the notion that gaming entrepreneurs have prior to starting their own gaming company either worked in the industry, in a management position in other industries or had been an entrepreneur in some other industry.

Table 6: Correlations in work experience of founders

	Industry	Management	Entrepreneur
Industry		0,2	0,49*
Management	0,2		0,56*
Entrepreneur	0,49*	0,56*	

*: $p < 0.05$

Founders' previous work experience from these three categories does not have a significant importance regarding the probability of using venture capital (Kaplan and Strömberg 2004, Hogan and Hutson 2005b). Instead they are all significant factors that explain the use of debt. And since there have been reports concerning the lack of venture capitalists investing in the gaming industry, companies with entrepreneurs that possess management and entrepreneurial experience are in a better position (Scherr 1993).

The number of founders reveals an interesting fact, only 25 percent of the gaming companies were founded by a single person. And since the average number of founders is 2,4, it can be said that gaming companies are largely founded by multiple persons. This holds various benefits to those companies, since for example according to Colombo and Grilli (2007) the number of founders is positively related to the amount of starting capital. This leads to the possibilities that multiple founders aid the company in financing their operations internally and not having to rely on acquiring external funding as well as having more resources to grow faster.

Table 7: Number of founders in sample companies

	Minimum	Maximum	Average	Median
Number of founders	1	4	2,4	2

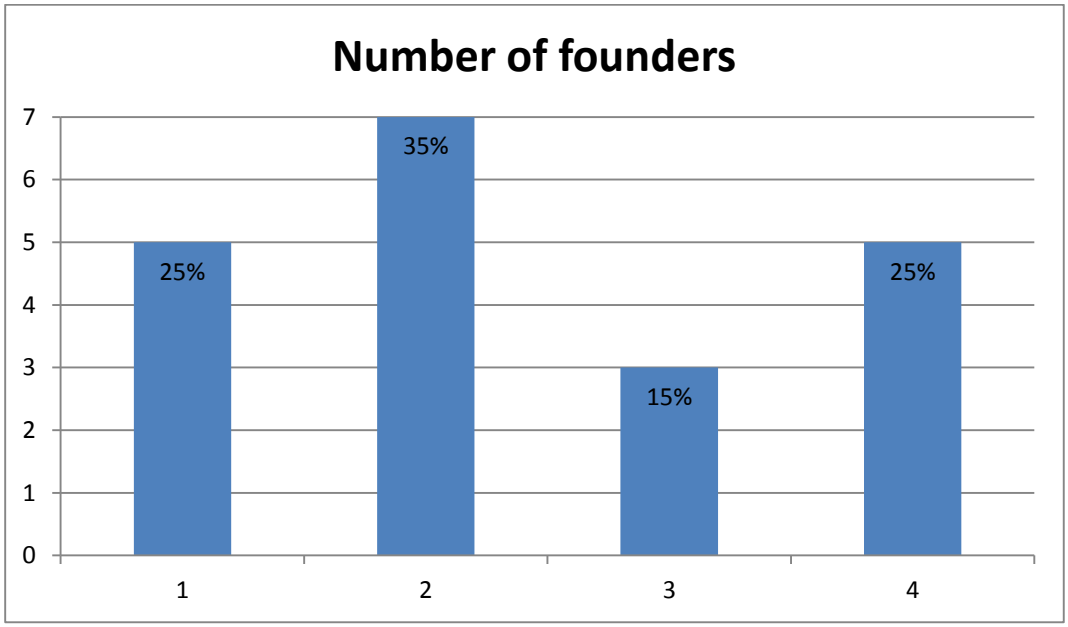

Figure 5: Number of founders in sample companies

The number of employees in the sample firms varies from one to 75. This means that there are multiple companies that don't have any recruited employees in addition to the founder(s). Also up to 55 percent of the game developers only employ a maximum of 5 people.

The average number of employees per company is only 10,85, which strengthens the notion that Finnish game developing companies are relatively small. It can also be explained by the fact that 60 percent of the companies that responded to this survey have been operating for less than four years. A report done by Neogames (2011) stated that a typical Finnish game studio employed 16 people on average, which also supports the notion of Finnish game studios being small.

Table 8: Number of employees in sample companies

	Minimum	Maximum	Average	Median
Number of employees	1	75	10,85	4

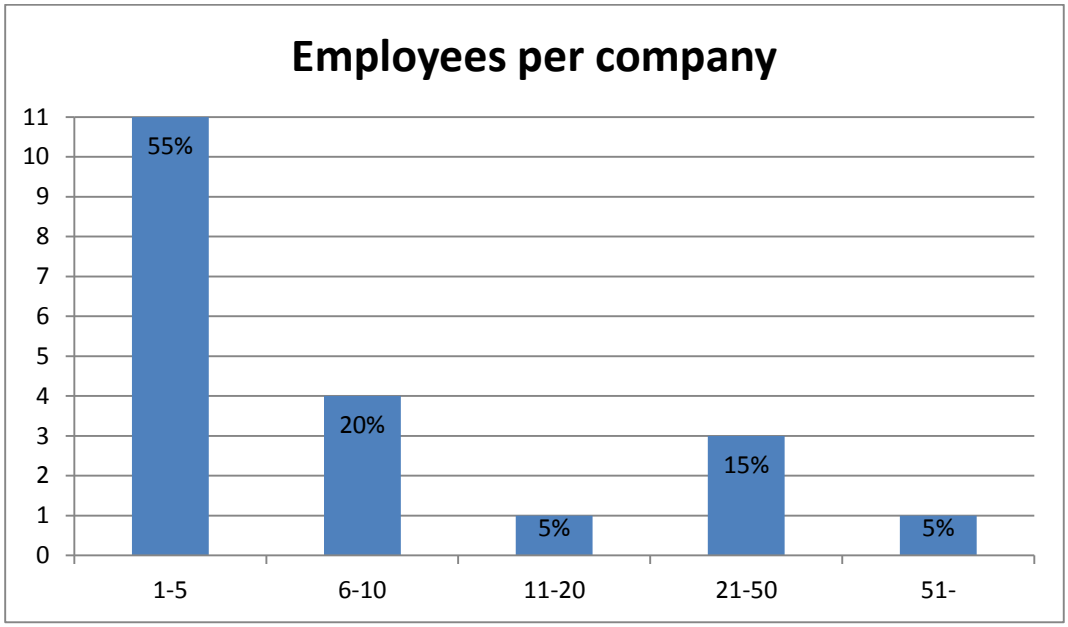

Figure 6: Number of employees in sample companies

Another indicator of company size in addition to number of employees is the company's turnover. As was the case with employees, the turnover from 2012 also varies heavily inside the sample. The average turnover of a company was 336,500 euros and the median 56,000 euros. This means that in addition to using the number of employees the average turnover also supports the notion that the sample companies are small in size.

Table 9: Yearly turnover figures, average and median calculated without outlier (in thousands).

	Min	25%	50%	75%	Max	Average*	Median*
Turnover 2012, n=14	2	12,5	128,5	775	6500	336,5	56

*n=13

30 percent of the companies had to be eliminated from turnover calculations since they were established during or after the year 2012, which left 14 companies in the sample. Also one outlier had to be removed

from mean and median calculations since its turnover was too high when compared to the other companies.

In Neogames' (2011) industry report the average turnover per employee was 75,850 euros in 2008 and 97,300 euros in 2010, which points to a significant increase in productivity. The average turnover per employee of the respondents was much lower. For all the companies that were established before 2012, the average was 38,490 euros and for the companies that had a turnover of more than 25,000 the average was 54,600 euros.

Table 10: Yearly turnover per employee (in thousands)

	Average turnover per employee
All companies	38,5
Companies with over 25,000 turnover	54

The major difference between the results of this survey and those of Neogames' industry report can be to some extent explained by the absence of big developers. Another explaining factor is that in this sample over 40 percent of the companies had a turnover of less than 100,000 euros.

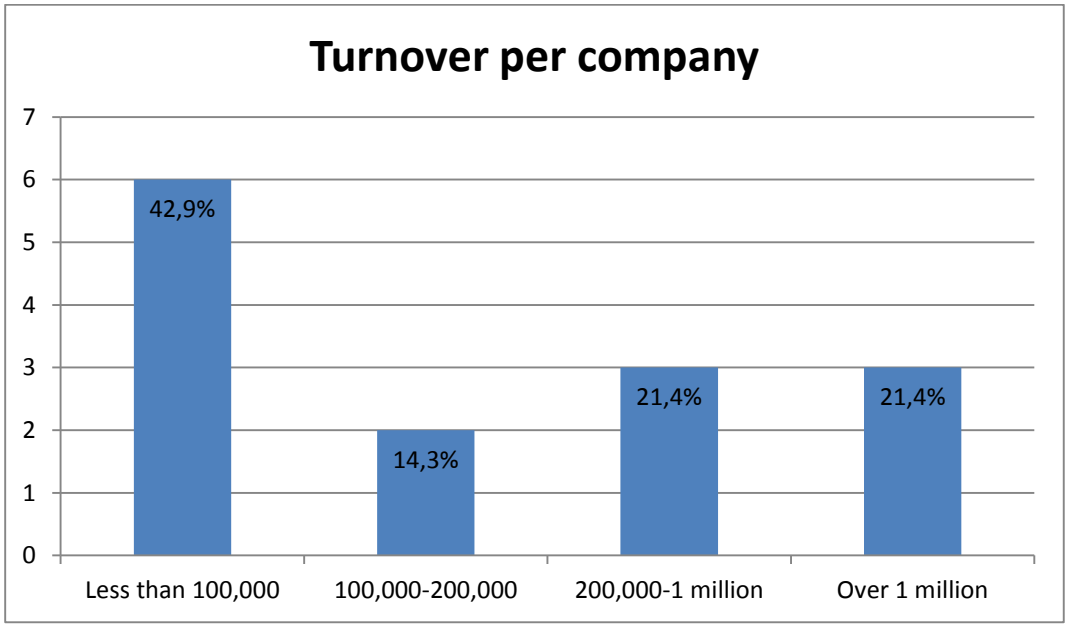

Figure 7: Yearly turnover per company (in euros, n=14)

The costs of operating for the first 12 months after establishment go well together with the previous results. Since 55 percent of the companies are employing only up to five people and running a small scale game development company does not require large investments, the costs of running a gaming start-up are not high. The average year one cost is close to 200,000 euros and the median is 105,000 euros, which means that most of the companies in the sample had significantly smaller year one costs than the average.

The possibility that a game developer company can be established with only a small amount of capital comes as a relief since they generally face difficulties when acquiring funding. This could also partially explain the lack of Finnish venture capitalists in the gaming industry. Reason being that game developers are able to finance themselves internally during the start-up stage and do not have a real need for venture capital. Also they might need it mostly at a later stage when the growth potential has already been realized to some extent.

Table 11: Year one costs (in thousands)

	Min	25%	50%	75%	Max	Average	Median
Year one costs	1	12	140	300	1000	202,1	105

In order to find out whether the number of founders is related to the year one costs, the correlation between these two variables is tested. This is done with the Spearman –test, since neither of these variables is normally distributed. The results of this test show that p=0.160, so these two variables have no correlation. This suggests that the amount of founders that game developer companies have is not linked to the capital requirements but instead serves other purposes.

5.2 How entrepreneurs perceive different funding sources

The first questions after background information are about how entrepreneurs feel regarding the three major funding sources available. The same four questions are asked about banks, private equity investors and public funding agencies. These questions were chosen as they were related to the problems that especially small game developers face when trying to get funding.

First of the four questions is targeted at the know-how of each funding source, since there have been reports that this is one of the main problems. Second question asks directly whether the entrepreneur believes that these funding sources are willing to provide funding. The last two questions are used to measure the respondents' opinion on what are the main investment criterions of each funding source. Together these four questions should be able to give a basic idea on how entrepreneurs view the three main sources for external funding.

The results are shown in two different ways: they are first shown in a table with all the answers and the average for each question and after that there is a figure where the neutral answers are eliminated. The reason for this figure is that in some questions there were a lot of neutral answers and some respondents stated that they used neutral as a “no answer”-option. The figure also illustrates entrepreneurs’ opinions in an easily accessible manner and emphasizes more the positive and negative answers. In the analysis of these results neutral answers are mostly left out, but they’re still present in the average calculations.

5.2.1 Banks

Literature portraits the relations between gaming companies and banks to be somewhat challenging. Banks do not possess the required know-how to evaluate the companies and projects properly and game developers lack fixed assets that can be used as collateral. Therefore banks are not considered to be the best choice for young high-tech companies. Results from this survey show that Finnish game entrepreneurs are no exception to this.

The notion that banks understand the game industry is not supported as only 20 percent of the answers agree to some extent and none agree totally. In fact the most support is gathered by the opinion that they fully disagree with it. Game developers are in general slightly more optimistic about banks’ willingness to provide them with a loan. Still, only 20 percent agree that banks would be willing to do so.

Out of the two questions concerning banks’ investment criterions, cash and fixed assets gather significantly more support than work experience. The difference between percentages that agree with the statements is 35 percent as cash and fixed assets is supported by 50 percent and work experience is only somewhat agreed by 15 percent.

Table 12: How entrepreneurs perceive banks

	Fully Disagree	Somewhat disagree	Neither agree or disagree	Somewhat agree	Fully Agree	Average
Banks understand my business	6	4	6	4	0	2,4
Banks are willing to provide a loan	5	3	8	3	1	2,6
Banks emphasize cash and fixed assets as an investment criterion	1	2	7	8	2	3,4
Banks emphasize work experience as an investment criterion	5	4	8	3	0	2,45

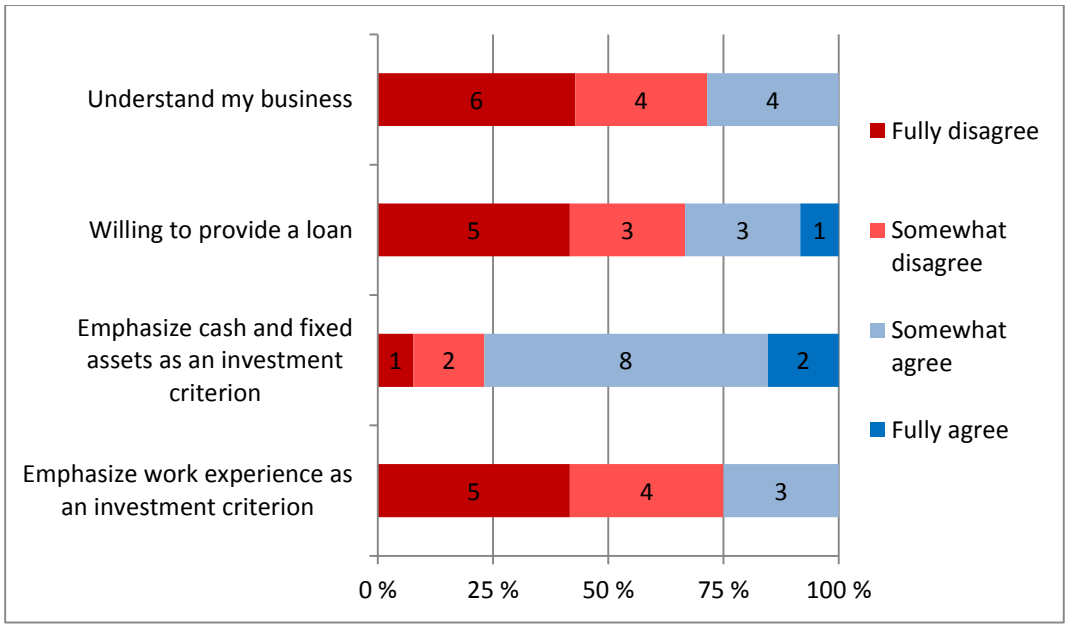

Figure 8: How entrepreneurs view banks, neutrals eliminated

All in all, the results of this survey definitely support existing literature. Entrepreneurs have a clearly negative perception of banks as a funding source, since they do not feel as though they are understood correctly and the emphasis is largely on fixed assets and cash as an investment

criterion. This explains why only a fifth of the respondents agreed to some extent that banks would be willing to provide their company with a loan and 40 percent disagreed.

5.2.2 Private equity investors

The term private equity investor is used to combine both business angels and venture capitalists, since their methods and capabilities are considered to be similar. They are also generally perceived out of all the sources for external funding as the most suitable to invest in high-tech companies. This is amongst other things linked to their industry specific know-how and a higher tolerance for risk. However these notions are not well supported amongst the respondents of this survey.

First and foremost, the belief in private equity investors' superior industry specific knowledge is not present amongst this sample as only 35 percent agree with it whereas 40 percent disagree. The statement that these investors are willing to provide funding for their company is only barely more supported. When combined, these two answers give doubt to the common perception that private equity investors would be the ideal funding source for small high-tech companies. Whether this is linked to the lack of available private equity remains unknown.

When asked whether game developers believe that equity investors emphasize cash and fixed assets as an investment criterion 70 percent neither agreed nor disagreed. It would seem that the respondents are truly neutral towards the statement, since only 25 percent chose the same option when questioned if equity investors emphasized work experience as an investment criterion. The latter was also significantly more agreed upon as 60 percent answered that they somewhat or fully agree that private equity investors emphasize work experience when evaluating investment opportunities. Only 15 percent disagreed with the statement.

These answers suggest that game developers do not feel as though private equity investors are neither especially knowledgeable regarding the game industry nor eager to finance their companies. However, they feel strongly that equity investors emphasize the entrepreneurs' work experience over the company's cash and fixed assets.

Table 13: How entrepreneurs perceive private equity investors

	Fully disagree	Somewhat disagree	Neither agree or disagree	Somewhat agree	Fully agree	Average
PEI understand my business	1	7	5	4	3	3,05
PEI are willing to provide funding	0	7	6	4	3	3,15
PEI emphasize cash and fixed assets as an investment criterion	2	2	14	2	0	2,8
PEI emphasize work experience as an investment criterion	1	2	5	8	4	3,6

PEI = Private equity investors

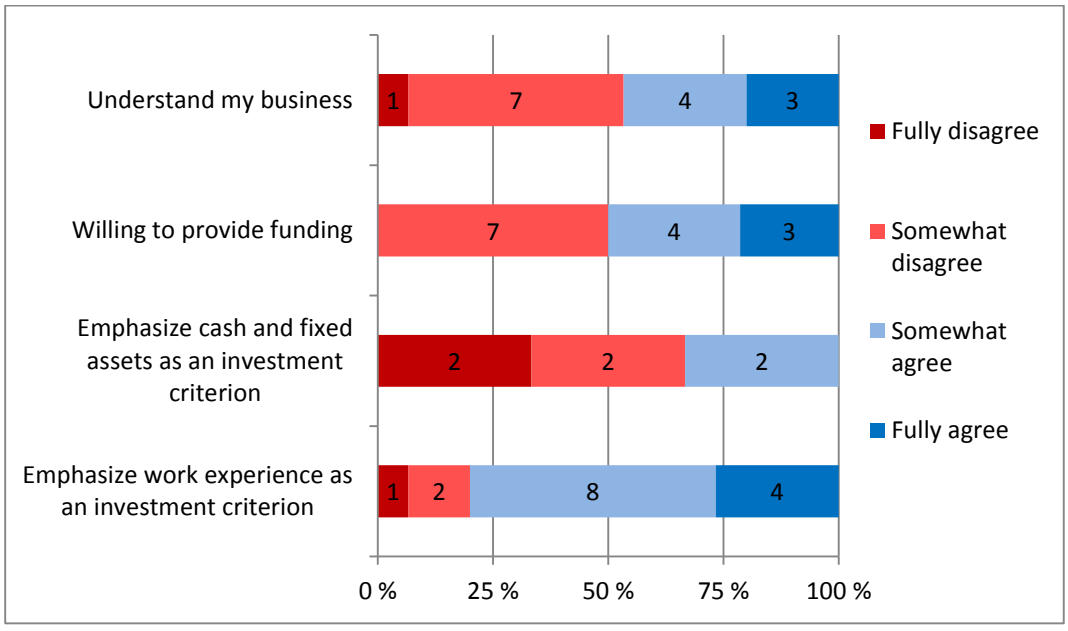

Figure 9: How entrepreneurs view PEIs, neutrals eliminated

The results regarding private equity investors' capability and willingness to invest appear however to be strongly correlated. This means that those who feel that equity investors would be willing to provide funding also feel as though they are being rightfully evaluated. Also those that felt equity investors did not understand the gaming industry responded negatively to the question whether equity investors were willing to provide them with funding.

Table 14: Correlation results from Spearman –test

	Understand my business
Willingness to provide funding	0,71 (p=0.001)

The correlation between these two variables was measured using Spearman –test since Lilliefors –test showed that they were normally distributed.

5.2.3 Public funding agencies

Literature concerning corporate finance is largely focused on the private sector and thus research on how public funding agencies are able to meet the demands of small high-tech companies or game developers is nonexistent. However for countries like Finland where private equity is scarce, these public agencies are especially important and merit exploring. Using the same four questions on public funding agencies should enable basic comparison between private and public funding sources.

Table 15: How entrepreneurs perceive public funding agencies

	Fully disagree	Somewhat disagree	Neither agree or disagree	Somewhat agree	Fully agree	Average
PFA understand my business	0	5	1	10	4	3,65
PFA are willing to provide funding	0	1	4	9	6	4
PFA emphasize cash and fixed assets as an investment criterion	1	3	11	5	0	3
PFA emphasize work experience as an investment criterion	1	2	6	9	2	3,45

PFA = Public funding agencies

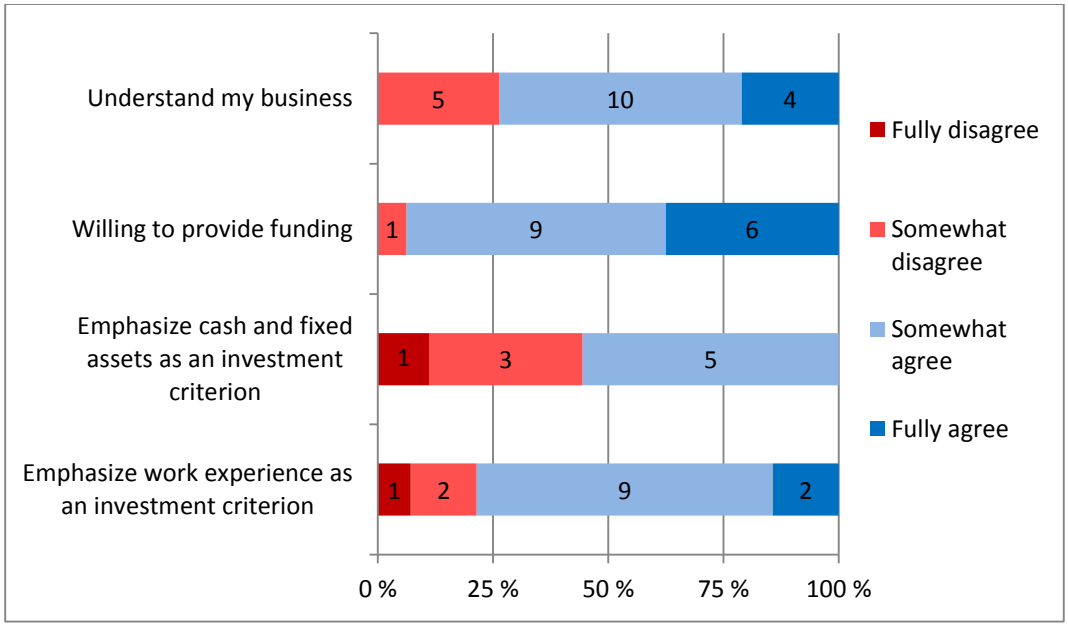

Figure 10: How entrepreneurs view PFAs, neutrals eliminated

First of all, the respondents largely support the notion that public funding agencies understand the gaming industry as 70 percent of them state that they somewhat or fully agree with it. This is an impressively large number for an industry that is considered to be heavily dependent on knowledgeable investors when it comes to financing. Another significant fact is that only one respondent felt neutral about it, which would suggest

that game developers, regardless of size or number of years operated, have a clear perception of public funding agencies. This could indicate that the public sector has been very successful in reaching game developers through various organizations and programs.

The average result for the second question is even more positive as 75 percent of respondents agreed that public funding agencies are willing to provide them with funding. Also similar to the previous question, the number of neutral answers is exceptionally low. But perhaps most importantly, only one respondent chose to somewhat disagree with the statement. Whether respondents feel that the public sector is willing to fund them because it is able to evaluate them, or they think they are being understood because of the willingness to fund is not deductable. Whatever the case is, game developers have a definitely positive perception of public funding agencies.

Similar to private equity investors, the emphasis on cash and fixed assets gathered the most neutral answers. Also those respondents who disagreed or agreed ended up equal, which resulted in the average being three. The last statement regarding emphasis on work experience gathered significantly less neutral answers and ended up being agreed upon as 45 percent somewhat agreed and 10 agreed fully whereas only 15 percent disagreed.

Table 16: Correlation results from Spearman –test

	Understand my business
Willingness to provide funding	0,77 (p=0.001)

As was the case with equity investors, there is a heavy correlation between the perceptions whether public funding agencies understand the gaming industry and their willingness to provide funding. The Spearman –

test was used to determine the correlations since the variables were normally distributed according to Lilliefors –test.

5.2.4 Comparison between funding sources

The way these respondents differentiate the three main sources for external funding is clear. And when it comes to the differences between the two private sources, results are not surprising as they somewhat follow the findings of previous studies. However, the answers regarding public funding agencies bring up very interesting notions, especially when compared to banks and private equity investors.

As mentioned, in literature equity investors are seen as more capable than banks when it comes to investing in high-tech industries, partly because of their know-how. The results of this survey portray the same picture as the average result for equity investors was much higher than for banks. Surprisingly the best average was however given to public funding agencies, which was even significantly higher than that of private equity investors'.

The views on whether these funding sources were willing to provide the entrepreneurs with funding yielded similar results. The lowest average was given to banks as only 20 percent felt that they would be able to get a loan. And as previously, private equity investors received a better average as 35 agreed with the statement and nobody fully disagreed with it. But again the difference between private and public funding sources was immense, as only one somewhat disagreed and 75 percent agreed either somewhat or fully. Combining the answers from the first two questions shows that entrepreneurs' opinions of public funding agencies are clearly the most positive. Out of the two private sources, equity investors are ahead as they are perceived as more able and willing than banks.

However, when questioned about investment criterions the ranking orders change as public funding agencies are placed between banks and equity investors in both results. The results for the third question were burdened by a large amount of neutral answers. In fact 70 percent chose the neutral answer when questioned whether equity investors emphasize cash and fixed assets as did 55 percent for public funding agencies on the same question. The highest average was given to banks since 50 percent felt that banks emphasize cash and fixed assets as an investment criterion.

The number of neutral answers dropped dramatically in the last question when asked whether these funding sources emphasized work experience, which also resulted in growing differences between the sources. In fact the difference between banks and the other two regarding work experience as an investment criterion was the largest out of all questions in this section. The answers regarding banks' investment criterions appear to explain why game developers feel that they would not be able to get a loan.

Table 17: Perception averages by source

	Banks	PEIs	PFAs
Understands my business	2,4	3,05	3,65
Willing to provide funding	2,6	3,15	4
Emphasizes cash and fixed assets as an investment criterion	3,4	2,8	3
Emphasizes work experience as an investment criterion	2,45	3,6	3,45

There was only a slight amount of correlation between the answers as only willingness to provide funding and understanding of the game industry were linked together for private equity investors and public funding agencies. The results regarding banks did not have significant correlations.

5.3 Opinions regarding internal and external funding

In the next section, entrepreneurs were questioned on how they perceived the usage of debt and equity in comparison to each other and internally produced cash flows. Research on high-tech companies suggests that they would be more inclined to use external equity than entrepreneurs in more traditional industries. Results from this survey also support that game developers prefer to use external equity over debt as a type of funding.

Table 18: Entrepreneurs' views on internal and external funding

	Fully disagree	Somewhat disagree	Neither agree or disagree	Somewhat agree	Fully agree	Average
Long-term bank loan suits my company	6	7	2	2	3	2,45
Prefer to use retained profits as much as possible	0	1	4	8	7	4,05
Prefer to use retained profits and debt before external equity	2	7	4	1	6	3,1
Prefer to use retained profits and external equity before debt	1	2	1	11	5	3,85

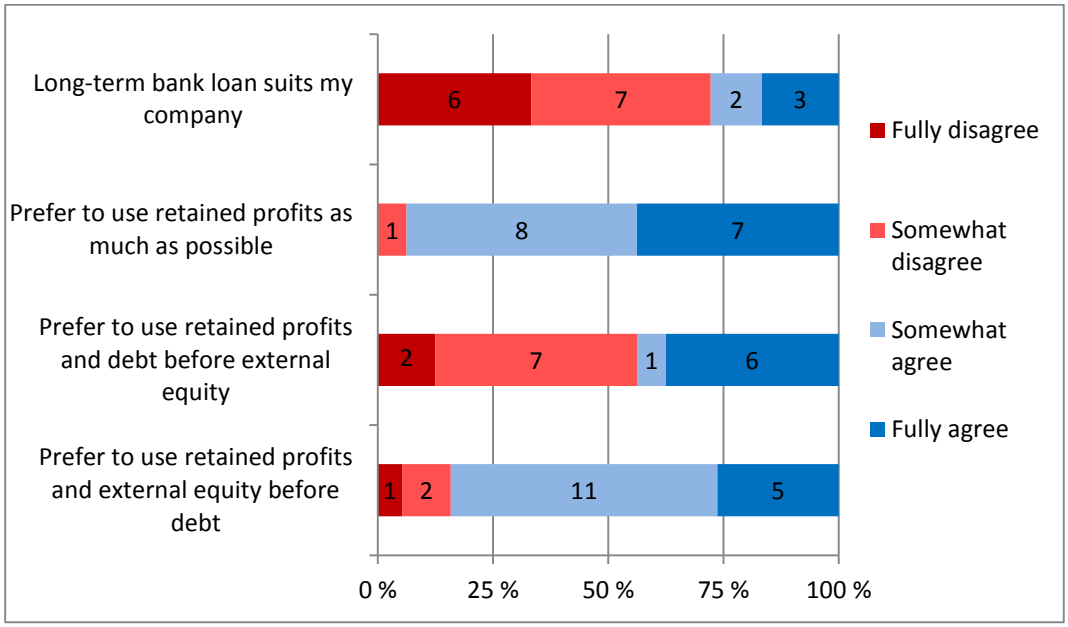

Figure 11: Entrepreneurs' view on internal and external funding, neutrals eliminated

The first question asked whether game developers thought that a long-term bank loan would be a suitable way to finance their company. Up to 65 percent disagreed with the statement, of which 30 percent fully disagreed whereas only 25 percent agreed with it. The average ended up being 2.45 which clearly states that long-term bank loans are not considered to be a preferable way to fund a gaming company. Again, this goes well together with previous studies on high-tech companies where this type of funding is even considered to be dangerous for high-tech start-ups.

The last three questions were used to find out whether pecking order – theory applied to game developers in a sense that they prefer to use primarily internal cash flows, debt second and external equity as a last resort. The average scores ended up however suggesting the opposite as external equity was ranked higher than debt.

Retained profits were clearly the most favored option when it comes to financing the company as only one respondent somewhat disagreed with it. Especially in an industry where external financing can be considered

scarce, using internal cash flows naturally becomes a desirable choice. The use of retained profits and debt over external equity was significantly less popular as only 35 percent agreed with the statement. The rest of the entrepreneurs were slightly divided as 20 percent felt neutral about it and 45 percent disagreed.

The last question in this segment contained the most important answer regarding entrepreneurs' preferences as it confirmed the favoring of external equity over debt. In fact only 15 percent did not feel as though retained profits and external equity were better options than debt and only a single respondent felt neutral about it. This meant that an impressive 80 percent preferred the use of external equity over debt which also makes it the second most agreed upon statement in the entire survey.

5.4 Willingness to give up power

The last two statements of this survey were used to find out how game developers felt about ownership because it is closely tied to the use of external equity. The entrepreneurs were first asked whether they felt that keeping a majority ownership in the hands of founders was important to them.

Table 19: Entrepreneurs' view on ownership

	Fully disagree	Somewhat disagree	Neither agree or disagree	Somewhat agree	Fully agree	Average
It's important that the majority ownership stays with the founders	1	2	0	6	11	4,2
Prefer to own 1% of a 50 million company than 100% of a 0,5 million company	6	4	5	1	4	2,65

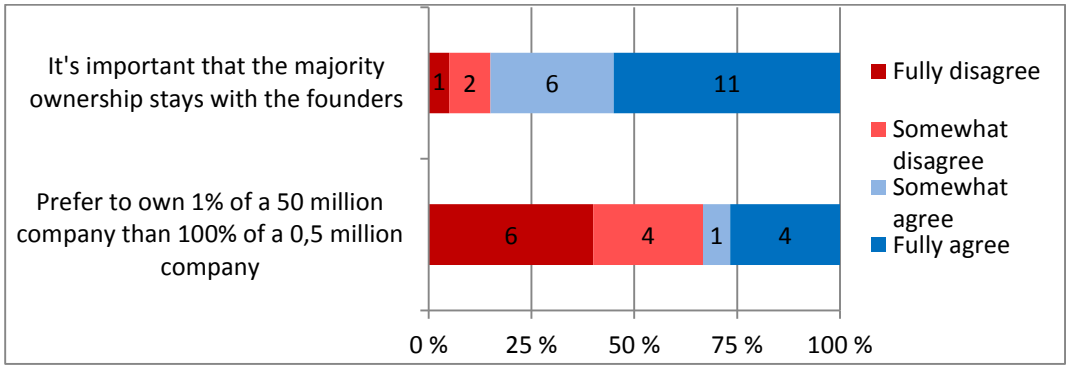

Figure 12: Entrepreneurs' view on ownership, neutrals eliminated

The average answer ended up being as high as 4,2 as 55 percent fully agreed with the statement and 30 percent somewhat agreed. Only 15 percent did not feel as though keeping a majority ownership was important. And since there were no neutral answers, it shows that game developers do largely prefer to stay independent and hold decision-making power amongst founders.

When combined with previous answers regarding the use of external equity it would seem as though game developers do wish to be financed through equity investors but only to a small extent. Naturally this is made easier since the start-up costs of a game developing company can be quite small.

In the last statement entrepreneurs were asked whether they would rather own one percent of a 50 million euro company or 100 percent of a 500,000 euro company. As the value owned is equal in both cases, the question was would they rather be a small part of a large company or completely own a small company.

The answers were similar to the previous questions but not nearly as drastic. Only 30 percent fully disagreed and 20 percent disagreed to some extent, which means that 50 percent of game developers either felt neutral about it or indeed wanted to be a part of a much bigger company. This brings an interesting notion as 85 percent felt that it was important to hold

majority ownership at least to some extent, but only 50 percent preferred to own a company completely if the option was one percent of a much larger company.

5.5 Where entrepreneurs feel a need for assistance

In the next section entrepreneurs were asked what they needed help with, regarding their business. They were given eight different options as well as an open answer, where they could add an answer in case all of their problem areas were not listed.

As can be seen from the figure, the results were scattered between all the options. However, game developers had the most difficult time with acquiring funding, which suggests that there are serious compatibility problems with game companies and available funding sources.

It is also worth noticing the way that the question is phrased. This answer means that 70 percent of game developers are currently having significant problems acquiring funding. The effects that this has on the Finnish gaming industry could be very dangerous if the percentage of game developers having problems growing and operating in an optimal manner is truly this high.

Since there are numerous other aspects that game developers are having issues with as well, it would seem as though funding sources that can bring additional resources and competencies would be most beneficial. Besides funding, developers also are having significant problems with marketing, improving their business model, financial planning and networking with customers, investors and other game companies. Only recruiting does not seem to be a commonly faced challenge for game developers.

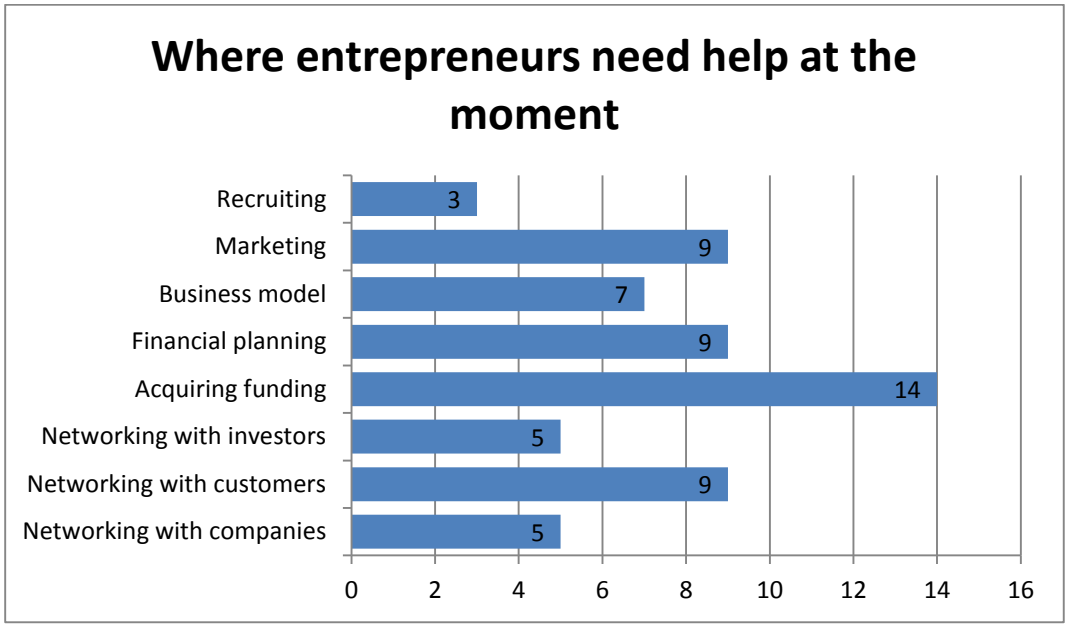

Figure 13: Where entrepreneurs need help at the moment (n=20)

When the respondents are grouped by whether they need assistance in acquiring funding, there are some significant differences especially regarding debt financing. Concerning the background information there are two things that stand out. The first major difference comes in the form of educational background. 83 percent of the entrepreneurs that do not require assistance with acquiring funding have a Master's degree whereas only 14 percent of the remaining entrepreneurs have one as well. The second significant difference regarding the background information of entrepreneurs has to do with the experience in gaming industry. The number of years that they've worked in the industry is nearly 70 percent higher for the entrepreneurs that do not need assistance. The rest of the background information is largely identical between the two groups.

Regarding their perception of banks, none of the entrepreneurs that do not need assistance feel as though banks would not be willing to provide funding. Out of the entrepreneurs that do need assistance 57 percent feels as though banks would not be willing to fund them. These answers clearly point out that the game developers are divided into two groups based on how much they are restricted by the effect of information asymmetry on

debt financing. Combined with the differences regarding background information, it would seem as though the divide reflects how educated and experienced the founders are. This in turn suggests that developers that have personal wealth to place as collateral do not feel the need for assistance regarding funding.

5.6 Used funding sources

In the last part of this survey, entrepreneurs were asked what funding sources they have utilized so far. In order to provide further information, private equity investors, excluding business angels, were divided into Finnish and foreign. There were eight different given options and also an open answer, in case they had used a funding source that had not been listed.

The one thing that developers had in common was that all of them had used personal wealth to fund their company, which was to be expected. However, the number of game developers that had received financing from public funding agencies was significantly high as 70 percent had used it.

The remaining funding sources had been used by much smaller percentages. Additionally, dividing private equity investors by nationality proved to be useful since it shows clearly that foreign private equity investors had been used by three respondents whereas only one respondent had acquired funding from a Finnish private equity investor. These did not include business angels, as they were a separate group.

Only 20 percent of respondents answered that they had received funding in the form of a bank loan, not specifying whether it was a short- or long-term loan. The same amount of respondents had also received funding from family and friends and 25 percent from other private citizens. This emphasizes the significance of networking, since friends, relatives and

other private citizens have funded more than twice the amount of companies that banks have.

Lastly, business angels were utilized by 25 percent of game developers. Since other Finnish private equity investors were utilized in only a single case, it would seem as though business angels are the only realistic option for game developers to acquire both equity based funding and non-financial resources from a Finnish private source.

When combined with the extensive list of things that game developers are having problems with, the low number of cases where private equity investors have been utilized is not ideal. More or less, these last two questions suggest that public funding agencies are in crucial role as a source of funding and as a source for non-financial resources. This is especially true for companies that are not able to attract equity investors, for example due to a remote location or lack of investors' industry specific know-how.

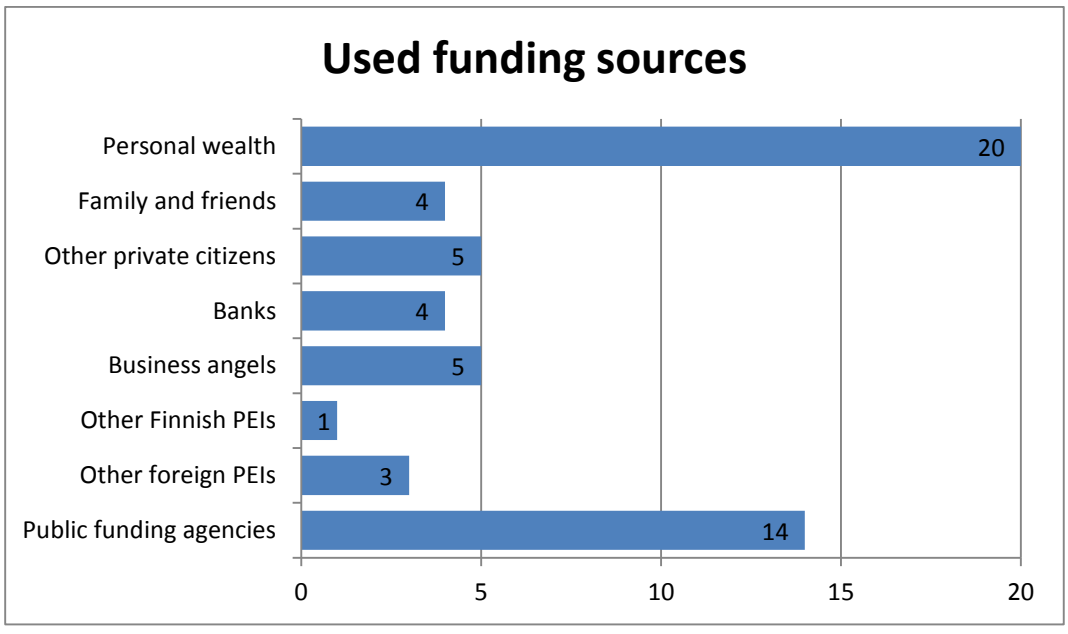

Figure 14: Used funding sources (n=20)

Linking opinions of funding sources to used funding sources reveal a peculiarity. All of the entrepreneurs that have acquired funding from banks seem to be the most negative when it comes to banks understanding their business. In fact, all those who have received funding from banks, answered that banks do not understand their business meaning that none of them agreed with it or were even neutral. This suggests that game developers possess the means to diminish the effect of severe information asymmetry in the case of banks. Whether this is through the use of sufficient collateral or small and short-term loans is not specified.

5.7 Funding the gaming industry in comparison to software

In the last section of this study we compare the results of this survey to results from the software industry. This should provide some information regarding the differences and similarities between these two industries. The results from software industry are gathered from two different studies by Hogan and Hutson (2005a, 2005b). These two surveys are easily compared since a large portion of the questions used in the game developer survey were adopted from these two particular studies.

However not everything can be compared as there are some sections in this study that have not been studied on software companies, for example their views on public funding agencies and where they need assistance. The best comparisons can be made on how the entrepreneurs' views differ on banks and private equity investors, ownership and the use of external debt and equity.

Before comparing their views, the respondents of both surveys are compared in order to find out whether the samples are similar in age, number of employees and number of founders. The purpose of this is to portray how closely these two samples remind each other or if they are significantly different.

In general game developer and software companies have a lot in common as both tend to have very little fixed assets and are mostly valued on the basis of their IP. The products of both industries are also similarly distributed partly through digital channels and start-up costs can be relatively low.

5.7.1 Comparison of samples

Firsts of all, these two samples do not seem to differ significantly according to their age. The number of less than five year old companies in the sample of this survey is 60 percent and 59 percent in the sample for the software industry. The sample used in this survey seems to have more companies that have been operating for less than two years, which means that there are more mature companies in the other sample. But the differences between the samples are minor.

Table 20: Game and software companies by age

	Finnish game companies	Irish software companies
Under 2 years old	30 %	13 %
2-4 years old	30 %	46 %
5-10 years old	25 %	22 %
Over 10 years old	15 %	19 %

The notion of this sample being younger somewhat explains the differences in the next comparison as well, since 75 percent of the game developers employ fewer than 10 people where as only 37 percent of software companies employ the same amount. This means that medium and large sized companies are better represented in the software industry's sample.

Table 21: Game and software companies by employees

	Finnish game companies	Irish software companies
Under 10	75 %	37 %
10-49	20 %	48 %
Over 50	5 %	15 %

Combining these two suggest that the study regarding the software industry consists of generally more mature and larger companies. This could act in their benefit especially in acquiring loans from banks. However the size or age of the company should not affect the preferences of entrepreneurs as previously stated.

Table 22: Game and software companies by number of founders

	Finnish game companies	Irish software companies
one	25 %	24 %
two	35 %	34 %
three	15 %	28 %
four or more	25 %	14 %

The number of founders is almost identical between these two samples as only slight differences appear in the top end options. The fact that game developers have more often had four or more founders means that they have also had a better opportunity to finance their company with personal wealth. Whether either one has been able to use personal wealth to fund a bigger portion of start-up costs, thus having less need for external funds, remains unclear since the year-one costs for software companies are not available.

5.7.2 Comparison of survey results

First off we focus on how entrepreneurs' views on banks differ from each other. Finnish game developers seem to have a more positive notion of banks' abilities to understand their business, although the differences are not major. The number of respondents that disagree or feel neutral about it is pretty equal but the number of entrepreneurs that agreed is twice as large for game developers.

The results for the next question are also similar as nearly a fifth of the companies from both industries think banks would be willing to provide a loan. Regarding the other answers, game companies seem to be more neutral than software companies as over half of software entrepreneurs disagreed with the statement where as only 40 percent of game developers did the same.

The largest differences concerning banks are found in the last statement as up to 77 percent of software companies and 50 percent of game developers feel that banks emphasize cash and fixed assets as an investment criterion. Also only 5 percent of software companies disagree with the statement whereas 15 percent of game developers feel the same.

Table 23: Game and software companies by perception of banks

	Finnish game companies			Irish software companies		
	Disagree	Neither agree or disagree	Agree	Disagree	Neither agree or disagree	Agree
Banks understand my business	50 %	30 %	20 %	58 %	33 %	9 %
Banks are willing to provide a loan	40 %	40 %	20 %	53 %	29 %	18 %
Banks emphasize cash and fixed assets as an investment criterion	15 %	35 %	50 %	5 %	18 %	77 %

Next comparison is focused on entrepreneurs' views on private equity investors. There is a slight difference between how software companies were approached as they were questioned about venture capitalists whereas game developers were questioned about private equity investors in general.

Both industries seem to be favoring this source for external funding over banks, since they are agreeing that private equity investors understand their business better and focus less on cash and fixed assets as investment criterion.

The differences between entrepreneurs' perceptions of banks and private equity investors seem to be much larger for software companies as they are for game developers. For example half of the respondents felt that equity investors understood their business where as only 9 percent felt the same for banks. The difference between investment criterions tell a similar story as 77 percent of software entrepreneurs felt that banks emphasized cash and fixed assets but only 18 percent felt the same about equity investors.

For game developers the biggest difference between these two groups is how they perceive investment criterions as half think that banks

emphasize cash and fixed assets but only 10 percent felt the same about private equity investors. Other than that there are no immense differences between the game developers' perception of banks and equity investors.

Table 24: Game and software companies by perception of private equity investors

	Finnish game companies			Irish software companies		
	Disagree	Neither agree or disagree	Agree	Disagree	Neither agree or disagree	Agree
PEIs understand my business	40 %	25 %	35 %	20 %	31 %	49 %
PEIs emphasize cash and fixed assets as an investment criterion	20 %	70 %	10 %	48 %	34 %	18 %

There seem to be some significant differences regarding how game developers and software companies view the importance of ownership. First off 85 percent of game developers think that it is important to retain a majority ownership for founders whereas 70 percent thinks the same for software companies. This means that the number of respondents that do not agree with the statement is twice as large for software companies as it is for game developers.

The next question reveals even larger differences as they are questioned whether they would rather own one percent of a 50 million euro company or 100 percent of a 500,000 euro company. The number of game developers that disagree with the statement is up to 75 percent whereas only 26 percent of software entrepreneurs disagree. This naturally means that three out of four software entrepreneurs would rather own one percent of a 50 million company. A difference this significant could very well explain any deviations between game and software entrepreneurs' willingness and possibilities in acquiring external equity.

Table 25: Game and software companies by view on ownership

	Finnish game companies			Irish software companies		
	Not at all	To some extent	To a large extent	Not at all	To some extent	To a large extent
Prefer to retain majority stakeholding for founders	15 %	30 %	55 %	30 %	38 %	32 %
Prefer to own 1% of a 50 million company than 100% of a 0,5 million company	75 %	5 %	20 %	26 %	18 %	56 %

The last comparison is between their views on the use of debt and equity. Even though both surveys reveal that the entrepreneurs would rather use equity than debt, there are still some major differences between the two industries.

Regarding whether a long-term bank loan would suit their company, only 25 percent of game developers answered yes whereas over half of software companies thought the same. A difference of nearly 30 percent can certainly be considered significant, since it means that software entrepreneurs are much more open to acquire debt when needed. Software companies also agreed more with the notion that they prefer to use retained profits as much as possible, which would be suggestive of a lesser need for external funding.

Table 26: Game and software companies by view on debt and equity

	Finnish game companies			Irish software companies		
	Not at all	To some extent	To a large extent	Not at all	To some extent	To a large extent
Long-term bank loan suits my company	75 %	10 %	15 %	47 %	27 %	26 %
Prefer to use retained profits as much as possible	25 %	40 %	35 %	10 %	22 %	68 %
Prefer to use retained profits and external equity before debt	20 %	55 %	25 %			
Prefer to use retained profits and equity as much as possible				19 %	34 %	47 %
Issue external equity only as a last resort				50 %	21 %	29 %

The statements that were used to find out whether entrepreneurs preferred equity over debt were not identical, so the comparison is not as straight forward as with previous questions. But the results are similar as 80 percent of game developers stated that they preferred external equity over debt 81 percent of software entrepreneurs preferred to use retained profits and equity as much as possible. 50 percent of software entrepreneurs also stated that they disagreed with the notion that they would only issue external equity as a last resort.

5.7.3 Conclusions

In general these comparisons suggest that there are fundamental similarities between funding game developers and software companies, as they both for example contradict the pecking order –theory in the same way. The answers also suggest that both believe private equity investors to be in a better position to understand their business and thus evaluate them better. There are however some significant differences as well, some of which could be explained by the differences between available external

funding sources in these countries as well as the entrepreneurs' willingness to give up power.

It is good to keep in mind that since this survey is targeted at entrepreneurs' opinions and preferences, a lot of them are affected by their personal experiences. This means that since the game developers in this survey have rarely procured investments from venture capitalists, the preferences and opinions regarding venture capitalists are not as well defined as they are in the case of banks or public funding agencies.

When it comes to banks, both industries are clearly at a disadvantage as banks do not seem to understand their business nor are they willing to provide funding. This is also made worse by the fact that banks tend to emphasize the meaning of cash and fixed assets as an investment criterion. When combined, these things result in banks being an incompatible funding source for both gaming and software industries, partly due to the strong presence of information asymmetry. Curiously, regardless of this 53 percent of Irish software companies answer that long-term bank loans would suit their companies but only 4 percent has utilized them. Respectively only 25 percent of Finnish game developers think bank loans would suit them and 20 percent have acquired them.

So even though perceptions of banks are quite similar, software companies are more willing to use long-term debt as a financing source. But regardless of their will, software companies are not able to acquire long-term debt financing from banks. This means that a severe information asymmetry is present in both industries when it comes to banks, but it forms a much more significant obstacle for software companies. This is emphasized especially in the later stages, since in both industries none of the companies that had been operating for less than two years were able to procure funding from banks. From all the game developers that had been operating for more than two years, almost 30 percent had received funding from banks, which is considerably more than with software companies.

Out of the conventional sources for external funding, both industries clearly rank equity investors above debt as they state that equity investors are more capable to understand their business and do not emphasize cash and fixed assets as an investment criterion. In the survey done by Hogan and Hutson (2005b) out of the total funding received 28 percent was from venture capitalists and 11 from business angels, whereas bank loans had been used to cover only four percent. In this study 20 percent of game developers had used venture capitalists, 25 percent business angels and another 20 percent had used bank loans. This shows that both have clearly preferred to use external equity over debt, but since the results are shown in this study by times used whereas with software companies by amount used, definite comparisons cannot be made.

One major difference between these two concerns the importance of ownership as Finnish game developers are more prone to retain a majority of the company for founders. The gap is even larger when questioned whether they would rather own a piece of a sizeable company than completely own a smaller one. This suggests that software entrepreneurs in Ireland are more appreciative of the benefits that are gained through equity investors and also through being a part of a larger company, thus they are more open to the idea of acquiring external equity.

So even though opinions of funding sources do not significantly differ between these two industries, there are some clear gaps between the motivations, effect of information asymmetry and available funding. These result for example in game companies being more able to acquire debt whereas software companies are mentally more compatible with external equity.

6 Conclusions

This study shows that there are clear differences between how game developers perceive the three major sources of external funding. Results are aligned with previous studies when it comes to the two private sources, however questions regarding the public sector bring up some very surprising answers. According to the respondents, the public sector is clearly the strongest when it comes to understanding the gaming industry and also clearly the most willing to provide funding. When it comes to how suitable the investment criterions are, private equity investors come out slightly ahead of the public sector as they downplay the importance of cash and fixed assets.

Even though game developers perceive external funding sources to be generally willing to provide funding, the biggest issue that they currently face is acquiring it. Up to 70 percent of companies state that they need help when it comes to finding investors that would finance them. When added to the fact that they need assistance in multiple areas, it suggests that the optimal funding would also be combined with non-financial resources. This limitation results in private equity investors and public funding agencies being the best matches for game developers.

The fact that these companies prefer private equity and public agencies over banks is also reflected in what funding sources they've utilized. Banks have only been used by 20 percent, where as professional private equity has been used by 40 percent and public funding agencies by 70 percent.

The survey did not reveal how much funding game developers had received from each funding source, thus the exact importance of each funding source cannot be determined. However the biggest investments are generally considered to be made by venture capitalist while banks and business angels are known for making smaller investments.

How these private sources of funding compare to the use of public funding agencies is unclear. One obvious sign of the importance of this source is however the number of times it has been used. The fact that 70 percent of the sample had utilized public funding agencies at some point means that it is clearly the most important external source for capital.

The results of this survey also point out that similarly to software companies, the costs of operating in the start-up phase are relatively small for gaming companies. In fact the median for year-one (first 12 months since establishment) costs was 105,000 euros for game developers and in Hogan and Hutson's (2005b) the start-up costs were under 63,500 euros for 46,1 percent of software companies.

But even though the year-one costs for game developers are low, it does not in any way mean that the industry is not suffering from restrictive lack of funding. The survey results clearly show that 70 percent of game developers are currently in a need of assistance when it comes to acquiring funding. That number is extremely high and problematic because the question asked for troubles the companies are facing currently and not at some point in the past.

The notion that game developers are able to start operating with such low demand for capital could to some degree explain the lack of Finnish venture capitalists. As 25 percent had received funding from business angels and 70 percent from public funding agencies, the nonexistent Finnish venture capitalists can be replaced with the use of foreign venture capitalists. Of course acquiring foreign private investors is much more challenging and costly for small game developers, but the fact that they have been utilized three times more shows that it is clearly possible. All in all, since it is not possible to create a supply of knowledgeable Finnish venture capitalists, the efforts should be placed in bringing Finnish game developers closer to foreign equity. Thankfully recent Finnish success stories like Rovio and Supercell have made it a bit easier to get the attention of foreign investors.

When Finnish game companies are compared to Irish software companies, the results show that software companies are more open to the idea of acquiring funding from private equity investors. This could to some degree be related to the know-how of private equity investors. Game developers' opinions state that they are not so certain that these private equity investors are able to understand their business. This was observed clearly as the number of respondents that disagreed with the statement that these investors understood their business was twice as large for game developers as it was for software developers. This also reflects on the views of ownership since software companies are more convinced that they would receive significant benefits from giving up shares in their companies. This naturally strengthens the determination to procure equity investments.

The start-ups in this surveys' sample provide an excellent insight into how they are able to fund themselves. Out of the six companies that have been operating for less than two years, five have received funding from public funding agencies. That means that during public sector's focus on game companies through the Skene program, over 80 percent of gaming start-ups have received funding from the government. This has lead to an unorthodox situation where only half of the start-ups states that they need help with acquiring funding whereas out of all the developers that have been operating for over two years the percentage is 79.

This can also be explained by the increasing focus on mobile games that require fewer resources from companies, but the number of financed companies should definitely be questioned and looked into. The notion that established and mature companies face more difficulties acquiring funding than start-ups should not be possible. This would instead suggest that public funding of gaming start-ups has been recently significantly generous.

Since there have been so few studies regarding the financing of game developers, suggesting topics for future research is quite easy. With that said, I feel that there are a few topics that especially require some

research. This study revealed how often different external funding sources have been utilized, but what remains unknown is to what extent developers were able to fund their companies. This is underlined by the fact that game developers need relatively little capital in the beginning.

Another interesting topic would be how unorthodox funding sources have evolved during the last few years to better suit the business model of game companies. As an example crowdfunding has recently strengthened its importance since funding the IP instead of the company seems to be a viable way of approaching the issue. A second example would be that even though the business model has evolved from selling physical copies to digital distribution, publishers still have an important role in the equation. As these unorthodox sources have gained notoriety, it would be interesting to see to what point they have replaced the more traditional funding sources.

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Appendix 1 – The survey questions

1. Yrityksen perustamisvuosi

_____

0 merkkiä jäljellä

2. Koulutustaso

Korkein suorittamanne tutkinto

◯ Ylioppilastutkinto

◯ Ammatillinen perustutkinto

◯ Ammattikorkeakoulu

◯ Alempi korkeakoulututkinto

◯ Ylempi korkeakoulututkinto

3. Työkokemus

Täysinä vuosina

Pelialalla _____

Esimiestehtävässä _____

Yrittäjänä _____

4. Perustajien lukumäärä

_____

5. Työntekijöiden lukumäärä

_____

6. Vuoden 2012 liikevaihto

Tuhansissa euroissa

_____

7. Ensimmäisen 12 kuukauden yritystoiminnan kustannukset

Tuhansissa euroissa

_____

8. Pankit

	Täysin eri mieltä	Hieman eri mieltä	En samaa enkä eri mieltä	Hieman samaa mieltä	Täysin samaa mieltä
Pankit ymmärtävät liiketoimintaani.	○	○	○	○	○
Pankit ovat halukkaita antamaan lainaa yritykselleni.	○	○	○	○	○
Pankit painottavat kassan ja kiinteän omaisuuden merkitystä sijoituskriteerinä.	○	○	○	○	○
Pankit painottavat työkokemukseni merkitystä sijoituskriteerinä.	○	○	○	○	○

9. Yksityiset pääomasijoittajat

	Täysin eri mieltä	Hieman eri mieltä	En samaa enkä eri mieltä	Hieman samaa mieltä	Täysin samaa mieltä
Pääomasijoittajat ymmärtävät liiketoimintaani.	○	○	○	○	○
Pääomasijoittajat ovat halukkaita rahoittamaan yritystäni.	○	○	○	○	○
Pääomasijoittajat painottavat kassan ja kiinteän omaisuuden merkitystä sijoituskriteerinä.	○	○	○	○	○
Pääomasijoittajat painottavat työkokemukseni merkitystä sijoituskriteerinä.	○	○	○	○	○

10. Julkiset rahoituslähteet (Tekes, Finnvera, yms.)

	Täysin eri mieltä	Hieman eri mieltä	En samaa enkä eri mieltä	Hieman samaa mieltä	Täysin samaa mieltä
Julkiset rahoituslähteet ymmärtävät liiketoimintaani.	○	○	○	○	○
Julkiset rahoituslähteet ovat halukkaita rahoittamaan yritystäni.	○	○	○	○	○
Julkiset rahoituslähteet painottavat kassan ja kiinteän omaisuuden merkitystä sijoituskriteerinä.	○	○	○	○	○
Julkiset rahoituslähteet painottavat työkokemukseni merkitystä sijoituskriteerinä.	○	○	○	○	○

11. Väittämät

	Täysin eri mieltä	Hieman eri mieltä	En samaa enkä eri mieltä	Hieman samaa mieltä	Täysin samaa mieltä
Pitkäaikainen pankkilaina on soveltuva rahoitusmuoto yritykselleni.	○	○	○	○	○
Haluan ensisijaisesti käyttää kertyneitä voittoja mahdollisimman paljon täyttääkseni rahoitustarpeet.	○	○	○	○	○
Käyttäisin mieluummin kertyneitä voittoja ja lainarahaa kuin ulkoista pääomaa rahoittaakseni yritystoimintaa.	○	○	○	○	○
Käyttäisin mieluummin kertyneitä voittoja ja ulkoista pääomaa kuin lainarahaa rahoittaakseni yritystoimintaa.	○	○	○	○	○

Pidän tärkeänä sitä, että vähintään 50% omistusosuus säilyy perustajilla.	○	○	○	○	○
Haluan mieluummin omistaa yhden prosentin 50 miljoonan arvoisesta yrityksestä, kuin 100 prosenttia 0,5 miljoonan arvoisesta yrityksestä.	○	○	○	○	○

12. Missä seuraavista asioista koet tarvitsevasi lisäapua tällä hetkellä

☐ Rekrytointi

☐ Taloudellinen suunnittelu

☐ Liiketoimintamallin suunnittelu

☐ Rahoituksen hankkiminen

☐ Markkinointi

☐ Verkostoituminen alan yritysten kanssa

☐ Verkostoituminen asiakkaiden kanssa

☐ Verkostoituminen rahoittajien kanssa

☐ Muu, mikä?

_____

13. Mitä seuraavista rahoituslähteistä yrityksesi on käyttänyt

☐ Perustajien henkilökohtainen varallisuus

☐ Läheiset

☐ Muut yksityishenkilöt

☐ Pankit

☐ Bisnesenkelit

☐ Muut suomalaiset pääomasijoittajat

☐ Muut ulkomaalaiset pääomasijoittajat

☐ Julkiset rahoituslähteet

☐ Muu, mikä?

_____