All your returns are belong to us -
An exploratory study of how industry characteristics affect investments in the Swedish video game sector

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Abstract:
Being relatively young, the Swedish video game industry has experienced explosive growth in recent years, surpassing several traditional industries. Exemplified by the purchase of King for approximately three times the price of Volvo, and the fact that one in ten people on the planet has played a Swedish video game. This development notwithstanding, the industry remains academically unexplored, suffering high rates of failure among new businesses, and for many companies, access to capital is problematic. In many ways a unique industry; Reversing traditional business models. involving the community, their customers, during pre-, mid- and post-production combined with companies being born global. Therefore, traditional tools for financial analysis, such as profitability ratios, are proving insufficient and the industry is perceived as a risky investment. The study analyzes the underlying variables of such ratios, from the perspectives of uncertainty and risk as well as accounting, considering the unique characteristics of the Swedish video game industry; Providing guidelines for better utilization of the ratios. The authors establish a solid foundation for future studies on the topic and provide investors with useful tools to increase their knowledge of the industry. The findings indicate that due to the abstract nature of the industry, stemming from assets and value creation, financial ratios should be used in tandem with a uncertainty and risk assessment of certain key areas of the industry.

Keywords: Swedish Video Game Industry, Industry Characteristics, Profitability Ratio, Knightian Uncertainty, Exploratory study, Community
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1. Introduction

Having hardly escaped anyone’s notice, the video game industry has grown explosively in recent years. Indeed, the industry increased from $41 billion in 2003 to $76 billion in 2013 making it the fastest growing component of the international media sector; with a growth rate four times higher than the US economy in 2012. (ESA, 2015; CNET, 2014) As the industry grows more powerful, developers become increasingly attractive to investors. In 2008 Activision formed Activision Blizzard by purchasing Vivendi Games for $18,9 billion dollars (IGN, 2008). The Swedish market has not been left out of this development, in 2014 Microsoft acquired Mojang for $2,5 billion (Mojang, 2014) and in 2015 Activision Blizzard acquired King for $5,9 billion. (Dagens Industri, 2015) To put this into perspective, the acquisition price for Volvo, paid by Geely, amounted to $1,8 billion (Dagens Nyheter, 2010).

The industry has seen growth not only in terms of revenue, but also in its user base, it is estimated by The Entertainment Software Association that in America, 42% of the population play video games at least three hours per week. The diversity in terms of gender and age has also increased as females now make up 44% of total gamers and the average age of players is 35 years old, among females 43 years old. (ESA, 2015) The Swedish video game industry has also seen astonishing growth, in 2004 the industry consisted of 800 people with a turnover of 650 million SEK compared to nearly 9 billion SEK in 2014, generated by over 3000 employees (Dataspelsbranschen, 2015). Another indication of the relative size of the Swedish video game industry is the fact that one in ten people on the planet have at some point played a game created by a Swedish developer (Dataspelsbranschen, 2015).

This development has been supported by changes in the industry infrastructure in recent years. New platforms for distribution have emerged for all major consoles and gaming devices. Steam was released by Valve for PC in 2003, a content delivery system handling everything from sales and distribution, to facilitating multiplayer access; all in a fully digitalized environment. Similar systems were soon thereafter developed for other major consoles and with the emergence of mobile gaming, Google Play and App Store have also been added to the mix. App Store alone contain over 2 000 000 apps, an increase from 10 000 in 2008. 458 954 of the App Store applications are games, constituting roughly 22,45% of total applications, making it the largest application category; twice the size of its closest rival. (appstoremetrics, 2015)

With the addition of new distribution channels combined with an ever growing user base and rapid expansion, the video game industry is highly relevant for academic study; especially within the area of business. New forms of financing have emerged through crowdfunding and early access payment plans, giving developers new ways to approach their business. A demand for business related research is also emphasised by Swedish studios and publishers (Dataspelsbranschen, 2011). Additionally, the unique, reversed income model of the industry along with
a deep embeddedness with the community highlight the need for new knowledge and a deeper understanding of the industry. Industry complexity is increased further by the concept of developers being born globals. The highly digitalized market enables any developer to reach all available markets at any stage in the development.

Three factors in particular drives this demand:

i. the realisation that developing a video game is no longer merely a question of technical development and innovation, but also a matter of creating a functioning firm, regardless of industry (Dataspelsbranschen, 2011 & 2014). When finding ways to achieve this, academic research is crucial, particularly in the case of the video game industry; as it presents a new corporate model with direct interaction with end consumers, even after a product release. This can be exemplified with the development of Killing Floor 2, in which forum votes were held to determine the design of core game mechanics. Further, many successful high budget titles originated from the community in the form of game modifications. Establishing an understanding of such a unique and expansive industry will be essential for its success.

ii. The most major obstacle to further industry expansion has been identified to be the access to financial muscle in early stages of development, as well as secure long-term financing. In terms of financing, the lack of accurate forecasting, and a common approach structure has maintained the difficulties of what to expect in terms of both investor returns; As well as access to capital on the side of developers and publishers. (Kreativ Sektor, 2015) Difficulties related to forecasting, which makes up the essence of the study, is rooted in uncertainty. This uncertainty takes on a multitude of characteristics, but a unison goal is to reduce it as much as reality allows. Without knowledge of the industry, such forecasting becomes a greater obstacle as the uncertainty related to an investment steadily grows as industry knowledge decreases. (Knight, 1921) In such an explosive growth industry, with low outsider knowledge and insight, the full potential for success is therefore hindered.

iii. The video game industry is a relatively new, academically unexplored, phenomenon with a unique business model; Encompassing elements from the movie industry in creating a virtual experience, technical knowledge in terms of coding and creating a functioning application, through interaction with community and fans throughout the creative process and while having very low barriers for entry every small company has the whole world as their market from the outset. Complex and deeply intertwined with technological development, the industry is highly dynamic, presenting challenges in terms of organizational structure and management.

1.1 Thesis aim
Drawing from the aforementioned obstacles and needs of the Swedish video game industry, it becomes evident that further business related studies focused on the industry would be bene-
The lack of performance predictability and structure in terms of financing, mentioned by investors as well as firms, stress the need for a more systematic approach when measuring financial performance in the industry. It is therefore highly relevant to examine whether or not traditional financial performance measures, previously employed in studies directed towards other industries, can be equally useful when determining the financial success of the video game industry, as means for decreasing uncertainty.

The issues faced by the industry in terms of financing likely stems from no isolated industry dilemma. Rarely using financial data for performance measure, in combination with a low degree of business related research in the industry, firms possibly lack a comprehensive understanding of how their own industry and firm characteristics affects financial performance. A study based solely on financial data to assess performance is most often proven to be limited, hindering the understanding of underlying parameters affecting financial ratios. To make qualified judgements and forecasts based on financial data, a complementary understanding of the industry as a whole is needed to reduce the feeling of investment uncertainty and risk; opening up for more capital from previously cautious investors. As investors are primarily interested in financial return, it makes sense to use metrics related to return as a way of illustrating the industry characteristics, providing an intuitive, familiar, and relatable tool.

The aim of this study is therefore to create a theoretical framework which can be used to better understand and predict financial rate of return levels in the Swedish video game industry. The basis of this framework will be industry characteristics in combination with financial rate of return data. In symbiosis, these parameters could help better the understanding of why the Swedish video game industry performs and behaves in certain ways, providing a more comprehensive tool for rate of return forecasting. As the model include industry characteristics, it aims to reduce the level of uncertainty by providing information about things an investor would normally have to assimilate on his or her own; efforts which has costs related to it which could be more efficiently spent elsewhere. The model will be constructed by using common financial rate of return ratios and subjecting their underlying parameters to industry characteristics, not normally present in financial reporting. These characteristics could alter the value of the chosen rate of return ratios, for example by adjusting firms’ assets presented in financial statements, to more accurately reflect their realistic value. Such a model would provide investors, and the industry, with a tool to increase accessibility to currently unobtainable capital, by lowering the need for investor industry knowledge; making investments more standardized. In practice, such a tool could essentially be viewed as a constructed model to perform the underlying work the individual, knowledgeable investor would normally perform before investing; thus reducing uncertainty by providing a richer amount of information that directly affect the investment.
1.2 Research aim

This study aims to explore Swedish video game industry characteristics, their impact on the level of perceived uncertainty and risk, the impact on investments and to what extent profitability ratios can be used to quantify and explain those impacts in monetary terms.

1.3 Contribution

The main contribution of this study is to delve deeper into the academically unexplored Swedish Video game industry; Identifying, analyzing and categorizing important success factors and characteristics of the industry in order to facilitate further research on this topic and address capital problems within the industry. This is achieved through analysis of the underlying variables of existing profitability ratios, how they are affected by industry characteristics, as well as increasing industry understanding in order to lower perceived risk and uncertainty, based on a Knightian approach to these two concepts.
2. Theory
This section will delve into the concept of uncertainty and risk as introduced and advocated by Knight (1921), its effect on behavior as well as relevant theoretical concepts pertaining to performance metrics by means of financial rate of return ratios. A literary overview of the video game industry is also provided, in brief. The reason being an absence of research directed at the video game industry that has relevance for the subject of this study.

2.1 Uncertainty and risk
Most individuals would agree that a fully knowable world would be less satisfying than the reality we live in. Despite this fact, a lot of effort are channeled towards reducing uncertainty. Two kinds of uncertainty are prevalent, uncertainty that can be measured and uncertainty that can not. Immeasurable uncertainty is usually pertained to things one cannot foresee or imagine; an individual from the 1850’s could not possibly imagine or measure his or her uncertainty regarding the spread of personal computers. This uncertainty also includes factors of indifference, such factors are not dependant on the situation, but nevertheless affect it; weather can be described as such an uncertainty, but its outcome is indifferent to what uncertainty one might have about it.

In the case of measurable uncertainty, probability, intuition and experience can help alleviate it. The difficulty increases alongside complexity, the more potential factors involved, the harder prediction becomes. To combat this phenomenon, grouping of situations can help reduce the level of uncertainty. In terms of business, any situation is commonly seen as unique and being subject to a great deal of individual and indifferent factors. A widespread approach to uncertainty reduction is grouping of situations for examination of trends and plausible outcomes. Such groupings become a sensitive matter when dealing with business situations as many factors are impossible to measure. This does not, however, mean that measures cannot be taken to reduce the level of uncertainty.

The most essential component when reducing uncertainty of any kind is knowledge. Knowledge is acquired by learning and failure, hence it’s a continuous process requiring errors and mistakes. This is paradoxically true even for immeasurable uncertainty. The upswing of experts and societal efforts to channel uncertainty determination in a specialised direction is a good way to illustrate this. Even though most decisions made not being based on science and observation, but instead on opinion, greater knowledge and experience aid the process of estimating uncertainty of all kinds. With greater knowledge and experience an individual becomes more proficient in assessing the likelihood of unexpected, calculable and immeasurable uncertainty. An experienced investor recognize signs earlier than an inexperienced one, as well as what actions to take when combating uncertain situations. This becomes evident when looking at what sums society at large spend to facilitate knowledge and information, regarding everything from
crop outcome to industrial growth.

Acquiring knowledge is however not a full remedy to the difficulties of uncertainty. A problematic paradox becomes evident when considering what acquiring knowledge means. To analyze a situation with the purpose of better forecast the future, one relies on the past. Thus one uses the past to determine what to do in a different situation in the future, leading to a situation where one uses a template based on a certain situation to better deal with another, likely different future scenario. The problem of knowledge depends on the future being different from the past, while the possibility of a solution depends on the future being like the past. Such reasoning illustrates the difficulties of uncertainty and emphasize the presence of immeasurable and indifferent factors.

The conclusion is that uncertainty is a fact of life, ineradicable from any business situation. On the other hand, it does not mean that uncertainty cannot be dealt with to a satisfactory extent. This returns focus to the increase of knowledge as well as grouping of situations. While groupings might not be entirely accurate, it can in many cases lower the level of uncertainty as well as increase the level of knowledge. To draw upon generalizations of fairly similar situations decreases uncertainty more than no generalization usually does. As the grouping and knowledge increase is a process, one can expect to decrease uncertainty and increase knowledge in small increments. While all uncertainty will never be removed, it can be diminished and combated through structured approaches and trial and error, becoming more proficient and more rewarding over time.

Rewards are intimately connected to uncertainty. The greater uncertainty, the greater rewards are needed to convince an individual to deal with the presented uncertainty. In terms of business and investment, a person will require a higher return the greater the uncertainty of that return coming to fruition. From such a perspective, knowledge and greater access to information becomes paramount when dealing with uncertainty. The more of the relevant parameters that can be assessed and factored into a decision the greater the diminishing power one has over the level of uncertainty. To achieve this, scientific research and accumulation and study of relevant data is essential; however, this comes at the cost of resources drawn from other uses. (Knight, 1921)

2.2 Financial ratios
2.2.1 Traditional tools for financial analysis
This section will provide a historic overview of financial ratios, how they have developed, how this development has affected academics’ as well as practitioners’ view of performance metrics in the modern era. Arguments both for and against the use of financial ratios in performance analysis is also presented.
2.2.2 Background

While the origins of financial ratios and performance measurement can be traced back through the annals of business administration and finance, to the invention of double-entry bookkeeping in fifteenth century, or even further, to Euclid’s Book V of his Elements, its true era of prevalence dawned around the shift between the 19th and 20th century. This began with the development of the current ratio, primarily to provide creditors a tool for assessing credit worthiness; as the current ratio is based on assets and liabilities. Soon thereafter ratios for measuring profitability in relation to level of investments were developed to aid managers in their work. (Eccles. R.G, 1991; Horrigan, 1966)

Over the coming decades, up until the sixties, a multitude of financial ratios were developed and utilized. In academia, research and discussion focused primarily on finding common ground regarding the classification of financial ratios; what metrics comprised various ratios as well as what intercorrelations were present between the different measures. The utility of such a framework stems from the ability to use fewer, but more representative, ratios for each type of classification. (Horrigan, 1966) Such a common ground, albeit not completely unison, were established by dividing ratios into general categories based on their nature as well as their tendencies through intercorrelation to indicate similar trends and conclusions. The categories include, among others, i. profitability, ii. solvency, iii. asset and debt turnover and iv. return on investment. The use of these specific categories became prevalent mainly in modern times, but the groundwork were laid through decades of research and debate. (Wang & Lee, 2008) After World War I, a large study by Alexander Wall (1919) found significant differences in financial ratio values depending on geographical location and industry type. Although the study was subject to substantial critique, it was recognized as being the first of its kind, paving the way for a more intricate understanding of financial ratios. The revelation of industry rooted trends in financial ratios sparked a discussion concerning subgrouping of firms within industries, to achieve more thorough specificity and reduce heterogeneity. (Horrigan, 1966)

Parallel to this development, Smith and Winakor (1930; 1935) established the idea of using ratios as predictors of business difficulties, naming net working capital to total assets as the most accurate predictor of business failure. The concept of using ratios as predictors of failure were substantiated in the same decade by Fitzpatrick (1931, 1932) and Ramser (1931), a development not only relevant for the use of ratios, but also in being the first of its kind to apply the scientific method as an instrument to evaluate the utility of financial ratios (Horrigan, 1966). While these initial studies suffered from a number of drawbacks, as is not uncommon in fledgling stages of research, Beaver (1966) significantly substantiated these ideas, showing that some ratios could predict business failure as much as five years in advance.

These simultaneous developments enabled the general financial ratio discourse to shift its fo-
From primarily discussing ratios in terms of classification based on the nature of various ratios, the practical applicability and utility of financial ratios became widely discussed. Building on the study by Wall (1919) it was proposed that firms tend to settle around a predetermined industry specific equilibrium, based on financial ratio industry averages (Gordon et al, 1966), a hypothesis that was supported by later studies (Copeland, 1968; Lev, 1969). By drawing from these findings, the narrative of financial ratios in academia turned its attention to the practical implications of applying financial ratio analysis as a measurement of corporate and/or industry performance. (Horrigan, 1966)

2.2.3 Financial ratios today

Historically, a significant amount of effort was directed at using financial ratios for categorization and classification, whereas in the modern era, focus has shifted towards performance metrics and, within academia, to the predictive abilities of ratios. This development is axiomatic according to Barnes (1987), who argue that this approach is more closely tied to the theory of financial ratios, advocated by Horrigan (1968), when taking the ratios’ statistical nature and use into consideration. Researchers began extensively testing what firm related events could be predicted by drawing on the statistical power of financial ratios. The most prevalent area was found to be business failure. Based on a multitude of industry wide studies from various countries, business failures, or a danger thereof, was accurately predicted, in some cases up to five years prior. Based on nothing but financial ratio values, financial distress and risk of failure has emerged to be the main area of reliable predictability; indicating a need for additional parameters to be added to the framework when assessing other performance aspects is of interest. (Sueyoshi, 2005; Ak et al, 2013; Beaver, 1966)

After the initial findings by Wall (1919) on the variations on financial ratios between industries, studies conducted in more modern times confirmed the results; with additional parameters to be added. (Cowen & Hoffer, 1982) Due to difficulties in achieving satisfying predictions in a wide variety of areas, based on financial ratios alone, more explanatory power was required. The driving forces behind the studied ratios needed to be taken into account when explaining both interfirm and industry differences in ratio values. It was found that industry as well as individual firm characteristics constitute the main driver behind industry and interfirm differences in terms of financial ratios, revealing financial ratios to be a tool among many; best utilized in combination with a broad knowledge in the area of management and controlling. (Gupta, 1969; Gupta & Heufner, 1972; Koralun-Bereznicka, 2013) The realization of the benefits when using a wider approach to financial ratios, mirror initial critiques and reflections raised long ago, advising caution when relying exclusively on financial ratios to make judgements on performance; indicating that a more cemented such view is beneficial. (Eccles, 1991)
2.2.4 Arguing the case for financial ratios

Constituting one of the primary arguments pertaining to the usefulness of financial ratios lie within the predictive capabilities of financial ratios found in the sixties (Beaver, 1966). Further advocated by Ak et al (2013), arguing their use, particularly from an investor perspective, in predicting significant corporate events such as bankruptcy, downsizing, raising equity capital and material earnings mistakes. Furthermore, they find that accounting based models are at a disadvantage compared to market based models (Ak et al, 2013). A study performed in Tehran further substantiated the use of financial ratios to investors, by demonstrating a significant relationship between selected financial ratios, based on profits, and premium returns (Koralun-Bereznicka, 2013).

One reason behind financial ratios’ rise to prevalence can be associated with the fact that they are intuitive and easy to calculate, accessibility of information through financial statements have made them an invaluable tool for managers and analysts alike and at first glance their interpretation is clear cut. Furthermore, allowing comparisons over time and between companies make them a powerful tool for statistical analysis within academia and among investment analysts. (Koralun-Bereznicka, 2013)

2.2.5 Limitations to financial ratios

While certainly being a potent and useful tool financial ratios suffer from a number of drawbacks that are necessary for analysts and researchers alike to take into account. Lev and Sunder (1979) argued that one of the main objectives of financial ratios is to control for size effects, however the conditions under which this objective can be met are very restrictive. Their main issue lies within the use of financial ratios without due theoretical considerations and that without such considerations, analyses risk missing their intended objective. They claim that use of ratios implicitly or explicitly assumes a relationship between the numerator and the denominator in cases where such a relationship has not been empirically, or theoretically, established, leading to unwarranted inferences and conclusions (Lev & Sunder 1979).

This issue holds true especially in the case of the Video game industry, the relative youth of the industry make the use of financial ratios difficult by increasing the need for empirically establishing the aforementioned relationship. Operating a company today is substantially different compared to only a few years ago, especially in a virtual environment, further bringing theoretical concepts into question. The Video game industry, for example, include the community, representing the market, at early stages in development and further involvement throughout development and even after release through patches and updates. This upsets the traditional income model of many companies where rather a product is designed to fit their intended customers rather than involving customers in development.
Theoretical and empirical assumptions aside Eccles (1991) argued that the strength of financial ratios lies within the assumption of being a uniform metric, allowing comparability across divisions, companies, industries and countries. Through this assumption they become a valid tool for decisions regarding resource allocation. However, put into practice there are limitations to this comparability on a fundamental level, attributed to different accounting conventions between countries and industries.

As mentioned above, Gordon et al (1966) proposed the tendency among firms, based on financial ratio industry averages, to settle around a predetermined industry specific equilibrium. Despite these findings, it is essential to remain critical to the straightforwardness of such a hypothesis. Industry averages and other broad, norm based, approaches to financial ratios must be supplemented with an analysis of the underlying parameters affecting said ratios. Without such an analysis, much of the understanding concerning financial ratios are lost, resulting in a flattened, bland, and possibly erroneous view of the firm or industry. (Koralun-Bereznicka, 2013)

2.2.6 Summarizing the history of financial ratios
Originating from an embryo in the 19th century, financial ratios have evolved greatly, shifting from a classification and categorization focus, into a concept centered around performance metrics and prediction. Taking their inherent qualities into consideration; an easy to calculate, straightforward, statistical tool for financial analysis, able to make comparisons over time and between companies, it is easy to understand their popularity among academics and practitioners alike. However caution is advised as without due theoretical considerations, interpretation of ratios may not be as straightforward as believed. Indeed, a number of researchers argue that the theoretical assumptions, implicit or explicit are often not met, to the detriment of ratio inference. There are also accounting differences, further complicating ratio interpretation. However, these issues can, to a great extent, be mitigated by a supplementary analysis of underlying internal and external parameters affecting the firm. Thus providing a well-rounded, argumentation based interpretation of financial ratio values and their meaning.
2.3 Rate of return ratios
This section will introduce the three rate of return ratios used in this study, their characteristics, rationale and limitations.

2.3.1 Return on invested capital - ROIC
The core concept of Return On Invested Capital (ROIC) is a measurement of a company’s efficiency in allocating available capital in order to yield desirable return, often compared with its Weighted Average Cost of Capital (WACC) for this very purpose. A ROIC with a higher value than the WACC indicates that the company is creating value, a fact that grants the ROIC relatively greater significance for capital intensive business sectors compared to sectors with less facility or equipment requirements (Damodaran, 2008).

\[
ROIC = \frac{Net\ Income - Dividends}{Invested\ Capital}
\]  
Equation 1 illustrates the common formula for calculating ROIC, there are however a number of considerations to be made regarding the variables and their underlying factors. In the numerator Net income is used, this value may be distorted by irregular one-time sources of income or loss such as currency fluctuations. It is possible to mitigate this issue by using tax adjusted operating profit. This adjustment is intuitive as Net Income primarily measures return for equity investors whereas operating income, a pre-debt measure of earnings, includes lenders in the form of interest payments (Damodaran, 2008).

\[
Invested\ Capital = Fixed\ Assets + Intangible\ Assets + Current\ Assets - Current\ Liabilities - Cash
\]  
Furthermore, the denominator is normally calculated as illustrated above, the rationale behind subtracting cash is consistent with earlier adjustments as income from cash interest is not part of operating income (Damodaran, 2008).

\[
ROIC = \frac{Operating\ Profit \ast (1 - Effective\ Tax)}{Invested\ Capital}
\]  
Above in equation 3 an illustration of ROIC calculation after due consideration is represented. One limitation however to the use this particular ratios is illustrated by the example of abnormal or one-time sources of profit or loss, ROIC as a metric contains no indication as to which part of the company is generating profits.
2.3.2 Return on Equity - ROE

As opposed to the ROIC, Return on Equity (ROE) places focus on the equity part of investments alone, showing what remains for investors after debt service costs has been adjusted for.

\[ ROE = \frac{Net \, Income}{Book \, Value \, of \, Equity} \]  \hspace{1cm} (4)

There are a few key differences when comparing the ROE to the ROIC, presented above; The main discrepancy being that cash is not included in the calculation, as a result ROE values will be depressed in companies with high cash reserves as they are vastly different compared to operating assets both in terms of risk and return (Damodaran, 2008).

\[ Non - Cash \, ROE = \frac{Net \, Income - Interest \, from \, Cash \times (1 - Tax \, Rate)}{Book \, Value \, of \, Equity - Cash} \]  \hspace{1cm} (5)

A variant of ROE is sometimes used to mitigate this issue, illustrated in equation 5, where adjustments are made to eliminate the problems arising from cash based income.

One of the main limitations to the use of ROE, while most companies have a positive book value for equity there are a large number of exceptions, with negative equity. In those examples ROE becomes a meaningless metric (Damodaran, 2008). Furthermore, companies with disproportionate amounts of debt will see distorted values of ROE as the denominator is directly affected by capital structure, a disproportionate amount of debt would increase cost of debt, lowering ROE (Woolridge & Gray, 2006).

2.3.3 Return on Assets - ROA

Return On Assets (ROA) is very similar to both ROIC and ROE, it measures how well management utilize company assets to generate profit. Intuitively this metric varies greatly between companies and further between industries depending on asset-requirements.

\[ ROA = \frac{Net \, Income}{Total \, Assets} \]  \hspace{1cm} (6)

There is however a key difference between ROA and the previously introduced metrics, it is not possible to compare ROA values to cost of capital. The latter is derived from equity and debt and does not incorporate liabilities invested in assets (Damodaran, 2008). Furthermore, ROA suffers from the same cash related issues as ROE albeit in a different form. Interest from cash reserves is not included in operating income but it is included in total assets, allowing it to remain in the denominator.
2.3.4 Financial ratios summarized

This part of the theory section has presented a brief history of financial ratios, their uses, effects and origin. Their limitations have been emphasized to illustrate their narrow use when acting as the only tool for analysis. Certain ratios have been uplifted as particularly relevant, namely those regarding the rate of return on investments. They have been presented and discussed to provide a clear picture of their area of use as well as usefulness in this study. A complement to the discussion has been provided through the concept of uncertainty and how it dictates behavior as well as what is needed to combat it. To illustrate how these factors all come together, a model has been provided to paint a picture of how the study aims to reduce uncertainty pertaining to investments by emphasizing the need for complementary industry data analysis, in tandem with useful financial ratios.
2.4 Swedish Video Game Industry
This section will introduce a number of core elements regarding the video game industry, based on literary review.

2.4.1 Structure of the video game industry
The industry can be divided into four main categories of actors: Developers, Publishers, Console manufacturers and distributors, all illustrated below in figure 1.

![Diagram of the structure of the video game industry]

Figure 1: Structure of the video game industry
Simplified, development studies create games. Publishers finance and promote games, both to distributors and console manufacturers. In turn, manufacturers develop hardware platforms, for which they receive royalty checks for games sold using their platform. Finally, distributors make games available to the public. (Cadin & Guérin, 2006)

However, the reality is not as clear cut, console developers create games internally, exclusively for their platform. Furthermore, they oftentimes play the role of publisher, financing or buying games directly from developers. The same is true for publishers who often have internal development studios, harnessing their market know-how to create popular games, characters or concepts where they control the intellectual property. (Cadin & Guérin, 2006) It is common that small development studios are subjected to high pressure from publishers or manufacturers to complete games fast, who then become the primary beneficiary in terms of reaping the reward of a successful game (Nichols, 2014).

2.4.2 The modern video game industry
Due to the current dominant structure of the video game industry, the largest emphasis is placed on software, rather than hardware. Console manufacturers such as Nintendo, Microsoft and Sony treat their hardware as loss-leaders, to be compensated by the more profitable software development. Often, each manufacturer produce or support third party software exclusive to their platform, in order to sell more units and introduce target audiences to their own software. Examples of such software are the Uncharted as well as Halo series, made exclusively for PlayStation (Sony) and Xbox (Microsoft) respectively.

With a larger emphasis on software, the video game industry becomes increasingly dependant on popular culture, which it adapts to as well as influence. This has led to an increase in franchising as well as licensing, especially in the video game industry’s relationship to the world of film. Many successful software launches stems from this crossover, such as Disney Infinity and Tomb Raider, among others. Such crossovers has aided the video game industry in shaking of its previous image as being a form of toys, to instead being treated as legitimate entertainment industry relevant for all ages and interests. (Nichols, 2014)

2.5 Theoretical summary
The theory section has illuminated the concept of uncertainty and risk, as philosophized by Knight, 1921. Several types of uncertainty and risk has been presented along with arguments for how to reduce them, along with explanations why. Further, financial ratios has been introduced with the help of a background, contemporary overview as well as arguments for and against the use of such metrics, complemented with common limitations.

Combining such theories with the description of the video game industry, a complex picture...
emerges. The uniqueness of the video game industry could be problematic when using financial ratios, due to a multitude of factors difficult to quantify; Such as competence and community interaction. These concepts cannot be included in traditional financial ratios as they are not present in the P/L or balance sheet. Not only does such characteristics make it difficult to determine the origins of various kinds of uncertainty of risk, they also raise demands for investor adjustments of financial statements in order to achieve a satisfactory reflection of the real value present in the firm. To circumvent such difficulties, the study will disregard regulatory constraints on accounting, allowing for argumentative adjustments of financial statement entries; aiding the presented theories in their adaptation to the uniqueness of the video game industry.

The traditional basis to uncertainty as well as financial forecasting is found visualized below, next to the different approach utilized by this study. A less rigid and traditional procedure is most likely needed to match the unique characteristics present in the industry.

2.6 Theoretical model
To further illustrate the approach to analyzing the video game industry a visual representation has been included.

![Theoretical model diagram]

As illustrated above in figure 2, rather than being constrained by accounting laws and regulations, which is normally the case, the analysis instead will incorporate industry characteristics and their potential impact on financial statements and financial ratios.
3. Method

3.1 Introduction

The method section contains the following parts, i. type of study, ii. Ratio Selection, iii. Company demarcation, iv. data collection, as well as v. operationalization. Together, these parts will present an outline of what kind of study that has been conducted, and how the study type affected choices concerning data collection. The operationalization is finalized through a detailed workflow description and a presentation of result format.

3.2 Type of study

The study is mainly exploratory in nature, including explanatory and descriptive elements in a complementary manner. The Swedish video game industry is largely unexplored in terms of business studies, feasibly making the case for a more descriptive study to establish an overview of the industry and how it works. Albeit such a study would prove useful, its contribution would be limited, both in terms of theory and practicality.

Instead, the study aims to create a foundation as well as a tool for further exploratory contributions. Financing is perceived to be the largest obstacle to further industry expansion, due to the lack of useful financial forecasting tools (Kreativ Sektor, 2015). The study will explore ways of converting an overarching understanding of the Swedish video game industry into a theoretically sound as well as practically useful forecasting model for financial rate of return ratios and lowering perceived uncertainty and risk; removing obstacles for the industry as well as furthering theoretical understanding. This will be the main contribution of the study.

3.3 Ratio selection

Three return oriented financial ratios has been selected for the purpose of the study, return on equity (ROE), return on assets (ROA), and return on invested capital (ROIC). These metrics are known as book rates of return, as they are based on accounting information. This demarcation comes intuitively as investors, and their difficulties in terms of accurate forecasting, is the main focus of the study. Considering the purpose of mending such a situation and improving accessibility to financing capital for firms, the inclusion, and adjustment of, financial ratios that does not reflect monetary returns would be redundant in terms of contribution.

Another contributing factor in the ratio selection process is data availability. The three aforementioned financial ratios are calculated exclusively with the use of accounting information, a type of data that is highly accessible. While theoretical implications indicate the superiority of market based models, the majority of the video game industry is not listed on the stock exchange, effectively making accounting based models the superior choice for analysis. Limiting the model structure to ratios made up of accounting information makes the model more intuitive and easier to understand. Because this type of data is widely used and easily obtainable,
the model has the benefit of a greater reach, as it is based on data relations many individuals are familiar with.

3.4 Company demarcation
Mobile game developers as well as individual (indie) developers will be excluded from this study, due to the nature of their business models. Naturally these segments would benefit from increased investment, but the options available to them are more abundant and accessible. Their less stressed need for funds in combination with a more varied business model make these developers less relevant for this study, as the need to overcome the financing obstacle is less acute in these segments.

3.5 Company selection
The video game industry, diverse in its nature, include a wide variety of companies, many of which unsuited for forecasting, attributed to their relatively small size. Furthermore, academic research has been scarce and even within the business sector there are few experts on the industry. In order to tackle this issue quota sampling is used (Bajpai, 2007), identifying relevant stratas within the population, further combined with a nonprobability sampling method, a judgement sample (Black, 2010) to select subjects for each stratum.

A judgement sample, while being subject to some degree of bias on account of the frame and the population not being identical (Deming, 1990) the industry characteristics mentioned above combined with the exploratory nature of the study a judgement sample approach is likely to yield superior results compared to other sampling methods. These issues are further mitigated by using a quota sample, limiting bias in subject selection to a certain extent. The stratums include small developers, large developers, publishers, industry organizations, academics, and a business perspective through audit and advisory firms.

A total of five interviews have been performed for the purpose of this study divided to yield relevant insight from a number of different perspectives pertaining to the video game industry. An academic perspective was provided by interviewing a senior researcher at Uppsala University, having published articles regarding the impact of reviews on application sales on mobile platforms. Furthermore, the CEO and co-founder of Coffee Stain Studios provided insight from a small, but successful, developer. The Head of strategic HR at a large developer and publisher listed on the Swedish stock exchange, who chose to remain anonymous, was interviewed. Further general insight into the Video Game Industry was provided by an analyst at Dataspelsbranschen, the national industry organization. Finally, complementing inside knowledge of the industry, a business and accounting perspective was provided by a valuation expert focused on the video game industry at Grant Thornton was also interviewed.
3.6 Data collection

Being primarily exploratory in nature, the interviews performed for the purpose of this study were required to probe interviewees in order to ascertain their perspective on important variables for investment. In order to meet this requirement semi-structured interviews were used, well suited for investigations of this kind (Cooper and Schindler, 2008), using themes to be covered rather than standardized questions allowed for greater adaptability to organizational context and interviewee competencies as compared to structured interviews. Furthermore, a semi-structured interview allows for greater complexity by using open ended questions on a specific theme, allowing interviewees to delve further into the selected topics. This is particularly useful in this type of study as themes and industry remain the same but organizational context can be considerably different for a publisher and a developer for example, and indeed between different sized developers.

Furthermore, face to face meetings hold a number of advantages, most importantly: managers are more likely to accept an interview rather than answering an online survey (North et al. 1983, cited in Healey 1991). It is also possible to perform deeper analysis, as compared to surveys or structured interviews. Regarding replicability however, there are some aspects that require attention, while semi-structured interviews are a very useful tool for exploring complex and dynamic concepts through high flexibility, results may be hard to replicate as they reflect a dynamic and complex reality at the moment of collection (Saunders et al. 2009), a problem which is especially true for the video game industry as it is very dynamic in its nature. This does not diminish the reliability of empirical results, quite the contrary, considering that a standardized approach could not be adopted without undermining the strengths of this type of research (Marshall & Rossman, 2006), which is the exploration of complex phenomenons pertaining to Knightian uncertainty. A reduction in complexity would be to the detriment of the authors analysis. However, in order to increase transparency and facilitate, to as great extent as possible, replicability, the rationale, strategic choices and processes pertaining to interviews are provided below.

In a practical sense the interviews were preceded by a letter of intent, explaining in general terms which themes would be touched upon during the interview and the purpose and aim of the study itself. Following the initial letter interviewees were contacted by telephone in order to book a meeting. This allowed interviewees to prepare and served the further purpose of allowing the adequate preparation. Interviews were recorded, while having a few downsides such as increased risk of answer inhibition the advantages of increased data reliability were deemed to outweigh potential downsides. (Saunders et al, 2009)

Rather than directly inquiring about financial ratios, interviewees were encouraged to explain their, and their companies, investment rationale. A direct and clear focus on financial ratios
during interviews would likely not yield desirable results but rather shift focus away from the intended object of study. The structure, including all themes covered and possible follow up questions, can be found in appendix 2.

Interviewer bias, creating a bias in interviewee responses through non-verbal behavior or otherwise unintentionally imposing the views of the interviewer on the interviewee (Saunders et al, 2009), pose a danger when using interviews for data collection. This risk is, in theory, relatively high in semi-structured interviews considering their probing nature. While interviewees may in principle be willing to participate, they may nevertheless withhold sensitive information, more easily done in this case as open questions are often used. In the case of this particular study, this risk is mitigated naturally by the unintrusive nature of the study. Details regarding specific companies are not of interest to the authors, a fact made abundantly clear to interviewees in order to further ensure honest and open replies. Furthermore, bias is mitigated through careful preparation, supplying interviewees with sufficient information beforehand and recording interviews for thorough analysis (Saunders et al, 2009).

3.7 Operationalization

One of the challenges with data collection through interviews in the context of this study is the potential lack of business and financial knowledge among interviewees. Acquiring information useful for adjusting financial ratios is not necessarily clear cut as it is uncertain whether interviewees possess the relevant theoretical understanding to give direct answers pertaining to financial ratio adjustments. However, as it is the prerogative of the authors to perform this analysis, such theoretical knowledge is not required. Indeed, the role of respondents is rather to give relevant insight into the unique characteristics, the nooks and crannies, such as they are, of the video game industry. This knowledge is analyzed by the authors through the lens of Knightian uncertainty and the underlying variables of the selected profitability ratios in order to yield a picture that, rather than being restrained by regulations, have been adapted to suit the unique characteristics of the video game industry.

In order to obtain industry information relevant for ratio analysis and reduction of perceived uncertainty and risk by investors, the authors utilized semi-structured interviews as well as including several perspectives through quota sampling. For example, interviewees were asked how they would say video game developers create value, what they would say is the most important asset of a video game developer and why or how they would characterize success in the industry. Further details regarding themes and questions during interviews are located in appendix 2.
3.7.1 Format of analysis

It is difficult to establish the explicit effects on investments caused by changes originating from the analysed parameters. However, support for a categorization of the effects can be found. Such a division could help clarify not only what parameters arguably interact and affect one another, but also establish a separation between accounting based adjustment effects and effects relating to the level of perceived risk.

The authors would argue that several aforementioned parameters possess effects of two overriding categories, the first being accounting based adjustments of financial statements, due to changes in value, assets and liabilities; The second being the effect on perceived uncertainty and risk levels, due to a lack of knowledge. To avoid confusion and entanglement during the discussion, a separate model is provided for each overriding category. Each model visually illustrates the constructed sub-categories within each overriding category of effect, containing various parameters related to each sub-category, based on the authors perceived level of correlation and shared nature between the studied parameters. Thereby the origin of each parameter effect within their respective sub-category, and overriding category, can be traced and studied separately.

In terms of uncertainty and risk, it is the authors view that such a structure ought to aid investors, as grouping of parameters to assess their probability and correlations is beneficial, even needed as the level of complexity and number of interacting parameters increase; As advocated by Knight. Considering the multitude of parameter effects in several directions, it is the overall grouping of the parameters into sub-categories, the individual parameter effects and the effects point of origin make up the areas of effect that are examined. The discussion will be based on how and where uncertainty increase or decrease, due to changes in the level of knowledge. There will not be any attempts to quantify such changes with a metric.

In discussing the second overriding category, accounting based adjustments, a similar structure is used for the same reasons. However, the practical implications of the parameter effects will be discussed from the perspective of adjustments to financial statement entries and how such adjustments affect financial rate of return ratios. This is an attempt to find the origin of the changes as well as to quantify them.

Clearly, many possible relationships exist and not all of them can be explored or found in a pilot study such as this. This is the case for both model perspectives.
4. Empirical findings
In conducting the empirical investigation, the authors found a number of recurring themes stemming from most interviewees; a synthesis of these themes are presented below. As respondents have been in agreement for the most part regarding the different aspects of the video game industry, the empirical findings will be presented from the perspective of the interviewees as a group, with a small number of directly attributed statements in cases where opinions differ. All information provided in the empirical findings, used in the analysis as well as discussion, were collected from the conducted interviews, with some statements further strengthened by additional sources.

4.1 Human resources
First and foremost, a recurring theme in all interviews, is the importance of human resources. Video game developers are to a very great extent relying on their employees, and their competencies, as their primary asset and in all interviewees have stressed this fact. This presents companies active in this industry with a number of challenges and opportunities which are highly relevant to not only the company but to potential investors as well.

Talent management and retention of key employees is an important task in any industry but very much so in the video game industry, exemplified by Square Enix who suffered a credibility nightmare when two lead developers moved on to another company and faith in upcoming releases dropped immediately as a result (GameZone, 2015). This shows the importance and the relatively high amount of power commanded by senior employees. A tool that works both ways as such individuals are given more leeway and access to capital, illustrated by Tommy Palm, one of the men behind Candy Crush Saga who have now begun a new project in virtual reality where investors have not been hard to come by. While in this case a serial entrepreneur it nonetheless shows potential gain in recruitment, gaining a senior developer from a competing developer is a potential big win.

One of the primary approaches to employee retention mentioned by several interviewees is monetary compensation in different shapes and forms. Industry specialists has stressed the need for such compensation systems during interviews, later substantiated by publishers and developers. First among these comes salary levels compared to industry average or comparable competitors, there seem to be indications that many companies drift towards industry average. Some companies use salary as a prolific tool, EA prides themselves on being the employer with highest salaries in the market. Indications were also given by interviewees that it lies in the interest of investors to investigate salary levels of companies as abnormally low or high salary levels are likely to affect P/L and balance sheet. For smaller studios however the issue of salary is less of a problem, relying primarily on junior competence and recruiting from universities which allow for lower salaries as recent graduates tend to prioritize experience and to a great
extent being driven by a passion for their craft rather than demanding a large paycheck.

Another monetary based approach used by some companies is profit sharing, opting for lower base salaries with larger bonuses based on company profits at year end. While holding certain advantages, such as cost control, it suffers risks depending on employee reception. First of all if bonuses are equally distributed it may be that certain employees feel unappreciated for their hard work, an especially precarious situation given the video game industry characteristics, relying heavily on key employees. Another potential pitfall is that employees might prefer money in their wallet today rather than at the end of the year.

Monetary compensation aside, in recent years’ human resources has seen a paradigm shift, where the old generation, to a greater extent at least, were happy with having found employment and tended to stay with organizations for a long period of time, nowadays however young professionals are looking have become increasingly choosy. It is no longer enough to have a stable employment, personal development or fulfillment, career opportunities, passion or favorable “soft” benefits have become increasingly important, simultaneously making competition harder as well as granting employers new tools to compete.

Many organizations active in the video game industry therefore place a significant amount of focus on being considered as an attractive employer. This can manifest in many forms; DICE for example has a gym and discounted massage connected to their offices and for the release of Battlefield 4 reported number or hours spent in the gym, getting massages and the amount of coffee consumed during production. Furthermore, there are organizations who rate companies’ attractiveness for future employees, securing a high ranking is a sure way to attract future talent.

A, probably unique, characteristic of the video game industry that surfaced during the interviews was that of the sheer availability and passion of employees. One publisher and developer revealed that they are contacted every day by young people offering to work for free for the chance to work in the field of their dreams. This further illustrates a deeper issue, there is an abundance of junior competence in the industry but companies are searching high and low for senior competence. Indeed, as the industry is relatively young the amount of senior professionals is suffering at the current growth rate. However as previously mentioned interviewees hypothesize that this is mainly an issue for large companies as small and mid-sized firms can rely on junior competence to a great extent.

One point of discord between interviewees was that of international versus national competition for employees. On the one hand salary levels are relatively low in Sweden compared to other alternatives, primarily North America. Some experts argued for this as an increasing-
ly high risk factor for Swedish companies as there is a significant risk of skilled individuals moving to greener pastures. Fortunately for the Swedish video game industry in particular the nation of Sweden in itself raises the relative attractiveness of them as employers. Generous paid parental leave, high levels of equality, a relatively safe environment and many progressive policies and companies entice a lot of people. While national policies certainly attract both national and international talent there is an emerging problem mentioned by several interviewees as well as being brought to popular attention in the media through Spotify’s open letter regarding the housing situation in Sweden, especially in the capital. Skyrocketing prices of housing is becoming an increasingly serious problem for companies.

4.2 Investors
There is an important distinction to be made between, primarily, two different kinds of investors: active and passive. Active investors are interested in taking part in development and running the organization whereas passive investors are merely supplying capital to be used. While several interviewees agree that access to capital is a primary concern for the industry there is a difference in gain for the companies depending on the type of investor.

Many developers have an extensive knowledge regarding creation of video games, however business knowhow and the skills necessary to run a successful company is often lacking. For example, there is often not any plans in place for how to scale development, production or distribution. By attracting active investors companies with the necessary knowledge stand to gain a lot by utilizing their experience. Some interviewees mentioned an absence of insight into these benefits, instead placing focus in purely monetary gains, a focus that is to a great extent misplaced.

Among active investors many publishers can be found and oftentimes buying a developer involves more than merely interest in a product or project but rather buying into the situation in which the developer is situated, in essence entering new markets, platforms or user segments through acquisitions. Especially for the latter “Monthly Active Users” (MAU) is a very important metric as it gives in indication of the user base to which the publisher would get access. However, this metric is not without its own set or problems as it says nothing about whether monetizing is possible, for free to play games for example it is not necessarily the case that customers are willing to pay at all to any great extent.

That is not to say one should disregard the importance of brand or intellectual property, both very important aspects of larger investments, especially considering the tendency within the industry of producing numerous sequels to successful games.
Something that was mentioned by respondents was the value of autonomy granted to self-financed studios, allowing for greater measures of creativity and artistic freedom in development. Indeed, a number of smaller studios are not interested in outside capital as they want to avoid external forces meddling with their creative process. In discussions regarding where value is added in the process of video game development, uniqueness and innovation were mentioned as core components which could be an explanation for the rationale behind rejecting outside capital.

This reasoning can be partly attributed to the size of the firm in question, as there is a significant difference in development processes and risk behavior between small and large firms. In general interviewees claim that larger companies, to a greater extent, rely on proven methods and concepts, instead opting for high production value and perfect execution. This is a strategy of necessity, at least partly, as they are subject to higher fixed costs and pressure from investors, therefore requiring significantly higher revenue. A large publisher or developer also has access to more capital, allowing for simultaneous development of several titles, minimizing risk since the success of one is likely enough to keep the company afloat. In contrast, smaller companies, with low fixed costs and very low barriers for entry, can tolerate higher risk by challenging norms and finding new concepts and creative solutions, with the aim of higher payoff in relation to the amount of capital invested. However, while not being interested in financing per se, many still acknowledging the usefulness and need of business competence received by investment companies, helping companies get started and making them work as intended. Another possible solution proposed by an interviewee was an increase in passive investors, willing to invest capital while simultaneously relinquishing control, rather focusing on diversification through smaller investments in several companies. This rationale is in some aspects similar to the strategy of larger companies, while a number of ventures will undoubtedly fail, judging by industry statistics, but the success of a few is likely to yield a rich enough payoff to compensate for the failures. A problem with this approach however is that investors would have to behave like passive active investors, many companies are not public and therefore require direct contact and knowledge of a different kind than what is normal for passive investors in general.

4.3 Community

Many interviewees, primarily from within the industry, placed a significant amount of emphasis on the importance of communities for the video game industry and both developers and publishers exert a lot of effort into building and maintaining a good relationship with their community. This can partly be attributed to the aforementioned metric of Monthly Active Users (MAU) as a strong community is more likely to purchase upcoming games. Furthermore, an open dialogue with the community can mitigate the risk of failure of new ventures. A strong community is also what keeps a game alive, sometimes for years beyond what could be expected and allows for further exploitation through expansions, Downloadable Content (DLC) and
through modding further sales of the original game.

According to several interviewees many companies in the industry have adopted an iterative development process where Quality Assurance regularly engage with the community to gauge their reception of different aspects of new games in order to assure future success, this is often performed on each individual game pre, mid and post production, not unlike the movie industry. Game development is a time consuming endeavor and matching trends in the industry is very important, as in many ways “early bird gets the worm” hold true, and close communication with the community helps mitigate this issue to some extent. Therefore, focus groups have become more commonplace, at least among larger studios and publishers.

Other companies have adopted a more “hands on” approach and rather than relying solely on a specialized Quality Assurance department have their developers active in the community forums, in direct contact with fans, discussing development of features in the game and answering community questions. Some even send their developers and programmers to conventions rather than communication experts, reasoning that the developers’ knowledge and passion for their product supersedes their lack of media or communications training.

Apart from maintaining an existing community, when it comes to community creation there is an idea of “Build it and they will come”. What is meant by this is that if a game is well crafted the community will appear as people in general who share a love or an interest in something tend to engage with each other, making sure the game is well made and prepare to take care of the community when it forms becomes paramount.

4.4 Reviews

Regarding the importance of online reviews there were a lot of interesting reflections from interviewees. Within the video game industry reviews on Steam or Metacritic are held in high regard and viewed as important measures of success according to both developers and industry organization experts. Indeed, nowadays many developers sign contract, or place review embargos, with reviewers to ensure that reviews are not made and or published until after the game has been released, illustrating their importance to game producers. Generally, this behavior is argued to stem from low or high confidence in the game; Illustrating a highly versatile and multi-factored phenomenon, discouraging generalization at this point in academic understanding of the concept. Furthermore, there have even been cases where contracts between developers and publishers in which the developer’s share of the profits have been conditioned on Metascore levels. From an investor perspective many company representatives consider track record on Metascore to be a very potent tool for analysis in terms of gauging potential future success. However, academic studies on the effects of rating on app sales paint a slightly different picture, while not entirely comparable it provides an interesting perspective for discussion. First
and foremost, there seem to be a score inflation, yielding relatively high scores even for games that are not considered very good. For example, a mobile game with a score below 4 out of 5 is considered to have a low rating. This can be attributed to several reasons, however most likely seems the explanation that apps that do not hold up to quality standards are simply deleted without being reviewed as users do not actively seek out and review apps but are rather forced into it by continuous reminders which require active use. While this has been tested for mobile apps and not video games there is a widespread view among many users that the same holds true for video games, especially in terms of scores given by reviewers. While unconfirmed and by some viewed as a conspiracy theory of reviews being bought by companies it raises the question of how effective relying on online reviews is as an indicator.

Furthermore, the study finds that actions speak louder than words by showing that the amount of users is more important than the rating itself, tying back to monthly active users, people are more likely in general to purchase a product that many others have already purchased rather than trying out a new product even if it has a higher rating. The study further finds that applications with no substitutes or applications with high network effects, I.E. a sufficiently large user base to force new users into the app, are subject to lower ratings. (Engström, 2015)

While a lot of focus within the industry is placed on Metascores, there are examples further illustrating the importance of actions over words and power of community within the video game industry. Goat Simulator for example, developed by Coffee Stain Studios, received low Metascores but has 90% positive reviews on Steam and is a big seller. It is hypothesized by interviewees that Metascores are important primarily in the initial stages of a game’s life after release, a low score possibly decreasing exposure in relevant media and having a negative impact on sales. However, in the long run the strength of community overrules Metascore as it prolongs the games life and ensures continued purchases.

4.5 Performance metrics
In terms of performance metrics, the Swedish video game industry is fairly limited, interviewees said. Most measures are not exclusive for the industry, but reliance is mostly placed upon classic metrics such as revenue. A central type of measurement is monthly active users (MAU); which allows developers to monitor activity in their user base. This is mentioned by several interviewees as crucial to determine what products to focus on, which to develop further and which to discard.

The power of the MAU metric is not to underestimated. Possibility is through it given to developers to choose between various approaches. Games such as Call of Duty is mentioned to have a high number of MAU for a shorter period of time by appealing to a large user base, while more niched games or genres can keep their games alive for a longer time period with a steady
number of users. A key component of this metric is that it thus allows for developers and/or publishers to aim for high initial revenue, which declines rapidly, or to aim for a steadier cash flow by maintaining a game for a longer time with the help of DLC’s and additional updates.

Another metric used is the number of employees, which according to interviewees does not really bring much to the table in terms of increased knowledge or understanding. Instead it is seen as a measure for size comparison between firms. A more detailed and data driven approach to firm performance evaluation is on the rise, but is at present mostly prominent in the Chinese video game industry. However, several interviewees emphasize that more extensive performance analysis would likely be beneficial, such as can be seen in many, more traditional, industries. Interviewees attribute the lack of extensive performance metrics in the Swedish video game industry to the age of the industry in combination with the lack of traditional corporate competence. It was also mentioned that large developers, and publishers in particular, channel more effort into performance analysis. Electronic Arts were brought up as an example; with the caveat that many publishers act in a more conservative way as their prime business less based on the actual development of the end product. Instead they act more as investors and facilitators of talented studios.

An interesting concept also emerged in discussions respondents from small to mid-sized studios in terms of performance metrics and means of comparing their own companies to competitors. Through comparing their own relationship with distributors and publishers with that of competitors it is possible to estimate their perceived value in the eyes of powerful actors in the industry.

### 4.6 Accounting and Compliance

The Swedish video game industry are, like every industry, subject to regulation and accounting policies. Due to the nature of the video game industry, a few challenges seem to present themselves when adding the aspect of accounting and compliance. Interviewees mention that government subsidies, while not very extensive in the industry, affect operating profit. In some sense, this is mentioned to skew some values presented in annual reports. It is not necessarily said to be a large obstacle, but something investors should be on the lookout after nonetheless.

Other aspects, present in almost all Swedish video game companies, are reporting of sales tax. According to interviewees, an increasing number of video game firms engage in relations with accounting and consultant firms and other specialists to overcome such problems. As video game companies are essentially born globals, as distributors through international sales platforms such as Steam, Playstation Network and so on, revenue streams originate from all over the world. The level of value added tax differs between countries, and firms facilitating sales platforms do not keep track of the amount of sales tax to be paid in each market. This is men-
tioned to increase the need for corporate competence in the industry, something particularly lacking in smaller firms; which make up the majority of firms in the industry. As an investor, costs related to these issues might not be correctly forecasted and included in annual reports, which increase the need for investor analysis and vigilance according to interviewees.

When examining annual report and other financial data, an investor targeting the Swedish video game industry should, to achieve accurate forecasting, aim to equalize firm value as much as possible. Interviewees mentioned issues relating the product development cycles and immaterial assets. Creative competence among employees is consistently mentioned to be the most important value adding factor for firms in the video game industry. Time, sometimes years, needed for development along with competence is hard, sometimes impossible, to measure. The dilemma introduces problems of normalization of company value. A thorough investor ought to neutralize unnatural fluctuations in revenue streams and asset levels; preferably across several fiscal years if possible. Without such attempts, investors can expect their forecasted rate of return ratios to be less accurate, according to interviewees.

What party owns and control the IP is also highly relevant. Respondents mention that sometimes the IP itself matter, but in most cases it is the competence behind its development that matters most. A crucial factor is said to be the longevity of the IP. Minecraft is brought up as an example, when its creator Mojang were acquired by Microsoft it was likely a combination of IP and competence purchase. Minecraft is believed to have a longer lifespan than many games, but the creativity behind its creation is the longest term part of Microsoft’s investment. As an outside investor, one must be cautious and carefully consider how much of an acquisition price is paid for the IP and how much for the creative competence. The reason being that the creative competence will affect future company value; much like an investor in Apple have to deduct what value is to be given to the iPhone and what value is to be given to the competence behind its development. Without such an analysis, interviewees warn that an investor might not know what to expect in terms of monetary returns or growth of their investment.

Another complication in the video game industry is the nature of its products. As digital distribution becomes more and more prevalent, the issue diminishes; but is unlikely to disappear altogether. A digital product, in terms of accounting, is currently viewed as a service, not a product. At the same time, a physical game disc is treated as a product. According to respondents, this schism not only force firms to keep track of various sales channels, but also raises the necessity for specialized accounting, tax and corporate competence. As a majority of firms in the Swedish video game industry have less than four employees, such knowledge is usually not available within the firm. It is mentioned that larger firms, such as DICE, EA and Ubisoft does not suffer as much from this; as they are sizeable enough to host proper accounting departments, like most other large firms in most industries. Interviewees highlight the importance for
potential investors to take this into consideration, for various reasons. Partly because the investor will have to spend time and resources to discern such information on their own, if the firm does not, through analyzing sales statistics and so on. Partly because the firm might be required to deal with the issue, incurring costs previously unforeseen, such as hiring an accounting firm or other kinds of specialists not already active in the company. This will affect the reported figures, thus potentially skewing previous forecasting.

In essence, all previously mentioned aspects necessary for investors to consider, is efforts taken to reduce uncertainty and risk. Interviewees emphasized that such resource intensive activities are not technically necessary to make investments, but they ought to be vital for any sound investor as maximizing the rate of return with a minimized uncertainty and risk is the name of the game.

4.7 Industry infrastructure
External factors, like in all industries, have a large impact on the Swedish video game industry. Respondents emphasize that many such factors are political and in many ways outside of their sphere of influence, in particular for the small firms that make up the bulk of the industry. Spotify recently wrote an open letter stating that the lack of accessible housing in Stockholm were, in time, going to force the company abroad. Interviewees highlight the need for a middle of the road-solution, video game companies will have to accept compromise and a certain level of flexibility, while the political powers could certainly utilize a more forceful approach to solving such issues. The housing situation, in particular, is said to be a major bottleneck for the industry. As firms act on a global market, competence will in many instances out of necessity be drawn from abroad; senior experience especially.

Developers mention that industry barriers of entry are lower than one might think. It is rarely the lack of equipment or things often associated with the video game industry specifically that poses the largest obstacles. More often than not, it is more general things such as office space, lack of knowledge facilitation in terms of institutions and the like which make up the majority of obstacles firms face. Incubators for small video game companies are on the rise, but the local and national government will have to do more in these areas to avoid a stagnation of expansion as well as to maintain the strong hold of the international video game industry that Sweden currently possess.

As access to capital is a major issue, particularly in the initial phases of firm formation, investors and government will both have to engage in the solution. Countries like China, Finland and Canada are promoted as examples of such ventures. Finland has adopted government support to a further extent than Sweden, giving subsidies and grants of various kinds and sizes. China has also adopted a system of grants for video game development, like in most countries where this is present, sums are quite small, but enough to provide some sort of work space and capital
for necessities for employees. The fact that rather minute sums are required to get started is frustrating according to many interviewees, as it demonstrates a lack of will from the government, rather than a lack of resources.

When it comes to improving the prerequisites for video game development, Canada is mentioned as a forerunner. The government of British Columbia has introduced tax credits to alleviate the initial startup difficulties. In tandem with grants, this has had positive results. British Columbia has experienced a surge in the relocation of video game companies to their province, increasing the number of jobs and making the area a vital part of the international video game industry.

Several interviewees mentioned that Sweden has other attractive properties, such as parental leave, social security etc, which all contribute to make the country attractive for international video game companies. But that is said to not be enough, more targeted actions are needed. In general, the industry is raising demands for better startup support alongside better infrastructure to cater to Sweden’s growing IT-sector; such actions are, according to respondents necessary if the industry expansion in Sweden is to continue.

Respondents highlight that the needs differ depending on company size, smaller firms will do better with small grants and limited infrastructure, while larger firms need less of the first and more of the latter. In essence this relates to risk and uncertainty, the vast majority of Swedish video game companies go under. Firms with less than four employees are particularly vulnerable, while making up more than 50% of the firms in the industry. During the initial phase, small grants can ease risk and uncertainty about the outcome of a project, opening up for more risk averse investors to engage. At the same time, large developers face uncertainty in infrastructure oriented issues, interviewees say. Thus the government can act as a guardian for small firms through monetary support, while easing uncertainty for larger firms and their need for stable capital by ensuring that competition and expansion does not suffer. Respondents repeatedly mention that Swedish lawmakers, in general, are not up to speed with the IT-sector. It is not described as an acute issue, but it will become one if laws and regulations concerning digital development and distribution are not addressed and developed at a similar pace as the industry.

4.8 Industrialization and specialization

A further difference in the distinction between small and large video game developers is that larger organizations tend to adopt a more industrial approach to development, a trend that some interviewees agree is growing within the industry. Smaller developers, to a greater extent, utilize their employees as generalists, working on different tasks depending on the developmental stage of the game whereas large corporations use specialists for specific purposes and parts development. This approach is enabled by development of several games simultaneously or
by the magnitude of larger projects driven by larger corporations, a small studio developing a single game has less use for that level of specialization. Interviewees hypothesize that this can partly be attributed to the risk behavioral differences between small and large corporations within the industry but also to the fact that as firm size increase, so does fixed costs and other commitments.

4.9 Gatekeepers
Another emerging power factor mentioned by interviewees are new forms av gatekeepers in the industry. Companies providing essential tools such as Steam and console as well as mobile market platforms grow in power in tandem with the growth of their platforms. Respondents highlighted that a handful of firms now more or less control all distribution of video games in the international arena. GameStop owns the physical market while Google, Apple, Valve, Microsoft, Sony and Nintendo controls various segments of the digital distribution system.

The manifestation of power is said by interviewees to reveal itself in forms of control over barriers to entry as well as influence over pricing, rating categorization, marketing and user exposure. Respondents say such firms will become increasingly important as they grow, exerting more and more influence. Depending on the future direction of the industry, interviewees mention that competition among them is likely to increase, with unclear outcomes.

4.10 Marketing
As the industry has grown, marketing has become increasingly important. Interviewees say that many games survive on exposure to a large audience, and the growing number of available games to play increase pressure to be noticed. Respondents said to have noticed that the industry, large firms in particular, is evolving to become more like the film industry, where marketing, trailers, continuous exposure and recognition is essential. This is mentioned to be clear from a number of perspectives. Marketing makes up a large part of budgets for development and sales of games and it has also become commonplace to see video game commercials at the Super Bowl and during primetime TV broadcasts, according to interviewees. According to interviewees it has also become more important what studio or creators that has developed a certain title, not unlike film directors; it is, however, not nearly as prevalent in the video game industry as of yet. Respondents said the community is also becoming a more integrated part of the marketing process. Video game streamers have followers in the millions, making such channel vital for any developer wanting to gain momentum in the market.

4.11 Rate of failure
On the subject regarding the relatively high rate of failure within the industry, one interviewee said “I mean, nine out of ten new companies fail”. Many interviewees attributed this to a combination of low barriers for entry, a regular computer combined with knowledge or pro-
gramming, and lacking insight into value creation in video game development. Any person can begin developing a video game, one of the possible reasons why such a vast majority of the companies in the industry are very small, however as one interviewee put it: “It is often the case that a person appreciates a game and decides to make one just like it rather than considering what adds value, which most often is uniqueness”.
5. Analysis
Below follows a synthesis of empirical findings analyzed in relation to their possible impact on financial ratios. The analysis will base its arguments on the empirical findings in tandem with the previously presented theories. Arguments for several potential, sometimes conflicting, scenarios will be presented. Judgement from the authors will be excluded and instead presented in the sections following the analysis. This is done to preserve objectivity and clarity of the presented arguments, independent of their final impact. As the study is of a highly exploratory nature, the authors thereby wish to provide future studies with the best prerequisites for judging the arguments without immediate interference of the current authors.

5.1 Human resources
As indicated by all respondents, human resources take center stage in the Swedish video game industry. The interviewee holding the position of Head of Strategic HR especially highlighted this; Recruitment of relevant competence is the most important factors facing firms in the industry. Senior competence, such as senior game designers, senior producers and so on, are notoriously hard to find. As part of retaining the necessary competence, recurrent personnel training is said to be essential. Competence is also mentioned by consultants and HR specialists alike as being the most valued property when acquiring other developers or publishers.

In the EU, most firms adhere to their respective national accounting laws, many of which are, to a large extent, based upon the IFRS accounting standards. Sweden is no exception in this case. The result is that recurrent personnel training is taken up as a cost, but its value adding effects to the development process and finished consumer products are not represented by total assets in the balance sheet. The resulting dilemma is that financial return ratios making use of assets, intangible assets in particular, will in the financial statements inaccurately reflect the value creation, thus the enterprise value, of a given video game firm in the Swedish video game industry.

It could be argued that such value could be taken up in the goodwill of the firm, which is represented in the pool of total assets, thus being included in the financial return ratios. On the other hand, goodwill present in the balance sheet has increased dramatically, giving rise to skepticism of what kind of value is actually added to goodwill. Why should an investor risk his/her capital when a firm is unable to accurately specify where the value is coming from?

Another issue with such a heavy emphasis on human resources is the increased cost of personnel. While junior competence is said to be abundant, senior competence is another thing entirely. Such competence is harder to come by and is often found abroad. As salary levels are mentioned as an obstacle in terms of matching with larger markets such as North America, Swedish video game firms run the risk of increased costs for personnel; Both in terms of fixed and variable costs. Such an increase will in turn decrease operating profit, negatively affecting
financial return ratios using operating profit as a tool for calculation. Administrative costs as well as other operating costs could also be affected. The resources needed to secure that the correct competence is recruited could increase as more time and money is needed in the process, higher level of competence could also increase the demand for better equipment, improved development processes, perks, larger office space and so on. All of which can spur an increase in operating costs, eventually affecting the operating profit and thus financial return ratios.

As a counter argument, all respondents mentioned factors outside of the firm as relevant. The Swedish society in itself attracts competence for a number of reasons. High quality infrastructure, a secure welfare system, parental leave could all allow Swedish video game companies to remain at a lower salary level as well as lowering the requirements for the best equipment, location and other firm related perks. Such societal factors could off-set demands requiring higher operating costs, again lowering the negative effect on financial return ratios. The interviewed HR specialist also mentioned that the company receive phone calls and emails from junior competence willing to work for free, simply for the opportunity to work in the video game industry. This could also affect financial return ratios by allowing firms to keep salary and other operating expenses low for most employees, while reserving such increases for the difficult to acquire senior competence.

The level of employer attractiveness could also play a role in human resources. A well respected track record, highly regarded IP’s and overall reputation could affect the direct cost of personnel and other operating expenses in either direction. A well respected developer attracts competence by offering prestige and status by other means than increased costs through salary and perks. However, a firm on the opposite end of the spectrum, being less reputable, might have to compensate it’s reputation and track record by offering greater material rewards.

5.2 Investors
While respondents were not in full agreement regarding the usefulness of external capital in terms of its effect on creative freedom and control versus initial financial stability, with all that it entails, they largely agreed that the increased business perspective granted by cooperation with investment companies increased likelihood of success. Firstly, without considering any direct effect on profitability ratios, or their underlying factors, taking cooperation with an investment company into consideration could potentially lower investors’ perceived risk to a certain extent. Especially true, and important, for very small studios where both the risk and potential reward are relatively high, combined with a, in general, more urgent need for capital compared to larger firms with a track record and more continuous revenue stream.

Secondly there is a potential effect on profit and loss stemming from investor cooperation. By cooperating and to a certain extent lending their name and credibility to developers investors
may affect interest rates, also pertaining somewhat to perceived risk but in the eyes of creditors, manifesting in an increased operating profit and thereby boosting rate of return ratios. However, while affecting P/L, this post falls outside operating profit it will not affect the profitability ratios analyzed in this study.

That is not to say that profitability ratios are entirely unaffected, business competence imported from investment companies, or individual investors for that matter, could of course have a positive impact on both cost control and to a certain extent strategic choices and thereby increasing operating income. On the other hand, this relies on the competence of the investment company, their knowledge of the industry, and the purpose of their cooperation with the developer. For example, assistance in pure accounting terms is likely to have a positive impact on cost control whereas influence over strategic decisions relies heavily on the company’s knowledge of the industry which may impede rather than help the developer.

5.3 Community
Assuming a video game developer manages to produce a product that is sufficiently well crafted, the community could be said to constitute the most important factor affecting investor returns. A video game developer with a strong and loyal community could, to a greater extent, be more certain of positive financial returns. Although the community is a powerful force, it largely depends on how the firm choose to interact with its community. As previously mentioned, the developer of Killing Floor 2 greatly involved its fanbase in the development process by allowing voting to decide the outcome of animations and game mechanics.

While the community possess limited agency over interfirm factors such as costs, it most decidedly affects the sales of a product; Thus affecting the level of financial returns as well as the level of perceived risk and uncertainty in investors. Two main approaches were mentioned when deciding what impact a game has on the community. For smaller firms, a loyal and long lasting contact with its fan base is more prevalent. Larger developers instead tend to go for scope and shorter longevity. This results in different investor approaches.

An investor looking to invest in a Swedish video game company potentially face some much needed work to assess the level of return as well as the level of risk and uncertainty. Smaller companies with more niched titles are usually able to continuously release DLC over a longer time period, thus providing a stable cash flow while working on the next game. If the firm does not cater to a loyal fanbase, an investor could face a future of increased costs for such undertakings. A larger firm, on the other hand, tends to have a less loyal community with higher demands on game quality and design. A telling analogy could potentially be found in the film industry. Much like Hollywood, a larger community expects top quality products while providing movie studios with less loyalty, if something better and more rewarding comes along,
the community hold little remorse for discarding the old product. The Swedish video game industry could act in the same way. Niched games retain cash flow potential by catering to special interests and themes, rather than selling large numbers of a polished but less daring game, which is mentioned to be typical for larger developers.

By such a rationale, investors engaging in firms developing titles such as Call of Duty, which are released every year, could expect shorter product cycles and an initial surge of sales, which diminishes more quickly than for a niched title. Gauging the community response is therefore essential. With increased demands for game quality comes increased operating costs, negatively affecting financial return ratios. On the other hand, one could argue that this increase is countered by higher sales, as the target community is larger. While this might be true, a more polished product requires sufficient senior competence and does not allow for equal community agency over the development process; Increasing investor risk and uncertainty from the perspective of guessing what a less than loyal community craves. While a respected track record in the community can mitigate such risks, it could arguably be dangerous to rely on it. A recent example is the new Call of Duty: Infinite Warfare, a title whose trailer as of 9 May, 2016, is one of the most disliked videos ever on YouTube, with 14 million views and over 1.1 million dislikes (Metro UK, 2016). This must not necessarily affect the sales, and thus returns, of the game, but an investor could be advised to take it into consideration. This could be especially important if there are substitutes which is being more highly revered by the community; In this case Battlefield 1, whose trailer has been watched 19 million times, receiving only 18 000 dislikes (Metro UK, 2016). Despite this, an argument should be considered, the Call of Duty series has experienced increased discontent from the community for several years, while selling more games with each release.

Smaller developers instead cater to a smaller, albeit more loyal, community. This, however, could present an investor with different risks, uncertainties and financial return expectations. In smaller firms, investors can rely more on the dedication of the community when it comes to sales and the risk of product failure. The community relating to niched titles could arguably be said to ignore reactions from the community at large, reducing the level of risk on terms of the investor. On the other hand, a niched title could face higher demands to meet specific criteria and preferences from its community, making interaction with the community a key element to avoid discontent; ensuring positive sales and financial returns while reducing risk.

5.4 Reviews
While there are some concerns regarding the reliability of reviews as a metric for present, or indicator of future success by extrapolating academic findings for mobile apps and games to the video game industry there are still arguments to be made for their usefulness in analyzing a developer. First of all, it is considered to be an important metric within the industry, indicated
by profit sharing between developers and publishers conditioned on Metascore. It is easy to hypothesize that a studio with previously high scoring titles are more likely to continue to have high ratings compared to a new untested studio or, to a greater extent, a studio with historically low reviews. This should lower investors perceived risk, allowing developers easier access to capital.

On the other hand, it is important to differentiate between different kinds of reviews, a high metascore, given by critics, will increase exposure in media and thereby likely have a positive impact on initial sales whereas a high user score indicates a higher longevity and long term sales. For this reason, caution should be advised when considering the impact of reviews, especially in cases where there are large discrepancies between users and critics, something that is not unheard of. Exemplified in one direction by Goat Simulator, developed by Coffee Stain Studios, which has a score of 62/100 on Metacritic but 88% very positive reviews on Steam which are user based, illustrating the potential weakness of relying completely on one metric in terms of reviews. Flipping the tables, Dragon Age II (DAII) received a Metascore of 82/100 compared with a meager 3,9/10 from users compared with the original game Dragon Age Origins (DAO) scoring 91/100 and 8,6/10. During the first 10 weeks after release DAO sold 2 million copies compared to 1 million copies of DAII, 600 000 of which during the first week compared to 400 000 for DAO during its first week according to VGChartz (2016). Illustrating both the importance of reviews for initial sales but also the power of user score, substantiating the academic findings for mobile apps to a certain extent in that customers tend to views actions to speak louder than words.

In terms of direct impact on profitability ratios and investor behavior, rather than having any concrete effect on ratio variables, and thereby not requiring any adjustments, it is reasonable to rather view it as a predictor of future cash flow or revenue. High critic scores serving as an indicator of initial sales potential and high user scores indicating a strong community and potential higher longevity of future games, indicating relatively stable cash flows.

5.5 Performance metrics
A recurring theme during interviews was the importance of Monthly Active Users (MAU), illustrating a segment of consumer of which the developer to some extent can exert control, and to some extent can be used as a predictor of buyers of future games. It is for example hypothesized that one of the reasons behind the extraordinary price tag on King was their very high number of MAU, consumers likely to purchase upcoming games, ensuring future revenue.

The possible effect on profitability ratios can be twofold in the case of MAU. First of all it could potentially be viewed as an intangible asset, increasing the denominator in several profitability ratios. An intuitive adjustment considering that the video game industry on average
should have relatively low assets, yielding relatively high ROA values. Another option is to view MAU, not unlike reviews, as an indicator of future revenue in which case it would not require any adjustments but rather due consideration by investors when analyzing a developer.

On the other hand, an issue that both of these options are contingent on with regard to MAU and it pertains to the developers’ ability to monetize these users. For example, a game with a free to play approach, relying on micro transactions for revenue, can have a high user base but if the community ultimately proves unwilling to pay for the extra services or features offered to premium players this metric quickly becomes much less useful.

5.6 Accounting and Compliance
Instantly operating on global market, video game companies are subject to various accounting and compliance regulations. The main effect this could have on investors are related to costs and resource allocation towards fulfilling such regulations. Depending on the nature of the video game firm, the resource intensity could differ greatly. A firm owned by a publisher who controls the IP might require a high portion of sales revenue, decreasing available funds for the investor, as well as potentially limiting growth for the developer.

In general terms, it can be argued that an investor will have to adjust to whether or not the firm possess the necessary tools and competence for regulation compliance. If it does not, time and money will have to be diverted, potentially adding the operating expenses from a number of perspectives. Examples of such allocations are the increased interaction between video game firms and accounting and consultancy firms. As physical video game products count as a product, digital downloads are categorized as a service, requiring different accounting practices and knowledge.

Should the firm solve this dilemma by taking in a large investor with extensive experience in such fields, a minor investor might see his/her ownership diluted, lowering expected returns. If the investor instead contributes with such competence himself/herself, it will require time that could otherwise be spent elsewhere; Forcing the investor to put more eggs in one basket. Regardless of the inherent competence of the firm or investor, resources are potentially required in the form of either costs or time, or both. Either way is negative for the investor, although resource requirements loading the firm could be the ones affecting the financial return the most; Mainly through increased expenses, lowering operating profit and potentially total assets.

An important dimension is the enlarged corporate function of the firm. With more stringent rules and compliance, creative freedom run the risk of suffering in the process; Which could constrain future value addition in the firm. Another technical aspect to consider is that investors could suffer in their predictions of rate of returns if one-time occurrences are considered.
Events such as government grants, currency gains/losses or something similar in nature could off-set the realistic average return of the firm. Collectively, such resource allocations in terms of compliance and occurrence of potential one-time events increase the risk and uncertainty of the investment.

Another potential hazard for investors is the industry income model. To lower risk, lack of returns and to avoid increased liabilities such as interest payments stemming from poor liquidity, it could be argued that an investor should be wary about relevant cash flow cycles. Larger firms tend to capitalize on their titles rather quickly, while smaller firms capitalize over a longer time period. An argument could be made that firms of all sizes should ensure that the firm is not in need of external capital injections between game releases. Currently, this seems to be mitigated by reallocating the majority of a development team to a new title, while a smaller team keep working on DLC’s, providing revenue until the next title is available for prepurchase; Generating cash flow on its own.

Without such considerations, an investor could run the risk of not managing day-to-day expenses, provided the previous revenue was not plenty enough for a hefty surplus, sufficient to support the firm during future development processes. At worst, illiquidity could eliminate the financial return of the firm altogether and/or hinder development processes enough to affect the long term firm value added from future titles.

5.7 Industry infrastructure
At the time of writing, investments from the government are not extensive in the Swedish video game industry. While this could be argued to have little effect on investors, an increase of such actions could benefit both the industry and potential investors. As capital injections are mainly required in the initial phases of development of a new video game firm, the risk and desired returns of investors could be lowered with the help of the government. Grants, access to cheap office space and even assistance with accounting could ease the transition from a start-up to a stable firm. At this stage, investors could then focus on making smaller investments in a multitude of firms, sharing the risk, and returns, with other stakeholders.

Considering the rate of failure of new video game developers in Sweden, the more risk that is diverted from investors, better access to capital could be achieved. Universities sometimes offer incubators, a solution which could assist investors engaging when sufficient corporate complexity and stability has been achieved; To avoid bearing the brunt of the initial start-up risks. Arguably, it is not necessary to lower the total corporate risk, simply sharing it by allowing investors to stretch their capital over a multitude of firms.

Similarly, to most industries, larger firms does not have the same need in terms of capital. More
often they are reliant on an existing structure or a publisher bearing a lot of the risk. The largest developers and publishers has been taken public, putting them in a position, accounting wise, similar to many other firms from various industries. Instead their infrastructure could be argued to be more heavily dependent on external support in the form of technology infrastructure and long term engagements such as housing. Such factors usually remain outside the control of the individual investor, despite being important to consider. The recent outburst from Spotify highlighting the need for better housing opportunities affect the video game industry as well. Arguably, an investor should consider the risk of a firm relocating or bearing additional expenses to accommodate senior competence in particular.

5.8 Industrialization and specialization
In terms of perceived risk there is a possible difference between small and large firms. The latter can manage risk to a higher extent, attributed to their size, allowing them to simultaneously develop multiple games, effectively distributing their risk on several titles where the success of one will compensate for potential the potential failure of others. The size and simultaneous development also allows for deeper specialization of development units, which enables large developers to deliver on execution rather than uniqueness, further mitigating risk to a certain extent.

However small studios have to be a Jack of all trades to a greater extent, less specialized and therefore not as secure in execution as their larger counterparts, higher risk but also with high potential rewards as initiation and development costs are significantly lower compared to AAA games, as fixed costs, if nothing else, are lower. In terms of risk behavior the increased risk is likely to require higher demands for returns, at the same time the investment is relatively small as developers of this size do not require much capital. Knight argues that people in general are interested in minimizing their losses, opting for lower risk even though that requires lower returns, this is consistent with the author’s analysis as well as industry issues with capital which primarily is a problem for small developers.

5.9 Gatekeepers
To consider what effect industry gatekeepers could have on an investment require computing of a multitude of factors, many of which can be difficult. An argument can be made that a firm engaging in exclusivity deals with for example a console manufacturer hinders relationships for the upcoming release or console generation. On the other hand, it could be said it most likely does not, seeing as it is a common practice in the industry.

Instead, one could argue that an investor ought to remain vigilant to the increasing power of gatekeepers such as Sony, Microsoft, Nintendo and Steam, to name a few. Not only do such firms have the opportunity to increase demands, potential payments for exposure and so on,
but the window of opportunity grows alongside their market share. Therefore, it can be argued that an investor should monitor the strategies of the gatekeepers, especially during new console generation launches. To exemplify, Sony changed their strategy and focused heavily on North America during the launch of the Playstation 4, helping them gain the upper hand over Microsoft and the Xbox One, in terms of sales. Thereby, it can be said that an attentive investor ought not be taken by surprise during such events.

Such a rationale could lead the investment and financial return to suffer from everything from increased operating expenses to loss of market share and future value creation by the developer.

5.10 Marketing
In terms of marketing, the main arguments concern expenditure of resources such as time and capital. Larger firms, with less innovative products, tend to spend more on marketing. The discrepancy between small and large firms, arguably present in the interaction with the community as well as in how companies deal with reviews, could also affect the level of marketing. It could be argued that a large firm suffering from negative reception with one of their titles, such as Call of Duty: Infinite Warfare, could lead an investor to expect more resources being diverted to marketing. In the case of community wide praise, smaller marketing sums might be needed to achieve a leverage effect as reliance for exposure rest more on the momentum of the community.

The opposite could be true for smaller firms. A niche title could hope to achieve a market large enough within their niche to disregard the overall reception to a greater extent. This might allow smaller titles to generate sufficient revenue without the need for extensive marketing costs, due to loyalty from a small segment of the market. On the other hand, should relatively large marketing expenditures be needed, an investor could be said to greatly increase his/her risk as smaller firms. It deserves mentioning that such risks pertain to those not already calculated, arguably it is the unexpected element of such resource spending that pose the majority of the risk. While unexpected costs are never preferable, smaller firms may not be equally adept to deal with them; Although it should not be precluded that large firms might see their financial rate of return significantly lowered due to marketing expenses.

5.11 Rate of failure
The relatively high rate of failure in the industry is an important aspect to any investor. One of the effects is that the industry favors active investors rather than passive, one issue with small developers is the lack of business thinking. An investor interested in delving into the depth of the video game industry must ask themselves and perhaps also the developer what aspect in the game adds value.
6. Discussion
In this section, the two models based on the overriding categories of parameter effect, as described in section 3.8.1, are provided as well as utilized as a basis for discussion.

6.1 Overriding Category: Risk - Figure 3
The authors have comprised the risk oriented model (Figure X) to contain four main sub-categories, i) Community, ii) Human Resources, iii) Corporate Climate and iv) Rate of failure.

![Figure 3: Overriding Category: Risk](image)

6.1.1 Sub-category: Community
The authors would argue that in terms of risk and its relation to parameters within the community category, an investor cannot reasonably assess how to relate to for example a metric such as MAU without also looking at marketing, gatekeepers and reviews; The same is true for any of the parameters. A high number of MAU may be present despite a large portion of negative reviews, in such a case, the number of MAU would lower the level of importance, in terms of risk, assigned to the review parameter. The authors argue that a multitude of such intercorrelation can be seen, a high number of MAU, easily accessible platforms provided by gatekeepers and positive reviews would lower the perceived risk and uncertainty about the direction of marketing expenses. The authors further argue that investors must consider the level of indifference pertaining to such risks. The community response to a game title is in many ways indifferent to a developer’s attitude towards the response itself, making it more difficult to combat. Despite this and contrary to Knight, the authors advise considering more nuanced degrees of indifference, as marketing evidently has the agency to alter perception and attitudes within a community.

6.1.2 Sub-category: Human Resources
Similarly, the authors believe that perceived risk and uncertainty about its future levels, relating to human resources, act analogously if observing for example compensation. Compensation levels might be too low, motivating a future increase of expenses, but it is dependent on many factors, competence being one of them. The authors argue that senior competence is the most difficult to come by, therefore also the most expensive to acquire as well as maintain. Knowing the level of competence in a firm is then clearly needed to remedy uncertainty and assign rele-
vant risk levels to fluctuations in expenses related to compensation. Further, the authors believe that low compensation, or disliked compensation delivery systems, could push competence away from the firm, resulting in a loss of competence. Without the relevant competence, investors are likely to discard plans of investments due to excessive needs for their own competence and/or capital in ways that can be difficult to foresee, thus raising risk and uncertainty. Seen from another perspective, a low degree of investor/corporate competence might allow for disproportionate compensation expenses due to inexperience in the area of business, resulting in a potential increased uncertainty concerning the ability to pertain a satisfactory level of developer competence. Extravagant levels of compensation, the authors believe, can instead increase uncertainty about the stability of the firm through its liability levels, thus increasing uncertainty about the liquidity and perhaps survivability of the company. The assigned grouping of parameters still helps however, as it clarifies where the uncertainty could originate, despite its end heightening effect ending up in another category.

6.1.3 Sub-category: Corporate climate
An equally intertwined parameter and category relationship is observable in the third category. External industry infrastructure, the authors argue, could minimize the discrepancies keeping firms from achieving a greater degree of specialization. Smaller firms provided with sufficient tools such as office space and competent incubators would foster less uncertain growth. Higher growth aids developers to achieve greater specialization, and thus efficiency, as the necessary size threshold for such measurable changes is approached. These evolutionary steps would remedy the issue of being unable to relate to uncertainty pertaining to concepts that is too distant to grasp. As substantiated by Knightian philosophy, a developer not in the position to reflect on the concept of specialization, will face difficulties assessing or even perceiving the benefits and uncertainty diminishing effects that come with it. The authors further argue that increased specialization can reduce the uncertainty of how to deal with more complex accounting and compliance regulations and policies as more resources can be used for such purposes. Further, industry infrastructure in the form of judicial efforts aimed at ease of accounting and compliance would lower complexity, thus uncertainty, but also have a diminishing effect on the uncertainty pertaining to for example compensation expenses related to accounting and compliance; Highlighting the explanatory power of the model in terms of uncertainty origins and its effect on parameters in other categories.

6.1.4 Sub-category: Rate of failure
Based on previously mentioned arguments, the authors argue that rate of failure to be the most elusive category. From the perspective of the investor, failure of investments can be remedied through diversification of risk and knowledge of the industry, a decision that aid developers mainly by making investors more prone to actually investing. However, it is clear that several factors reducing or increasing general uncertainty carry over to the rate of failure of develop-
ers themselves. In that sense, the authors argue the case for a Knightian view that emphasize knowledge to be the most essential component when aiming to reduce uncertainty. Evidently, parameters affect each other not only within the categories assigned in the study, but also those placed in other categories entirely. Knights view that no business situation can truly be labeled as identical due to the multitude of relevant factors involved are believed by the authors to have merit; As the described relationships between parameters and categories exemplify the difficulties of making fully reliable relationship predictions, not to mention quantifying them. Therefore, the authors argue that extensive knowledge is needed to further specify the many relationships and indifference nuances affecting the rate of failure, both in terms of developers as well as investments. The main benefit of that knowledge, regarding uncertainty, would be vastly improved grouping. A Knightian approach to uncertainty in business is thereby substantiated in general, the authors believe even more so when examining the Swedish video game industry.

6.2 Overriding Category: Accounting based adjustments - Figure 4
The authors have comprised the accounting based adjustment model (Figure X) to contain three main sub-categories, i) Community, ii) Human Resources, and iii) Corporate Climate. Category iv) Rate of Failure, has been excluded from this perspective, based on the rationale that risk of failure is mainly studied using the current ratio; A financial ratio whose nature share too few similar traits with the studied financial return ratios to remain relevant for this study. The result would be a discussion continuously steering towards the concept of risk, which has instead been examined with different tools in section 6.1.

6.2.1 Sub-category: Community
Much like the discussion concerning risk illustrates, numerous relationships exist also within the monetary effects on the firm, pertaining to parameters connected to the community. MAU is used as a metric for assessing the size of the user base and, according to the authors, this metric has agency over the potential adjustments to for example reviews. A game title poorly received by professional critics mustn’t affect the financial outcome of an investment. Provid-
ed the number of MAU is sufficient, as is commonly seen in niched communities, customers might not be off-set by such reviews. Goat Simulator is an illustrative example. With no critical acclaim, but a loyal user base, the title has generated a lot of revenue and is without doubt correctly labeled a success. A high MAU metric along with praise from the community at large, the authors argue, might also lead an investor to adjust the expenses for marketing downward; As cheaper, more small scale marketing options become available, instead relying more heavily on mouth-to-mouth exposure. This would lower operating expenses, increase operating profits, increase assets and return on invested capital, thus having a positive effect on the studied financial ratios in a quantifiable way.

Should the number of MAU instead be low, major investments in marketing or accepting financial loss might be necessary. In either case, the authors believe the investor to lose, as both scenarios lower operating profit. Investments might increase liabilities such as debt or reducing assets like cash, quantifiable with any of the financial return ratios provided. Expenses related to gatekeepers could also affect assets and liabilities, less standard exposure on various platforms might motivate marketing investments, high expected sales and community praise might give gatekeepers incentive to raise costs of participation. Argued by the authors, either scenario highlight the limitation of relying solely on financial ratios in this area, as they provide quantifiable change metrics, but provide the investor with little help on how to interpret and act on said changes, without the necessary complementary knowledge of the industry. The authors believe even more so in terms of the community effect on forecasting, due to the added inherent difficulty of predicting the future.

6.2.2 Sub-category: Human Resources

Should accounting adjustments related to human resources be treated without consideration of other category effects, it presents less difficulty. The authors argue that costs related to compensation, recruitment and injected investor capital are quite observable and quantifiable. The financial effects of competence and recruiting are, the authors argue, the most elusive in this category. Not only could it be largely affected by parameters from other categories, it could also be difficult to forecast. An expensive, senior developer might move on, motivating large investments in specialised recruitment, negatively affecting operating expenses. Employees might leave the developer due to unsatisfactory compensation or a poor industry reputation. Each case negatively affect all ratios examined in this study; either by potential loss of future revenue stemming from poor developing competence, increased costs for recruitment due to voluntary terminations.

Further, the authors find it likely that a negative spiral could emerge, draining competence not only in terms of development, but also corporate competence. Investors would not be equally prone to investing in less reputable firms, resulting in a loss of competence, often lacking in
the industry. Such competence loss, the authors theorize, ought to make firms less efficient in some aspects, possibly raising overall expenses due to inexperience and mismanagement; All of which results in less profit allocated to investor returns. Investors looking at developers with below average compensation, the authors believe, ought to adjust such expenses upward, increasing liabilities and lowering the rate of return on invested capital. Not only ought this be done to avoid some of the aforementioned scenarios of competence loss, but also because industries generally settle around a given range of compensation, further substantiating such an adjustment; provided the firm is below that range. The opposite adjustment does not seem particularly common or equally executable by the authors. Again, the limitations of relying too heavily on financial return ratios becomes apparent. In terms of human resources, the authors argue that they provide a more powerful tool for quantifying financial statement adjustments due to the more apparent effects exerted by these parameters. The imagine painted is still problematic and flat, however; albeit slightly more useful. As seen before, it is the ratios lack of provided context and understanding of the underlying causes that paints such a picture.

6.2.3 Sub-category: Corporate Climate
When examining the corporate climate of a firm or industry, an investor ought to adjust for the flow of cash. As is commonplace in the Swedish video game industry, large discrepancies between titles may occur. As argued by the authors, smaller firms do not always have the degree of specialization necessary to allow core teams to remain in projects, producing revenue generating DLC’s while the majority of the development team move on to the next title. This, the authors believe, is more common in larger firms. Without such possibilities an investor looking to accurately assess the real financial situation of the firm as well as his/her return, ought to normalize such revenue streams over more than one accounting period. Without such adjustments, the authors consider it difficult to form any kind of helpful insight on the outcome of an investment. Not only does uneven cash flows fluctuate returns, the authors argue it to be value destroying. Less resources needed to maintain a cash flow from a title would allow the developer to produce more titles in a given time period, thus creating more value; increasing assets, average revenue, increasing the return on equity and so on.

Perks provided from infrastructure could also skew the reported financial outcome of a developer. The authors argue that a large grant, for example, would have to be normalized in some way, should it be arbitrarily received some years but not all, an investor ought to consider it a one-time item and discard it altogether if necessary; as it does not accurately represent a source of trusted value in the firm. The effects it can have on the studied ratios are multi-faceted.

The effect of accounting and compliance policies also affect the selected rate of return ratios. If a firm lacks the necessary degree of specialization in the accounting field, unexpected costs stemming from sales varying between markets, different tax levels for physical and digital
game copies and profit destination are not unlikely, according to the authors. Like many industries, large owners, in this case generally publishers, can be expected to demand a large part of the developer generated revenue. The authors emphasize the importance for an investor to examine the phenomenon closely, possibly adjusting for it in the financial statements; as the percentage taken can differ greatly between years. The same rationale is advocated by the authors when treating costs related to acquisitions.

6.2.4 Summary accounting based adjustments
The recurring conclusion regarding the usefulness of financial return ratios as gauges for parameters affecting investments in the Swedish video game industry is that they leave much to be desired. ROE suffer greatly from the fact that few developers are active on the stock market, forcing investors to rely on book value; a metric the authors believe to be a poor reflection as immaterial assets such as competence, community and more are so vital. Similarly, ROA arguably provide a skewed value due to difficulties accurately quantifying developer assets. The high number of difficult to measure parameters ultimately affecting the ratios also off-set their usefulness as intuitive and easy to calculate.
7. Conclusion
The overarching theme promoted by the authors is the high degree of complexity present in the video game industry. The authors found that financial ratios suffer from limitations that are well known, arguably even more so due to the abstract nature of the industry in terms of assets and value creation. Instead the study promotes a limited use of financial ratios, complemented with a heavy emphasis on knowledge and uncertainty and risk approximation, which the authors argue better reflects potential outcomes in developing game studios and publishers. A great need for further studies into various areas found to have much agency on the financial outcome of video game developers and their invested capital has also been illuminated.

8. Further research
Several areas interesting for further study has been highlighted in this study. The authors argue that more studies similar to this one is needed, alongside more data driven research. While this study has made an attempt to map the overarching structure affecting investments in the Swedish video game industry, no parameter has received in-depth attention. While this study argues against the usefulness of financial ratios, future research should not treat this as given; The study provides a much too shallow dive into the subject to make any conclusive judgement. Therefore, further exploratory studies are preferably complemented with niched studies examining specific relationships; similar to the study by Englund & Forsell, 2015.
9. References


10. Appendix 1 - Glossary

**AAA** - Popular term for well financed and developed games. Usually via large distributors and physical channels.

**Casual Games** - Simple games, minimalistic story, easy to learn and optimized for short gaming sessions.

**Crowdfunding** - A method for securing funding, usually by using an online platform where individuals or organizations can pledge money.

**Crowdsourcing** - Outsourcing to an undefined group of users rather than paid employees.

**Digital distribution** - Sales and distribution through digital channels rather than retail.

**DLC** - Downloadable Content, extra features and addons available for a fee, smaller than traditional expansion packs.

**Freemium** - Umbrella term for business models that offer their products for free but generate revenue through microtransactions, unlocking advanced features or items.

**Free-to-play** - Games that are free to play, generating revenue through ads or microtransactions.

**Gaming** - The colloquial term for playing video games, often used to demonstrate one’s interest in video games.

**In-app purchase** - Purchase performed within a game or an app, usually in the form of unlocking additional features, maps or items.

**Indie** - Stemming from “Independent”. Indie games are often developed by smaller studios independent of large publishers, often by means of digital distribution channels.

**IP** - Intellectual Property, intangible assets of a company.

**Middleware** - Software used to develop games, usually to bridge the gap between different software components.

**Microtransactions** - Online transactions involving small amounts of money, often used for
DLCs or in-app purchases.

**Off-shoring** - International outsourcing.

**On-shoring** - Intraneational outsourcing.

**Retail** - Physical copies, sold over the counter or similar retail establishments.

**Social Games** - Umbrella term for games utilizing or functioning within social media.
11. Appendix 2 - Interview guide

Below is a basic representation of the general questions and themes used during interviews, however adaptations were made depending on which perspective the interviewee in question possessed as well as depending on their answers.

- Introduce yourself, what is your position and how get there?
- How would you define success in the video game industry?
  Follow up: How do you compare yourself with other developers?
- How would you say that video game developers create value for their customers?
- How do you view online reviews, such as Metacritic, how important, if at all, are they for video game developers?
- What part does the community play in the industry?
  How does it affect the success of a game?
- Which aspects of a company would you be most interested in if faced with an investment decision?
- How do you compare yourselves to your competitors?