

A Work Project, presented as part of the requirements for the Award of a Master's degree in
Finance from the Nova School of Business and Economics.

INVESTMENT COMMITTEE PAPER ON KEYWORDS STUDIOS – Financial Modeling

PIA ZANDER (58244)

Work project carried out under the supervision of:

Inês Lopo de Carvalho, António

Miguel Bernardo

17/12/2024

Abstract

This project explores the leveraged buyout of Keywords Studios, a global leader in gaming outsourcing services. It evaluates the investment rationale, emphasizing the buy-and-build strategy, operational efficiency improvements driven by AI integration, and strategic geographic expansion. The financial analysis focuses on value creation drivers such as revenue growth, EBITDA margin improvements, cost synergies, and multiple arbitrage. Projected returns underscore the potential for significant value creation, culminating in an exit strategy through an IPO, strategic sale, or secondary sale. Keywords Studios' market leadership and adaptability to industry trends solidify its position as a lucrative private equity investment.

Keywords

Private Equity, Leveraged Buyout, Keywords Studios, Value Creation, Valuation, Gaming Industry, AI Integration

This work used infrastructure and resources funded by Fundação para a Ciência e a Tecnologia (UID/ECO/00124/2013, UID/ECO/00124/2019 and Social Sciences DataLab, Project 22209), POR Lisboa (LISBOA-01-0145-FEDER-007722 and Social Sciences DataLab, Project 22209) and POR Norte (Social Sciences DataLab, Project 22209).

Table of Contents

Group Part	5
1. Introduction	5
2. Foundation of Analysis	5
2.1. Company Overview	5
2.2. Market Overview	6
3. Formulation of the Investment Case	8
3.1. Investment Thesis	8
3.2. Strategies for Value Enhancement	9
4. Financial Modeling and Exit Considerations	13
4.1. Methodological Approaches to Valuation	13
4.2. Analysis of Capital Structure and LBO Modeling	14
4.3. Projection of Returns and Exit Options	16
4.4. Areas for Due Diligence	18
Individual Parts	19
5. Financial Modeling (Pia Zander - 58244)	19
5.1. Development of a Financial Model	20
5.1.1. Data Sources and Input	20
5.1.2. Setting up the Model	21
5.1.3. Income Statement	22
5.1.4. Balance Sheet	23
5.1.5. Cash Flow Statement	24
5.1.6. Testing and Validating of the Model	24
5.2. Key Performance Indicators (KPIs)	27
5.3. Common Pitfalls in Financial Modeling	28
5.4. Areas for Due Diligence	28
5.5. Summary	29
Bibliography	31

Group Part

1. Introduction

The gaming industry has experienced remarkable growth over the past decade, driven by technological advancements, expanding player demographics, and increasing demand for outsourcing services. Keywords Studios, a market leader with a comprehensive service portfolio and global presence, presents a compelling investment opportunity for private equity (PE). This report evaluates the viability of a leveraged buyout (LBO) of Keywords Studios, leveraging its strong historical performance, robust M&A track record, and alignment with industry trends, such as AI-driven operational enhancements. The analysis identifies key drivers of value creation and projects attractive returns, offering insights into strategic decision-making for achieving a successful exit.

2. Foundation of Analysis

2.1. Company Overview

With more than 70 studios spread across 26 countries, Keywords Studios is a global outsourcing firm providing its clients services across three distinct business units. Create, Keywords Studios first division, covers the beginning of the development process and focuses on game development and art services and thus includes the creation of a storyline and narrative framework for the respective game as well as the design of characters and objects within the game world. Keywords Studios' second business division, Globalize, focusses on quality assurance and functional testing, audio production, and localizing the game to make it more appealing to players worldwide. Engage, the final business division, provides ongoing support to Keywords Studios clients after the game has been developed and released. This division specialises in marketing services as well as maintaining and increasing player engagement. Since the company's foundation in 1998, Keywords Studios has made over 65 acquisitions. This focus on M&A has expanded the company's services and reach, ensuring

Keywords Studios' competitiveness and adaptation to the fast-changing needs of their client base. This is accompanied by an expanding employee base, totaling more than 12,300 professionals and generating over €780m in revenue in 2023 across the Americas, Europe, Asia, and Oceania. Over the last years, Keywords Studios was able to grow significantly, profiting from COVID-19 and increasing their revenue from €326m in 2019 to €780m in 2023, reflecting a CAGR of 24.3%. The company achieved strong financial results in 2023, with an EBITDA of €109m, implying an EBITDA margin of 14.0%, and a net profit of €20m. Most of Keywords' revenue is generated from partnerships with top gaming companies such as Electronic Arts, Take-Two Interactive, Nintendo, Ubisoft, Riot Games, and Supercell. In 2023, Keywords Studios' top five clients alone accounted for 30.8% of its revenue. These collaborations often involve working on global game titles, reflecting Keywords' market-leading role in the outsourcing industry. Additionally, roughly 30-40% of the company's revenue is recurring, as a result of long-term partnerships based on trust and integration into the clients' workflows, allowing Keywords to contribute to the success of major franchises and reinforcing its reputation in the game development industry.

2.2. Market Overview

Keywords Studios is a leading service provider to the gaming industry, deeply influenced by the sector's operations and evolution. The global gaming market is projected to reach €190bn by 2027, growing at a CAGR of 3.1% from 2024E to 2028E (Newzoo, 2024). The global player base is expected to increase from 3,422m in 2024E to 3,759m in 2027E, covering console, PC, and mobile gamers. This growth is driven by rising youth demographics, technological advancements, and a broader shift in media consumption toward gaming.

Geographically, the largest gaming markets by number of players are Asia-Pacific (1,809m), Middle East & Africa (559m), Europe (454m), Latin America (355m), and North America (244m) (Newzoo, 2024). High-growth regions include India (16.7% avg. CAGR), South

Korea (12.3% avg. CAGR), Norway (11.4% avg. CAGR), Sweden (10.9% avg. CAGR), and China (9.7% avg. CAGR). In India, growth is particularly fueled by the digital marketing market, a proxy for Keywords' Engage segment, which boasts a CAGR of 30.2% (Expert Market Research, s.d.).

These dynamics present significant opportunities for Keywords Studios, which derives most of its revenue from the Americas (39.8%), followed by Europe (31.6%), Asia-Pacific (10.9%), and Australasia (3.4%) (Keywords Studios, 2023). Despite its global footprint, Keywords Studios' addressable market differs from the total gaming market size, as it operates within the outsourcing services sector rather than game publishing. Keywords Studios focuses on the outsourced video game content creation segment, which represents a €38bn opportunity as of 2024E (Keywords Studios, 2023). This market spans the entire gaming value chain, from pre-production services like game development to post-production services such as player engagement.

Keywords Studios currently holds a 6% share of this outsourced market, far outpacing its closest competitors, who hold approximately 2% each (Keywords Studios, 2023). The company's leadership is driven by its ability to address the increasing complexity of game development as major gaming companies focus on core activities. The rise of mobile gaming and free-to-play models has further amplified demand for services like localization and player support, areas where Keywords Studios excels (Pwc, 2024).

The gaming outsourcing market is highly fragmented, with numerous service providers offering specialized services. Keywords Studios competes with firms such as Pole to Win (JP), Globant (AR), Room 8 Studios (CY), QLOC (PL), iXie (US), Lionbridge (US), Sumo Group (UK), Virtuos (SG), and Digital Hearts (JP). While these competitors vary in their industry focus and service offerings, Keywords Studios differentiates itself by providing the most integrated service portfolio in the gaming sector.

Key trends shaping the market include disruption driven by AI, the emergence of cloud gaming, and the growing demand for scalable service providers (Pwc, 2024). As the most integrated player in the market, Keywords Studios is well-positioned to leverage these trends, capitalize on its market leadership, and succeed in an industry that is evolving rapidly.

3. Formulation of the Investment Case

3.1. Investment Thesis

Keywords Studios is an attractive target for a leveraged buyout case of a private equity fund, as the company is the market leader in the growing gaming service market, with a presence across North America, Europe and Asia at 3x size of the next competitor. The company acquired over 65 studios across 26 countries and follows a strong and continuous buy-and-build market consolidation strategy to further increase its market share. Additionally, Keywords has proven strong revenue growth with high average EBITDA margins of 16.5% on average (2020-2023), driven by increased demand in the gaming industry and solid customer relationships. With low historical debt levels and strong cash flow generation, Keywords presents a strong target for a leveraged buyout. Additionally, in terms of services offered with a proactive approach to implementing AI trends, Keywords is the leading one-stop service provider. The company has established agreements with leading game developers for award winning titles. Its strategic investment in four AI-driven tools underscores its commitment to aligning with future trends and positions it strongly to lead the industry's transition toward AI-driven business models. Long-standing partnerships with 24 of the top 25 global gaming companies and the top 10 mobile game companies ensure revenue generation and present solidified relationships with customers. Moreover, the company has an experienced, knowledgeable management team with deep industry knowledge. Lastly, Keywords has an AA MSCI ESG rating, showcasing its strong alignment with ESG principles including diversity, sustainable practices, and responsible

business operations, which supports long-term resilience and attractiveness to socially conscious investors.

3.2. Strategies for Value Enhancement

Keywords Studios presents significant potential for value creation. Inorganic revenue growth is expected through a strong market consolidation strategy, which focuses on identifying well-aligned add-on acquisitions. Additionally, organic growth and cost efficiencies are projected through a comprehensive strategy aimed at transforming the traditional game development business model into a more AI-driven approach.

3.2.1. Mergers and Acquisitions: A Buy-and-Build Approach

Over twelve potential acquisition targets were screened, narrowing down to four with the strongest strategic fit and highest value-creation potential. The buy-and-build strategy focused on two main approaches. The first approach identified high growth segments. The segment Create was identified as the most profitable, contributing 43% of revenue in 2023 and having an adjusted EBITDA margin of 28%. Engage was also set as a focus as it has historically shown the highest revenue CAGR of 45.8% (2019-2023). Expanding these high growth segments through acquisitions of smaller studios in high-growth segments and niche-genres can help Keywords strengthen its core division, expand service offerings and capture new markets.

The second approach targeted high growth geographies, characterized by a high CAGR for Create and Engage markets, minimal or no current market share for Keywords or regions with a large and expanding player base. For Keywords, Asia offers substantial expansion potential, especially in South Korea and China, where extending Create and Engage services may leverage the regions enormous potential and boost market share. Additionally, with strong anticipated CAGRs and Keywords Studios' limited presence in Poland and Sweden presents substantial expansion prospects.

Based on these criteria, Winking Studios has been chosen as a strategic add-on. Headquartered in Singapore, Winking offers 2D/3D art, animation, and game development services, with operations in China, Taiwan, South Korea and the USA. The acquisition enables Keywords to expand its game development segment into high-growth markets, strengthen client relationships and enhance cross-selling opportunities to drive revenue growth.

Bloober Team, a video game developer specializing in the horror genre and headquartered in Poland, integrates cutting edge AI and VR technology. With operations in North America, Asia and Europe, this acquisition allows Keywords to expand its service offerings, tapping into the niche horror genre market. Additionally, Keywords can leverage AI and VR technologies to engage a new player base and elevate its technology expertise.

YGGDRAZIL is headquartered in Thailand and delivers animation services, premium graphics and game development services. Its operations are in Thailand, China, South Korea, USA and Japan. This add-on will allow Keywords to expand its service quality while expanding into high-growth markets.

MOBA Network, headquartered in Stockholm, Sweden, owns and operates major global gaming communities, offering platforms for gamers to connect, with operations in the US and UK. This acquisition strengthens Keywords' player engagement services, enhancing its offerings to existing clients.

The investment case envisions two acquisitions: Winking Studios and Bloober in 2025 and YGGDRAZIL and MOBA in 2026. Each target has been valued using comparable company and comparable transaction analysis to determine entry EBITDA multiples. Winking will be acquired at a 13.4x multiple for an EV of €71.63m, Bloober at 13.0x for an EV of €112.70m, YGGDRAZIL at 13.0x for €53.30m and MOBA at 13.9x for €127.98m. Each acquisition will be financed with 50% debt through an M&A facility and 50% equity.

Upon completion of each acquisition, a dedicated task force will execute a 150-day strategic plan to ensure smooth business integration and achieve anticipated value creation. For this, quarterly reviews will be conducted to track progress, with market expansion plans deployed after the first 100 days, followed by revenue synergy implementation after 150 days. After the integration, the value creation will be monitored continuously. The total projected inorganic revenue from all add-on acquisitions by 2030 is expected to reach €993.12m.

3.2.2. Integration of AI for Operational Optimization

The gaming industry is undergoing a significant transformation, with AI reshaping traditional workflows and value chains. Automation is revolutionizing tasks such as localization, testing, and customer support, enabling services that are faster, more cost-effective, and scalable. For Keywords Studios, traditionally reliant on labor-intensive processes, embracing AI represents both a disruption risk and an opportunity to strengthen its position as a market innovator and leader.

To mitigate the risks and capitalize on the opportunities presented by AI, the second pillar of the value creation strategy involves transitioning to an AI-driven business model by leveraging three platforms: KantanAI, XLOC, and Helpshift. This strategy is designed to drive revenue growth, reduce costs, and enhance service quality, positioning Keywords Studios as a forward-thinking innovator in the gaming industry.

The first initiative focuses on the localization service line within the Globalize division, targeting revenue growth by integrating KantanAI's advanced translation capabilities with XLOC's content management system. This integration aims to optimize localization workflows by automating translation processes and centralizing content management, leading to faster delivery times and higher accuracy. By reducing delivery timelines by 40% and enhancing the quality of services, a 15% price premium can be justified. This initiative is

projected to generate €21m in additional revenue within the Globalize division over the investment horizon. To achieve these improvements and enhance capacity, €1m will be invested annually in R&D between 2025 and 2027.

The second initiative seeks to expand the deployment of Helpshift's automated player support platform among new and existing clients. By allocating €2m annually to sales and marketing between 2025 and 2030, the strategy emphasizes showcasing Helpshift's proven value through client case studies that highlight substantial cost savings and efficiency gains. The plan includes acquiring at least one major new gaming client each year who transitions their support services to Helpshift. This effort is expected to significantly boost Helpshift's contribution to the Engage division, increasing its revenue by €90m over the investment period while growing market share in player support services.

The third initiative aims to achieve substantial cost savings through enhanced automation in player support services. In 2024, Keywords employs approximately 2,640 player support agents, some of whom handle complex queries that cannot yet be fully managed by Helpshift. Through dedicated R&D efforts, supported by an annual €3m investment, the aim is to advance Helpshift's technology to increase automation from 60% to 80% by 2028. This development will allow for a gradual reduction in headcount to 90% of the level otherwise required without improved automation, reducing reliance on human agents. The initiative is projected to save €46m in personnel expenses over the investment period, driving substantial margin improvement in the Engage division.

Through these initiatives, Keywords Studios leverages AI to deliver transformative growth, operational efficiency, and cost optimization, ensuring a sustainable competitive advantage and reinforcing its position as a leader in the gaming services industry.

To ensure the successful execution of these AI-driven initiatives, the private equity fund will establish a dedicated AI Centre of Excellence (CoE) comprising industry-leading experts in AI

development, product management, and data analytics.

4. Financial Modeling and Exit Considerations

4.1. Methodological Approaches to Valuation

The valuation of Keywords Studios has been derived using a range of different valuation methods, including Discounted Cash Flows (DCF), the Sum of the Parts (SOTP), the Comparable Companies Analysis (CCA) and the Comparable Transaction Analysis (CTA). To ensure a balanced analysis, the methods have been weighed differently to account for limitation in each of the different valuation methods. The DCF was given 40% of the weighting, the SOTP 30%, while the CCA and CTA each accounted for 15%. Additionally, a range between the 25th and 75th percentile as presented in a football field in table 1 in the appendix has been chosen to present a fair valuation range for Keywords Studios.

Focusing first on intrinsic valuation methods and taking Keywords Studios' future cash flows from a long-term perspective into consideration, the DCF was based on a weighted average cost of capital (WACC) of 7.2% and a terminal growth rate of 2.3%. With that, the terminal growth rate is inline with the 10-year expected inflation rate for the United States of America, as North America represents the largest geographic source of revenue for Keywords Studios. In order to determine the exit multiple, the average EV/EBITDA of the next twelve months (NTM) for comparable companies was calculated at 9.6x. Both the Gordon Growth method as well as the Exit Multiple method have been weighted equally, to derive an average DCF based enterprise value for Keywords Studios of €2,746m. The Dividend Discount Model (DDM) calculated an Enterprise Value of €260m but was excluded from the final purchase price as the company operates in a sector, with limited dividend distributions.

In addition to intrinsic valuation methods, relative valuation methods were used, where the focus has been on the sum of the parts valuation, as this method deconstructed Keywords

Studios into its primary operating divisions, applying segment specific EBITDA multiples to each of the company's business divisions and as such yielding an enterprise value that accurately reflects segment specific potentials. This valuation method resulted in median EV/Revenue and EV/EBITDA multiples of 2.7x and 11.9x, respectively. The CCA resulted in median EV/Revenue, EV/EBITDA and P/E multiples of 1.3x, 8.8x and 20.3x, respectively. However, the global video games market continued to encounter difficulties in 2023, which highlights the necessity of interpreting comparable values with some caution as these multiples may undervalue future growth potential in a rebounding sector. Similarly to the CCA, the CTA faced limitations as only two relevant and comparable transactions in the past two years could have been considered for the analysis. Alongside earlier data, the CTA resulted in the widest valuation spread and highest multiples. With a median EV/Revenue multiple of 3.6x and a median EV/EBITDA multiple of 11.3x, the CTA implied a median valuation for Keywords Studios of €2,381m.

The final weighted average enterprise value for Keywords Studios, resulting from the weighted enterprise value derived from each valuation method, the resulting valuation for Keywords Studios was €2,203m, implying a fair share price of €26.06. This in return results in an implied weighted EV/EBITDA multiple of 15.3x for Keywords Studios based on all discussed intrinsic, market, and transaction-based valuation methods.

4.2. Analysis of Capital Structure and LBO Modeling

The acquisition of Keywords Studios will require a total investment of €2,289m. The organization of the capital structure used to finance the leveraged buyout was carefully evaluated, incorporating an analysis of the company's historical financial performance to assess its ability to sustain leverage, as well as prevailing market conditions. This comprehensive assessment ensured that the debt-to-equity ratio was optimized and thoroughly stress-tested to achieve financial resilience and operational flexibility.

The debt portion accounts for 40.9% of the total acquisition funding, equating to a leverage ratio of 6.5x Debt-to-EBITDA. This is closely aligned with current market conditions, which show 10-year lows in U.S. LBO loan leverage ratios at 5.9x Debt-to-EBITDA in 2023 (Bain & Company, 2024). The debt structure comprises Term Loan A, Term Loan B, and Term Loan C. A decision was made to exclude mezzanine debt due to its higher cost of capital and the suitability of senior debt in meeting financing needs. Interest rates for the debt tranches were derived using a 5-year swap rate of 4.1% (based on the 5-year U.S. Treasury rate as of 30/11/2024), combined with market research on median fixed-rate loans, resulting in rates of 7.0% for Term Loan A, 7.4% for Term Loan B, and 7.8% for Term Loan C. Targeted acquisitions will be financed with a combination of a dedicated M&A facility, contributing 50% of the required capital at the same interest terms as Term Loan C, and an equity contribution embedded in the equity instruments for the LBO of Keywords Studios.

The equity contribution constitutes €1,352m, representing 59.1% of the total capital structure. This is primarily composed of a Fixed Return Instrument (FRI) valued at €1,323m, carrying a fixed rate of 9.3% in line with average PIK coupon rates (e.g., 9.31% tracked on Bloomberg for similar fixed return securities). The FRI enables the deferral of cash interest payments, allowing operational cash flows to remain available for strategic investments and acquisitions during the holding period. Additionally, sweet equity of €4.4m is contributed by management, aligning their interests with those of the private equity sponsor and ensuring strong performance incentives. Transaction fees amounting to €66m and a minimum cash reserve of €20m for ongoing operations were also accounted for, alongside the enterprise value of €2,203m, resulting in total sources and uses of €2,289m.

The feasibility of this LBO is reinforced by the implementation of three financial covenants designed to ensure both financial discipline and operational flexibility. Net leverage was set to decline progressively over the investment horizon, beginning at 6.5x EBITDA and reducing to

manageable levels as the company deleverages through cash flow generation and EBITDA growth. Interest coverage was established to ensure sufficient EBITDA to cover interest expenses, with a minimum ratio of 1.0x, leaving comfortable headroom to tackle unforeseen challenges. Finally, the cash cover covenant was introduced to guarantee adequate free cash flow for servicing both interest payments and debt repayment, ensuring liquidity throughout the holding period. These covenants safeguard lender interests while providing the company with the financial latitude required to execute its acquisition-driven growth strategy.

4.3. Projection of Returns and Exit Options

4.3.1. Returns

The investment in Keywords Studios has been projected over a six-year holding period, culminating in an exit in 2030E. At the exit, the company's enterprise value (EV) is expected to reach €6,187m, based on a forecasted EBITDA of €405m and an exit multiple of 15.3x. The total value created during the investment period is projected to be €4,877m, driven by four key components: revenue growth, EBITDA margin improvement, deleveraging, and multiple arbitrage.

Management is expected to receive significant returns on their investment in sweet equity. Their €4.372m contribution, representing 15% of ordinary shares, is projected to generate €556m by 2030E, corresponding to a multiple on money (MoM) of 127.1x and an internal rate of return (IRR) of 124.2%. Institutional investors, who will contribute €1,348m at entry in 2024E through a combination of a €1,323m shareholder loan and €25m in ordinary shares, are expected to achieve inflows of €5,587m at exit. This translates to a MoM of 3.6x and an IRR of 24.7%. Additional capital infusions of €192m are planned in 2025E (€96m) and 2026E (€94m) to support the company's growth strategy and operational improvements.

4.3.2. Value Creation

The breakdown of value creation shows that revenue growth is the largest contributor,

accounting for €2,459m or 50.4% of the total value. This growth is driven by a combination of organic expansion and the successful integration of add-on acquisitions, supported by AI-driven initiatives to enhance scalability and efficiency. EBITDA margin improvement contributes €856m, representing 17.5% of total value creation. This improvement is achieved through cost synergies, operational efficiencies, strategic pricing, and the impact of AI, which accounts for 50.9% of the EBITDA margin uplift. Deleveraging is expected to generate €876m, representing 18.6% of total value creation, as net debt decreases from €917m in 2024E to €41m by 2030E. This reduction is supported by robust free cash flow generation and disciplined debt repayment. Lastly, multiple arbitrage contributes €124m or 2.5% of total value creation. Add-ons acquired at lower EBITDA multiples are integrated into Keywords Studios, which commands a higher multiple of 15.3x. No multiple arbitrage is assumed for Keywords Studios itself, as the exit multiple equals the entry multiple.

4.3.3. Sensitivity Analysis

To assess the robustness of the investment, sensitivity analysis was conducted to evaluate the impact of variations in entry and exit multiples on returns. The results show that changes in the entry multiple have a more significant impact on the investment compared to changes in the exit multiple. Adjustments to the entry multiple yield a range of MoM between 3.1x and 4.4x and IRR between 21.4% and 29.0%, whereas changes to the exit multiple result in a narrower range, with MoM between 3.2x and 4.1x and IRR between 21.9% and 27.2%. A scenario using a high entry multiple of 17.3x and a low exit multiple of 13.3x would result in a MoM of 2.7x and an IRR of 18.8%, making the transaction less financially attractive. Conversely, a low entry multiple of 13.3x and a high exit multiple of 17.3x would deliver a MoM of 5.0x and an IRR of 31.7%, demonstrating the importance of negotiating favorable entry pricing and timing exits during favorable market conditions.

This analysis highlights the importance of entry valuations, operational enhancements, and

strategic exits in maximizing the returns for both management and institutional investors. By focusing on these factors, the investment case for Keywords Studios is well-positioned to deliver significant value despite prevailing macroeconomic uncertainties.

4.3.4. Exit Options

After successfully selecting a target, developing a business plan, acquiring the company, and working with Keywords to improve their equity story throughout the investment period, it is crucial to consider the exit options. The exit strategy for Keywords Studios considers three primary pathways: an initial public offering (IPO), a strategic sale, and a secondary sale. Each option has been evaluated based on its potential to maximize returns, the associated risks, and the market conditions likely to prevail at the time of exit in 2030E (Osborne Clarke, 2015). Alternative exit options are a Management Buyout (MBO), recapitalization, and liquidation (The Entrust Group, 2024).

4.4. Areas for Due Diligence

Due diligence is a crucial step in the investment process for any acquisition. It aims to expose potential risks, validate assumptions and deepen the understanding of factors driving the business. For Keywords Studios, the most important areas of due diligence are commercial, operational and financial.

The commercial due diligence will provide expert insights into market dynamics, growth rates, customer concentration, churn rates and the reliance on only a few clients. This will help assess potential dependencies on key accounts. Competitors will be analysed by using third-party consultants to get insights into competitive threats and further considerations for market entry and exit strategies

Operational due diligence is crucial to evaluate the risk of disruption by AI for Keywords. Industry experts will evaluate how AI advancements can replace or disrupt service offerings and will have an in-depth analysis of Keywords' current AI infrastructure.

The financial due diligence will validate assumptions in the financial model, ensuring that for example balance sheet items were classified correctly and data integrity is met. A legal, tax and environmental due diligence will be conducted as well but were deemed less critical for the investment decision.

A comprehensive due diligence is essential for the PE fund to understand past challenges of the company, to implement a mitigation strategy and uncover any potential red flags that could impact the investment decision.

Individual Parts

5. Financial Modeling (Pia Zander - 58244)

One of the most important yet little-known financial analytical skills is financial modeling. To estimate a company's future performance, financial modeling aims to combine accounting, finance and a company's internal information. A financial model seeks to reconstruct a company's core financial statements, the income statement, balance sheet, and cash flow statement and project them precisely to forecast future performance (Schmidt 2024).

Financial models are among the most widely used tools in private equity, investment banking and further related finance sectors. They play a critical role in the negotiation of transaction agreements, valuation of companies, analysis of a company's financial performance and decision-making, such as evaluating M&A acquisition considerations (Yan 2024). Financial models play a crucial role in fields such as private equity as they allow companies to make data-supported strategic decisions, guaranteeing a methodical approach to expansion decisions, build investor trust by giving them a clear and transparent financial picture, and identify possible hazards. Therefore, companies can create mitigation plans and protect financial stability based on fundamental models (Wood 2023).

Investments made by private equity firms are known to increase significantly in value. To achieve such growth, financial models are used throughout the whole investment process. Before it is decided that an investment will be made, a financial model will be used to support that decision-making by showcasing risks, giving detailed insights on operating performance and cash management and potential returns of the investment (Walsh et al. 2024). Among the most well-known financial models is the merger model, which evaluates mergers and acquisitions' financial effects and is essential for strategic transaction considerations. A company valuation based on predicted future cash flows is done using the discounted cash flow model (Wood 2023). Leveraged buyout models are characterised by using debt to cover a sizable amount of the purchase price (Rosenbaum and Pearl 2020).

In conclusion, financial models are essential for business professionals engaged in financial decision-making processes. They give detailed insights into a company's business, efficiency, value creation and potential returns.

5.1. Development of a Financial Model

The process of building a financial model involves defining its objectives, implementing input data such as historical financials and projecting a forecast based on these inputs. The model's accuracy is ensured by testing and validation and the results build the foundation for strategic decision-making. The following will analyse the construction of a financial model based on the example of Keywords Studios.

5.1.1. Data Sources and Input

The foundation of a financial model is based on one or more variable input sets, supported by robust data sources. Forecast predictions are based on the three financial statements which set the foundation for the financial model. Data providers such as Bloomberg, Refinitiv, and annual reports from Keywords Studios were used to obtain historical data. Using well-known data providers ensures reliability and accuracy (Yan 2024). Reports from sources such as

Statista and IBIS World provided industry information to improve assumptions and projections. MergerMarket was used to analyse past industry transactions to identify relevant transaction multiples for a comparable transaction multiple analysis, providing a benchmark for valuation. Industry risks and credit ratings can be analysed with the help of bank and government reports, which help to understand how economically and financially stable a business is.

Additionally, conducting interviews with industry experts, investment bankers with experience with acquisitions within the video game industry or employees from Keywords Studios allows to get an in-depth knowledge of the business model of the corporation and industry-specific topics. Assumptions and strategies incorporated into the financial model can be validated and aligned with current market trends based on the insights obtained from the interview.

5.1.2. Setting up the Model

The initial stage in setting up a model is to define its purpose to understand the goal and what output should be retrieved. A financial model usually serves the two main purposes of calculating a series of financial scenarios and effectively communicating them to stakeholders (Hynd 2020). To build the model, different tools and software can be used. Excel is the most widely used option and has also been used to create the model for Keywords Studios. The program comes with many preferred options for accountants and financial professionals due to its strong data analytics capabilities and versatility (Wood 2023). To examine how changes in dependent variables affect the results of important output variables is a common goal of financial models. Excel is often seen as favourable tool because of its flexibility to be adapted and adjusted at any stage of the development process. This makes it easy to change assumptions and scenarios without much effort (Gupta and Wang 2023). Specialized tools like Power BI or Tableau can be an alternative to Excel if particular modeling requirements

and advanced features are needed. However, these tools can lack the ability to perform repetitive tasks reliably and are potentially less accurate in monitoring the accuracy of a financial model (Wood 2023).

The programming language Python is another alternative to Excel. This tool is highly capable to build comprehensive financial models. Python has the adaptability to manage huge datasets and offers advanced capabilities in areas such as risk management, portfolio optimization and pricing of derivatives (Gupta and Wang 2023). However, while Python can increase efficiencies in these areas, activities like derivatives pricing are not business areas of private equity funds. For financial models focused on valuing companies, Excel remains a preferred tool among investment professionals.

5.1.3. Income Statement

A company's profit (or loss) is presented in the income statement. Forecasting the most important line items from the income statement is essential for the financial model.

Revenue is the top-line item, showing how much money a company has generated by selling its services or products over the period of typically one year. Revenue levels are important to analyse a business's ability to compete in its sector. Larger revenue volumes often allow businesses to attain economies of scale, increase market share and lower perceived risk, which could all lead to higher valuations compared to smaller competitors. After deducting the costs of goods sold from sales, gross profit is obtained. It is a key indicator of a business's operational efficiency and is often shown as a percentage of revenues (Rosenbaum and Pearl 2020).

EBIT, often the same as operating profit shown in the income statement, excludes taxes and interests and allows for comparison between companies with distinct capital structures. The pro forma number EBITDA is derived by adding back depreciation and amortisation to EBIT.

Since it represents the overall cash operating expenses incurred by the business, it is a frequently used representation for operating cash flow. Net income is the bottom line and represents the profit that is left for a company after all expenses have been deducted. When all of the company's debts have been paid off, net income may also be thought of as the earnings that equity holders can obtain (Rosenbaum and Pearl 2020).

Projecting future revenues, expenditures and expenses is usually based on historical trends, industry outlooks and strategic assumptions. For Keywords Studios, the revenue forecast was derived by analysing the projected growth of each business division across the specific geographies where the company operates, based on industry reports. This guarantees that the forecast is based on both regional and market trends and industry-specific data. Based on this analysis, most remaining line items were forecasted as a percentage of revenues, ensuring alignment with the company's revenue trends and operational scale.

5.1.4. Balance Sheet

The balance sheet gives a summary of a business's financial performance and lists its assets, liabilities, and ownership by shareholders as of a specific date. The balance sheet is composed of three main elements: assets, shareholders' equity, and liabilities. Further classifying liabilities and assets into current and noncurrent items according to their liquidity and maturity provides a better understanding of the organization's short- and long-term financial commitments and resources. The balance sheet provides insights to evaluate the overall financial status, liquidity, and solvency of a business. It helps to analyse the risk-return profile of companies by assessing debt levels, liquidity, and capacity to manage financial obligations. By comparing the corporate's financial performance with industry norms, weaknesses and strategic improvements can be identified. Evaluating the business's assets and obligations in regard to current debt also acts as a tool for prospective lenders to assess the creditworthiness of the business (Singh 2023).

The balance sheet is forecasted by projecting assets, equity, and liabilities based on expense trends and anticipated revenue growth. For Keywords Studios, most line items were forecasted based on percentages of revenue.

5.1.5. Cash Flow Statement

This statement provides a broad comprehension of a company's cash inflows and outflows over a typical duration of one year. The statement is divided into three categories: operating, financing and investing cash items. Cash generated from the corporate's main business is classified as operating cash flow. It includes net income, adjustments for working capital and non-cash positions, such as depreciation and amortization. Cash flow from investments represents cash movements from when long-term assets are bought and sold. Any cash flow impacting the overall capital structure is reported as financing cash flow. This includes raising and paying back money.

Although it offers information on how much money a firm makes, the cash flow statement cannot replace the income statement to evaluate the profitability level of a company. The cash flow statement does not include non-cash activities and cannot capture a company's liquidity fully (Wasif 2023). The forecast of the cash flow statement is obtained by understanding how the line items in the other two statements have changed from one period to the other.

5.1.6. Testing and Validating of the Model

To make sure that a financial model functions reliably and in line with their intended purpose, testing and validation measures are crucial. This guarantees that models are theoretically sound, yield reliable results and are continuously tracked throughout time (Sudjianto 2024). Two important tools for this purpose are sensitivity and scenario analysis, which both help to assess different risk factors and support decision-making. The scenario analysis evaluates the impact it has when several inputs are changed at the same time. The outcome shows significant changes, such as different economic outlooks, and can influence the results of the model. This

method shows how one event can impact multiple assumptions simultaneously and ultimately change the output of the overall model. Therefore, the scenario analysis is a crucial method for decision-making processes. The ability to quickly compare scenarios ensures that consistent and accurate information is effectively communicated to stakeholders (Carse 2021).

The sensitivity analysis measures the effect of altering one individual variable at a time, providing clarity on how that specific factor influences outcomes and results. This enables decision makers to gain a better understanding and deeper insight into potential vulnerabilities and risks of the business, creating a better comprehension of the challenges faced by the company (Carse 2021).

Error checks can be implemented to ensure that the financial model is working without defects. While a model is mostly never without any mistakes, error checks allow to reduce the degree of arising problems. Areas of increased risk are at model interfaces, such as those that exist between sheets, sections, or segments. Checks ensure that transferred data is precise and correctly linked (Yeldham 2021).

A computer method to understand the impact of risk and ambiguity in operational, financial, and project management scenarios is the Monte Carlo simulation. This technique creates multiple potential outcomes for a model by deriving independent variables based on the probability distributions of the input variables. This simulation plays a crucial role in financial modeling, as corporations are impacted by several variables. Traditional predictive models can fail to reflect this unpredictability, which would lead to erroneous forecasts and fewer judgments. By taking into consideration the uncertainty and variety of important inputs, Monte Carlo simulation overcomes this restriction and generates a more accurate range of potential outcomes. This offers financial professionals an improved risk assessment, helping them in their decision-making (Majka 2024).

In modeling Keywords Studios, multiple error checks have been implemented to minimize the risk of mislinking formulas across different sheets and to streamline validation processes. These checks ensure that the balance sheet is balanced and numbers, linked to different sheets, are correctly linked, which reduces the time needed for manual verification. Therefore, changes to assumptions can be implemented more efficiently as error checks can identify if these changes cause errors on other sheets. Additionally, a scenario analysis has been implemented to assess whether investing in the company remains viable and generates sufficient returns, even if certain assumptions are not met.

For this purpose, a “bank case” has been developed to represent a pessimistic scenario, displaying a case where the anticipated value creation is no longer fully achievable, for example, if only one add-on could be acquired. This scenario allows the fund to evaluate how returns would be impacted under unfavourable conditions, providing a comprehension of the risk profile of an investment and potential downsides. The bank case can also be implemented to assess if the debt that was taken on for the leveraged buyout could be repaid, ensuring financial stability even in less favourable outcomes. The “investment case” represents a baseline scenario, where revenue forecasts align with expectations and all planned add-ons can successfully be acquired. Finally, the “management case” outlines an optimistic scenario, representing a more favourable outlook with increased value creation and improved returns. The implementation of these different scenarios offers a well-informed understanding of possible outcomes and can be used to support decision-making processes.

The sensitivity analyses have been conducted to assess the impact of changes in the entry multiple on returns, determined by indicators like the internal rate of return and the money multiple. This helps the fund to understand how critical assumptions, such as the entry multiple, can influence overall returns.

5.2. Key Performance Indicators (KPIs)

Corporations utilize financial KPIs as measurements to monitor, assess and evaluate their financial health for strategic decision-making. KPIs enable stakeholders and investors to analyse numerous criteria, including profitability, solvency, liquidity, valuation and efficiency which are covered by these KPIs. The gross profit margin deducts the costs of goods sold from revenue to get a better understanding of a company's profitability level. Leverage ratios play a crucial role for PE investors to determine current debt levels and identify how much debt can be utilized to finance a transaction, such as a leveraged buyout. One key metric in this context is the ratio from debt-to-equity, which determines the percentage of a business's funding sourced from equity as opposed to debt. By implementing KPIs in a financial model, investors can get important insights about the corporate's financial position. Monitoring these metrics closely enables a private equity fund to identify potential financial risks, such as an extremely high debt ratio, which could pose challenges to the company's long-term performance. Other indicators can help funds determine a business's capacity to produce profits and efficiently handle debt, which directly affects investment decision-making (Stobierski 2020).

For companies with diverse business divisions, like Keywords Studios, using distinct KPIs for each segment can provide deeper insights into segment-specific performance. This approach is mostly valuable for divisions that operate independently and differ fundamentally, such as financial services and retail. Additionally, the industry in which a business works will influence the KPIs to some extent.

It is crucial to list the sources of the data used to calculate KPI's and any potential restrictions on data so that readers can evaluate for themselves how reliable the information is (PwC, n.d).

5.3. Common Pitfalls in Financial Modeling

The foundation of any financial model is its input data. As discussed before, the three core financial statements are the starting point for forecasting future performance. The accuracy and reliability of these figures is critical to build a robust model. External data, such as industry trends or macroeconomic data are also important for the projection of financials, as they capture external influences outside the company's direct control. A common challenge in financial modeling is sourcing accurate and sufficient numbers and correctly contextualizing these within the broader context of the company's business. Developing reliable financial models requires ensuring data quality and carefully assessing assumptions, particularly in consideration of the dependence on external data sources. These sources might not always offer current or correct information, which could jeopardise the model's dependability. This emphasizes the importance of properly checking external inputs and evaluating assumptions to reduce any potential hazards (Majka 2024).

5.4. Areas for Due Diligence

The due diligence process is often associated with mergers and acquisitions and is an important step for buyers, such as private equity funds, to make informed decisions. It enables the buyer to assess potential risks in-depth and uncover critical information that might not have been available during the initial analysis. This evaluation ensures that the acquisition is approached strategically and with full disclosure. The due diligence is broken down into commercial, financial, tax, operational, legal and environmental aspects. The commercial due diligence analyses business-specific areas such as the business model (Daley, Geelen, and Green 2024). Conducting this thorough analysis is crucial for financial modeling as it allows you to validate, adjust, or refine certain assumptions of the model, ensuring that they are accurate and align with real-world scenarios (OECD, n.d.).

Up to 55% of all mergers and acquisitions fail to deliver shareholder value, with one of the primary causes being insufficient deal preparation. Poor due diligence often results in overpaying, as share prices are overestimated, and overcalculating the long-term value of the target business. Insufficient analysis of critical factors like the respective market, business model and competitive positioning can lead to this outcome. All these elements are integral to building an accurate financial model that determines the business's valuation compared to peers. Robust calculations require a deep understanding of the market dynamics, business operations, key drivers and potential risks. A comprehensive due diligence elevates the financial model to a higher level, grounding it in detailed, data-driven analysis and ensuring a more accurate valuation of the business (Boston Consulting Group, n.d.).

5.5. Summary

This paper has analysed the significance of financial modeling, particularly for investment professionals in private equity funds. It focused on the structure and validation process of building a robust financial model. It highlighted the importance of accurate and reliable input data, which will enable investors and managers to make well-informed decisions. When selecting input factors, it is essential to incorporate not only internal company data but also market information from industry reports to understand broader trends and implications.

For Keywords Studios, analysing the market performance across all three business divisions was critical to gain a holistic view of each segment's future potential. This process involved using historical data from annual reports, as well as industry reports, to analyse expected growth rates.

Building the model for Keywords Studios showed that applying cross-checks increased efficiency and accuracy as errors were spotted timely and promptly fixed. Implementing thorough validation methods such as scenario and sensitivity analyses helps to understand how different assumptions can affect outcomes and returns. The assessment of investment

opportunities must take potential downfalls into consideration. Therefore, private equity funds must include effective validation measures to ensure that investment decisions remain feasible and would still generate returns if external or internal influences change. In conclusion, the careful construction of financial models can be the determining factor in making sound investment decisions.

Bibliography

Bain & Company. (2022, December 31). Bringing Science to the Art of Revenue Synergies.

Retrieved December 5, 2024, from <https://www.bain.com/insights/revenue-synergies-m-and-a-report-2022/>

Bain & Company. (2024). Global Private Equity Report 2024. Retrieved from

<https://www.bain.com/insights/topics/global-private-equity-report/>

Boston Consulting Group. n.d. “Successful Due Diligence - How BCG Supports Strategic Due Diligence.” Boston Consulting Group. Accessed December 10, 2024.

https://media-publications.bcg.com/flash/PDF/Due_Diligence.pdf.

Daley, Brendan, Thomas Geelen, and Brett Green. 2024. “Due Diligence.” *The Journal of Finance* 79 (3): 2115–61. <https://doi.org/10.1111/jofi.13322>.

Expert Market Research. (n.d.). Indian Digital Marketing Market Report and Forecast 2024-2032. Retrieved from <https://www.expertmarketresearch.com/reports/indian-digital-marketing-market>

“Global Private Equity Report 2024.” Bain & Company.

<https://www.bain.com/insights/topics/global-private-equity-report/>.

Gupta, Karan, and Ying Wang. 2023. “Redefining Efficiency: Computational Methods for Financial Models in Python.” *International Journal of Computer Trends and Technology* 71 (10): 114–21. <https://doi.org/10.14445/22312803/ijctt-v71i10p113>.

Hynd, Alistair. 2020. “Intro to Financial Modelling - Part 1: Model Definition and Purpose.” Institute of Chartered Accountants in England and Wales. January 23, 2020.

<https://www.icaew.com/technical/Technology/Excel-community/Excel-community-articles/2020/Intro-to-Financial-Modelling-Part-1>.

Keywords Studios. (2023). Annual Report.

Majka, Marcin. 2024. “Monte Carlo Simulation in Financial Modelling.” Researchgate.

- September 30, 2024.
- https://www.researchgate.net/publication/384466839_Monte_Carlo_Simulation_in_Financial_Modelling.
- Majka, Marcin. 2024a. "Forecasting Financial Models." ResearchGate. September 14, 2024.
- https://www.researchgate.net/profile/Marcin-Majka-2/publication/384055036_Forecasting_Financial_Models/links/66e747a0a438c86fcd1933d/Forecasting-Financial-Models.pdf.
- Newzoo. (2024). Global Games Market Report. Newzoo. Retrieved from https://best-of-gaming.be/wp-content/uploads/2024/09/2024_Newzoo_Global_Games_Market_Report.pdf
- OECD. n.d. "The Essentials: Characteristics of Due Diligence." Organisation for Economic Co-Operation and Development. Accessed December 11, 2024.
- <https://mneguidelines.oecd.org/Essentials%20of%20due%20diligence.pdf>.
- Osborne Clarke. (2015, February 4). Private equity exits: IPOs vs trade sales and secondary buyouts. Retrieved October 24, 2024, from Osborne Clarke:
- <https://www.osborneclarke.com/insights/private-equity-exits-ipos-vs-trade-sales-and-secondary-buyouts>
- PwC. n.d. "Guide to Key Performance Indicators Communicating the Measures That Matter." PricewaterhouseCoopers. Accessed December 11, 2024.
- https://www.pwc.com/gx/en/audit-services/corporate-reporting/assets/pdfs/uk_kpi_guide.pdf.
- Pwc. (2024, January 16). Top 5 developments driving growth for video games. Retrieved from <https://www.pwc.com/us/en/tech-effect/emerging-tech/emerging-technology-trends-in-the-gaming-industry.html>
- Rosenbaum, Joshua, and Joshua Pearl. 2020. Investment Banking: Valuation, LBOs, M&A,

and IPOs. John Wiley & Sons.

Schmidt, Jeff. 2024. "Financial Modeling: Essential Skills, Software, and Uses." Corporate Finance Institute. November 20, 2024.

<https://corporatefinanceinstitute.com/resources/financial-modeling/what-is-financial-modeling/>.

Singh, Himanshu (September 4, 2023). "Balance Sheet". Wall Street Oasis. December 10, 2024. <https://www.wallstreetoasis.com/resources/skills/accounting/balance-sheet>

Stobierski, Tim. 2020. "13 Financial Performance Measures Managers Should Monitor." Harvard Business School Online. May 5, 2020.

<https://online.hbs.edu/blog/post/financial-performance-measures>.

Sudjianto, Agus. 2024. "Model Validation Practice in Banking: A Structured Approach for Predictive Models." SSRN. October 2, 2024. <https://ssrn.com/abstract=4977043>.

The Entrust Group. (2024, July 19). 6 Private Equity Exit Strategies for PE Investors.

Retrieved November 25, 2024, from <https://www.theentrustgroup.com/blog/private-equity-exit-strategies>

Walsh, Bridget, Jon Morris, Tim Dutterer, and Luke Pais. 2024. "How the Drivers of Private Equity Value Creation Are Changing." EY. May 8, 2024.

https://www.ey.com/en_us/insights/strategy-transactions/how-the-drivers-of-private-equity-value-creation-are-changing.

Wasif, Aqsa. 2023. "Cash Flow Statement." Wall Street Oasis. September 15, 2023.

<https://www.wallstreetoasis.com/resources/skills/accounting/cash-flow-statement>.

Wood, Samuel. 2023. "What Is Financial Modelling?" London School of Business & Finance. January 25, 2023. <https://www.lsbfi.org.uk/blog/online-learning/what-is-financial-modelling>.

Yan, Andy. 2024. "Financial Modeling for Beginners." Wall Street Oasis. October 23, 2024.

<https://www.wallstreetoasis.com/resources/financial-modeling/financial-modeling-for-beginners>.

Yeldham, John. 2021. "Intro to Financial Modelling Part 12: Error Reduction - Constructing Error Checks." The Institute of Chartered Accountants in England and Wales. January 21, 2021. <https://www.icaew.com/technical/technology/excel-community/excel-community-articles/2021/intro-to-financial-modelling-part-12>.