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Private Equity Challenge

Potential Leveraged Buyout of Nexus – Returns Analysis

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Abstract

This work seeks to assess Nexus AG from both commercial and financial perspectives as a plausible candidate for a leveraged buyout transaction. Through the analysis, it becomes evident that Nexus AG is a compelling private equity target, given the favorable outlook in strategic and financial dimensions. The valuation of Nexus resulted in approximately, primarily influenced by utilising multiples derived from comparable companies and transactions. Through value creation strategies like cloud transformation and international expansion, this work shows that the buyout of Nexus could result in a MOIC of 4.0x and an IRR of 33.0%.

Keywords

Private Equity, Leveraged Buyout, Healthcare Software, Nexus AG, Cloud Transformation

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Section A – Investment committee paper – Group work

1. Company overview

Nexus AG is a German software developer dedicated to creating, selling, and servicing software solutions for the international healthcare market. The firm's primary offering, the Hospital Information System (NEXUS / HIS), along with integrated diagnostic modules, presents a diverse product range catering to the functional needs of hospitals, psychiatric institutions, rehabilitation facilities, and diagnostic centres. Employing approximately 1,700 individuals, Nexus operates in seven European countries with its own sites and extends its services to customers in 23 countries through certified dealers. The company's key personnel include CEO Dr Ingo Behrendt, CSO Ralf Heilig, and CDO Edgar Kuner. The modular product structure allows for a fully customised software solution, beginning with a base information system and adding modular software based on client requirements. The company also engages in the development of specialised software. Nexus offers a portfolio of over 2,000 tailored software solutions licensed to the market. The company possesses a network of 40 subsidiaries in Europe and one in the US. The second aspect of Nexus's business model involves IT services and software maintenance, encompassing installation, maintenance, IT servicing, and consulting. A smaller portion of the business involves supplying third-party hardware and infrastructure components such as PCs, servers, and monitors. By combining these activities, Nexus has emerged as a leader in the European healthcare software industry. The company recorded strong top-line growth over the past years, with a significant increase in revenue from €112.5m in 2016 to €211.5m in 2022. At the same time, Nexus' EBITDA margin grew from 18.7% to 21.0% throughout the period, mainly due to operational improvements and higher productivity, resulting in a strong EBITDA of €29.4m in 2022. The company's business model is highly cash-generative, with a cash conversion ratio of at least 73% throughout recent years, driven by moderate working capital requirements and low maintenance capex needs. Free cash flow was

somewhat volatile due to M&A investments and continued efforts of debt amortization.

2. Business model

Nexus generates value through its three segments: software license sales (18%), maintenance and IT consulting services (76%), and, finally, hardware deliveries (6%). Through its license sales segment, Nexus sells license contracts to worldwide healthcare providers like hospitals and clinics, which gives them the right to use the software for an undetermined amount of time. The base contract includes the software customisation, the software installation on-premise, and a maintenance and update service, which the client pays at the time of the update/maintenance. The unique modular offer of Nexus consists of many self-developed add-on sales in addition to the main information software, all compatible with each other. Revenues are generated through a one-time license sale, granting clients the long-term right to use the software. In addition to the base offering, Nexus also offers its clients (1) the option to operate the information software remotely for them using the Nexus One Cloud system through a subscription model, which accounts only for a small fraction of Nexus business, (2) IT consulting services such as training, support or projects development, (3) self-developed specialised modules compatible with a third party HIS providers and (4) the re-sale and delivery of third-party hardware like computers.

3. M&A activity over the past years

Nexus has been active in M&A activity with more than 26 acquisitions in the past seven years and an inorganic revenue of more than €3.0m since 2018, peaking at €7.9m in 2021. The robust track record reflects the organisation's strategic acquisition expertise and an understanding of market dynamics. This supports the assumption that Nexus AG could be an excellent platform for add-on acquisitions. The acquisitions range from a broad spectrum of different sizes, stages of companies' lifecycle, specialisations, and countries, underscoring the organisation's diverse and adaptive approach to growth. Despite the company's remarkable success in M&A activities,

Nexus AG's geographical reach appears somewhat concentrated. Most of its subsidiaries are within the DACH region, with over half in Germany. While this regional focus has advantages, deepening market penetration and fostering relationships, it poses geographic expansion and diversification challenges.

4. Market overview

The healthcare IT market is a rapidly growing sector, marked by the integration of advanced information technology into healthcare operations. Currently, this market is on a trajectory of substantial growth, with projections indicating a potential size of €1,096.5bn and an annual growth rate (CAGR) of 19.8% over the next five years. This market is segmented into five critical areas: Hospital Information Systems (HIS) (CAGR 7.0%), Enterprise Resource Planning (ERP) solutions (6.2%), functional (19.3%), clinical, and ambulatory software. HIS solutions, crucial for managing both clinical and administrative data, are being enhanced by artificial intelligence (AI) and machine learning for predictive analytics and cybersecurity enhancements. ERP solutions, vital for operational excellence in healthcare institutions, are increasingly cloud-based, offering continuous monitoring and optimization of workflows. The functional software segment, focusing on the Internet of Things (IoT) and connected devices, is revolutionizing diagnostics and patient management through automation and real-time data sharing. Several factors are driving this market's growth. Government initiatives, technological advancements, and evolving healthcare practices play a significant role. There is a growing need for secure patient communication and effective prescription management, necessitating robust IT infrastructures. In Europe, the German Hospital Future Act and the French "Ma Santé" program are notable examples of legislation fostering market growth by allocating substantial funds for healthcare digitalization. Companies like SAP and Oracle Cerner are realigning their healthcare IT portfolios, creating new opportunities for market penetration and expansion. Among these, Nexus AG stands out for its integrated solutions across HIS, ERP, and functional

software segments. With a substantial market share, particularly in the DACH region, Nexus competes effectively against firms like Dedalus and CompuGroup by leveraging its comprehensive product suite. The future of the healthcare IT market is set up for continued growth, driven by technological innovations and regulatory support. For leaders like Nexus, adapting to market trends, such as the withdrawal of SAP's IS-H software from the healthcare market, and capitalizing on regulatory changes and advancements in cloud computing and IoT will be crucial. The ongoing need for innovative, patient-centered care solutions will propel market expansion, offering significant opportunities for companies positioned to meet these evolving demands.

5. Valuation

For the valuation of Nexus, two main methods were employed: multiples valuation (specifically EV/EBITDA, EV/revenue, and EV/EBIT) and the discounted cash flow (DCF) analysis. In the multiple valuation, EV/EBITDA played a pivotal role, contributing 60% to the overall valuation, while the remaining 40% was assigned to EV/revenue and EV/EBIT. For the comparable company analysis (CCA), the median multiples were 1.2x for EV/revenue, 9.2x for EV/EBITDA, and 13.9x for EV/EBIT. The comparable transaction analysis (CTA) focused on EV/EBITDA (60%) and EV/revenue (40%), resulting in multiples of 21.9x and 4.4x, respectively. With regard to the DCF analysis, the authors forecasted the unlevered free cash flows and computed a weighted average cost of capital (WACC) of 8.70% through the application of the capital asset pricing model. For the terminal value, a 2.1% perpetual growth rate was assumed, and an exit multiple of 15.6x was used based on the average of comparable transactions and trading multiples. The Gordon growth method contributed 30%, whereas 70% was allocated to the exit multiple method, leading to a DCF valuation of €1,395.8m (27.0x EV/EBITDA). The final valuation combined the three methods, assigning weights of 40% to both CCA and CTA and 20% to the DCF. The resulting valuation for Nexus was €886.6m. It

was subsequently presented in a valuation football field, along with the 25th and 75th percentiles of each method to display a valuation range. The authors deemed the final enterprise value reasonable, with strong historical performance, favourable market conditions, and positive future prospects as contributing factors.

6. Investment thesis and value creation

Nexus AG is an attractive target for many reasons. It is well-positioned in the market and has shown stable margins and growth in the past years. Nexus, a leader in specialized diagnostics solutions, is strategically positioned in the growing European healthcare technology sector. With the broadest product portfolio, Nexus's management in 2022 anticipated an 8-9% organic growth rate until 2026, driven by hospitals' increasing demand for efficiency and quality care. The company's unique market position and potential for scalability set the stage for improved margins and a potential transition to a SaaS Cloud business model. Nexus's commitment to ESG initiatives aligns with evolving regulatory landscapes, enhancing its competitive edge. Financially, Nexus's relatively low debt level compared to its peers, with only €8.7m in long-term borrowings while maintaining its cash and cash equivalents account at €20m in 2022, makes the company an ideal candidate for a leveraged buyout (LBO). Government subsidies, particularly in Germany, further bolster Nexus, providing a solid foundation for sustained growth. After analyzing Nexus's current business model and its embedded value drivers, three strategic initiatives were identified to boost returns. These include implementing cloud deployment and transitioning to a SaaS model. In addition, the business plan involves targeted expansion in Austria by leveraging existing subsidiaries and increasing Nexus's market share in France through an internationalization strategy.

6.1 Cloud transformation

Nexus primarily relies on an on-premises model for its software solutions, hosting them at clients' sites. However, evolving market dynamics, particularly in healthcare, indicate a

diminishing relevance of on-premises deployment driven by regulatory changes. Increasing patient numbers, stricter data privacy regulations, and growing workloads necessitate a shift to cloud solutions. The adoption of cloud systems for data storage and information system operations can enhance data security, reduce costs, and offer operational efficiencies. This trend aligns with initiatives led by the Austrian and French governments. In the European healthcare market, cloud deployment contributed over €63.3bn in 2023 and is expected to grow at a CAGR of 18.1% to reach €145.5bn by 2028, presenting substantial revenue potential for Nexus. While Nexus currently provides remote operation of clients' information systems through its cloud, it is acknowledged that these services need optimisation and expansion to accommodate all existing on-premises clients. To attract clients favoring cloud deployment, it is planned to enhance Nexus's cloud platform infrastructure and transition to a SaaS model. This strategic shift aims to capitalise on recurring revenue and increased operational efficiency, anticipating compensatory reductions in on-premises model costs. The transition is expected to generate additional cash flow, with projected increases in customer adoption and revenue growth. Although a slight margin pressure may arise due to higher staff costs for uninterrupted support, long-term benefits are expected to outweigh potential challenges. The two-year implementation phase will involve migrating existing clients progressively to the cloud passing on associated costs to clients. Leveraging expertise from the PCS add-on, specialising in cloud technology, Nexus aims to mitigate risks and expedite deployment.

6.2 Buy-and-build strategy

Twelve potential add-on targets have been assessed, with a focus on strategic fit and potential synergies. Prioritizing these targets based on strategic alignment, Nexus has identified Professional Clinical Software GmbH (PCS) as a standout choice for its first add-on acquisition. With 30 years of expertise in healthcare software solutions, PCS aligns with Nexus's expansion goals. The HIS market in Austria, with an expected CAGR of 15% from 2024 to 2028, presents

a lucrative opportunity for Nexus. The company could strategically prioritize Austria for immediate market share and revenue growth by leveraging its existing network and subsidiaries across Austria and Switzerland. The evaluation of potential add-ons considers both strategic and financial aspects. Essential criteria include the compatibility of product offerings with Nexus's portfolio and the established presence and profitability in Austria. Setting a threshold of a minimum €5.0m in EBITDA and a minimum margin of 10%, Nexus ensures that selected companies are financially robust. PCS emerges as an ideal choice, not only meeting but exceeding these criteria. With a product range encompassing hospital information systems, imaging solutions, and unique clinical applications, PCS offers Nexus a pathway to increased market share and diversified offerings in Austria. The integration of PCS aligns with Nexus's strategy, emphasizing a robust buy-and-build approach. The investment rationale for acquiring PCS is multifaceted. Foremost is the prospect of rapidly increasing Nexus's market share in Austria, capitalizing on the growing HIS market. The acquisition is anticipated to create synergies that drive efficiency and reduce duplicated overheads, generating economies of scope. The infusion of PCS's expertise in cloud development, combined with its proficiency in functional and clinical healthcare areas, positions Nexus for enhanced competitiveness. Financing the acquisition with a balanced mix of debt and equity underscores Nexus's commitment to a prudent financial strategy. Notably, the divestment decision by PCS's previous shareholder, GPI Group, would align with its broader shift towards the Italian and US markets. As PCS integrates into Nexus, the focus remains on rapid deployment to capture the dynamic Austrian HIS market. While full integration is envisioned, PCS retains a high level of autonomy in strategy implementation, recognizing the critical importance of its market knowledge and skilled workforce to the success of Nexus's buy-and-build strategy in Austria.

6.3 Internationalization

To enhance its global presence and navigate potential regional economic fluctuations, Nexus should consider strategic acquisitions beyond the current DACH stronghold to expand into new markets. By diversifying its geographic footprint, Nexus AG could strengthen its resilience and capitalise on emerging opportunities in different international markets. This approach aligns with the company's demonstrated capability in successful M&A activities. It also slightly changes its geographic focus on its previous inorganic growth strategy. Maincare Solutions would be the first acquisition for this strategy in 2025, and Visiodent SA would be the second acquisition in 2026. Nexus AG's primary market is the DACH region. France contributed a modest 3.4% to the total revenue in 2022, ranking it the fifth most significant country in Nexus AG's portfolio. Sales in France increased substantially by 11.5% in the first half of 2023 compared to the previous year's period. Consequently, Nexus AG is well-positioned to leverage its established customer base and existing client relationships. Moreover, the commitment of two top executives to this region and two subsidiary companies within France equips Nexus AG with substantial market insight and expertise. This local presence and knowledge base are advantageous for streamlining and accelerating the integration of acquisitions. The French healthcare market has unique characteristics, and its public sector invests significant amounts in healthcare. In fact, the French government is focused on improving the healthcare system, and the newly introduced bill "Ségur de la Santé" aims to make medical support more accessible, increase collaboration between health practitioners, and enhance patients' experience in the medical sector. To achieve these goals, the government is investing €2.0bn over three years. This investment program puts pressure on healthcare providers to prioritise digitalisation and technological advancements. (Ministère de la Santé et de la prévention 2023). In 2025, it is planned to make a significant move by acquiring Maincare Solutions, a renowned French company specialising in electronic patient records, hospital administration,

interoperability, and telemedicine technologies. This acquisition is a strategic step for Nexus, as Maincare Solutions provides a comprehensive hospital information system that aligns well with Nexus's existing offerings. The acquisition of Maincare Solutions supports the strategic expansion into the French healthcare market. It will strengthen Nexus's presence in France, enhance its bargaining power due to increased size and network, and create opportunities to access new customer segments within the French healthcare industry. The strategy aims to acquire Visiodent SA in 2026, a French company with expertise in designing digital dental imaging and radiology systems, as well as cloud-based management platform software for dental clinics. The company's administrative support software solution is marketed as a SaaS. Given Visiodent's substantial experience in the dental market, the acquisition will enhance Nexus's position in this sector and expand its reach in the broader healthcare sector. It offers avenues for further expansion in the niche, shared product features, market insights, customer base expansion, and access to skilled professionals with dental expertise in the French market. Additionally, the acquisition could prove advantageous for Nexus by securing the company at a lower multiple compared to Nexus's current valuation.

7. Acquisitions agenda

In executing the buy-and-build strategies, a planned phased acquisition approach targets twelve potential companies, emphasising Priority 1 entities – PCS, Maincare, and Visiodent. The acquisition schedule unfolds as follows. PCS's planned acquisition date is in January 2024 at a multiple of 15.7x. Cross-sectional teams will seamlessly transition both Nexus and PCS to a Cloud SaaS model, leveraging PCS's existing cloud operations. Post-acquisition, the aim is to expand the clinical and functional business by capitalising on PCS's specialised expertise. Maincare will be acquired at the same time at a multiple of 9.4x. Commencing Cloud deployment from June onwards, the expertise of Nexus and PCS cloud teams will be utilised to integrate standardised technology within Maincare. The growth strategy includes market

consolidation in Austria and strategic internationalisation in the French markets. Visiodent's acquisition is planned for January 2026 at an EBITDA entry multiple of 8.2x. Initiating cloud deployment in April will draw from the experience gained in Maincare. The designated goal is rapid expansion into the dental software market, enhancing the overall market presence of the company. The value creation and synergies approach encompasses horizontal expansion through the acquisition of healthcare software providers and vertical integration, such as strengthening the clinical and functional business with PCS and venturing into the dental software market with Visiodent. A robust financial strategy is central to the entry conditions, defining acquisition multiples through comprehensive valuation processes, averaging 11.1x. Financing is structured through a mix of acquisition facilities (€113.8m), balance sheet cash (€16.4m), and additional fund equity (€97.4m), with a total financial commitment for add-ons amounting to €227.6m. Operational enhancements are integral to the strategy. Anticipating synergies playing a pivotal role, elevating EBITDA margins where necessary, the EBITDA margin scenario has been conservatively modelled to guide value creation projections. The buy-and-build strategy is poised to fuel strategic growth, fostering synergies across the expanding portfolio and ensuring a phased, sustainable approach to integration and financial management for sustained success.

8. Business plan

The business plan for Nexus is a comprehensive strategy to transform the company's revenue streams and market position through a transition to a Software-as-a-Service (SaaS) model and international expansion. In 2023, Nexus anticipates net revenue of €232.1m, based on historical growth and current reports. The revenue stream is currently combined with an assumed split of services, maintenance, licences, SaaS, and deliveries, which is reflective of industry norms. However, license sales are projected to phase out by 2026 as the SaaS model becomes the primary business focus, starting in 2024. The shift to SaaS is expected to result in reduced

maintenance revenue as it gets integrated into the SaaS offerings. Nevertheless, services revenue should increase as customers require more customized support for the interoperability of Nexus's software solutions. Concurrently, hardware sales will align with market growth rates as the focus shifts to a subscription-based model. The introduction of the SaaS model aims to minimize upfront payments for clients, thus facilitating more accurate software expense planning and enhancing customer retention. This strategy is projected to boost recurring revenue from 30% in 2023 to 47% in 2028. Consequently, Nexus's revenue CAGR is expected to surge to 24.1%, bolstered by a strategic M&A approach and a persistent demand for its services, culminating in revenues of €683.9m by the end of the holding period. Geographically, Nexus plans to diversify to reduce reliance on the German market, especially considering the expected cessation of digitalization subsidies by 2025. Despite this risk, the forecast is optimistic about continued growth in Germany, supported by expert opinions and industry reports. Target markets for organic growth include Switzerland and Austria, where SAP and Cerner's withdrawal presents a substantial market opportunity. Nexus aims to capture an annual market share increase of 0.9% in Switzerland and 1.5% in Austria. In France, growth is anticipated through strategic acquisitions. The operational forecast indicates a positive trajectory, with a reduction in development costs due to standardization across Europe, streamlined administrative expenses through headcount reductions, and stable operating expenses. EBITDA margins are expected to improve through enhanced efficiency and synergy from acquisitions. A consistent EBITDA growth is projected, from €51.7m in 2023 to €166.7m in 2028. This growth reflects strategic pivots, such as the capitalization of development costs and the reduction of license-based revenues in favour of the more sustainable SaaS model. To conclude, Nexus's business plan is geared towards establishing the company as a European leader in healthcare software through cloud transformation, SaaS conversion, and

internationalization, resulting in a well-diversified revenue structure and improved profitability over the forecast period.

9. LBO

The financing for Nexus's Leveraged Buyout (LBO) is carefully structured, comprising a total capital injection of €928.8m. This sum is segmented between equity and debt based on the current debt market accessibility and maximization of fund returns. The equity portion amounts to €515.5m, of which the sponsoring entity provides a substantial subordinated loan of €413.3m. Additionally, the sponsor and Nexus's management team also contribute to the equity with common stock investments of €24.0m and €6.0m, respectively. On the debt front, the structure is diverse and aligned with existing market trends, expert insights, and strategic assumptions. The composition includes Term Loan A, Term Loan B, Term Loan C, Mezzanine Debt, and an Acquisition Facility, cumulatively amounting to €413.3m. This represents 44.5% of the total funding sources and corresponds to an 8.0x EBITDA leverage ratio. The debt instruments' interest rates are thoughtfully benchmarked against the 5-year EURIBOR swap rate. The total uses of the funds are calculated at €928.8m, enveloping the enterprise value of €886.6m, a stipulated minimum cash reserve of €20.0m, and transaction fees totalling €22.2 m. The enterprise value itself is a result of an EBITDA multiple analysis and a DCF analysis, with the EBITDA for the year 2023 projected at €51.7m and valued at an EV/EBITDA multiple of 17.2x. In a reassuring financial position for 2023, Nexus is anticipated to maintain a net cash-positive status, with its cash and cash equivalents surpassing total debt and other debt-like obligations by €69.6m. The transaction fees, pegged at 2.5% of the enterprise value, are broken down into sponsor and M&A advisory fees at 1%, due diligence costs at 0.75%, and arrangement fees at 0.75%. These fees are standard for transactions of such magnitude and complexity, ensuring that all due diligence and financing arrangements are conducted thoroughly and strategically. Regarding covenants, Nexus AG exhibits favorable financial

health post-LBO. The net debt-to-EBITDA ratio, with a headroom between 19.8% and 24.5%, ensures robust debt coverage. The Debt Service Coverage Ratio consistently exceeds the minimum threshold of 1.0x, affirming Nexus's liquidity and ability to settle liabilities. Interest coverage, with a minimum headroom of 19.8% in 2024 indicates preparedness for meeting debt and financial obligations. For the debt repayment, the conservative scenario aligns with Nexus's financial capabilities, with anticipated cumulative debt repayment of €144.7m and cumulative cash interest of €162.0m from 2024 to 2028, ensuring efficient debt management. Despite debt servicing, substantial free cash flow remains accessible annually, providing resources for sustained growth and potential investments. In conclusion, Nexus AG emerges as financially robust, adept at meeting obligations, maintaining liquidity, and efficiently managing debt repayment throughout the LBO holding period.

10. Exit and returns

The exit process for Nexus AG, as outlined in the Investment Case, forecasts robust returns for institutional investors and management by 2028. Institutional investors anticipate a 4.0x MOIC with a corresponding IRR of 33.0%, while management expects a MOIC of 68.4x and an IRR of 132.8%. The total value creation at exit amounts to €2,361.8m, driven by market demand, government incentives, and strategic shifts. The value creation in Nexus's LBO generated by revenue growth consists of a substantial €1,078.2 m, driven by strategic acquisitions and operational enhancements. EBITDA margin expansion contributes by €413.3 m, showcasing a commendable MOIC of 0.81x as Nexus's cash-generative model foresees strong cash generation. Over the holding period, cash generation comprises 7.8% of total value creation, at €184.8 m. Meanwhile, multiple arbitrage contributed by €260.9m thanks to lower EV/EBITDA multiples in add-on acquisitions. Finally, the synergies contribute by €424.7 m. Nexus's exit strategy involves selling to a healthcare software solutions company, aiming for synergies with industry giants. Potential buyers include Oracle, Optum, Philips, GE Healthcare, and Microsoft.

Despite the challenges posed by Nexus's size, strategic advantages in financial expertise and potential speed in the exit process make Oracle an attractive buyer. However, integration challenges, cultural differences, and regulatory hurdles are acknowledged risks.

11. Due diligence

The due diligence process is a vital stage of the acquisition process as it is expensive. It demands commitment from the buyer and the seller and is thus performed only at a later stage of the purchase. The Commercial, Tech, and Legal DD will require particular attention, given the inherent nature of the target business. In Tech due diligence, issues related to implementation and interoperability hold vital significance and demand consistent and thorough analysis. This becomes significantly pronounced in the context of acquisitions planned due to its essential role in the fund's value-creation process. Moreover, additional aspects of due diligence specific to Nexus' acquisition require in-depth examination as they could pose potential challenges. For instance, employee retention emerges as a pivotal concern in this field, with Nexus having experienced some past issues in this domain, according to the GAIA report and its financial statements. Understanding and mitigating these challenges is imperative to the acquisition's success, and a meticulous examination of the broader due diligence landscape will be instrumental in ensuring a comprehensive understanding of the potential risks and opportunities associated with the transaction.

Section E – Focus Area: Return Analysis – Nell Van den Ende – 52806

E1. Introduction: The PE industry under new conditions

The post-Covid rally in the global private equity (PE) sector, noted for its resilience, faced a significant challenge from the Fed (Bain & Company 2023). Despite global challenges such as rising inflation, the Ukrainian war, and tensions with China, the PE industry saw record deal activity in Q1 2022. However, in June 2022, when the Fed and other central banks raised interest rates, deals declined as banks withdrew from funding leveraged transactions, marking the end of a 12-year high-performance streak. Deal count fell by 10% to 2,318 transactions, and average deal value dropped by 28% from 2021, yet it increased by 22% compared to its 5-year average. The industry closed the year with 3.7 trillion in dry powder (Bain & Company 2023). Buyouts continued to grow at a CAGR of 11% since 2012, remaining the dominant asset class despite the rapid growth of alternatives. Add-on acquisitions exceeded 72% of North American buyouts by deal count in 2022, appealing for their financing through portfolio balanced sheets. This fueled the rise of buy-and-build strategies, where a GP acquires smaller companies to build them into a larger entity with a higher valuation. In H2 2022, exits faced a more substantial decline, only strategic sales exceeded their five-year average, mainly due to the resilience of corporate earnings. The rate reversal prompted PE investors to shift focus from multiple expansion to revenue and margin improvement. As interest rates are expected to decrease in 2024, the private sector is anticipated to resume an upward trajectory, emphasizing operational improvements and buy-and-build strategies.

To achieve optimal exit values and returns, understanding and defining the PE industry is crucial. This paper, complementing the investment committee presentation of Nexus AG (NXU.DE), a German healthcare software developer, specifically focuses on leveraged buyouts (LBO). The theoretical foundation includes defining PE, presenting the evolution of LBOs' structure, and presenting a return analysis applied to the Nexus case study. The paper concludes

by summarizing factors influencing the returns for investors providing equity or debt for PE investments.

E2. PE Characteristics and differentiation

PE is a distinct asset class within alternative investments. The CFA Institute defines this category as "a disparate group of investments that are distinguished from long-only, publicly traded investments in stocks, bonds, and cash" and thus differs from the latter, commonly referred to as "traditional investments." Firstly, PE assets have low transparency since target companies are generally not publicly traded. This lack of publicly available data forces investors to value such investments through companies' cash flows and unrealized investments. Secondly, PE returns show a very low correlation with other asset classes, enabling investors to enhance their portfolio's risk-return profile. Regarding PE investment strategies, they can be categorized into a few main groups: investments in LBOs, involving the acquisition of majority stakes in companies; growth equity, encompassing minority stakes in growing companies; and special situations, such as distressed buyouts, which focus on companies in or near bankruptcy. In the case of Nexus AG, an LBO investment strategy is employed to take the company private. PE professionals typically seek to generate returns and exit multiples when taking a company private by implementing operational improvements to increase profitability and employing financial engineering, such as increasing the firm's leverage to later sell resulting common stocks at a higher price. Consequently, PE buyouts are predominantly financed with debt rather than equity, and this debt financing is typically provided through the syndicated loan market.

E2.1 Positive effects of PE ownership and evolution of performance metrics

A wide literature documents positive effects of PE ownership on various aspects of firm outcomes and performance, including operating performance (Fracassi et al. 2022), productivity (Lerner et al. 2019), innovation (Amess et al. 2016), or even performance during recessions (Bernstein et al. 2019). Moreover, recent academic studies investigated the

performance of PE-backed companies in a difference-in-differences (DiD) setting, comparing the post-buyout performance of PE-backed companies to that of matched, non-sponsored control firms. Empirical evidence from DiD studies suggests strong outperformance of PE-backed companies relative to control firms in terms of their operating performance and growth (Cohn et al. 2021, Lavery et al. 2021, Fracassi et al. 2022). Harris, Jenkinson, and Kaplan (2014) analyzed the performance of almost 1,500 PE funds. They found out that buyout funds' performance consistently outperformed the S&P500 by more than 3.2% annually and an average of 23.5% over a fund's life. In addition, Thomson Reuters launched the "Thomson Reuters PE Buyout Index," a new investable public index that tracks the performance of PE buyout deals, which, in 1997, showed an impressive, annualized return of 17.26% (Reuters 2014). These returns represent the total performance of PE buyout funds but only a portion of the total return generated by all investors that provided capital.

E2.2 PE Financing and optimal LBO capital structure

PE transactions involve a PE firm acquiring a company, often offering a premium of 15 to 50 percent above the prevailing stock price if the target company is publicly traded (Bargeron et al. 2007). Allocated capital within the PE fund finances the acquisition, operational improvements, add-ons strategy, and strategic actions undertaken by General Partners (GPs) to generate multiples. Investors, known as Limited Partners (LPs), providing funds expect a return on their capital exposed to business risks during the holding period of the PE fund. The structure comprises four sources: (1) Equity Capital, (2) leveraged loans, (3) subordinated debt, and (4) hybrid equity instruments, which differ in providing capital in the form of equity, debt, or a hybrid form. These sources capture all investors expecting a return from the PE investment (Harris et al. 2014; Baldi 2015). Financing for acquisitions typically involves 60 to 90 percent debt, consisting of senior and secured loans facilitated by banks. Senior Debt, with lower interest rates, has priority claims on cash flow and is secured by company assets but comes with

stricter limitations and covenants. LBO debt may include a junior, unsecured portion financed by subordinated to senior debt, which often represents about 20% to 30% of the capital structure and incurs higher interest due to increased risk (Brown et al. 2021). PE firms deploy funds from investors as equity, covering the remaining 10 to 40 percent of the purchase price. The newly appointed management team contributes a small fraction of the total equity amount. Limited Partners and other actors investing capital into PE funds are interested in portfolio companies' performance during the holding period, seeking a financial return (Kaplan 2005; Axelson et al. 2008). The ideal financial structure for an LBO aims to maximize equity return while maintaining an appropriate risk profile. Striking this balance is crucial to avoid potential financial distress and increased debt costs. Generally, higher seniority and security correspond to lower risk and reduced required return.

E3. Measures of returns and proceeds

In an LBO model, a critical aspect involves determining expected returns and the factors influencing them. Exit returns are computed by multiplying forecasted EBITDA for the exit year by the exit multiple. Once debt is fully repaid, the residual amount becomes available for distribution to equity holders. In the case of Nexus AG, and typically in LBOs, institutional proceeds include a subordinated loan calculated based on the opening balance and yearly payment-in-kind (PIK) interest, usually around 8%, along with institutional ordinary shares. Management proceeds solely stem from their share of ordinary shares. Returns experience a significant surge once the total value surpasses debt repayments and the fixed return instrument. PE funds use metrics such as the internal rate of return (IRR) and money multiples to gauge performance. The IRR, similar to the net present value (NPV) formula, reflects the rate of return a PE fund achieves on its investments, sensitive to cash flow timing. Historically, financial sponsors' hurdle rates have exceeded 30%; in severe economic conditions, they may loosen rates to 15% to 20%. Larger deals like Nexus AG typically have lower hurdle rates than smaller

ones. Recognizing sensitivity, metrics like money multiples, representing the ratio of payouts to investments without considering cash flow timing, are valuable additions. LBO investments usually yield an MM return of 2.0x to 5.0x. While both IRR and money multiples lack a risk component, limiting comparability with other investments, money multiples reveal the total value returned. However, MM does not consider the investment period's length, introducing a drawback. Evaluating PE investments with both IRR and money multiples provides a comprehensive performance and timing considerations (Patrick and French 2016; Higson and Stucke 2012). Subsequent sections use both measures to assess proceeds.

E3.1 Nexus investment case

The decision to exit in 2028 results from a strategic assessment, considering MM, IRR, and operational portfolio work requirements. In the case of Nexus AG, the exit year is linked to a forecasted EBITDA of €166.7 m, leading to an enterprise value of €3,063.7 m, assuming a constant EV/EBITDA multiple of 17.2x at exit. From an institutional perspective, the investment in Nexus yields a MM of 4.0x and an IRR of 33%. Their committed capital includes a shareholder loan of €485.5 m with a PIK element of 10%, and 80% of ordinary shares totaling €24.0 m. In 2028, these instruments together contribute to a return of €2,424.5 m for a total initial entry investment of €606.9 m. Respectively, the proceeds from the shareholder loan amount €781.9 m while €1,642.6 m for ordinary shares. A sensitivity analysis reveals the investment's dependency on entry and exit multiples, showcasing potential improvements in return measures through multiple arbitrage scenarios. For instance, adjusting the entry multiple to 15.2x with an exit multiple of 19.2x yields a MM of 5.31x and an IRR of 41.2%, highlighting the strategic impact. Turning to the management's sweet equity, totaling €6 m commitment at entry, equivalent to 20% of ordinary shares, the expected proceeds consist of €410.7 m. Additionally, the management is expected to make an equity commitment for add-ons from the beginning, reflected in the entry investment. The calculated internal rate of return stands at an

impressive 132.8%, showcasing the robust performance of this investment. A sensitivity analysis for sweet equity demonstrates the potential for improved returns through multiple arbitrages. Notably, the exit year's duration accentuates sensitivity, with considerable variations in money multiples and IRRs observed for different exit periods. An exit in 2029 would have generated a lower estimated IRR of 113.0% for management. In conclusion, the comprehensive analysis of the exit waterfall for Nexus AG emphasizes the nuanced interplay of entry and exit strategies, underscoring the importance of considering multiple factors, including entry and exit multiples, holding periods, and strategic initiatives, in shaping calculated returns.

E3.2 Nexus bank case

The bank case presents a distinct economic landscape marked by a more challenging environment during the investment period. The forecasted revenues at exit (2028) stand at €539.2m, or €100.7m lower compared to the investment case (€683.9m), reflecting potential growth constraints and adverse effects from global geopolitical challenges. The assumption is that revenue synergies from the internationalization strategy may not materialize or potential challenges in pivoting towards the cloud may arise, causing a decline in new customer. Integration risks come to the forefront, encompassing the non-realization of cost-saving potentials, increased R&D expenses tied to "Nexus One Cloud," and limited gross profit margin improvements from an unsuccessful transition into a pure cloud business. With a more conservative EBITDA forecast of €119.8 m, the enterprise value (EV) of Nexus AG in 2028 stands at €2,056.8 m, resulting in a total equity money multiple of 2.52x and an internal rate of return (IRR) of 21.3%. Institutional investors value a MM of 2.6x (IRR of 21.3%), while the management perspective values a MM of 32.1x, and a corresponding IRR of 100.1%.

E4. Exit waterfall

In the subsequent section, the Investment Case is examined to determine the Enterprise Value (EV) of Nexus. First, the forecasted 2028 EBITDA of €178.5m is multiplied by the exit multiple

of 17.2x, resulting in an EV of €3,063.7 m. Subsequently, the remaining net debt of €228.5 m is subtracted. In 2028, the remaining total debt amounted €393.5m, but with a positive cash position of €161.0m, the net debt is €228.5 m. After deducting net debt, along with debt-like items such as leasing liabilities and pension provisions, the anticipated total equity value at exit is €2,835.2 m. The €781.9 m in shareholder loans are then subtracted, yielding a final ordinary equity value of €2,053.3 m. This amount comprises €410.7 m in sweet equity and €1,642.6m in institutional ordinary shares. In the Nexus LBO, a performance-related shares of sales incentive model is employed. The management team is set to receive 2.5% of revenue, while the senior staff will receive 5%, fostering alignment with company success. Employee salaries are projected to grow at an average rate of 2.7%, increasing in later years to attract talent and support growth. This compensation strategy aims to incentivize, attract, and retain talent, fostering a motivated and high-performing workforce in the Nexus LBO journey. The equity split aligns with CEO Dr. Ingo Behrenft's founding role and managerial success. His €123.0 m (30%) stake serves as an incentive for his continued contribution. CSO Ralf Heilig's substantial equity (€102.5m or 25%) recognizes his pivotal role in executing the growth strategy. CDO Edgar Kuner's €61.5m (15%) acknowledges his shorter-term role of two years, to be later replaced to better align with Nexus group's new development under the fund's strategies. The remaining sweet equity belong to the add-ons management team.

E5. Value creation

During the holding period of the investments, multiple factors contribute to the creation of total value. This chapter describes the outcome of the applied strategies and the impact of various drivers on the overall creation of value. Specifically, Nexus's value creation was founded on five pillars: revenue growth, EBITDA-margin expansion, cash generation, multiple arbitrage, and the impact of realized synergies.

E5.1 Nexus Investment Case

The primary driver of value creation is revenue growth, comprising €1,078.2 m or 45.7% of the total. Nexus, the main revenue driver, accounts for 88.72% of revenue growth and 40.5% of the total value created. It expects sustained growth through cloud solutions, accelerated by Maincare and PCS cloud expertise. Add-on acquisitions contributed to revenue growth by €121.6 m, with Maincare at 4.6%, PCS at 0.3%, and Visiodent at 0.2%. Cloud transformation, strategic measures, and new market entry result in a revenue growth contribution with a MOIC of 2.09x. The second pillar is EBITDA margin improvements, totaling €413.3m or 17.5% of total value creation. Despite appearing less significant, these improvements contribute to Nexus's standalone success with enhanced gross profit margins. The primary driver is cost structure enhancement through direct operational management and expanding the more lucrative software segment business, leading to an EBITDA margin improvement (MOIC of 0.80x). The exit multiple is notably conservative due to the business model transformation towards SaaS. The third pillar is cash generation, contributing €184.8m or 7.8% of total value creation. Nexus anticipates robust cash generation driven by its business model and value creation initiatives. The planned exit envisions nearly full amortization of Term Loan A. Furthermore, 50% of the generated cash will be reinvested, financing planned acquisitions of PCS and Visiodent, contributing to sustained growth. The fourth pillar, multiple arbitrage, constitutes €260.9 m or 11.0% of total value creation. Acquiring add-ons at lower EV/EBITDA multiples underpins this, detailed in the valuation section. The positive impact on exit value is realized through enhanced post-integration EBITDA, subsequently attracting a higher exit multiple. The fifth pillar, synergies, contributes €424.7m or 18.0% to total value creation. Revenue synergies in 2028 are complemented by cost savings achieved through strategic partnerships among the add-ons teams. These five pillars culminate in value creation of €2,361.8m, representing a total MM of 5.6x and an IRR of 32.9%. This holistic approach underscores Nexus AG's strategic prowess in maximizing value across various dimensions.

E5.2 Nexus Bank Case

The overall value creation that occurs in the bank case is significantly different from that which occurs in the investment case as a direct result of the above-mentioned assumptions that were made regarding the bank case. The total value creation fell to €1,271.5m. The most important value driver for this investment is still revenue growth, which is responsible for a contribution of €530.3m or 41.7% of the total value creation.

E6. Exit strategy

The reviewed literature and data emphasize the impact of various factors on equity and debt investor returns, a synthesis reiterated here. Equity returns hinge on factors like target company performance, capital market conditions, and the competitive landscape. Debt investors focus on mitigating capital losses and ensuring consistent cash returns, such as fixed interest repayments (Kaplan and Strömberg, 2009). Diverse exit strategies for equity investors yield varying values and returns. Gompers, Kaplan, and Mukharlyamov's (2016) analysis reveals that over 50% of PE investors pursue a strategic buyer exit, achieving the highest IRR. Approximately 30% opt for a financial sale, while only about 20% choose an IPO exit. Timing is crucial, with the top factors being the "Achievement of operating plan," "Capital market conditions," and "Competitive considerations" (Gompers, Kaplan, Mukharlyamov 2016). Considering Nexus's market position and size, a secondary sale emerges as an appealing exit strategy, driven by potential synergies with larger healthcare software solutions companies. Pros include expertise in financial engineering, faster processes, flexibility, focus on improvements, and competitive dynamics. However, cons involve integration challenges, high due diligence costs, reduced competitive dynamics, and regulatory hurdles. Analysis confirms Oracle as an ideal buyer, aligning with Nexus's acquisition strategy, given its size, financial prowess, track record, and available cash. Secondary sale to financial investors was considered, but high-interest rates and Nexus's focus on industry-specific buyers favored strategic buyers. IPO was contemplated, but

concerns about cost, complexity, and market volatility steered Nexus towards prioritizing a strategic sale over an IPO.

E7. Conclusion

In conclusion, the PE landscape, molded by global events and economic shifts, displays resilience amid evolution. The post-Covid surge in deal activity encountered a setback with the Federal Reserve's 2022 interest rate hike, marking the end of a 12-year high-performance phase. Despite this downturn, PE remains robust, dominated by buyouts and a rising prominence of alternative strategies like add-on acquisitions. The Nexus AG case study explores LBOs intricately, covering theoretical foundations, characteristics, financing structures, and return metrics. It unveils strategic decision-making importance through Nexus's value creation strategy and a bank case navigating conservative economic challenges. Positive effects of PE ownership on firm outcomes, productivity, and innovation during economic downturns are highlighted. Nexus AG's exit strategy analysis emphasizes the nuanced considerations of strategic, financial sales, or IPOs, with Oracle identified as an ideal strategic buyer aligning with growth plans. The paper concludes with an in-depth look at Nexus AG's value creation pillars: revenue growth, EBITDA margin improvement, cash generation, multiple arbitrage, and synergies. Nexus AG's strategic prowess is evident in maximizing comprehensive value creation, as seen in the exit waterfall analysis, showcasing the interplay of entry and exit strategies, holding periods, and strategic initiatives shaping calculated returns. In summary, the PE industry, though facing challenges, remains dynamic. The Nexus AG case study provides insights into LBOs, strategic decision-making, and exit strategies. As the industry anticipates a potential 2024 decrease in interest rates, practitioners are set to resume an upward trajectory, focusing on operational improvements and innovative investment strategies.

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