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PRIVATE EQUITY CHALLENGE – LEVERAGED BUYOUT OF KRONES - VALUATION

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Abstract

This document assesses the leveraged buyout (LBO) of Krones AG, a publicly traded beverage equipment manufacturer and service provider, serving as a supplementary resource to the investment committee paper (ICP). Utilizing publicly available information from sources like Bloomberg, Capital IQ, and Refinitiv, both quantitative and qualitative analyses were conducted. These include a comprehensive valuation of Krones AG, LBO modelling, and analyzing the competition landscape. Based on our analysis, the potential return on investment for the Krones AG LBO, spanning 5 years, could reach up to 3.5x the initial investment, contingent upon financial model assumptions and the success of value-creation strategies.

Keywords

Private Equity, Corporate Finance, Leveraged Buyout, Value Creation, Operating Model, Krones AG, Valuation, Returns Analysis

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1. Company Overview

Krones AG, founded in 1951, is one of the largest equipment and machinery manufacturers for filling and packaging, process and intralogistics solutions for the beverage and liquid food industry. Krones' significance in the beverage industry is underscored by the fact that every 4th beverage container runs through Krones' ecosystem. Headquartered in Neutraubling, Germany, Krones operates across over 150 countries worldwide, employing over 17.000 individuals. The company is present globally with 24 production sites, 48 production sites, and 15 service centers. In 2023 Krones generated EUR 4,922m in total revenues and recorded a gross margin of 51.7% and an EBIT Margin of 6.2%.

Within its primary operations of filling and packaging, Krones holds the global market and technology leadership position. This segment accounts for roughly 80% of the total revenue, making it the most substantial segment, while the process technology and intralogistics units are significantly smaller.

The product portfolio ranges from individual machines to turnkey lines up to holistic production facilities. Thus, Krones positions itself as a one-stop shop for beverage production facilities and additionally offers extensive consulting services on planning entire beverage plants or optimizing existing ones and lifecycle services (LCS).

Krones' customer base primarily ranges from the beverage and liquid food industry to a few customers in the pharmaceutical and chemical industries. Moreover, Krones extends its expertise to the plastics industry, offering machinery for producing PET bottles and systems for PET recycling. In terms of size, global accounts, regional accounts, and SME enterprises account for 30%, 40%, and 30%, respectively.

1.1. Business Model

As a One-Stop-Shop for the beverage and liquid food industry, Krones' modular product portfolio allows customers to select from a wide range of machinery (individual machines,

turnkey lines and holistic beverage plants) and services (digital services and lifecycle services) that can be tailored to their specific needs. This modular approach enables Krones to address the diverse requirements of various industries ranging from beverage production to pharmaceuticals.

The business model of Krones revolves around three major business segments: filling and packaging technology, process technology and intralogistics. Each segment earns revenues by offering new machinery and after-sales services (clustered into lifecycle services and digital services), whereas for every segment the sale of new machinery equipment accounts for the majority of segment revenues.

The biggest business segment filling and packaging technology comprises technology like filling, capping, tempering and labelling solutions. In 2021, the process technology division including the intralogistics division was split into two autonomous business segments.

The product portfolio of the process technology division consists of cutting-edge solutions for processing and treatment (mixing, heating, cooling, sterilization etc.) mainly for beverages and liquid food. The intralogistics division provides comprehensive solutions for streamlining processes within production facilities like material flow optimization, automated warehousing or picking and loading systems.

By adding intralogistics services to the portfolio in recent years, Krones is at an excellent position to be pioneer in the increasing digitalization of the beverage industry, since Krones knows all of the processes involved in beverage production to the smallest detail.

Additional services like digital and lifecycle services complement Krones' product offering. Digital solutions like data analytics, process automation, digital monitoring and predictive maintenance enable customers to increase operational efficiency. Instead, lifecycle services (LCS) provide ongoing support throughout the lifespan of Krones' machinery, ranging from maintenance, spare parts, technical support and training. Krones' digital solutions and

lifecycle services (LCS) are provided within the framework of a service level agreement (SLA) and grants Krones a substantial share of recurring revenues each year.

The global footprint of Krones is a crucial factor in the expansion of its service-based business segment, allowing for tailored, localized support and services and facilitating adapting to regional market dynamics.

1.2.Key financials

In 2023, Krones generated a total of EUR 4.922m revenues, which has been growing at a CAGR of 4.5% since 2019. The core business segment of Krones, Filling and Packaging Technology, accounts for 78% of group's total revenues while Process Technology and Intralogistics account for 9% each.

The Covid-19 pandemic notably impacted revenue growth in 2020, but there was a subsequent increase in revenues from 2021 onwards. Krones is heavily export-oriented, generating 90% of sales outside of their home market Germany, while 55% of revenues are generated in advanced economies and 45% in emerging markets. The revenue growth is mainly demand-driven, as price increases can only be passed on to customers with a delay due to long lead times, however, the management increased prices recently, which will have an effect in the upcoming years. While in terms of absolute numbers, the core business filling and packaging technology is most attributable to sales revenue growth, the remaining two business segments process technology and intralogistics noticed higher percentage growth. They grew after their split in 2021 with CAGRs of 23.3% and 18.4% respectively, whereas filling and packaging technology grew with a CAGR of 4.1% from 2019 to 2023, but with 12.3% after 2021. As Krones has not recorded high levels of M&A activity in recent years, revenue growth was primarily organic rather than inorganic.

Krones AG recorded an EBIT margin of 6.2% in 2023 and an EBITDA margin of 9.3%, while the group segments filling and packaging technology, process technology and

intralogistics recorded an EBITDA margin of 10.3%, 7.0% and 7.5%, respectively. Filling and Packaging present a higher margin because Krones can enforce higher prices for this segment, as it holds market and technology leadership. Krones' strategic transformation from a plain manufacturer of beverage plants to a manufacturer and manager of beverage plants may have further margin improvement potential as the profitable service business gains in importance.

Operating cash flow is mainly driven by fluctuations in EBIT and working capital. NWC was reduced in times of high order intake due to an increase in advanced payments and trade payables but increased in 2023 due to higher inventory. Another important aspect in the cashflow statement is the high CAPEX as Krones is operating in the asset-heavy machinery business. Therefore, NWC and Capex contributed to a lower Free Cash Flow in 2023 after very high free cash flows in 2021 and 2022.

1.3.Competitive advantages

As the only one-stop shop in the beverage equipment manufacturing industry, Krones stands out for its extensive global presence and customer proximity, operating in over 150 countries through more than 100 engineering locations, production sites, service centers, and sales offices. Their operations are strategically divided across five key regions: Asia Pacific, Africa, Europe, South America, and North America, each with a flagship service center or production facility. This geographical spread not only ensures close customer relationships but also contributes to Krones' strong export orientation, with approximately 89% of its total revenues in 2023 generated outside its home market of Germany. This international diversification, with revenues nearly evenly split between advanced economies and emerging markets, underscores Krones' ability to adapt and respond to diverse market needs, enhancing its reputation and benefiting from the word-of-mouth effect.

2. Market Overview

As a manufacturer of equipment for the beverage industry, Krones' market is mainly driven by the consumption of beverages. Krones' total addressable market can be clustered by packaging material and by region. In 2022 over 1,500 billion beverage containers were filled and this is expected to grow at 3.2% per annum. The focus areas of Krones glass, cans and PET bottles are expected to grow by 2%, 2.9% and 3.6% respectively. Based on container type, Krones is the market leader in PET lines, glass lines and can lines while for Aseptic PET solutions Krones is the second biggest equipment provider.

The global consumption of packaged beverages in North America, South America, Europe, Africa and APAC is growing at 2.2%, 2%, 2.3%, 3.4% and 4.4% respectively.

The two regions of Europe and the USA differ from the emerging markets in terms of customer preferences, market trends, competition, risks, and winning strategy.

The addressable market of Krones' core segment, Filling and Packaging technology, is valued at EUR 48b and is expected to grow at a CAGR of 4.7% to EUR 60b in 2028. The overall beverage industry is driven by technological progress, increased awareness for sustainability, global population growth and changing customer behavior. The integration of automation and Industry 4.0 technologies in production facilities of beverage producers increase efficiency and production capacity, while simultaneously help to lower operating costs. Another key topic in the beverage industry is the growing awareness of sustainable beverage container solutions and recycling solutions with the primary goal of waste and CO2 reduction. As an overarching megatrend of global population growth, the growing global middle class and the continuous urbanization fuels the demand for bottled beverages, especially in Asia Pacific and Africa. Shifting customer preferences to increased health and consumer awareness also lead to higher demand for packaged beverages.

2.1.Competitive Landscape

KHS is one of two main competitors of Krones. KHS is a subsidiary of the German steel manufacturer Salzgitter AG, belongs to its technology business unit, and accounts for 90% of its sales. KHS is one of the world's three leading suppliers in filling and packaging machinery equipment. Its product portfolio focuses on high-performance systems and solutions for lower output rates. Like Krones AG, KHS offers processing technology for a wide variety of beverages and liquid food products and Intralogistics.

The other main competitor of Krones is Sidel, a subsidiary of privately held Tetra Laval group. Sidel is a leading supplier of equipment for filling and packaging of beverages and liquid food. The product offering of Sidel is complemented by another subsidiary of Tetra Laval, Tetra Pak, with processing equipment solutions. Sidel generated EUR 1,440m in revenues and has a workforce of roughly 5,000 FTE in over 90 countries in 2022.

Coesia is a privately held conglomerate of companies operating in multiple sectors and offering a range of products and services that cater to various industries like packaging, beverage filling equipment and automation systems for production lines. Coesia specializes in packaging technology. As Coesia stopped publishing annual reports in 2020 and is not obliged to publicly disclose financial information in the same manner that publicly traded companies are, the most recent financial information is from 2020.

Another competitor of Krones is german-based GEA Group AG. GEA focuses on systems supply for the food, beverage, and pharmaceutical industries. In contrast to Krones, GEA focuses on components rather than whole beverage plants.

SIG group is a prominent player in the packaging industry for beverages and liquid food, focusing on aseptic packaging. The product portfolio also includes filling machines, processing equipment and intralogistics solutions. SIG group is the only system provider that offers stand-up pouches, carton packaging and bag-in-box packaging.

3. Investment Highlights and Value Creation

Krones AG, a leading player in the filling and packaging equipment sector, offers a strong investment opportunity characterized by four key factors:

Firstly, Krones' attractiveness is anchored in its market leadership and defendable position within the vital beverage end market. The company has established itself as a leader by consistently offering innovative products that set new industry standards, thus securing competitive advantages and pricing power. Additionally, the specialized nature of its equipment manufacturing creates significant barriers to entry and helps Krones maintain its market position and protect its market share from new competitors.

Secondly, Krones' geographical footprint underpins its robust market position and builds the foundation for its best-in-class service portfolio. The global presence serves a well-diversified customer base that can benefit from flexibility, speed, and proximity, which are critical in today's dynamic market environment. This customer-centric approach has led to a track record of innovation and cutting-edge advancements in sustainability and digitalization that meet the ever-evolving demands of the market.

Thirdly, as a one-stop shop within the beverage industry, Krones offers comprehensive solutions beyond its core business filling and packaging. Delivering the full value chain for beverage producers, the company offers a range of additional solutions including process technology, intralogistics, and recycling. Krones' modular and turnkey solutions are tailored to meet diverse customer requirements and enable quick and efficient system deployment after delivery. This holistic approach solidifies Krones AG's status as a key player in the industry, simplifying client operations and fostering strong customer loyalty.

Lastly, Krones AG's financial solidity is reflected in its high cash conversion, which enables leverage and growth and allows for prompt deleveraging. This financial strength, supported by a significant asset base, consistent revenue streams, and stable cash flows, allows Krones

to strategically leverage debt financing. The deployment of debt financing for financing the transaction, its service business expansion, and a buy-and-build strategy is intended to guarantee long-lasting value and ultimately boost returns (IRR and MoM) for the private equity sponsor.

3.1. Value Creation Strategies

Based on the investment rationale outlined above, Krones AG is pursuing four distinct value-creation strategies to strengthen its global leadership and sustainable revenue growth while improving its EBIT margin:

1. Strategic Growth in APAC and North America: Krones aims to expand its market presence in the Asia-Pacific (APAC) region, particularly in countries like China, India, and the Philippines, where the demand for packaged beverages and machines is growing. The strategy involves focusing on key accounts, offering cost-efficient machinery, and leveraging existing product portfolios and infrastructure. Additionally, Krones seeks to strengthen its operations in North America by capitalizing on technological advancements, digitalization, and sustainability trends in the beverage industry. Moreover, Krones plans to engage with major US clients regarding the new packaging legislation, encouraging them to invest in eco-friendly packaging and recycling solutions.
2. Enhancing service-based business model: Krones plans to shift from being a traditional machinery manufacturer to a holistic manager of beverage plants, offering comprehensive service packages. This transition involves the development of digital services, such as data collection, cloud-based services, and predictive maintenance. Krones aims to increase the share of machinery under service-level agreements (SLAs) and enhance customer engagement through value-added services.
3. End Market Optimization: Krones aims to diversify and expand its market presence

beyond the core beverage sector by strategically acquiring companies with expertise in the pharmaceutical and cosmetics machinery markets. This strategy leverages Krones' existing knowledge in liquid filling and packaging and process technologies, allowing it to enter related industries.

4. Operational Improvements: Krones plans to employ best cost country sourcing strategies to reduce raw material and component costs. Alongside this, the company is focused on operational improvements, including restructuring, expanding globally, optimizing its workforce, and launching digital initiatives. These actions aim to improve profitability, increase competitiveness, and create a more resilient supply chain, ultimately positioning Krones for significant earnings growth.

These strategies collectively aim to solidify Krones' position as a global leader in the packaging and beverage industry while diversifying its revenue streams and enhancing its profitability.

4. Business Plan

The business plan builds the bridge between value creation and the return analysis as it quantifies the different strategies and is forecasted over the entire holding period. There are three different scenarios, the base case, the investment case, and the bank case, all with different purposes and assumptions. First, the base case includes all organic value creation strategies but excludes the strategic acquisitions. The four acquired targets are forecasted separately and the combination with the base case equals the investment case. This case is therefore the most sophisticated and detailed forecast and will be used to assess the returns. In contrast, the bank case is more conservative and simplified with less detailed assumptions because the main purpose of this approach is to ensure the debt repayment if the targeted value creation strategies are unsuccessful.

The most crucial element of the base case is the revenue forecast as organic growth is one of

the main drivers itself and correlated with other drivers as well. Revenues are calculated by dividing order intake with the book-to-bill ratio, where order intake is expected to be in line with the market growth of each segment. Moreover, price increases and additional revenues due to service business expansion are added on top. The most relevant cost positions are cost of materials and personnel expenses. Both are forecasted as percentage of revenue with a declining tendency based on the operational improvement strategy. Another important aspect is the relationship between capital expenditure and depreciation and amortization. Capex is expected to constantly increase over time as investments into the machinery business are necessary in this asset-heavy industry. D&A is expected to be equal to the average capex of the previous and the current year, leading to significant difference between EBITDA and EBIT. The last major element is the net working capital forecast, where all five line items, namely inventories, trade receivables, contract assets, trade payables, and contract liabilities are forecasted separately with their respective cash conversion cycle metric. The different dynamics lead to an increase in NWC over time. However, growing at a slower rate than revenues, is in the line with the operational improvement strategy and the investment highlight cash generation.

In the investment case, all four targets are forecasted rather conservative without any revenue synergies but growing constantly with the market rate. However, cost synergies are expected to be implemented due to higher bargaining power with suppliers and by consolidating administrative functions. This leads to an EBIT margin improvement of 0.5% per company per year. The acquisition cost for the target companies is based on the EV/EBIT valuation multiples as these firms have a very similar business model compared to Krones and is considered as M&A Capex.

The bank case assumes the value creation strategies are ineffective and is therefore mainly used for the credit statistics to indicate the credit risk for lenders. This is why, revenues are forecasted

only with the market growth rates of each segment and margin improvement are barely existing. NWC is also growing in line with the cash conversion cycle without expecting significant improvement. Therefore, all relevant numbers such as revenues, EBIT, and free cash flow are lower in the bank case in the base case. The investment case includes the strategic acquisitions on top to the base case and has the best results.

5. Valuation, Sources & Uses and Returns

The valuation of Krones AG is an important aspect of our LBO for estimating the correct purchase price and determining the total uses needed for financing, which includes the purchase price, companies' pre-LBO debt, financing costs, and transaction expenses.

Our valuation employed both intrinsic and relative methods. The intrinsic valuation was done through the Discounted Cash Flow (DCF) method that focuses on the present value of future cash flows. For the relative valuation, we used Precedent Transactions and Public Trading Comparables to compare Krones with similar publicly listed companies and recent transactions on the market.

For the relative valuation, we first identified a peer group for Krones based on the three segments: Filling and Packaging, Process Technology, and Intralogistics. The segments were separated due to their different operational and financial characteristics. Our peer group selection was based on databases like S&P Capital IQ, equity research papers, and the provided information from Krones' website.

The trading comparables are based on the principle that similar companies represent an important reference for the valuation of a target company due to common business and financial characteristics and risk factors. The value of a company or its EV/EBIT multiple is therefore measured by its competitors. For the trading comparables, we benchmarked Krones against the selected peer companies and analyzed key financial statistics and ratios. We calculated EV/EBIT and EV/EBITDA multiples for 2023E and 2024E while we mainly focused on the

EV/EBIT multiple given the importance of D&A resp. CAPEX, which can be partly approximated by D&A, in the machinery industry. The median EV/EBIT multiples for Krones' segments are as follows: 9.80x for Filling and Packaging in 2023, 13.94x for Process Technology in 2023, and 13.77x for Intralogistics in 2023. For 2024, the multiples are 9.43x for Filling and Packaging, 12.38x for Process Technology, and 12.22x for Intralogistics.

In the precedent transactions analysis, we included deals from the past 10 years given the limited number of relevant transactions due to the uniqueness of Krones' business model. We looked at transaction multiples and focused on transactions that were similar to Krones' operational and financial profile of the three different business segments. After an in-depth analysis, we selected 13 previous transactions in the Filling and Packaging Technology segment, 8 in the Process Technology segment and 7 in the Intralogistics segment for the valuation of Krones. For these segments, we calculated various EV/EBIT multiples, including minimum, 25th percentile, median, average, 75th percentile and maximum. This analysis resulted in a median EV/EBIT multiple of 11.11x for Filling and Packaging Technology, 17.12x for Process Technology and 18.40x for Intralogistics.

In addition to the relative valuation methods, we also used the intrinsic valuation method DCF. This was done with two different methods: one based on our forecast assumptions, and another based on consensus data from brokers. Starting with the 2023 EBIT, we projected the Free Cash Flows (FCFs) up to 2033, assuming that a steady state would be achieved by that year. The terminal value was calculated using the Gordon growth model, assuming a long-term growth rate of 1.67% based on the historical and future GDP growth of OECD countries.

For the discount rate, the Weighted Average Cost of Capital (WACC) was estimated at 10.13% for both approaches. The discounted FCFs and terminal value of Krones AG resulted in an EV of EUR 3,427.3m based on broker data and EUR 3,466.4m using our base case assumptions. These calculations resulted in EV/EBIT multiples of 11.28x and 11.41x, respectively, which

relate to Krones' forecast EBIT of EUR 303.8m for 2023.

To determine the right entry multiple for Krones AG, we used two different approaches. The first approach is solely based on a sum-of-the-parts (SOTP) valuation method while the second approach is a combination of a SOTP valuation and the two DCF results. Combining all factors, the implied entry multiple for Krones, based on a pure SOTP valuation, is estimated at 10.73x. This leads to an entry EV of approximately EUR 3,260.1m. For the second approach, the company-level entry EV/EBIT multiple for Krones derived from the different relative and intrinsic valuation methods, was estimated at 11.28x. This resulted in an EV of EUR 3,427.3m. By integrating the outcomes of both valuation methods and averaging the EVs of EUR 3,427.3m and EUR 3,260.1m, and then dividing by the total EBIT, the resulting entry multiple for Krones is calculated to be approximately 11.01x, corresponding to an associated EV of EUR 3,343.7m. Finally, the purchase price was calculated by adjusting the EV for bridge items like financial debt, unfunded pension liabilities, non-operating assets, and cash. After these adjustments, the final purchase price was calculated to be EUR 3,513.5m

To finance the total uses for the acquisition of Krones AG, the total funds are derived from debt financing of EUR 1,597.1m, equating to 3.5x EBITDA (EUR 456.3m), and equity amounting to EUR 1,868.7m resp. 4.1x EBITDA.

The debt structure consists only of a single first-lien term loan. This loan is provided by a select group of private lenders and includes a super senior Revolving Credit Facility (RCF) of EUR 250m. This approach ensures a simplified debt structure while complying with the covenants in the bank case. Moreover, it utilizes the advantages of private lending, which enables faster execution, looser covenants and simpler negotiations.

On the equity side, the funding includes a subordinated shareholder loan of EUR 1,735.1m. This loan carries a payment-in-kind (PIK) interest rate of 9.0% per annum. In addition to this, ordinary shares amount to EUR 1336m. The ordinary shares are distributed such that the

management holds a minor stake of 6.7m shares (representing 5% ownership), while the sponsor holds the majority with 126.9m shares.

6. Exit

The exit of the investment in Krones is planned after a holding period of five years. Due to Krones' large size and therefore potential lack of financial and strategic investors, the proposed exit strategy is an initial public offering. At exit Krones is expected to generate an EBIT of EUR 642m, leading to an enterprise value of EUR 7,109m and an equity value of EUR 6,731m. The exit multiple marginally increases to 11.07x. In 2028, the sponsors anticipate proceeds of EUR 6,524m with a 3.5x money multiple and a 28.5% IRR, while management expects EUR 207m, achieving a 31.0x money multiple and 98.7% IRR. In equity value creation for Krones AG, EUR 4,801m is generated over five years. Deleveraging accounts for 21.6% due to strong cash generation, organic revenue growth contributes 29,8% and organic margin expansion adds 29.4%. The total equity value creation from organic growth initiatives is 3.09x, which increases to 3.57x with strategic acquisitions.

Individual Part

1. Introduction

An important part of the work project and LBOs, in general, is figuring out how much the company is worth. This is crucial because it is important to estimate the correct purchase price of the company to determine the total sources of funds needed to finance the uses. The total uses are calculated based on the purchase price plus the amount of debt the company has in the balance sheet before the purchase, which has to be paid back to the creditors. Additionally, the costs associated with financing and the transaction increase the total uses.

In practical terms, there are primarily two different valuation methods used to determine a company's value: intrinsic and relative valuation techniques. Intrinsic valuation involves in determining the present value of the company's future cash flows. The most used approach is known as the Discounted Cash Flow (DCF). On the other hand, relative valuation means to compare the target company to other similar companies (peers) or recent transactions in the market. The most used approaches are known as precedent transaction - estimating a company's value resp. purchase multiples from a selected group of comparable recent transactions - and public trading comparable, where the value of a company is determined by comparing it to peer companies in the public market, using their current enterprise value and forward financials as a basis for comparison (Rosenbaum and Pearl 2009).

In the work project, we decided to use both, intrinsic and relative valuation methods to determine the entry purchase price of Krones. For the relative valuation, we decided to use both, precedent transactions and trading multiples and for the intrinsic valuation we used two different approaches DCF approaches to compute the entry EV/EBIT multiple.

For the entry valuation, we explicitly decided to use an EV/EBIT multiple given the asset-intensive business model of Krones. In contrast to the EV/EBITDA, the EV/EBIT multiple takes into account depreciation and amortization (D&A). The difference becomes particularly

relevant in industries with high capital intensity, like manufacturing or industrials, where D&A expenses vary significantly and may have a huge impact on the operating profit and therefore, on the EBIT margins. In such sectors, EV/EBIT, by recognizing D&A, provides a more precise measure to value a company. Although D&A is a non-cash expense and is added back in the cash flow statement (cash flow from operations), it comes from capital expenditures, which are mostly significant and frequent outflows for many companies in the industrial industries. Therefore, EV/EBIT provides investors with a better indication of profit margins and future growth, as it often better reflects the actual financial strength of a company.

2. Peer Group Selection

At the beginning of the valuation, the selection of the peer group of Krones AG is crucial for both relative valuation methods but also for the DCF to determine the beta for the CAPM based on the selected peer group. To identify the correct peer group with a similar business model and financial characteristics it is necessary to understand the business of the target company (Rosenbaum and Pearl 2009). After carefully analyzing the business model of Krones based on publicly available information such as the annual report and equity research papers, we decided to separate the peer group into the three different operating segments of Krones: Filling and Packaging, Process Technology and Intralogistics. The reason for that was, that all three segments have different operational (different products) and financial profiles in case of margin and growth. Moreover, it was difficult to find a company similar to Krones that provides the whole value chain for beverage producers since most competitors are focused on either process technology, filling and packaging lines or intralogistics.

Based on this basic analysis, we created a preliminary list of companies within the closely related sub-sectors that ensure a high degree of operational similarity in terms of products and services as well as customers and end markets. Geographic presence was another key factor in our selection process. We have focused on companies that operate in the same regions as our

target company, as this often implies a similar regulatory environment and market dynamics. As Krones operates globally, we have focused on the Europe, Americas and APAC regions as this is where the majority of sales are generated. We then refined this list by taking into account company size, which we measured using financial metrics such as market valuation and other financial size characteristics including Revenue, EBIT and EBITDA. This step was crucial to compare companies operating in similar business profiles and occupying a similar market position given their size. Companies of similar size in a given sector are more likely to have similar multiples than companies with significant differences in size due to economies of scale, purchasing power, pricing leverage, customers or growth prospects. The final important factors we have analyzed for peer selection are financial characteristics, including profitability margins and growth rates on Revenue, EBIT and EBITDA basis, to ensure that the selected peers have a comparable financial profile to Krones. In this way, we formed a peer group that accurately reflects Krones' operational, financial and market characteristics, while providing a solid foundation for our subsequent analysis of trading multiples. To identify the peer companies, we used databases such as S&P Capital IQ and referred to equity research papers as well as information available on Krones' corporate website.

For the filling and packaging segment, we identified five comparable companies such as GEA Group Aktiengesellschaft (Germany), SIG Group AG (Switzerland), Hangzhou Youngsun Intelligent Equipment Co. Ltd. (China), Greatview Aseptic Packaging Company Limited (China), and Winpak Ltd. (Canada). In the process technology segment, we identified six peers: Valmet Oyj (Finland), John Bean Technologies Corporation (United States), Sulzer Ltd (Switzerland), Marel hf. (Iceland), Alfa Laval Corporate AB (Sweden), and The Middleby Corporation (United States). For the intralogistics segment, our comparables comprised Jungheinrich Aktiengesellschaft (Germany), Kardex Holding AG (Switzerland), Interroll Holding AG (Switzerland), Columbus McKinnon Corporation (United States), and Wincanton

plc (United Kingdom).

3. Trading comparable

The basis of trading comps lies in the assumption that similar companies offer a benchmark for valuing a target company because they share key business and financial characteristics, performance drivers, and risk profiles. Therefore, the enterprise value respectively the EV/EBIT multiple of a company can be determined based on its relative position among its peers (Rosenbaum and Pearl 2009). After establishing the comparable company universe (peer group) grounded on the methodology described in the previous part of the thesis, we benchmarked these companies against each other and Krones. Therefore, various financial statistics and ratios were analyzed to better understand the financial profile and market valuation of Krones. For the market valuation, we focused on the market capitalization and the enterprise value. To evaluate the financial profile, we considered metrics such as Revenue, EBITDA and EBIT. Our analysis included the assessment of the size (EUR amount of the selected metric), CAGR (for 2022-2024) and margins for both historical (2020-2022) and forecast periods (2023-2024). After benchmarking the selected peer companies with these metrics across the respective operating segments, we calculated the expected EV/EBIT and EV/EBITDA multiples for each for 2023 and 2024. The focus on the two forecast years (2023-2024) aligns with our assumption of entering the investment at the start of 2024 and reflects the belief that a company's valuation hinges on its future performance. However, our primary focus was on the EV/EBIT multiple in line with the specific sector characteristics that were previously outlined.

After calculating the multiples for each selected peer company, we determined the minimum, 25th percentile, median, average, 75th percentile, and maximum multiple for each of the three segments. This resulted in a median EV/EBIT multiple of 9.80x for 2023E and 9.43x for 2024E in the filling and packaging segment, 13.94x for 2023E and 12.38x for 2024E in the process

technology segment, and 13.77x for 2023E and 12.22x for 2024E in the intralogistics segment.

4. Precedent Transactions

For the second relative valuation approach we used a precedent transactions analysis, also known as precedent transactions or transaction comps. The analysis of precedent transactions involves examining past M&A transactions of acquired companies that are similar to Krones in terms of industry, size and business model - products and services - as well as end markets, to determine the current value of the company. This process therefore involves a similar approach to determining the universe of comparable companies while looking for relevant transactions in the recent past. Similar to the trading multiples, we have chosen to look at the three operating segments separately for the reasons outlined above. A main difference between transaction and trading multiples is that transaction multiples include a "control premium" and potential synergies, while trading multiples reflect the current (public) market valuation without these considerations. Hence, transaction comps typically result in higher multiples compared to trading comps, primarily because acquirers pay a "control premium" for decision-making rights over the target's operations and cash flows, and secondly, due to strategic buyers expecting synergies from the merger, like cost savings and growth opportunities, which support higher acquisition prices (Rosenbaum and Pearl 2009).

In our search, we included transactions from the past 10 years, driven by the limited number of relevant deals in the core business segments of filling & packaging, and process technology with available EV/EBIT multiples. Nevertheless, our focus was primarily on transactions that occurred within the last 5 years. Our search employed two distinct approaches: Firstly, we utilized the databases S&P Capital IQ and Mergermarket to identify recent transactions based on our selected peer group from the trading comps. Secondly, we conducted a targeted search based on the business descriptions of acquired target companies, focusing on keywords like "Filling and Packaging", "Filling lines", "Packaging machinery", "Packaging", "Process

technology", "Beverage process", and "Intralogistics". This leads us to more than 1000 transactions which we screened based on the availability of multiples (Mainly EV/EBIT) and business and financial profile including size. Due to the unique business model of Krones AG, our search reached only a limited number of relevant transactions for the main business segment. Therefore, we also incorporated smaller transactions below EUR 50m enterprise resp. transaction value.

After analyzing all the transactions, we selected 13 precedent transactions for the filling and packaging segment, 8 transactions for the process technology segment and 7 transactions for the intralogistics segment to value Krones. Similar to the trading comps, we derived the minimum, 25th percentile, median, average, 75th percentile and maximum EV/EBIT and EV/EBITDA multiple for each of the three segments based on the selected transaction multiples. As a result, we derived a median EV/EBIT of 11.11x for the filling and packaging segment, 17.12x for the process technology segment and 18.40 for intralogistics.

5. Discounted Cash Flow Valuation

Supplementary to the two relative valuation approaches, we employed an intrinsic valuation method known as the DCF while using two different approaches: one based on our forecast assumptions, and the other relying on broker[1] consensus data about future performance. The intrinsic value of a company determined with the help of DCF analysis stands in contrast to its market value, which is the price determined by the market at any specific time. Consequently, DCF is an essential tool for a comprehensive valuation, providing an important alternative to relative (market-based) valuation methods such as trading comparables and precedent transactions. These market-based methods can be influenced by various factors, including market anomalies, which underline the importance of the DCF in providing a more intrinsic

[1] Including Warburg Research, Baader Helvea Equity Research and two other brokers which were not visible

valuation perspective. Unlike relative valuation approaches, the DCF method focuses on estimating the intrinsic value of a company by projecting its future cash flows and discounting them to present value rather than comparing Krones to similar companies. For this purpose, we performed the DCF on a company-wide basis instead of segment-specific calculations, as we did not have sufficient data to accurately determine the free cash flows (FCFs) for each operating segment.

Based on EBIT for 2023, we have projected the FCFs for the period up to 2033, assuming that the steady state will be reached by this time. The forecasted numbers were derived either from our base case assumptions or the broker data. For calculating the FCFs, we determined the Net Operating Profit Less Adjusted Taxes (NOPLAT) by deducting taxes, calculated using the statutory tax rate of 27.6% as reported in the annual report (2022), from the EBIT. This approach is based on the assumption that the company is entirely equity-financed because the effects of the tax shield are considered in the discount rate.

Following the computation of the NOPLATs, we adjusted the NOPLATs for all important free cash flow components such as D&A, changes in trade and other working capital, CAPEX, changes in provisions and accruals, and other non-cash income/expenses to determine Krones' FCFs annually up to the end of the forecast period in 2033. To calculate the terminal value, we utilized the Gordon growth model with an assumed growth rate of 1.67% based on the historical (from 1995) and future (until 2060) long-term real GDP growth of the OECD countries. This value is in line with recent fairness opinions in the German public takeover market, where the long-term growth rates were estimated between 1.0% and 2.0%.

Furthermore, the discount rate, which was also applied in the Gordon growth method and later used to discount the free cash flows for the present value calculation, was determined based on Krones' Weighted Average Cost of Capital (WACC). The WACC was calculated by combining the after-tax cost of debt, proportionate to Krones' net debt relative to its estimated EV, with

the cost of equity multiplied by the proportion of equity value to the EV, determined through iterative calculations.

For calculating the cost of debt, we estimated a potential credit rating for Krones, based on financial health and operational risk assessments of selected peers with existing credit ratings which leads us to a rating in the range of BBB+ to A-. The risk-free rate is based on the German 10-year government bond yield, which stood at 2.64%. By averaging the ratings between BBB+ and A- and incorporating the risk-free rate along with the suggested credit spread by Aswath Damodaran, we arrived at a pre-tax cost of debt of 4.45% for both DCF approaches. Consequently, the post-tax cost of debt was calculated at 3.22%.

To estimate Krones' cost of equity, we employed the Capital Asset Pricing Model (CAPM) that predicts the expected return on an equity investment. The CAPM calculates the cost of equity by multiplying the company's beta with the equity risk premium and then adding the risk-free rate. As previously noted, the risk-free rate was determined to be 2.64%.

To determine Krones' beta, we calculated the median unlevered beta, based on the recent five-year data, from our selected peer group including GEA Group Aktiengesellschaft, Alfa Laval Corporate AB, Valmet Oyj, SIG Group AG, Sulzer Ltd, John Bean Technologies Corporation, and ATS Corporation (not in the peer selection for trading comps but show similar risk profile). This resulted in an unlevered median beta of 1.10. We then re-levered this beta using the debt-to-equity ratio obtained from the DCF through iterative calculations and the tax rate, leading to a levered beta of 1.13 for both approaches.

The market risk premium was derived from the average of the historical arithmetic and geometric returns since 1993 from the CDAX and the implied returns from the DAX, leading to 9.51%. Putting all together, the cost of equity for Krones was calculated at 10.42% for the broker case and 10.43% for the base case, driven by a slightly higher debt-to-equity ratio in the base case DCF. However, the total WACC resp. the discount rate was estimated at 10.13% for

both the broker and the base case DCF. Subsequently, we discounted the projected FCFs and the terminal value to their present values to determine the overall enterprise value.

The sum of discounted FCFs and the terminal value resulted in an EV of EUR 3,427.3m based on the broker data and EUR 3,466.4.4m based on the base case assumptions. This results in an EV/EBIT multiple of 11.28x and 11.41x, respectively, based on Krones' EBIT in 2023 of EUR 303.8m.

6. Entry Multiple Derivation and Summary

To determine the appropriate entry multiple for Krones AG, which allows us to estimate a fair purchase price and determine the total financing requirement, we have calculated the EV/EBIT multiple by averaging the results from two different approaches.

The first approach is solely based on a sum-of-the-parts valuation method where we calculated a separate EV for each of the three operating segments based on the multiples we derived from the trading and the transaction comps by multiplying with each segment EBIT.

In the budget year of 2023, the segment EBIT for Krones AG's filling and packaging segment is projected at EUR 262.2 million, while it is EUR 21.0 million for the process technology segment and EUR 20.5 million for the intralogistics segment. Based on the averages derived from transaction multiples and the anticipated trading multiples for 2023 and 2024, the entry EV/EBIT multiple for the filling and packaging segment is estimated to be 10.11x. For the process technology segment, the calculated multiple stands at 14.48x, and for the intralogistics segment, it is 18.8x. Putting all together, the implied entry multiple (weighted segment multiple) for Krones based on the pure SOTP valuation is estimated to be at 10.73x while the entry EV is calculated at EUR 3,260.1m.

For the second approach, we combined the SOTP valuation with the results from the two DCF methods. Based on the estimated multiples from the transaction comps for each segment at 11.11x, 17.12x and 18.40x for the filling and packaging, process technology and intralogistics

segment, respectively, we derived a total company multiple for Krones by multiplying the segment multiples with the segment EBIT, divided by the total company EBIT. These results in a company-level multiple of 12.02x based on the transaction comps. Same for the transaction comps, we calculated the company-level EV/EBIT multiple derived from the segment multiples of 9.8x, 13.9x and 13.8x for the filling and packaging, process technology and intralogistics segment, respectively, leading to an expected company-level multiple of 10.35x for 2023. For 2024, we observed a company-level entry multiple of 9.85x derived from the expected trading multiples in the three segments of 9.4x, 12.4x and 12.2x. The two DCF approaches yielded an EV/EBIT multiple of 11.28x and 10.41x for the broker and base case assumptions, respectively. Finally, by taking the median of the estimated company-level multiples from the different relative and intrinsic valuation methods, the entry EV/EBIT multiple for Krones was estimated at 11.28x resulting in an EV of EUR 3,427.3m.

By combining the two different methods and taking the average of the estimated EVs of EUR 3,427.3m and EUR 3,260.1m divided by the total EBIT, the implied entry multiple for Krones is estimated at 11.01x with an associated EV of EUR 3,343.7m.

To calculate the purchase price, we adjusted the EV by either subtracting or adding various bridge items, depending on their nature. These items consisted of financial debt, unfunded pension liabilities, and non-operating assets, including investments in associates and financial assets, as well as cash. The financial debt, amounting to EUR 297.8m, and unfunded pension liabilities of EUR 167.6m were subtracted, while non-operating assets and cash, totalling EUR 22.2m and EUR 612.9m respectively, were added. This led to a final purchase price of EUR 3,513.5m.

References Jean-Pierre Vincon

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