

# Exercise Set 2

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This exercise set is mainly connected to the first lecture, but also exercising some known skills before the second and third lectures. Please prepare before the class meets, as suggested on the first exercise set.

## Exercise 1: Risk in Micro

The demand for risky assets can be rooted in standard consumption theory from Micro. This exercise introduces the basic idea.

An investor has decided to invest the cash amount  $m > 0$  in period 1, and cares about the resulting cash flow in period 2. At period 2, the economy is either in a Good or a Bad state. In period 1, there are markets where you can exchange current cash for future contingent cash. The investor takes as given the current market price  $p_G > 0$  for future cash in the Good state, and market price  $p_B > 0$  for cash in the Bad state.

a) We may regard this as a two-good consumption problem. The investor purchases cash amount  $c_G$  for the Good state and  $c_B$  for the Bad state. The budget constraint is  $p_G c_G + p_B c_B = m$ . Illustrate such a budget line in the space of possible  $(c_G, c_B)$ .

b) Suppose that the investor evaluates future cash through a utility function  $U(c_G, c_B)$ . Illustrate some indifference curves, and the optimal choice, supposing that the utility function satisfies standard properties such as continuity, monotonicity, quasi-concavity.

c) Suppose that our investor actually considers expected utility  $U(c_G, c_B) = \pi u(c_G) + (1 - \pi)u(c_B)$ . Further, let  $u(c) = \log(c)$ , so  $U(c_G, c_B) = \pi \log(c_G) + (1 - \pi) \log(c_B)$ . Argue that this particular form means that the investor has Cobb-Douglas preferences over bundles  $(c_G, c_B)$ .

d) Using your insight from c), argue that the investor's optimal choice is  $c_G = \pi m / p_G$  and  $c_B = (1 - \pi)m / p_B$ .

## Exercise 2: Beliefs about Returns

An investor believes that the returns of 3 stocks will depend on the economic environment:

	Good env.	Bad env.
Stock 1	13%	-19%
Stock 2	6%	2%
Stock 3	-4%	5%

The probability of the good economic environment is 60%.

- a) Compute expected return as well as return variance for each stock.
- b) Calculate the covariance of each pair of stock returns, and list the variance-covariance matrix that follows from these investor beliefs.

### Exercise 3: News

As an appendix to this exercise set is a news announcement from Coloplast. Take just one or two minutes to look at this. You will not need all the detailed information for this exercise.

- a) Look up information about Coloplast B shares at Nasdaq OMX Nordic where they are traded. What is currently the total market capitalization of these shares?
- b) How did the share price change at the time of the news announcement?
- c) Intuitively, do you think that the shareholders in Coloplast must gain from the announced acquisition of Kerecis?

### Exercise 4: Returns Data

- a) Find where on the website of Nasdaq OMX Nordic, you can download historical share price data in a .csv file.
- b) Download price data since September 2013 for the OMX Copenhagen 20 index (OMXC20), and three companies of your choice. (Tick the box to obtain “Adjusted” prices, in order to avoid problems of missing information about dividends and other special events).
- c) Briefly inspect the columns in your table. Do you know what they mean?

In the following, keep only the series for the “Closing price” for the day, and get rid of the other statistics (such as “Bid” and “Trades”). Also, ignore that there exist weekends and holidays, and study the “daily” return from trading day to trading day in your series.

- d) For each of the four time series, compute this series of daily return realizations.
- e) For each of the four time series, compute the mean daily return.
- f) Compute an estimate of the variance-covariance matrix for daily returns on the four time series. (You can suppose that the vector of daily return is an independent draw from a fixed distribution.)

# Coloplast announces agreement to acquire Kerecis and raises long-term growth expectations

**Coloplast has signed an agreement to acquire Kerecis, an innovative, fast-growing company in the biologics wound care segment, for up to USD 1.3 billion (around DKK 8.9 billion), of which USD 1.2 billion (around DKK 8.2 billion) is an upfront cash payment**

- Kerecis represents an attractive opportunity to strategically strengthen Coloplast's presence in the advanced wound care market by entering the high-growth, US-centric biologics segment
- With a mission to improve wound care treatment, Kerecis has developed and patented a clinically differentiated, sustainable, and scalable technology platform based on intact fish skin
- Produced with minimal processing, the fish skin retains its similarity to human skin, resulting in improved wound healing. The technology is backed by compelling evidence from multiple clinical trials and has already been used to treat tens of thousands of patients
- Since the launch of its product offering in 2016 Kerecis has become the fastest growing company in the biologics wound care segment, with DKK 510 million in revenues and reaching break-even in FY 2021/22<sup>1</sup>
- Due to a highly cost-efficient production setup, Kerecis has an attractive gross margin level, accretive to Coloplast's gross margin. Kerecis has strong potential to expand its profitability driven by continued growth and scalability
- Revenue growth assumptions: Kerecis is expected to grow around 50% in FY 2022/23. The company is expected to continue its strong growth trajectory with an estimated three-year CAGR of around 30% until FY 2025/26
- EBIT margin assumptions<sup>2</sup>: Kerecis' EBIT margin is expected to be around 10% in FY 2022/23 and to continue expanding to around 20% in FY 2025/26. In the following years, the EBIT margin is expected to be in line with Coloplast's long-term guidance of more than 30%
- The acquisition is expected to accelerate Coloplast's group organic growth with around 1%-point contribution as of FY 2024/25. The acquisition is expected to be margin dilutive short-term
- As a result of the acquisition, Coloplast raises its long-term organic growth guidance to 8-10%, from previously 7-9%. The long-term EBIT margin guidance is unchanged at more than 30%, however, the EBIT margin in the Strive25 period is now expected to remain below 30% and includes around 100 basis points dilution p.a. from Kerecis (incl. PPA amortisation)
- The transaction is expected to be increasingly EPS accretive from FY 2026/27
- Following the expected acquisition, Kerecis will operate as a stand-alone business unit under its own identity and brand, with integration focused on business support and other selected areas to support the company's strong growth outlook and continued expansion
- The total enterprise value for 100% ownership of Kerecis amounts to up to USD 1.3 billion (around DKK 8.9 billion), consisting of USD 1.2 billion (around DKK 8.2 billion) upfront cash payment and an earnout potential of maximum USD 100 million (around DKK 680 million)
- The transaction is expected to be financed through an equity capital raise
- As of today, 77% of Kerecis' shareholders have committed to sell their shares to Coloplast. Closing of the transaction is subject to customary regulatory approvals and an acceptance threshold of at least 90%, and is anticipated in Q4 2022/23

"At Coloplast, we are committed to securing long-term growth drivers through organic and inorganic opportunities. The advanced wound care market holds significant untapped potential, and today Coloplast is only present in the advanced dressings segment and mostly outside of the US. Chronic, surgical, burn, and other hard-to-heal wounds are a major area of unmet clinical need and a growing

social and economic challenge. With the acquisition of Kerecis we obtain a differentiated product offering and strong commercial US infrastructure, allowing us to expand into the fast-growing biologics wound care segment and at the same time expand our position in the US. We believe that Kerecis is an emerging category leader, well positioned to continue outgrowing the market over the long-term. I am excited to welcome Kerecis into the family and together build a truly global wound care franchise with a unique offering, to the benefit of the many patients in need of wound treatment,” says Kristian Villumsen, President & CEO of Coloplast.

“Kerecis was founded with a purpose to extend the lives of patients with technologies that support the body’s own ability to heal. Our intact fish-skin technology, coupled with our digital platform, has allowed us to be true to our purpose. In just a few years, Kerecis has grown to become the fifth largest company in the US biologics wound care segment. The fish skin used in Kerecis’ products is derived from wild and sustainable fish stock, caught in the pristine Icelandic waters and processed using 100% green energy in the town of Isafjordur, close to the Arctic Circle. Kerecis and Coloplast possess similar values and are both on a mission to improve patients’ lives through an innovation-driven culture. The acquisition will enable us to leverage Coloplast’s strengths to scale our business and bring the benefits of our unique fish-skin technology to many more patients. I believe our companies are a great match with a strong cultural fit, rooted in Nordic values. I am confident that together we can continue our growth journey to the benefit of patients,” says Fertram Sigurjonsson, founder and CEO of Kerecis.

### **Transaction and financing highlights**

The total enterprise value for 100% ownership of Kerecis amounts to up to USD 1.3 billion (around DKK 8.9 billion), consisting of USD 1.2 billion (around DKK 8.2 billion) upfront cash payment on a cash and debt free basis, and an earnout potential of maximum USD 100 million (around DKK 680 million) dependent on financial performance in FY 2023/24.

As of today, 77% of the shareholders in Kerecis have committed to sell their shares in Kerecis to Coloplast. Kerecis’ Board of Directors has recommended to the company’s minority shareholders to sell their shares in Kerecis to Coloplast. Closing of the transaction is subject to (i) customary regulatory approvals and (ii) shareholders representing at least 90% of the share capital in Kerecis having accepted to sell their shares in Kerecis to Coloplast. Closing of the transaction is anticipated in Q4 2022/23.

The transaction is expected to be financed through an equity capital raise of around 9 billion Danish kroner via an accelerated bookbuilding without pre-emption rights for existing shareholders. The equity capital raise is anticipated to be completed in Q4 2022/23. An equity bridge facility matching the total price for 100% of the share capital has been provided by Danske Bank and Nordea.

Coloplast’s largest shareholder, Niels Peter Louis-Hansen, and family are supportive of the acquisition and will participate in the equity capital raise.

The financing structure of the acquisition will allow Coloplast to maintain a prudent capital structure. Today’s announcement does not impact Coloplast’s capital allocation and dividend policy to return excess liquidity to shareholders through dividends and share buybacks. Coloplast continues to target a pay-out ratio of 60-80% of net profit.

### **Financial guidance – Coloplast adjusts long-term growth guidance and maintains long-term EBIT margin guidance, with the following assumptions:**

#### **Organic growth**

- Organic growth expectations raised to 8-10%, from previously 7-9%
- Kerecis is expected to be growth accretive, contributing around 1%-point to group organic growth as of FY 2024/25. Revenue impact in FY 2023/24 to be treated as acquired growth

#### **EBIT margin**

- The long-term EBIT margin guidance of more than 30% remains unchanged and applies beyond the Strive25 strategic period (ending in FY 2024/25)

- The EBIT margin during the Strive25 period is now expected to remain below 30%, and assumes dilution of around 100 basis points p.a. from Kerecis (incl. impact from PPA amortisation)

Coloplast's financial guidance for FY 2022/23 excluding transaction related costs is unchanged. Special items for FY 2022/23 are expected to increase by DKK 50 million due to transaction related costs (advisory fees).

### **Kerecis – an innovative, fast-growing company with a proprietary fish-skin technology platform**

Kerecis' story started in 2009 in Iceland when Fertram Sigurjonsson, an entrepreneur and inventor with extensive experience from the medical device industry, came up with the concept of using fish skin to heal damaged tissue. With a background in the prosthetic industry, Fertram's mission was to reduce amputations by identifying a material that is as similar to human skin as possible and could be used to support the body's own ability to heal and prevent amputations.

The product offering was launched in 2016 in the US, making Kerecis the only FDA-approved manufacturer of a patented fish-skin technology. As no disease-transfer risk exists between cold-water fish and humans, the Kerecis fish skin is only gently processed. This results in effective wound healing, backed by compelling clinical evidence. Kerecis's portfolio includes a variety of products for treatment of chronic, surgical, and burn wounds, with the vast majority of sales in the hospital segment. Globally, more than 20,000 patients have already been treated with this novel fish-skin technology<sup>3)</sup>.

Since its outset, Kerecis has had a strong focus on sustainability through its unique waste-to-value proposition. The company's product portfolio is sustainably produced using fish skin, a by-product from Icelandic fisheries, and 100% green energy. Kerecis is headquartered in Iceland and has around 500 employees globally, of which more than two-thirds in the US. Kerecis' production facilities are based in Isafjordur in North-West Iceland, close to the Arctic Circle.

The biologics wound care segment<sup>4)</sup> in which Kerecis operates is estimated at around DKK 15 billion, of which DKK 14 billion in the US, with a high-single digit growth p.a. driven by the US. As a result of the differentiated technology, strong clinical adoption, and successful commercial strategy, Kerecis has been growing rapidly since the launch of its product range, reaching a market share of around 5% and a number five position in the US biologics wound care segment.

### **Compelling strategic rationale behind the acquisition of Kerecis**

The total advanced wound care market<sup>4)</sup> is estimated at around DKK 55 billion, of which up to DKK 26 billion in the advanced dressings segment, around DKK 15 billion in the biologics segment, and around DKK 13 billion in the external devices segment. Coloplast's existing wound care business is focused on the advanced dressings segment and geographically concentrated in Europe and China. Coloplast has a global number five position in the advanced dressings segment, with 5-10% market share, and around DKK 1.8 billion in revenues in FY 2021/22. The strategic rationale behind the acquisition of Kerecis and expansion of Coloplast's wound care footprint into the biologics segment is compelling:

- The biologics segment is the fastest growing segment in the advanced wound care market
- Kerecis represents a long-term growth opportunity for Coloplast's wound care business, with its differentiated product offering, strong US commercial presence, and scalable technology
- Strong fit between the companies – innovation-driven culture, Nordic origins and values, and geographical complementarity
- Sustainability leadership through Kerecis' unique waste-to-value proposition, allowing for a highly cost-efficient production setup with minimal processing
- Significant growth potential through continued utilisation of the novel fish-skin technology for wound treatment and market share gains
- Long-term opportunity to expand presence of the fish-skin technology in geographies outside of the US and new segments
- Continued growth and expansion supported by Coloplast's industry-leading infrastructure

## Investor and analyst conference call

Coloplast will host a conference call today, Friday, 7 July 2023, at 11.00h CEST. Access the conference call webcast directly here: [Coloplast Conference Call](#)

To actively participate in the Q&A session please sign up ahead of the conference call on the link here to receive an e-mail with dial-in details: [Register here](#)

## Advisors

FIH Partners acted as transaction advisors, Kromann Reumert acted as Lead Legal Advisors, and PWC acted as financial advisors to Coloplast. Danske Bank will act as Sole Global Coordinator in connection with the equity capital raise and Joint Bookrunner together with Nordea.

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*This announcement is available in an English and Danish-language version. In case of discrepancies, the English-language version shall prevail.*

- 1) For the year ended September 2022, 98% of revenues were generated in the US
- 2) EBIT margin assumptions for Kerecis are excluding PPA amortisation
- 3) Based on Kerecis' estimates
- 4) Market data, market growth and competitive position contained in this document are estimates based on internal analysis and publicly available information

Coloplast was founded on passion, ambition, and commitment. We were born from a nurse's wish to help her sister and the skills of an engineer. Guided by empathy, our mission is to make life easier for people with intimate healthcare needs. Over decades, we have helped millions of people to live a more independent life and we continue to do so through innovative products and services. Globally, our business areas include Ostomy Care, Continence Care, Wound and Skin Care, Interventional Urology and Voice and Respiratory Care.

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