

## Research Article

# Sustainable Portfolio Optimization Model Using PROMETHEE Ranking: A Case Study of Palm Oil Buyer Companies

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Sustainability is one of the main concerns of decision makers, factories, and retailers. This importance increases when the organization needs to define, implement, and manage a sustainable portfolio to succeed in today's environment of change and uncertainty. Therefore, this study examines the portfolio of palm producers from 2010 to 2020. The proposed optimization model is based on the classic mean-variance approach and companies ranked using the PROMETHEE method. Our findings indicate that the effects of this asset allocation change in favour of high-score sustainability investments significantly influence risk-adjusted returns of portfolios. According to the finding, sustainable portfolios perform better than conventional ones. The findings could be useful to private and institutional investors and fund managers in constructing and managing their portfolios. The efficient frontier of the best 50% portfolio shows a higher risk for a higher return. This could explain that a higher sustainability score in different criteria leads to more optimal portfolios in terms of risk and return. Intended contributions include considering sustainability, minimizing risk, and portfolio management simultaneously.

#### 1. Introduction

Sustainability means focusing on the long-term effects of the company's operations and the durability of resources for future use while being profitable today [1]. The extension of sustainability has now been added to many organizational topics [2]. These concepts are intended to emphasize the importance of social and environmental concerns along with economic factors in planning [3]. Also, the financial market globally has had a lot of growth in sustainable investment as sustainable investors seek their usefulness from financial returns and the social effects of their investment [4, 5].

Portfolio risk is an event with uncertain conditions that has both positive and negative effects on one or more objectives (Al Janabi, 2020). A risk may have one or more reasons, and if it does occur, it may have a positive or negative impact on portfolio success [6]. Risk management is a structured process for evaluating and analyzing portfolio risks with the goal of investing in potential opportunities and adjusting events, activities, or phrases that can affect the portfolio [7, 8].

Risk management is critical where the dependencies between portfolio components are high, where the cost of failure of portfolio components is high, or when the risks of one portfolio component increase the risks of other components. Risk management identifies and describes potential improvements in the performance of portfolio components that may increase quality, customer satisfaction, and service levels for the organization and portfolio components. Risk management may create new portfolio components. The purpose of portfolio risk management is to accept the correct amount of risk estimates by optimally delivering outputs at different times to the organization [9, 10].

The concept of sustainability was first introduced in the 1970s and early 1980s but was generally defined in the 1892 report of the World Commission on Environment and Development. Various definitions of sustainability have been proposed. One of the most complete definitions of the The term sustainability is becoming increasingly accepted in the business community, and the number of companies publishing sustainability reports is increasing. Zhang et al. [12] state that according to a report in 2016, about 79% of the 250 global companies have published separate annual reports on sustainability that address environmental, social, and economic issues.

Palm oil, the world's most widely consumed edible oil, hit a record high in October and grew in 2021 for the third year in a row. This added to concerns about global food price inflation as the supply chain suffered from adverse weather conditions, the COVID-19, and labor shortages. Prices are expected to remain high in the first quarter of 2022 [13].

Recently, sustainability has become an important concern of many manufacturing, retail, and hospitality industries, particularly among companies of palm-based products, as the result of the increasing international pressure and demand on sustainable production [14]. It is also considered an effective solution to advance the constant development and extension of the manufacturing industry [15]. Palm oil is among the top 17 oils and fats used as an ingredient in different products available in the supermarket, while consumers' perception of palm oil as a product ingredient is limited [16]. Despite the wide range of applications of palm oil, there have always been controversies about the environmental and social consequences of its production, processing, and trade. High oil yield by the palm trees has encouraged wider cultivation, leading to the clearing of forests in many parts of Indonesia and Malaysia for the availability of space for oil-palm monoculture [17]. Figure 1 shows the distribution of palm-based product companies based on the country of origin. The largest number of companies are in Europe, and then the U.S. and Asia are ranked next.

Recently, several largest multinational firms developed some awareness with respect to social and environmental losses [18]. Nevertheless, the implementation of sustainable palm oil principles remains voluntary. Though, some previous studies observed no significant difference between sustainable and nonsustainable investment returns [19, 20]. Most of the literature on sustainable investment compared the returns of either singular assets or of actively or passively managed portfolios, usually after accounting for the effects due to investment style [21]. The main issue of sustainable asset weights while considering sustainability. It is unclear whether adopting sustainability standards affect the riskadjusted return in an optimal portfolio.

The findings of the study contribute to the literature by shedding light on the influence of sustainability investment on risk-adjusted returns of portfolios. Moreover, the findings enable investors to realize the influence of the sustainability factor on portfolio performance and consequently make better investment decisions. Companies of palm-based products also benefit from the findings of the study by understanding the role that sustainable practices can play in their stock price. This paper has been organized as 5 sections. Introduction and literature review section have been presented in first and second sections. Methodology and results sections have been presented in sections 3 and 4. Finally, the conclusion section has been presented in section 5.

#### 2. Literature Review

Palm oil is an oil from the kernel of the palm fruit. The largest supplier of this oil is Malaysia, which is used as a cholesterol-free oil in most African countries. The Worldwide Fund for Nature (WWF)'s palm oil scorecard provides insight into palm oil buyer firms' strategies and endeavours with respect to resolving environmental issues caused by palm oil production. The following is a summary of the literature review:

Momenitabar et al. [22] presented a model for sustainable closed loop supply chain. The main contribution is considering lateral resupply and backup suppliers. Also, they forecast demand using the fuzzy inference system. Ortiz–Sanchez and Alzate [23] presented a sustainable biomass supply chain model. They described some indexes based on environmental, social, and economic aspects. The main contribution of the paper was describing criteria for biomass upgrading selection. Tseng et al. [24] presented a new mathematical model for the textile industry. The contributions of their research were considering industrial disruption and ambidexterity. The fuzzy Delphi method is used to validate the proposed model.

Ghasemi et al. [25] presented a model for medical tourism destination decision. Considering sustainability is one of the contributions of their paper. They solved the model using the Fuzzy SWARA-PROMETHEE algorithm. The weights of the criteria were determined using the fuzzy SWARA algorithm, and the medical tourism destinations were ranked using the PROMETHEE method.

Khan et al. [26] presented a model for sustainable portfolio optimization. Considering the risk-taking behavior of investors is the main contribution of their paper. The results show that as portfolio allocation weights increases, the risk of portfolio increases. Also, results show that a portfolio with inclusion of skewness is sustainable.

Fang et al. [27] presented a sustainable portfolio model considering climate change. Considering risk management and pricing are the contributions of their paper. They used an integrated assessment model to optimize the portfolio. The results show that as price increases, the risk value increases.

Yu et al. [28] presented a value-at-risk model for crude oil portfolio. They extremely use value theory to model the considered problem. The main contribution is considering the expected shortfall of oil companies. Results show that as the demand increases, the risks increase.

Austin et al. [29] presented a sustainable oil palm model considering conservation value approaches. The considered case study was oil palm cultivation in Gabon. The main objective of their research was minimizing the negative



FIGURE 1: Distribution of palm-based product companies-based country origin (WWF palm oil buyer score card, 2021).

environmental impact. The results show the suitable performance of the presented model.

Due to literature review, the contributions of our paper include considering sustainability, minimizing risk, and portfolio management simultaneously.

Figure 2 presents the share of respondents who meet the key sustainability criteria for different sectors, including manufacturing, retail, and hospitality. Manufacturers of palm-based products conquer the average with respect to including policies and schemes to guarantee supplier accountability and compliance. For instance, 61% of manufacturers expect suppliers to implement deforestation-free and/or conversion-free procedures, while 48% need suppliers to verify their palm oil supply chain plant.

#### 3. Methodology

To investigate the significance of the sustainability score in stock market value and optimal investment portfolio, we adopted the modern portfolio theory (MPT) within a threestep framework (Figure 3). The first step includes extracting the historical data of monthly adjusted close prices for each stock. In the second step, we calculate the variance-covariance matrix based on the value of the monthly return of each stock and the average return of each stock. The expected return and risk of the optimal portfolio are then estimated using a simulation method based on the Markowitz model.

3.1. Data. There are several palm oil buyer companies available worldwide. However, the focus of this study is to evaluate the impact of the sustainability score on the



FIGURE 2: Share of palm oil buyer companies who meet key sustainability criteria by sector (data from WWF palm oil buyer scorecard, 2021).

performance of companies of palm-based products as the buyers of palm oil (palm oil buyer scorecard, 2020). Figure 4 illustrates the performance of the companies in individual sectors that includes 61% manufacturers such as Ferrero, Henkel, PepsiCo, Johnson \$ Jonson, and others. In the next rank, there are 35% of suppliers including 35% retailers such as IKEA, Carrefour, Marks and Spencer, and some hospitality companies (%4) such as McDonald's corporation, SODEXO, and Greggs.Companies are ranked by using the PROMETHEE method according to the score they have





Palm oil volumes captured by the scorecard (thousand MT), 2021

FIGURE 5: Palm oil volumes captured by countries, 2021.

The overall multicriteria preference list  $\pi(a,b)$  is denoted as (4) [31]:

$$\pi(a,b) = k \sum_{j=1}^{k} W_j P_j(a,b), \quad j = 1, 2, \dots, k.$$
(4)

where  $W_j$  represents the weight of the criterion *j*. The incoming flow phi–, which indicates the outranked character of the alternative "a", can be represented as follows [32]:

$$phi^{+}(a) = \sum_{x \in A} \pi(x, a), phi^{-}(a) = \sum_{x \in A} \pi(a, x).$$
 (5)

(6) expresses the overall preferred degree of the alternative "a".

$$\varnothing(a) = \varnothing^+(a) - \varnothing^-(a).$$
(6)

3.3. Portfolio Construction and Screening. The main concern of sustainable portfolio optimization is to select the best set of rational asset weights whilst taking the sustainability score into account. The modest and effective approach to incorporate sustainability constraints in a portfolio decision is screening. Generally, the portfolio risk is calculated as the market risk while the number of involving assets in the portfolio approaches infinity. However, there is no consensus on the best number of assets to be included in the portfolio that eliminates the nonsystematic risk. Statman et al. [33] believe that a suitable portfolio could be constructed with 30 and 40 stocks for a borrowing and lending investor, respectively. However, a complete diversification impact could be obtained with only 18 stocks or more in the portfolio if the investments are allotted within different asset classes [34].



FIGURE 3: The framework of methodology.



FIGURE 4: Performance of the companies in individual sectors.

achieved in each criterion. The palm oil buyers' scorecard evaluates a varied selection of companies worldwide. Accordingly, the data regarding the monthly closure prices for 70 stocks of companies of palm-based products from 1st January 2010 to 10th September 2021 were investigated. A description of the selected companies of palm-based products is presented in Table 1. The following analysis and outcomes of this paper are based on the historical data of the stock price that was downloaded from http://finance.yahoo.com.

Figure 5 presents the palm oil volumes captured by countries. The highest amount of palm oil volume captured belongs to Europe, followed by North America, Asia, Africa, and Australia.

3.2. Promethee. To calculate the ranking of the companies according to their scores in each criterion, including commitments, sustainable palm oil purchasing, supplier accountability, sustainability platforms, and on-the-ground action, the PROMETHEE method is applied.

The deviations between two alternatives with respect to j the criterion is as (1) [30]:

$$d_j(a,b) = f_j(a) - f_j(b)$$
  $j = 1, 2, \dots, k.$  (1)

Applying the preference function using (2) and (3)

$$P_j(a,b) = F_j[d_j(a,b)], \quad j = 1, 2, \dots, k,$$
 (2)

$$0 \le P_j \le 1 \cdots j = 1, 2, \dots, k.$$
 (3)

To examine the role of including the sustainability score in optimal portfolio decision-making, we performed the screening procedure to construct four different portfolios. A partial screening approach is applied, where a predetermined proportion of the companies is excluded from the investment universe. We performed three levels of partial screening at 20%, 50%, and 80% levels, where companies with a lower sustainability score at the bottom of the list will be excluded. The fourth portfolio contains all the available stocks in the investment universe with no screening. Table 1 presents the screening approach and number of companies included in each portfolio.

To attain the objective of the study, all the companies are selected from manufacturers of palm-based products. Thus, sector properties or the company size are not considered while constructing these four portfolios. The selection procedure is based on the sustainability score, where the best 20% portfolio consists of the stocks with the highest sustainability score. The best 20% portfolio consists of fourteen stocks which is less than the required number of stocks for a complete diversification impact [34, 35]. Nevertheless, we consider these portfolios interesting from an appraisal viewpoint to examine the possibility of diminishing diversification impact with a small number of stocks.

3.4. Markowitz Model. Prior to modern portfolio theory, the investors' concern was the individual securities' risk and return, where the investment decisions were made by investing in securities with the highest return and lowest risk. This approach has changed following the introduction to modern portfolio theory. Harry Markowitz, in his seminal Portfolio Selection in 1952 known as modern portfolio theory, pursues to generate a greater possible return for a certain level of risk or returns in the lowest possible risk for a particular level of return. In fact, investment decisions are made based on the assessment of the total portfolio risk and not to build a portfolio of preselected individual securities. Hence, the modern portfolio theory underlines the association between the attributes of the assets rather than the individual assets' qualities [36].

The main assumption in modern portfolio theory is that the securities' return is a set of random variables which could be estimated for a specific period. The mathematical characteristic of return allows us to estimate the investment risk based on the standard deviation of return. The expected return of the portfolio is represented by a linear combination of the returns for all assets involved in the portfolio. The portfolio risk is then estimated based on a nonlinear standard deviation and correlations of the individual assets' return, known as portfolio standard deviation. Markowitz's theory is based on the diversification effect which assumes that the higher the number of assets in the portfolio, the greater the corresponding number of covariances and therefore the lower the portfolio risk. This assumption is based on the heightening of the significance of the correlations between the assets which influences the portfolio risk more than the effect of individual assets' risk. The mathematical representation of Markowitz model also known as the mean-variance model is shown as follows(see

[37]).

$$\max E(r_p) = \max \sum_{i=1}^n w_i \mu_i,$$

$$\min \sigma_p = \min \sqrt{\sum_{i=1}^n \sum_{j=1}^n w_i w_j \sigma_{ij}},$$

$$0 \le w_i \le 1, \quad i = 1, \dots, n,$$
(7)

where  $\omega_i$  is the weight of capital to be invested in the asset. *i*  $r_i$  is the return on the asset.  $i \mu_i$  is the expected return on the asset.  $i \mu_{ij}$  is the covariance between the return on assets iand *j*.  $E(r_p)$  is the expected return of the portfolio.  $\sigma_p$  is the standard deviation or risk of the portfolio.

Rate of return or the percentage of gain or loss on the investment is calculated by the formula, see [38]:

$$r_{it} = \frac{P_{it} - P_{it-1}}{P_{it-1}},$$
(8)

where  $P_{it}$  refers to the price of stock *i* at time *t*, and  $P_{it-1}$ refers to the price of stock i at time t - 1.

Then, the expected return of the asset i, i = 1, ..., n, is calculated by

$$\mu_i = E(r^i) = \frac{\sum_{t=1}^m r_t^i}{m},\tag{9}$$

where  $r_{it}$  is the return on the asset *i* between periods t - 1and t, and for a specific period of time (m), we have  $t=1,\ldots,m.$ 

The following formula presents the variance for asset *i*:

$$\sigma_i^2 = Var(r^i) = \frac{\sum_{i=1}^m (r_t^i - \mu_i)^2}{m-1}.$$
 (10)

To measure the level of risk of assets, investors often use standard deviation [32] which is recognized as the most popular indicator for risk of assets. Standard deviation determines the dispersion around the expected returns, which is calculated as follows:

$$\sigma_{i} = \sqrt{\sigma_{i}^{2}} = \sqrt{\frac{\sum_{t=1}^{m} \left(r_{t}^{i} - \mu_{i}\right)^{2}}{m-1}}.$$
(11)

While constructing a portfolio consisting of different assets, dimensions of risk are structured in the return covariance matrix represented by  $\Omega_{n \times n}$ . This matrix includes variances in its principal diagonal and covariances between all pairs of assets.

$$\Omega_{n \times n} = \begin{pmatrix} \boldsymbol{\sigma}_1^2 & \cdots & \boldsymbol{\sigma}_{1n} \\ \vdots & \ddots & \vdots \\ \boldsymbol{\sigma}_{n1} & \cdots & \boldsymbol{\sigma}_n^2 \end{pmatrix}.$$
 (12)

We calculate the covariance as (8):

$$\sigma_{ij} = COV(r^{i}, r^{j}) = \frac{\sum_{t=1}^{m} (r_{t}^{i} - \mu_{i})(r_{t}^{i} - \mu_{j})}{m}.$$
 (13)

3.5. Performance Measurements. We applied risk measures to evaluate the portfolios' performance, which is essential to compare the constructed portfolios and analyse the findings properly. The Sharpe ratio is one of the most consistent assessments of performance given that it determines the surplus return,  $r_p - r_f$ , per unit of risk,  $\sigma_p$ . The greater the Sharpe ratio, the better the risk-adjusted return is attained [39].

Sharpe = 
$$\frac{r_p - r_f}{\sigma_p}$$
. (14)

To explain more about the Sharpe ratio, let us suppose that we have a portfolio, and we are trying to add a particular stock to our investment portfolio of risky assets. If we can borrow and lend at the risk-free rate, we would add the stock if it can improve the portfolio's Sharpe ratio. Using this law, we arrive at the risk-return equilibrium relationship by the capital asset pricing model. The expected excess return is called the risk premium [40].

We estimated the risk-free rate based on the average monthly 1-month treasury for countries which are included in the research, that equals to 0.49%.

3.6. Simulation Optimization Model. The development in computer science over the last decade has provided the opportunity of application of optimizing simulation models. This advancement presents one of the extremely exciting possibilities in simulation. Compared with traditional portfolio optimization models, simulation optimization can cope with more scenarios and schemes. The simulation optimization model might outperform the traditional optimization technique due to its capability of forecasting the aimed outcomes as various sources of risks, and multiple constraints are employed [41]. The statistically significant outcomes are in fact the results of two discrete functions based on a metaheuristic search algorithm. The optimization model applies the outcomes from the simulation model within an aligned operation. The simulation model provides the best outcomes for the optimizer based on a proper determination of the probability distributions. Next, another group of inputs are created by the optimizer. These values will be later assessed by the simulation model. The simulation model will repeat this procedure for almost 10,000, which produces a distinctive value in every round with the aim of achieving the global optimum.

In this study, we applied Crystal Ball opt Quest as it provides all the necessary attributes to perform proper simulation optimization. Based on a spreadsheet risk analysis model, we investigated the impact of several unique inputs on the outputs using the spreadsheet estimation and simulation method. The inputs were calculated according to their statistical distribution. To perform the simulation model, we employed the Monte Carlo model to produce

TABLE 2: Risk, return, and the maximum Sharpe ratio of portfolios.

Period	All	Best 80%	Best 50%	Best 20%
2015	-0.00328	0.010	0.0119	-0.0003
2016	0.01591	0.009	0.0105	0.009
2017	0.01095	0.012	0.0160	0.020
2018	-0.01037	-0.012	-0.0060	0.003
2019	0.01025	0.020	0.0244	0.025
2020	0.01730	0.017	0.0049	0.011
Mean return	0.012	0.013	0.014	0.014
Min stdv	0.044	0.024	0.024	0.014
Sharpe ratio	0.16	0.33	0.38	0.65

arbitrary and independent values required for the simulation model [42, 43].

Based on the data collected from WWF, four experimental portfolios have been created. Each portfolio contains a specific number of stocks according to the sustainability score of the company (Table2). Each company is determined based on its historical stock value over the past 10 years in the experimental portfolio set. Then, the best distribution for each strategy is calculated using the historical data and statistical computing mechanism of Oracle Crystal Ball Simulation.

#### 4. Results and Discussion

The effectiveness of the proposed approach was tested from two aspects. On the one hand, we examined the excess returns of the proposed portfolios constructed based on the screening over the investment horizons from 2015 to 2020. On the other hand, we constructed and compared the efficient frontiers for these portfolios.

Companies ranked using the PROMETHEE method, and the results are shown in table (C. Table 3). Figure 6 illustrates the GAIA chart of ranked companies based on 5 criteria including C1: commitments, C2: sustainable palm oil purchasing, C3: supplier accountability, C4: sustainability platforms, and C5: on-the-ground action.

As shown in Figure 7, the actions are marked with points, and the criteria are marked with vectors. As it turns out, the criteria of sustainable palm oil purchasing and onthe-ground action are in conflict. Commitments and sustainability platforms are also in line with the decision brain. According to the GAIA chart, the second action is selected as the best action.

Table 2 reports the excess returns of the constructed portfolios. The first portfolio called "All" consists of 70 companies, and the others have been reduced according to the screening level with best 80%, best 50%, and best 20% sustainability scores. The mean and volatility of annual excess returns and Sharpe ratios are also examined and reported in Table 2. The findings based on the risk and return of the tangency portfolio reveal that the portfolio's movements are close but incomparable.

The highest values are shown in bold. The portfolio of the best 20% provides the maximum average return, implying a significant linkage between the financial performance and the sustainability score.

TABLE 3: Companies ranked using the PROMETHEE method.

Company name         Action ranking         Phi         Phi         Phi         Phi         Phi           C1         Corps originated (2.32MT)         1         0.4957         0.00812           C3         Ferrer (2.25,57 MT)         3         0.4261         0.5364         0.1043           C4         IKEA (2.900 MT)         4         0.4060         0.5354         0.1155           C6         Carealia (2.62,99 MT)         5         0.3913         0.5358         0.1623           C7         Kaufinat Sitting & Co. KG (2.989 MT)         10         0.8351         0.5378         0.1623           C8         The Co-operative Group (7.431.6 MT)         17         0.3681         0.3911         0.1763           C9         Backender (2.860 MT)         36         0.3420         0.5497         0.2841           C11         Ar Af Tools (39, 329 MT)         13         0.2468         0.4412         0.2145           C13         REWE Croup (8.464 MT)         8         0.2467         0.4312         0.2414           C14         Legac Dubon Nurrition and Biocimence (10.474 MT)         7         0.1739         0.4390         0.2511           C14         Carteniou Riske (2.431 MT)         13         0.1307		1 6				
C1         Coop Switzerland (2033 MT)         2         0.519         0.0571         0.0172           C3         Ferrero (20.570 MT)         3         0.4261         0.5304         0.1012           C3         Ferrero (20.570 MT)         4         0.4001         0.5014         0.1014           C4         IKEA (29.000 MT)         5         0.3971         0.5358         0.1565           C6         Greenia (20.429 MT)         10         0.3855         0.5478         0.1012           C8         The Co-operative Group (7.413 KMT)         14         0.3507         0.2374         0.1184           C10         The Hershey Company (32.566 MT)         12         0.2870         0.1383         0.1475         0.1584           C12         The Stefe Laader Companius Inc. (3.614.7 MT)         5         0.2864         0.4435         0.1514           C3         REWE Group (6.494 MT)         2         0.1797         0.439         0.2017           C13         Deform Nutrinn and Bioscience (100, 743 MT)         6         0.2466         0.4348         0.2348           C14         Legapy DuPorn Nutrinn and Bioscience (100, 743 MT)         2         0.172         0.399         0.2318           C14         Legapy DuPorn Nutrinn and		Company name	Action ranking	Phi	Phi+	Phi–
C2         John Lewis Partnership (2.522 MT)         1         0.4957         0.003           C3         Ferrer (2.20.570 MT)         3         0.4261         0.5304         0.1043           C4         IKEA (23.000 MT)         4         0.4000         0.5358         0.1555           C6         Carcalia (20.729 MT)         5         0.3913         0.5478         0.1623           C7         Kaufhad Sifting & Co. KG (2.89 MT)         10         0.8858         0.5478         0.1623           C9         Beieradri (2.860 MT)         14         0.507         0.5275         0.1768           C10         The Hershey Company (32.566 MT)         36         0.3420         0.3431         0.1481         0.1481           C11         ArA fa Foods (39, 329 MT)         12         0.277         0.997         0.2087           C12         The Este Lauder Companies Inc. (5.614.7MT)         6         0.2406         0.4502         0.2141           C14         Lagaey DuPon Nutrition and Biosciences (100, 7.14 MT)         7         0.1739         0.2148         0.2351           C17         Undiekscien Bx. (12.225.5MT)         29         0.1333         0.3681         0.2248           C21         ALDT and (83.381MT)         21	C1	Coop Switzerland (2,033 MT)	2	0.5159	0.5971	0.0812
C3         Ferrero (220570 MT)         3         0.4261         0.5304         0.1014           C4         IKEA (23,000 MT)         4         0.4000         0.5114         0.1014           C5         Mars, Inc. (64,16 MT)         9         0.3371         0.5356         0.1565           C6         Cerealia (20,429 MT)         10         0.3855         0.5378         0.1265           C8         The Cooperative Group (74,134.6MT)         17         0.3681         0.5391         0.1710           C9         Bcicradorf (24,601 MT)         14         0.3507         0.2375         0.1784           C11         He Hersher Company (15,12,56MT)         59         0.2411         0.4435         0.1594           C12         The Estee Lauler Company (15,12,56MT)         5         0.2400         0.4380         0.2174           C13         Lagoy DiPont Natrificia and Biocicences (100, 743 MT)         6         0.2400         0.4380         0.2371           C14         Lagoy DiPont Natrificia and Biocicences (100, 743 MT)         7         0.1275         0.4230         0.2348           C17         Upided Encyer (80,0437 MT)         7         0.1275         0.4230         0.2348           C14         Maren (80,047 MT) <t< td=""><td>C2</td><td>John Lewis Partnership (2,252 MT)</td><td>1</td><td>0.4957</td><td>0.6029</td><td>0.1072</td></t<>	C2	John Lewis Partnership (2,252 MT)	1	0.4957	0.6029	0.1072
C4         IKEA (23:000 MT)         4         0.4000         0.5014         0.0156           C5         Mars, Inc. (64.16 MT)         9         0.3913         0.5356         0.1565           C6         Cerealia (20.429 MT)         10         0.3851         0.5378         0.1623           C8         The Co-operative Group (7.431.6 MT)         17         0.3681         0.5327         0.1623           C9         Beierskorf (28,60 MT)         12         0.2370         0.4957         0.2387           C11         Arda Foods (39, 329 MT)         12         0.2370         0.44957         0.2381           C12         The Ester Lauder Company (32,566 MT)         8         0.2667         0.44812         0.2145           C13         REWE Group (80.484T)         8         0.2667         0.44812         0.2145           C14         Lagery DuPont Nurrition and Biosciences (00, 743 MT)         7         0.179         0.3913         0.2361           C17         Unlikeries BV. (12, 444 MT)         13         0.1617         0.3884         0.2377           C14         Darine (67, 233 MT)         29         0.1133         0.3681         0.2376           C14         Darine (67, 234 MT)         13         0.1183	C3	Ferrero (220,570 MT)	3	0.4261	0.5304	0.1043
C5         Mars, Inc. (6/,416 MT)         9         0.3971         0.5376         0.1355           C6         Cercala (20,429 MT)         10         0.3855         0.5378         0.1355           C7         Kaufland stiftung 8 Co, KG (2,899 MT)         10         0.3855         0.5378         0.1205           C8         The Co-pertive Group (7,431.6MT)         14         0.3507         0.5374         0.1884           C11         The Hierhy Company (23,560 TT)         12         0.2870         0.44957         0.2877           C12         The Estee Laider Companies Inc. (3,614.7MT)         59         0.2841         0.44957         0.2174           C14         Leggy DuPont Nutrinio and Busciences (100, 7347)         6         0.2029         0.4029         0.2010           C16         Danone (3/231MT)         20         0.1739         0.4290         0.2511           C18         Migros (19,659 MT)         13         0.1130         0.4290         0.2517           C18         Migros (19,659 MT)         20         0.1333         0.3484         0.2367           C21         Kerry Foods (11,929 MT)         20         0.1188         0.3370         0.2377           C18         Marso (14,040 MT)         22	C4	IKEA (29,000 MT)	4	0.4000	0.5014	0.1014
C6         Carealia (20.429 MT)         5         0.3913         0.5178         0.11623           C7         Kaufland sitting & Co. KG (2.989 MT)         10         0.3555         0.5178         0.11623           C8         The Co-operative Group (7.431.6 MT)         14         0.3507         0.5275         0.11768           C10         The Hershey Company (32.566 MT)         26         0.3420         0.5324         0.4495           C11         ArAla Foods (39, 329 MT)         12         0.2370         0.4495         0.1284           C12         The Estee Lauder Companies Inc. (3.614 / MT)         8         0.2667         0.4815         0.2145           C14         Legacy DuPont Nutrition and Biosciences (100, 743 MT)         6         0.2200         0.4209         0.2200           C16         Danone (67.31 MT)         13         0.1307         0.4384         0.2377           C19         Upfield Enrope RV. (43.255 MT)         29         0.1333         0.3684         0.2379           C21         ALDT Sud (Holer) (9.355 MT)         42         0.1138         0.3884         0.2377           C14         Carreafour (6.127 MT)         13         0.0314         0.3391         0.2258           C22         ALDT Sud (Holer)	C5	Mars, Inc. (64,416 MT)	9	0.3971	0.5536	0.1565
C7         Kaufand stiftung & Co. KG (2,989,MT)         10         0.3855         0.6728         0.0170           C8         The Co-operative Group (7,431,6MT)         14         0.3507         0.5736         0.1710           C9         Beiersdorf (2,601,MT)         14         0.3507         0.5736         0.0184           C11         Arla Foods (39, 329,MT)         12         0.2370         0.44957         0.0287           C12         The Stete Lauder Companies Inc. (3,614,7MT)         59         0.2481         0.4495         0.2174           C14         Legger DuPont Nutrinio and Busciences (100, 743 MT)         6         0.2406         0.4180         0.2174           C15         Continental Bakeries IX, (12, 484 MT)         16         0.2029         0.4029         0.2031           C16         Danore (67,231 MT)         29         0.1333         0.3884         0.2377           C18         Migroog (19,659 MT)         13         0.1188         0.3884         0.2367           C22         ALD15 Wei (Horie (1):1.355 MT)         20         0.8181         0.4128         0.3159           C23         EDEEXA Zentrale (1.1004 MT)         22         0.089         0.3370         0.2434           Carereoue (5,1.74 MT) <td< td=""><td>C6</td><td>Cerealia (20,429 MT)</td><td>5</td><td>0.3913</td><td>0.5478</td><td>0.1565</td></td<>	C6	Cerealia (20,429 MT)	5	0.3913	0.5478	0.1565
C8         The Co-operative Group (7,431.6 MT)         17         0.3581         0.5391         0.1710           C9         Beiersdorf (28.60 MT)         36         0.3420         0.5394         0.1884           C11         Arla Foods (39, 329 MT)         12         0.2870         0.4987         0.2081           C12         The Estee Lauder Company (32.566 MT)         59         0.2841         0.4435         0.1594           C13         REWE Group (6.048 MT)         6         0.2406         0.4438         0.2174           C15         Continental Backreis B.V. (2.484 MT)         16         0.2029         0.4029         0.2021           C17         Unifeer (810.437 MT)         7         0.1739         0.42300         0.2351           C18         Unfoid Encope B.V. (243.255 MT)         29         0.1333         0.3661         0.2377           C19         Unfoid Encope B.V. (243.255 MT)         30         0.1188         0.3848         0.2666           C22         ALDI Sud (Hofer) (91.355 MT)         10         0.01188         0.3848         0.2666           C23         EDEKA Zentrale (1.104 MT)         11         0.0681         0.3370         0.2371           C24         Resonann (5.369 MT)         16	C7	Kaufland stiftung & Co. KG (2,989 MT)	10	0.3855	0.5478	0.1623
C9         Beiersdorf (28,601,MT)         14         0.5377         0.1768           C10         The Herskey Company (32,566 MT)         36         0.3420         0.5345           C11         Arla Foods (39, 329 MT)         12         0.2870         0.4957         0.2087           C12         The Estac Lander Companies Inc. (3614, 7MT)         59         0.2841         0.4435         0.1574           C14         Legacy DuPont Nitrition and Bioscinces (100, 743 MT)         6         0.2406         0.4480         0.22145           C16         Danone (57,231 MT)         20         0.1797         0.331         0.2116           C17         Unilever (80,0437 MT)         7         0.1797         0.3381         0.2348           C20         L'Orael (83,383 MT)         25         0.1275         0.3652         0.2377           C21         Kerry Foods (11,929 MT)         30         0.1188         0.3894         0.2367           C22         ALD Food (14,567 MT)         11         0.0481         0.3371         0.3133           C35         Repsico Inc. (451,125 MT)         11         0.0481         0.3176         0.2284           C36         Rosmann (5,567 MT)         15         0.0881         0.3370         0.	C8	The Co-operative Group (7,431.6 MT)	17	0.3681	0.5391	0.1710
Ci0         The Hersbey Company (32,566 MT)         36         0.4200         0.5304         0.1884           C11         Arka Foods (39, 329 MT)         12         0.2870         0.4875         0.1594           C13         REWE Group (6.048 MT)         8         0.2667         0.4812         0.2145           C14         Legacy DuPont Nutrition and Biosciences (100, 743 MT)         6         0.2209         0.4020         0.2029         0.4020         0.2017           C15         Continental Backries R.V. (21, 484 MT)         16         0.2029         0.4020         0.2377           C17         Uniferer (810.437 MT)         7         0.1739         0.4230         0.2377           C19         Upfoid Enrope BV, (23.2325.5MT)         29         0.1333         0.3681         0.2348           C22         ALDI Stod (Hofer) (V1.55 MT)         42         0.1180         0.4290         0.3079           C23         EDEKA Zentrale (11.04 MT)         22         0.08941         0.4174         0.333           C24         Carrefour (6,127 MT)         32         0.0841         0.4379         0.2275           C25         Pepsico Inc. (451.136 MT)         11         0.0841         0.3101         0.3103           C26	C9	Beiersdorf (28,601 MT)	14	0.3507	0.5275	0.1768
C11         Arla Foods (9), 329 MT)         12         0.2871         0.4957         0.2087           C12         The Estee Lander Companies Inc. (3.614.7 MT)         59         0.2841         0.4413         0.1214           C14         Legacy DuPont Nutrition and Bioscines (100, 743 MT)         6         0.2466         0.4300         0.2174           C15         Continental Bakeries R.V. (12, 444 MT)         16         0.2029         0.4029         0.2251           C16         Danone (67,231 MT)         7         0.1737         0.333         0.2484         0.2374           C17         Univer (8)(0.437 MT)         7         0.1737         0.3681         0.2348         0.2348           C20         LOrrael (83.383 MT)         25         0.1275         0.3652         0.2375           C21         Kerry Foods (1).929 MT)         30         0.1188         0.3844         0.2307           C22         ALDI Stad (Hofer) (13.55 MT)         12         0.0841         0.3170         2.6269           C22         ALDI Stad (Hofer) (13.55 MT)         13         0.0812         0.3826         0.2675           C23         FDEKA Zentrale (11.094 MT)         12         0.0812         0.3820         0.2130           C24	C10	The Hershey Company (32,566 MT)	36	0.3420	0.5304	0.1884
C12         The Estee Lauder Companies Inc. (3,6147,MT)         59         0.2341         0.4435         0.1494           C13         REWE Group (8,048 MT)         8         0.2667         0.4432         0.2145           C14         Legacy DuPont Nutrition and Biosciences (100, 743 MT)         6         0.2200         0.179         0.3913         0.2116           C17         Uniliver (810,437 MT)         7         0.1739         0.4290         0.2231           C18         Migros (19,659 MT)         13         0.1507         0.3884         0.2348           C20         L/Drad (83,333 MT)         25         0.1275         0.3652         0.2377           C21         Korrey Foods (1,929 MT)         30         0.1188         0.3884         0.2666           C22         ALDI Sud (Hofer) (91,355 MT)         42         0.1130         0.4290         0.3159           C3         EDEKA Zentrale (11,004 MT)         22         0.08941         0.4174         0.3330           C24         Carrefour (6,12,14 MT)         11         0.0841         0.4174         0.3330           C25         Pepsico Inc. (451,154 MT)         11         0.0841         0.4174         0.3330           C26         Rosomann (5,369 MT)         <	C11	Arla Foods (39, 329 MT)	12	0.2870	0.4957	0.2087
C13         REWE Group (8,048 MT)         8         0.2667         0.4812         0.2145           C14         Legacy DuPont Nutrition and Biosciences (100, 743 MT)         6         0.22046         0.4290         0.2006           C15         Continental Bakeries B.V. (12, 448 MT)         16         0.22046         0.4290         0.2301           C17         Unilever (810,437 MT)         7         0.1739         0.4290         0.2351           C18         Migros (19,659 MT)         13         0.1507         0.3584         0.2377           C19         Upfield Europe B.V. (243,225.5 MT)         29         0.1333         0.3681         0.2486           C21         Kerry Foods (11,292 MT)         30         0.1188         0.3884         0.2609           C22         ALD1 Sud (Holer) (91,355 MT)         42         0.1130         0.4290         0.3150           C23         EDEKA Zentrale (11,004 MT)         22         0.0481         0.3177         0.3307         0.2276           C25         Pepsico Inc. (51,154 MT)         11         0.0041         0.3397         0.2275           C24         Resonant (5,569 MT)         18         0.0345         0.3275         0.3310           C27         Tessco Pre, (51,714 MT)<	C12	The Estee Lauder Companies Inc. (3,614.7 MT)	59	0.2841	0.4435	0.1594
C14         Legacy DuPont Nutrition and Biosciences (100, 743 MT)         6         0.2450         0.2174           C15         Continent Bakeries B.V. (21, 484 MT)         16         0.2029         0.4029         0.2000           C16         Danone (67,231 MT)         20         0.1779         0.333         0.2116           C17         Unificer (810,437 MT)         7         0.1739         0.4209         0.2251           C18         Migros (19,659 MT)         13         0.1507         0.3884         0.2377           C19         Upfield Europe B.V. (243,225.5 MT)         29         0.1333         0.3681         0.2348           C22         ALD1 Sud (Hofer) (19,355 MT)         30         0.1188         0.3844         0.2490         0.3159           C23         EDEKA Zentrale (11,004 MT)         22         0.00841         0.4174         0.3333           C26         Rossmann (5.369 MT)         11         0.0841         0.3371         0.3326           C26         Rossmann (5.369 MT)         18         0.0474         0.3330         0.2725           C29         Henkel AG & Co. IGAA (109,913 MT)         48         0.0493         0.3623         0.3130           C31         Johnson and Johnson (52,251 MT)	C13	REWE Group (8,048 MT)	8	0.2667	0.4812	0.2145
Cl5         Continental Bakeries B.V. (12, 484 MT)         16         0.2029         0.4029         0.4029         0.2010           Cl6         Danone (67, 231 MT)         7         0.1797         0.3913         0.2116           Cl7         Unilever (810,437 MT)         7         0.1797         0.4290         0.2351           Cl8         Migros (19,659 MT)         13         0.1507         0.3884         0.2377           Cl9         Upfield Europe B.V. (243,225 SMT)         29         0.133         0.3681         0.2377           Cl2         Kerry Foods (11,929 MT)         30         0.1118         0.4290         0.3159           Cl2         ALDI Sud (Hofer) (91,353 MT)         42         0.1130         0.4290         0.3130           Cl2         Repsico Inc. (51,164 MT)         11         0.0441         0.3377         0.2609           Cl2         Repsico Inc. (51,164 MT)         18         0.0074         0.3307         0.2754           Cl2         Resonant (5,529 MT)         26         0.0667         0.3391         0.2754           Cl2         Henkel AG & Co. LGA (10,991 MT)         43         0.0493         0.3262         0.310           Cl2         Henkel AG & Co. LGA (10,991 MT)         3 <td>C14</td> <td>Legacy DuPont Nutrition and Biosciences (100, 743 MT)</td> <td>6</td> <td>0.2406</td> <td>0.4580</td> <td>0.2174</td>	C14	Legacy DuPont Nutrition and Biosciences (100, 743 MT)	6	0.2406	0.4580	0.2174
Cl6         Danone (67,231 MT)         20         0.173         0.4290         0.2151           Cl7         Unilever (810,457 MT)         13         0.1507         0.4884         0.2371           Cl8         Upfield Europe BV. (243,225.5MT)         29         0.1333         0.561         0.2348           C20         Kerry Foods (11,292 MT)         30         0.1188         0.4884         0.2696           C21         ALDI Stod (Hofer) (10,355 MT)         42         0.1130         0.4290         0.3139           C23         EDEKA Zentrale (1,004 MT)         22         0.08841         0.3971         0.3133           C24         Carrefour (6,127 MT)         11         0.0814         0.3971         0.3133           C25         Pepsico Inc. (451,136 MT)         11         0.0814         0.3971         0.3130           C26         Rossmann (5,362,329 MT)         26         0.0667         0.3391         0.2725           C29         Henkel AG & Co. I.CaA (109,913 MT)         43         0.0403         0.3275         0.2841           C31         Johnson and Johnson (52,525.1 MT)         19         0.0406         0.3710         0.3304           C32         SODEXO (2,929 MT)         53         0.0377	C15	Continental Bakeries B.V. (12, 484 MT)	16	0.2029	0.4029	0.2000
Cl7         Unilever (810,437 MT)         7         0.1597         0.3884         0.2357           C18         Migros (19,659 MT)         13         0.1507         0.3884         0.2377           C19         Upfield Europe B.V. (243,225 SMT)         29         0.1333         0.3681         0.2347           C21         Kerry Foods (11,929 MT)         30         0.1188         0.3884         0.2476           C22         ALD1 Sud (Hofer) (91,355 MT)         42         0.1130         0.4200         0.3130           C23         EDEKA Zentrale (1,040 MT)         22         0.0889         0.3507         0.2609           C24         Carreforu (6,127 MT)         32         0.0841         0.4174         0.3330           C25         Pepsico Inc. (451,136 MT)         11         0.0841         0.3971         0.3130           C27         Tesco PL (3,17,14MT)         18         0.0754         0.3507         0.2754           C38         Kellog Company (65,232,MT)         19         0.0406         0.3710         0.3310           C30         Lotter Bakeries         28         0.0435         0.3275         0.3314           C31         Johnson and Johnson (52,521 MT)         39         0.0234         0.3312	C16	Danone (67,231 MT)	20	0.1797	0.3913	0.2116
C18         Migros (19,659 MT)         13         0.133         0.3681         0.2378           C19         Upfield Europe B.V. (243,225 5 MT)         29         0.1333         0.3681         0.2348           C20         Kerry Foods (11,29 MT)         30         0.1188         0.3884         0.2696           C21         ALD1 Sud (Hofer) (91,355 MT)         42         0.1130         0.4290         0.3159           C23         EDEKA Zentrale (11,004 MT)         22         0.0891         0.3170         0.3333           C25         Pepsico Inc. (451,136 MT)         11         0.0812         0.3826         0.3014           C26         Rosmann (5.369 MT)         15         0.0812         0.3826         0.3014           C27         Tesco Plc. (31,714 MT)         18         0.0754         0.357         0.2725           C29         Henkel AG & Co. LGAA (109,913 MT)         43         0.0493         0.3223         0.3310           C31         Johnson and Johnson (52,525.11MT)         19         0.0406         0.3710         0.331           C33         Saputo Dairy UK (29,161 MT)         35         0.0029         0.3319         0.3326           C33         Saputo Dairy UK (29,161 MT)         45         0.00	C17	Unilever (810,437 MT)	7	0.1739	0.4290	0.2551
C19         Upfield Europe BV, (243,225, MT)         29         0.133         0.3681         0.2348           C20         L'Orcal (33,38 MT)         25         0.1275         0.3652         0.2377           C21         Kerry Foods (11,292 MT)         30         0.1188         0.3864         0.2409           C23         EDEKA Zentrale (11,004 MT)         22         0.0899         0.3507         0.3260           C3         EDEKA Zentrale (11,004 MT)         32         0.0841         0.4174         0.3330           C26         Ressiman (5,369 MT)         15         0.0812         0.3266         0.3010           C27         Tesco PL (3,17,14MT)         18         0.0754         0.3507         0.2754           C38         Kellogg Company (65,232,91T)         26         0.0667         0.3391         0.2252           C39         Henkel AG &G. LGA (109,913MT)         19         0.0406         0.3710         0.3300           C30         Lotus Bakeries         28         0.0435         0.3275         0.2841           C31         Johnson c12,525,1 MT)         39         0.0233         0.3310         0.3362           C33         Saputo Dairy UK (29,161 MT)         39         0.0203         0.3314 <td>C18</td> <td>Migros (19,659 MT)</td> <td>13</td> <td>0.1507</td> <td>0.3884</td> <td>0.2377</td>	C18	Migros (19,659 MT)	13	0.1507	0.3884	0.2377
C20         L'Oreal (83,38 MT)         25         0.1275         0.3652         0.2377           C21         Kerry Foods (1) 929 MT)         30         0.1184         0.3884         0.2696           C22         ALDI Sud (Hofer) (91,355 MT)         42         0.1130         0.4290         0.3159           C23         EDEKA Zentrale (1,004 MT)         22         0.08841         0.3971         0.3130           C25         Pepsico Inc. (451,136 MT)         11         0.0841         0.3971         0.3130           C26         Rossman (5,62,322 9MT)         15         0.0812         0.3307         0.2754           C28         Kellog Company (65,232 9MT)         26         0.0667         0.3391         0.2754           C31         Johnson and Johnson (5,252.1MT)         19         0.04045         0.3275         0.2841           C33         Saputo Dairy UK (2),161 MT)         39         0.0203         0.3310         0.3383           C34         Nairri's Oatcakes Ltd (1.230,6MT)         24         0.0174         0.3464         0.3702           C35         Barry Callebaut (76,965 MT)         45         0.0029         0.3391         0.3362           C35         Barry Callebaut (542 2MT)         35         0	C19	Upfield Europe B.V. (243,225.5 MT)	29	0.1333	0.3681	0.2348
C21         Kerry Foods (1,929 MT)         30         0.1188         0.3884         0.2696           C22         ALDI Sud (Hofer) (9,355 MT)         42         0.1130         0.4290         0.3159           C23         EDEKA Zentrale (1,004 MT)         22         0.0899         0.3507         0.2699           C24         Carrefour (6,127 MT)         32         0.0841         0.3130           C25         Pepsico Inc. (61,136 MT)         11         0.0841         0.3370         0.3130           C26         Rossmann (5,569 MT)         15         0.0812         0.3320         0.2754           C28         Kellogg Company (65,232 MT)         26         0.0467         0.3391         0.2718           C30         Lotus Bakeries         28         0.0435         0.3275         0.284           C32         SODEXO (2923 MT)         53         0.0377         0.435         0.4072           C33         Saputo Dairy UK (29,161 MT)         39         0.0203         0.3318         0.346           C34         Nain's Oatcakes Lid (1,239.6 MT)         21         0.0029         0.3361         0.3272           C35         Barry Calebaut (76,965 MT)         45         0.0029         0.3362         0.3372	C20	L'Oreal (83,383 MT)	25	0.1275	0.3652	0.2377
C22         ALDI Sud (Hofer) (9),355 MT)         42         0.1130         0.4290         0.3159           C23         EDEKA Zentrale (1.004 MT)         22         0.0841         0.4174         0.3333           C24         Carrefour (6.127 MT)         32         0.0841         0.4174         0.3333           C25         Pepsico Inc. (451,136 MT)         11         0.0841         0.3302         0.3130           C26         Rossmann (5.6232.9 MT)         15         0.0841         0.3262         0.3014           C28         Kellogg Company (65,232.9 MT)         43         0.0493         0.3623         0.3310           C30         Latus Bakeries         28         0.0435         0.3275         0.2841           C31         Johnson and Johnson (52,525.1 MT)         19         0.0406         0.3710         0.3304           C33         Saputo Dairy UK (29,161 MT)         39         0.0203         0.3391         0.3132           C35         Barry Calebaut (76,965 MT)         24         0.0174         0.3246         0.3072           C36         Torms Group (85 MT)         21         0.0029         0.3612         0.3623           C37         Young's Scafood Ltd. (592.2 MT)         35         0.0029	C21	Kerry Foods (11,929 MT)	30	0.1188	0.3884	0.2696
C23         EDEKA Zentrale (11,004 MT)         22         0.0899         0.3507         0.2609           C24         Carrefour (6,127 MT)         32         0.0841         0.4174         0.3333           C25         Pepsico Inc. (451,136 MT)         11         0.0841         0.3971         0.3130           C26         Rosmann (5,369 MT)         15         0.0812         0.3826         0.3014           C27         Tesco Pic. (31,714 MT)         18         0.0754         0.3507         0.2754           C28         Kellogg Company (65,232,9MT)         26         0.0667         0.3391         0.2725           C29         Henkel AG & Co. LGA (109,913 MT)         19         0.0406         0.3710         0.3304           C31         Johnson and Johnson (52,525.1 MT)         19         0.0406         0.3710         0.3345           C32         SODEXO (29.32 MT)         33         0.0371         0.4355         0.4358           C34         Nairris Votrakes Ld (1.239.6 MT)         21         0.0129         0.3341         0.3162           C35         Barry Callebaut (76,965 MT)         21         0.0129         0.3432         0.3072           C36         Toms Group (85 MT)         21         0.0029	C22	ALDI Sud (Hofer) (91,355 MT)	42	0.1130	0.4290	0.3159
C24         Carrefour (6,127 MT)         32         0.0841         0.4174         0.3333           C25         Pepsico Inc. (451,136 MT)         11         0.0812         0.3826         0.3130           C26         Rossmann (5,369 MT)         15         0.0812         0.3826         0.3014           C27         Tesco Plc. (3,714 MT)         18         0.0754         0.3507         0.2754           C28         Kellogg Company (65,232.9 MT)         26         0.0667         0.3391         0.2725           C29         Henkel AG & Co. LGA. (109,913 MT)         43         0.0493         0.3223         0.3304           C31         Johnson and Johnson (52,525.1 MT)         19         0.0406         0.3710         0.3304           C33         Saputo Dairy UZ (29,161 MT)         39         0.0223         0.3391         0.3188           C34         Nairn's Oatcakes Ltd (1.239.6 MT)         24         0.0174         0.3246         0.3072           C35         Barry Callebaut (76,963 MT)         21         0.0029         0.3362         0.3632           C36         Toms Group (85 MT)         31         -0.0521         0.3246         0.3762           C38         Marks & Spencci (5,469 MT)         47         -0	C23	EDEKA Zentrale (11,004 MT)	22	0.0899	0.3507	0.2609
C25         Pepsico Inc. (451,136 MT)         11         0.0812         0.3826         0.3014           C26         Rossmann (5,369 MT)         18         0.0754         0.3826         0.3014           C27         Tesco Plc. (31,714 MT)         18         0.0754         0.3826         0.2754           C28         Kellogg Company (65,232.9 MT)         26         0.0667         0.3391         0.2725           C29         Henkel AG & Co. GLA(109,913MT)         19         0.0406         0.3263         0.3301           C30         Lotus Bakeries         28         0.0437         0.4435         0.4036           C31         Johnson and Johnson (52,525.1MT)         39         0.0203         0.3391         0.3304           C32         SODEXO (2,932 MT)         24         0.0174         0.3226         0.3072           C35         Barry Callebaut (76,965 MT)         21         0.0029         0.3391         0.3362           C36         Toms Group (85 MT)         21         0.0029         0.3623         0.3072           C38         Marks & Spencer (5,469 MT)         46         -0.0261         0.2928         0.3189           C39         Sainsbury's (11,876 MT)         67         -0.0261         0.2928	C24	Carrefour (6,127 MT)	32	0.0841	0.4174	0.3333
C26         Rossmann (5,369 MT)         15         0.0812         0.3826         0.3014           C27         Tesco Pic. (31,714 MT)         18         0.0754         0.3507         0.2754           C28         Kellogg Company (65,232.9 MT)         26         0.0667         0.3391         0.2725           C29         Henkel AG & Co. IGAA (109,913 MT)         43         0.0493         0.3623         0.3130           C30         Lotus Bakeries         28         0.0435         0.3275         0.2841           C31         Johnson and Johnson (52,525.1 MT)         19         0.0406         0.3710         0.3391         0.3381           C33         Soputo Dairy UK (29,161 MT)         39         0.0203         0.3391         0.3623           C35         Barry Callebaut (76,965 MT)         21         0.0029         0.3642         0.3623           C36         Toms Group (85 MT)         21         0.0029         0.3189         0.3326           C37         Young's Scafood Ltd. (59.2 MT)         35         -0.0029         0.3043         0.3072           C38         Marks & Spencer (5,469 MT)         46         -0.023         0.3159         0.3352           C37         Young's Scafod Ltd. (59.2 MT)         37	C25	Pepsico Inc. (451,136 MT)	11	0.0841	0.3971	0.3130
C27         Tesco PLc, (31,714 MT)         18         0.0754         0.3507         0.2754           C28         Kellogg Company (65,232,9MT)         26         0.0667         0.3391         0.2725           C29         Henkel AG & Co. IGaA (109,913 MT)         43         0.0493         0.3623         0.3130           C30         Lotus Bakeries         28         0.0435         0.3275         0.2841           C31         Johnson and Johnson (52,525.1 MT)         19         0.0406         0.3710         0.435         0.4058           C33         Saputo Dairy UK (29,161 MT)         39         0.0203         0.3391         0.3326           C34         Nairn's Oatakes Ld (1.2396 MT)         24         0.0174         0.3246         0.3622           C35         Barry Callebaut (76,965 MT)         45         0.0029         0.3612         0.3623           C37         Young's Seafood Ldt, (592.2 MT)         35         -0.0029         0.3043         0.3072           C38         Marks & Spencer (5469 MT)         46         -0.0261         0.2928         0.3189           C43         Premiser Foods (13,375 MT)         37         -0.0493         0.3272         0.3555           C41         Zeelandia H.J. Decleman bx. (3	C26	Rossmann (5,369 MT)	15	0.0812	0.3826	0.3014
C28         Kellogg Company (65,232.9 MT)         26         0.0667         0.391         0.2725           C29         Henkel AG & Co. LGaA (109,913 MT)         43         0.0493         0.3623         0.3130           C30         Lotus Bakeries         28         0.0435         0.3275         0.2841           C31         Johnson and Johnson (52,525.1 MT)         19         0.0406         0.3710         0.3304           C32         SODEXO (2,932 MT)         53         0.0377         0.4435         0.4058           C33         Saputo Dairy UK (29,161 MT)         39         0.0203         0.3391         0.3362           C35         Barry Callebaut (76,965 MT)         24         0.0174         0.3246         0.3072           C36         Toms Group (85 MT)         21         0.0029         0.3419         0.3362           C38         Marks & Spencer (5,469 MT)         46         -0.0201         0.3159         0.3362           C39         Sainsbury's (11,876 MT)         67         -0.0261         0.2928         0.3188           C40         Royal FrieslandCampina (131,747 MT)         37         -0.0493         0.3072         0.3565           C41         Zeelandia H.J. Doeleman b.v. (3.056 MT)         38	C27	Tesco Plc. (31,714 MT)	18	0.0754	0.3507	0.2754
C29         Henkel AG & Co. LGaA (109,913 MT)         43         0.0493         0.3623         0.3130           C30         Lotus Bakeries         28         0.0435         0.3275         0.2841           C31         Johnson and Johnson (52,525.1 MT)         19         0.0406         0.3710         0.3304           C32         SODEXO (2,932 MT)         53         0.0377         0.4435         0.0405           C33         Saputo Dairy UK (29,161 MT)         39         0.0203         0.3391         0.3362           C35         Barry Callebaut (76,965 MT)         45         0.0029         0.3391         0.3362           C36         Toms Group (85 MT)         21         0.0029         0.3043         0.0372           C37         Young's Seafood Ltd. (592.2 MT)         35         -0.0029         0.3043         0.3072           C38         Marka & Spencer (5,469 MT)         67         -0.0261         0.2928         0.3188           C40         Royal FrieslandCampina (131,747 MT)         37         -0.0493         0.3072         0.3565           C41         Zcelandia H.J. Doeleman b.v. (3,506 MT)         45         -0.0696         0.3159         0.3884           C42         LIDL (K,662 MT)         65	C28	Kellogg Company (65,232.9 MT)	26	0.0667	0.3391	0.2725
C30         Lotus Bakeries         28         0.0435         0.3275         0.2841           C31         Johnson and Johnson (52,521 MT)         19         0.0406         0.3710         0.3304           C32         SODEXO (2,932 MT)         53         0.0377         0.4435         0.4058           C33         Saputo Dairy UK (29,161 MT)         39         0.0203         0.3391         0.3382           C34         Nairn's Oatcakes Ltd (1,239.6 MT)         24         0.0174         0.3246         0.3072           C35         Barry Callebaut (76,965 MT)         21         0.0029         0.3391         0.3362           C36         Toms Group (85 MT)         21         0.0029         0.3043         0.3072           C38         Marks & Spencer (5,469 MT)         46         -0.0203         0.3159         0.3362           C39         Sainsbury's (11,876 MT)         67         -0.0493         0.3072         0.3565           C41         Zeelandia HJ. Doeleman bv. (3.506 MT)         31         -0.0570         0.2898         0.3385           C42         LIDL (87,662 MT)         63         -0.0696         0.3159         0.3355           C43         Premier Foods (13,375 MT)         27         -0.0783	C29	Henkel AG & Co. LGaA (109,913 MT)	43	0.0493	0.3623	0.3130
C31       Johnson and Johnson (52,525.1 MT)       19       0.0406       0.3710       0.3304         C32       SODEXO (2,932 MT)       53       0.0377       0.4435       0.4058         C33       Saputo Dairy UK (29,161 MT)       39       0.0203       0.3391       0.3188         C34       Nairn's Oatcakes Ltd (1,239.6 MT)       24       0.0174       0.3246       0.3072         C35       Barry Callebaut (76,965 MT)       21       0.0029       0.3652       0.3623         C37       Young's Seafood Ltd. (592.2 MT)       35       -0.0029       0.3043       0.3072         C38       Marks & Spencer (5,469 MT)       67       -0.0203       0.3159       0.3388         C40       Royal FrieslandCampina (131,747 MT)       37       -0.0493       0.3072       0.3565         C41       Zeelandia H.J. Doeleman b.v. (3,506 MT)       31       -0.0522       0.3246       0.3768         C42       LIDL (87,662 MT)       65       -0.0696       0.3159       0.3855         C43       Premier Foods (13,375 MT)       27       -0.0783       0.2986       0.3768         C44       Groups Casino (2,679.7 MT)       23       -0.0870       0.2899       0.3768         C45 <t< td=""><td>C30</td><td>Lotus Bakeries</td><td>28</td><td>0.0435</td><td>0.3275</td><td>0.2841</td></t<>	C30	Lotus Bakeries	28	0.0435	0.3275	0.2841
C32         SODEXO (2,932 MT)         53         0.0377         0.4435         0.4088           C33         Saputo Dairy UK (29,161 MT)         39         0.0203         0.3391         0.3188           C34         Nairn's Oatcakes Ltd (1,239.6 MT)         24         0.0174         0.3246         0.0372           C35         Barry Callebaut (76,965 MT)         45         0.0029         0.3391         0.3362           C36         Toms Group (85 MT)         15         0.0029         0.3043         0.0372           C38         Marks & Spencer (5,469 MT)         46         -0.0203         0.3159         0.3362           C39         Sainsbury's (11,876 MT)         67         -0.0261         0.2928         0.3188           C40         Royal Friesland Campina (13,747 MT)         37         -0.0493         0.3072         0.3565           C41         Zeelandia H,J. Doeleman b.v. (3,506 MT)         31         -0.0522         0.3246         0.3768           C42         LIDL (87,662 MT)         C3         -0.0870         0.2899         0.3768           C43         Premier Foods (13,375 MT)         27         -0.0783         0.2896         0.3768           C44         Groups Casino (2,6797 MT)         23         <	C31	Johnson and Johnson (52,525.1 MT)	19	0.0406	0.3710	0.3304
C33         Saputo Dairy UK (29,161 MT)         39         0.0203         0.3391         0.3181           C34         Nairn's Oatcakes Ltd (1,239.6 MT)         45         0.0029         0.3362           C35         Barry Callebaut (76,965 MT)         21         0.0029         0.3652         0.3652           C36         Toms Group (85 MT)         21         0.0029         0.343         0.3072           C38         Marks & Spencer (5,469 MT)         46         -0.0203         0.3159         0.3362           C39         Sainsbury's (11,876 MT)         67         -0.0261         0.2928         0.3188           C40         Royal FrieslandCampina (131,747 MT)         37         -0.0493         0.3072         0.3565           C41         Zeelandia H.J. Doeleman b.v. (3,506 MT)         31         -0.0522         0.3246         0.3768           C42         LIDL (87,662 MT)         C5         -0.0696         0.3159         0.3884           C44         Groups Casino (2,679.7 MT)         23         -0.0670         0.2899         0.3768           C45         Colgate-Palmolive Company (204,616 MT)         38         -0.1014         0.2783         0.3797           C47         Proctere & Gamble (604,011 MT)         44	C32	SODEXO (2,932 MT)	53	0.0377	0.4435	0.4058
C34       Nairn's Oateakes Ltd (1,239.6 MT)       24       0.0174       0.3246       0.3072         C35       Barry Callebaut (76,965 MT)       21       0.0029       0.3652       0.3652         C37       Young's Seafood Ltd. (592.2 MT)       35       -0.0029       0.3043       0.3072         C38       Marks & Spencer (5,469 MT)       46       -0.0203       0.3159       0.3362         C39       Sainsbury's (11,876 MT)       67       -0.0261       0.2928       0.3188         C40       Royal FrieslandCampina (131,747 MT)       37       -0.0493       0.3072       0.3565         C41       Zeelandia H.J. Doeleman b.v. (3,506 MT)       31       -0.0522       0.3246       0.3768         C42       LIDL (87,662 MT)       27       -0.0783       0.2989       0.3768         C43       Premier Foods (13,375 MT)       27       -0.0783       0.2899       0.3768         C44       Groups Casino (2,679.7 MT)       23       -0.0870       0.2899       0.3779         C45       Colgate-Palmolive Company (204,616 MT)       38       -0.1014       0.2870       0.384         C46       Oriflame Cosmetics (3,648 MT)       44       -0.1014       0.2783       0.3797         C4	C33	Saputo Dairy UK (29,161 MT)	39	0.0203	0.3391	0.3188
C35         Barry Callebaut (76,965 MT)         45         0.0029         0.3362           C36         Toms Group (85 MT)         21         0.0029         0.3652         0.3623           C37         Young's Seafood Ltd. (592.2 MT)         35         -0.0029         0.3043         0.3072           C38         Marks & Spencer (5,469 MT)         46         -0.0203         0.3159         0.3362           C39         Sainsbury's (1,876 MT)         67         -0.0493         0.3072         0.3565           C41         Zeelandia H.J. Doeleman b.v. (3,506 MT)         31         -0.0522         0.3246         0.3768           C42         LIDL (87,662 MT)         65         -0.0696         0.3159         0.3885           C43         Premier Foods (13,375 MT)         23         -0.0870         0.2899         0.3768           C44         Groups Caino (2,679.7 MT)         23         -0.04870         0.2899         0.3768           C45         Colgate-Palmolive Company (204,616 MT)         38         -0.1014         0.2870         0.3884           C46         Orifiame Cosmetics (3.648 MT)         44         -0.1014         0.275         0.4319           C47         Procter & Gamble (604.011 MT)         34         -0.1	C34	Nairn's Oatcakes Ltd (1,239.6 MT)	24	0.0174	0.3246	0.3072
C36       Toms Group (85 MT)       21       0.0029       0.3652       0.3623         C37       Young's Seafood Ltd. (592.2 MT)       35       -0.0029       0.3159       0.3362         C38       Marks & Spencer (5,469 MT)       66       -0.0203       0.3159       0.3362         C39       Sainsbury's (11,876 MT)       67       -0.0431       0.3072       0.3565         C41       Zeelandia H.J. Doeleman bv. (3,506 MT)       31       -0.0522       0.3246       0.3768         C42       LIDL (87,662 MT)       65       -0.0696       0.3159       0.3855         C43       Premier Foods (13,375 MT)       27       -0.0783       0.2896       0.3768         C44       Groups Casino (2,679.7 MT)       23       -0.0870       0.2899       0.3788         C45       Colgate-Palmolive Company (204,616 MT)       38       -0.1014       0.2873       0.3797         C47       Procter & Gamble (604,011 MT)       34       -0.1043       0.3275       0.4319         C48       ALDI Nord (30,238 MT)       61       -0.1138       0.3130       0.4419         C49       Barioche Pasquier (3,909 MT)       47       -0.1217       0.2522       0.3738         C51       Fraser and	C35	Barry Callebaut (76,965 MT)	45	0.0029	0.3391	0.3362
C37       Young's Seafood Ltd. (592.2 MT)       35       -0.0029       0.3043       0.3072         C38       Marks & Spencer (5,469 MT)       46       -0.0203       0.3159       0.3362         C39       Sainsbury's (11,876 MT)       67       -0.0261       0.2928       0.3188         C40       Royal FrieslandCampina (131,747 MT)       37       -0.0493       0.3072       0.3555         C41       Zeelandia H.J. Doeleman b.v. (3,506 MT)       31       -0.0522       0.3246       0.3768         C42       LIDL (87,662 MT)       65       -0.0696       0.3159       0.3855         C43       Premier Foods (13,375 MT)       27       -0.0783       0.2896       0.3768         C44       Groups Casino (2,679.7 MT)       23       -0.0870       0.2899       0.3768         C45       Colgate-Palmolive Company (204,616 MT)       38       -0.1014       0.2870       0.3884         C46       Oriflame Cosmetics (3,648 MT)       44       -0.1014       0.2783       0.3797         C47       Procter & Gamble (604,011 MT)       34       -0.1043       0.3225       0.4319         C48       ALDI Nord (30,238 MT)       41       -0.118       0.310       0.4319         C49	C36	Toms Group (85 MT)	21	0.0029	0.3652	0.3623
C38       Marks & Spencer (5,469 MT)       46       -0.0203       0.3159       0.3362         C39       Sainsbury's (11,876 MT)       67       -0.0261       0.2928       0.3188         C40       Royal FrieslandCampina (131,747 MT)       37       -0.0493       0.3072       0.3565         C41       Zeelandia H.J. Doeleman b.v. (3,506 MT)       31       -0.0522       0.3246       0.3768         C42       LIDL (87,662 MT)       65       -0.0696       0.3159       0.3855         C43       Premier Foods (13,375 MT)       27       -0.0783       0.2869       0.3768         C44       Groups Casino (2,679.7 MT)       23       -0.0870       0.2899       0.3768         C45       Colgate-Palmolive Company (204,616 MT)       38       -0.1014       0.2870       0.3884         C46       Oriflame Cosmetics (3,648 MT)       44       -0.1043       0.3275       0.4319         C48       ALDI Nord (30,238 MT)       61       -0.118       0.310       0.4319         C49       Braisen Family (13,707 MT)       50       -0.1391       0.3043       0.4435         C51       Fraser and Neave, Limited (44,000 MT)       49       -0.1623       0.2896       0.4609         C52	C37	Young's Seafood Ltd. (592.2 MT)	35	-0.0029	0.3043	0.3072
C39         Sainsbury's (11,876 MT)         67         -0.0261         0.2928         0.3188           C40         Royal FrieslandCampina (131,747 MT)         37         -0.0493         0.3072         0.3565           C41         Zeelandia H.J. Doeleman b.v. (3,506 MT)         31         -0.0522         0.3246         0.3768           C42         LIDL (87,662 MT)         65         -0.0696         0.3159         0.3855           C43         Premier Foods (13,375 MT)         27         -0.0783         0.2986         0.3768           C44         Groups Casino (2,679.7 MT)         23         -0.0870         0.2899         0.3768           C45         Colgate-Palmolive Company (204,616 MT)         38         -0.1014         0.2873         0.3797           C47         Procter & Gamble (604,011 MT)         34         -0.1014         0.2222         0.3739           C48         ALDI Nord (30,238 MT)         61         -0.1188         0.3130         0.4319           C49         Bahisen Family (13,707 MT)         50         -0.1391         0.3043         0.4435           C51         Fraser and Neave, Limited (44,000 MT)         49         -0.1623         0.2986         0.4609           C52         Nestle SA (452,719 MT) <td>C38</td> <td>Marks &amp; Spencer (5,469 MT)</td> <td>46</td> <td>-0.0203</td> <td>0.3159</td> <td>0.3362</td>	C38	Marks & Spencer (5,469 MT)	46	-0.0203	0.3159	0.3362
C40       Royal FrieslandCampina (131,747 MT)       37       -0.0493       0.3072       0.3565         C41       Zeelandia H.J. Doeleman b.v. (3,506 MT)       31       -0.0522       0.3246       0.3768         C42       LIDL (87,662 MT)       65       -0.0696       0.3159       0.3855         C43       Premier Foods (13,375 MT)       27       -0.0783       0.2986       0.3768         C44       Groups Casino (2,679.7 MT)       23       -0.0870       0.2899       0.3768         C45       Colgate-Palmolive Company (204,616 MT)       38       -0.1014       0.2783       0.3797         C47       Procter & Gamble (604,011 MT)       34       -0.1043       0.3275       0.4319         C48       ALDI Nord (30,238 MT)       61       -0.118       0.3130       0.4319         C49       Brioche Pasquier (3,909 MT)       47       -0.1217       0.2522       0.3739         C51       Fraser and Neave, Limited (44,000 MT)       49       -0.1623       0.2986       0.4609         C52       Nestle SA (452,719 MT)       48       -0.1797       0.3043       0.4841         C53       Dragsbaek A/S (26,771 MT)       48       -0.1297       0.3043       0.4841         C54	C39	Sainsbury's (11,876 MT)	67	-0.0261	0.2928	0.3188
C41Zeelandia H.J. Doeleman b.v. (3,506 MT)31-0.05220.32460.3768C42LIDL (87,662 MT)65-0.06960.31590.3855C43Premier Foods (13,375 MT)27-0.07830.29860.3768C44Groups Casino (2,679,7 MT)23-0.08700.28990.3768C45Colgate-Palmolive Company (204,616 MT)38-0.10140.28700.3884C46Oriflame Cosmetics (3,648 MT)44-0.10140.27830.3797C47Procter & Gamble (604,011 MT)34-0.10430.32750.4319C48ALDI Nord (30,238 MT)61-0.11880.31300.4319C49Brioche Pasquier (3,909 MT)47-0.12170.25220.3738C50Bahisen Family (13,707 MT)50-0.13910.30430.4435C51Fraser and Neave, Limited (44,000 MT)49-0.106230.29860.4609C52Nestle SA (452,719 MT)48-0.17970.30430.4841C53Dragsbaek A/S (26,771 MT)41-0.19130.28990.4812C54Dm-drogerie-market (11,684 MT)57-0.20580.22900.4348C55Denis Asia Pacific Pte Ltd (Ayam Brand) (698 MT)51-0.20870.2464-0.4986C55Denis Asia Pacific Pte Ltd (Ayam Brand)69-0.21660.22980.23480.5275C56Ausda Stores Ltd (17,693 MT)54-0.26670.25800.5246C57Asda Stores Ltd (	C40	Royal FrieslandCampina (131,747 MT)	37	-0.0493	0.3072	0.3565
C42LIDL (87,662 MT)65-0.06960.31590.3855C43Premier Foods (13,375 MT)27-0.07830.29860.3768C44Groups Casino (2,679.7 MT)23-0.08700.28990.3768C45Colgate-Palmolive Company (204,616 MT)38-0.10140.28700.3884C46Oriflame Cosmetics (3,648 MT)44-0.10140.27730.3797C47Procter & Gamble (604,011 MT)34-0.10430.32750.4319C48ALDI Nord (30,238 MT)61-0.11880.31300.4319C49Brioche Pasquier (3,909 MT)47-0.12170.25220.3739C50Bahisen Family (13,707 MT)50-0.13910.30430.4435C51Fraser and Neave, Limited (44,000 MT)49-0.16230.29860.4609C52Nestle SA (452,719 MT)48-0.17970.30430.4841C53Dragsback A/S (26,771 MT)41-0.19130.28990.4318C54Dm-drogerie-market (11,684 MT)57-0.20580.22900.4348C55Denis Asia Pacific Pte Ltd (Ayam Brand) (698 MT)51-0.20870.24640.4551C57Asda Stores Ltd (17,693 MT)54-0.26670.25800.5246C58BASF (441,108 MT)54-0.26670.25800.5246C59COOP Denmark (825 MT)63-0.27830.22030.4986C56Aigremont (29,032 MT)56-0.29280.23480.5	C41	Zeelandia H.J. Doeleman b.v. (3,506 MT)	31	-0.0522	0.3246	0.3768
C43Premier Foods (13,375 MT)27-0.07830.29860.3768C44Groups Casino (2,679.7 MT)23-0.08700.28990.3768C45Colgate-Palmolive Company (204,616 MT)38-0.10140.28700.3884C46Oriflame Cosmetics (3,648 MT)44-0.10140.28700.3897C47Procter & Gamble (604,011 MT)34-0.10430.32750.4319C48ALDI Nord (30,238 MT)61-0.11880.31300.4319C49Brioche Pasquier (3,909 MT)47-0.12170.25220.3739C50Bahisen Family (13,707 MT)50-0.13910.30430.4435C51Fraser and Neave, Limited (44,000 MT)49-0.16230.29860.4609C52Nestle SA (452,719 MT)48-0.17970.30430.4812C53Dragsback A/S (26,771 MT)41-0.19130.28990.4812C54Dm-drogerie-market (11,684 MT)57-0.20580.22900.4348C55Denis Asia Pacific Pte Ltd (Ayam Brand) (698 MT)51-0.20870.24640.4551C56Lutosa SA (9,880)52-0.21160.20290.4145C57Asda Stores Ltd (17,693 MT)55-0.25800.2406-0.4986C58BASF (441,108 MT)54-0.26670.25800.5246C59COOP Denmark (825 MT)63-0.27830.22030.4986C59COOP Denmark (825 MT)56-0.29280.23480	C42	LIDL (87,662 MT)	65	-0.0696	0.3159	0.3855
C44Groups Casino (2,679.7 MT)23-0.08700.28990.3768C45Colgate-Palmolive Company (204,616 MT)38-0.10140.28700.3884C46Oriflame Cosmetics (3,648 MT)44-0.10140.27830.3797C47Procter & Gamble (604,011 MT)34-0.10430.32750.4319C48ALDI Nord (30,238 MT)61-0.11880.31300.4319C49Brioche Pasquier (3,909 MT)47-0.12170.25220.3739C50Bahisen Family (13,707 MT)50-0.13910.30430.4435C51Fraser and Neave, Limited (44,000 MT)49-0.16230.28990.4812C52Nestle SA (452,719 MT)48-0.17970.30430.4841C53Dragsbaek A/S (26,771 MT)41-0.19130.28990.4812C54Dm-drogerie-market (11,684 MT)57-0.20580.22900.4348C55Denis Asia Pacific Pte Ltd (Ayam Brand) (698 MT)51-0.20870.24640.4551C56Lutosa SA (9,880)52-0.21160.20990.4145C57Asda Stores Ltd (17,693 MT)54-0.26670.25800.5246C58BASF (441,108 MT)54-0.26670.25800.5246C59COOP Denmark (825 MT)56-0.29280.23480.5275C60Aigremont (29,032 MT)56-0.29280.23480.5275C61Wm Morrison Supermarkets plc (13,861 MT)40-0.29570.	C43	Premier Foods (13,375 MT)	27	-0.0783	0.2986	0.3768
C45Colgate-Palmolive Company (204,616 MT)38-0.10140.28700.3884C46Oriflame Cosmetics (3,648 MT)44-0.10140.27830.3797C47Procter & Gamble (604,011 MT)34-0.10430.32750.4319C48ALDI Nord (30,238 MT)61-0.11880.31300.4319C49Brioche Pasquier (3,909 MT)47-0.12170.25220.3739C50Bahisen Family (13,707 MT)50-0.13910.30430.4435C51Fraser and Neave, Limited (44,000 MT)49-0.16230.29860.4609C52Nestle SA (452,719 MT)48-0.17970.30430.4841C53Dragsbaek A/S (26,771 MT)41-0.19130.28990.4812C54Dm-drogerie-market (11,684 MT)57-0.20870.24640.4551C55Denis Asia Pacific Pte Ltd (Ayam Brand) (698 MT)51-0.20870.24640.4551C56Lutosa SA (9,880)52-0.21160.20290.4145C57Asda Stores Ltd (17,693 MT)54-0.26670.25800.5246C58BASF (441,108 MT)54-0.26670.25800.5246C59COOP Denmark (825 MT)63-0.27830.22030.4986C60Aigremont (29,032 MT)56-0.29280.23480.5275C61Wm Morrison Supermarkets plc (13,861 MT)40-0.29570.23190.5275C62Amorepacific (23,064 MT)69-0.31300.20	C44	Groups Casino (2,679.7 MT)	23	-0.0870	0.2899	0.3768
C46Oriflame Cosmetics (3,648 MT)44-0.10140.27830.3797C47Procter & Gamble (604,011 MT)34-0.10430.32750.4319C48ALDI Nord (30,238 MT)61-0.11880.31300.4319C49Brioche Pasquier (3,909 MT)47-0.12170.25220.3739C50Bahisen Family (13,707 MT)50-0.13910.30430.4435C51Fraser and Neave, Limited (44,000 MT)49-0.16230.29860.4609C52Nestle SA (452,719 MT)48-0.17970.30430.4811C53Dragbaek A/S (26,771 MT)41-0.19130.28990.4812C54Dm-drogerie-market (11,684 MT)57-0.20580.22900.4348C55Denis Asia Pacific Pte Ltd (Ayam Brand) (698 MT)51-0.20870.24640.4551C56Lutosa SA (9,880)52-0.21160.20290.4145C57Asda Stores Ltd (17,693 MT)54-0.26670.25800.5246C58BASF (441,108 MT)54-0.26670.25800.5246C59COOP Denmark (825 MT)63-0.27830.22030.4986C60Aigremont (29,032 MT)56-0.29280.23480.5275C61Wm Morrison Supermarkets plc (13,861 MT)40-0.29570.23190.5275C62Amorepacific (23,064 MT)69-0.31300.20000.5130	C45	Colgate-Palmolive Company (204,616 MT)	38	-0.1014	0.2870	0.3884
C47Procter & Gamble (604,011 MT)34-0.10430.32750.4319C48ALDI Nord (30,238 MT)61-0.11880.31300.4319C49Brioche Pasquier (3,909 MT)47-0.12170.25220.3739C50Bahisen Family (13,707 MT)50-0.13910.30430.4435C51Fraser and Neave, Limited (44,000 MT)49-0.16230.29860.4609C52Nestle SA (452,719 MT)48-0.17970.30430.4841C53Dragsbaek A/S (26,771 MT)41-0.19130.28990.4812C54Dm-drogerie-market (11,684 MT)57-0.20580.22900.4348C55Denis Asia Pacific Pte Ltd (Ayam Brand) (698 MT)51-0.20870.24640.4551C56Lutosa SA (9,880)52-0.21160.20290.4145C57Asda Stores Ltd (17,693 MT)55-0.25800.2406-0.4986C58BASF (441,108 MT)54-0.26670.25800.5246C59COOP Denmark (825 MT)63-0.27830.22030.4986C60Aigremont (29,032 MT)56-0.29280.23480.5275C61Wm Morrison Supermarkets plc (13,861 MT)40-0.29570.23190.5275C62Amorepacific (23,064 MT)69-0.31300.20000.5130	C46	Oriflame Cosmetics (3,648 MT)	44	-0.1014	0.2783	0.3797
C48ALDI Nord (30,238 MT)61-0.11880.31300.4319C49Brioche Pasquier (3,909 MT)47-0.12170.25220.3739C50Bahisen Family (13,707 MT)50-0.13910.30430.4435C51Fraser and Neave, Limited (44,000 MT)49-0.16230.29860.4609C52Nestle SA (452,719 MT)48-0.17970.30430.4841C53Dragsbaek A/S (26,771 MT)41-0.19130.28990.4812C54Dm-drogerie-market (11,684 MT)57-0.20580.22900.4348C55Denis Asia Pacific Pte Ltd (Ayam Brand) (698 MT)51-0.20870.24640.4551C56Lutosa SA (9,880)52-0.21160.20290.4145C57Asda Stores Ltd (17,693 MT)55-0.25800.2406-0.4986C58BASF (441,108 MT)54-0.26670.25800.5246C59COOP Denmark (825 MT)63-0.27830.22030.4986C60Aigremont (29,032 MT)56-0.29280.23480.5275C61Wm Morrison Supermarkets plc (13,861 MT)40-0.29570.23190.5275C62Amorepacific (23,064 MT)69-0.31300.20000.5130	C47	Procter & Gamble (604,011 MT)	34	-0.1043	0.3275	0.4319
C49Brioche Pasquier (3,909 MT)47-0.12170.25220.3739C50Bahisen Family (13,707 MT)50-0.13910.30430.4435C51Fraser and Neave, Limited (44,000 MT)49-0.16230.29860.4609C52Nestle SA (452,719 MT)48-0.17970.30430.4841C53Dragsbaek A/S (26,771 MT)41-0.19130.28990.4812C54Dm-drogerie-market (11,684 MT)57-0.20580.22900.4348C55Denis Asia Pacific Pte Ltd (Ayam Brand) (698 MT)51-0.20870.24640.4551C56Lutosa SA (9,880)52-0.21160.20290.4145C57Asda Stores Ltd (17,693 MT)55-0.25800.2406-0.4986C58BASF (441,108 MT)54-0.26670.25800.5246C59COOP Denmark (825 MT)63-0.27830.22030.4986C60Aigremont (29,032 MT)56-0.29280.23480.5275C61Wm Morrison Supermarkets plc (13,861 MT)40-0.29570.23190.5275C62Amorepacific (23,064 MT)69-0.31300.20000.5130	C48	ALDI Nord (30,238 MT)	61	-0.1188	0.3130	0.4319
C50Bahisen Family (13,707 MT)50-0.13910.30430.4435C51Fraser and Neave, Limited (44,000 MT)49-0.16230.29860.4609C52Nestle SA (452,719 MT)48-0.17970.30430.4841C53Dragsbaek A/S (26,771 MT)41-0.19130.28990.4812C54Dm-drogerie-market (11,684 MT)57-0.20580.22900.4348C55Denis Asia Pacific Pte Ltd (Ayam Brand) (698 MT)51-0.20870.24640.4551C56Lutosa SA (9,880)52-0.21160.20290.4145C57Asda Stores Ltd (17,693 MT)55-0.25800.2406-0.4986C58BASF (441,108 MT)54-0.26670.25800.5246C59COOP Denmark (825 MT)63-0.27830.22030.4986C60Aigremont (29,032 MT)56-0.29280.23480.5275C61Wm Morrison Supermarkets plc (13,861 MT)40-0.29570.23190.5275C62Amorepacific (23,064 MT)69-0.31300.20000.5130	C49	Brioche Pasquier (3,909 MT)	47	-0.1217	0.2522	0.3739
C51Fraser and Neave, Limited (44,000 MT)49-0.16230.29860.4609C52Nestle SA (452,719 MT)48-0.17970.30430.4841C53Dragsbaek A/S (26,771 MT)41-0.19130.28990.4812C54Dm-drogerie-market (11,684 MT)57-0.20580.22900.4348C55Denis Asia Pacific Pte Ltd (Ayam Brand) (698 MT)51-0.20870.24640.4551C56Lutosa SA (9,880)52-0.21160.20290.4145C57Asda Stores Ltd (17,693 MT)55-0.25800.2406-0.4986C58BASF (441,108 MT)54-0.26670.25800.5246C59COOP Denmark (825 MT)63-0.27830.22030.4986C60Aigremont (29,032 MT)56-0.29280.23480.5275C61Wm Morrison Supermarkets plc (13,861 MT)40-0.29570.23190.5275C62Amorepacific (23,064 MT)69-0.31300.20000.5130	C50	Bahisen Family (13,707 MT)	50	-0.1391	0.3043	0.4435
C52Nestle SA (452,719 MT)48-0.17970.30430.4841C53Dragsbaek A/S (26,771 MT)41-0.19130.28990.4812C54Dm-drogerie-market (11,684 MT)57-0.20580.22900.4348C55Denis Asia Pacific Pte Ltd (Ayam Brand) (698 MT)51-0.20870.24640.4551C56Lutosa SA (9,880)52-0.21160.20290.4145C57Asda Stores Ltd (17,693 MT)55-0.25800.2406-0.4986C58BASF (441,108 MT)54-0.26670.25800.5246C59COOP Denmark (825 MT)63-0.27830.22030.4986C60Aigremont (29,032 MT)56-0.29280.23480.5275C61Wm Morrison Supermarkets plc (13,861 MT)40-0.29570.23190.5275C62Amorepacific (23,064 MT)69-0.31300.20000.5130	C51	Fraser and Neave, Limited (44,000 MT)	49	-0.1623	0.2986	0.4609
C53Dragsback A/S (26,771 MT)41-0.19130.28990.4812C54Dm-drogerie-market (11,684 MT)57-0.20580.22900.4348C55Denis Asia Pacific Pte Ltd (Ayam Brand) (698 MT)51-0.20870.24640.4551C56Lutosa SA (9,880)52-0.21160.20290.4145C57Asda Stores Ltd (17,693 MT)55-0.25800.2406-0.4986C58BASF (441,108 MT)54-0.26670.25800.5246C59COOP Denmark (825 MT)63-0.27830.22030.4986C60Aigremont (29,032 MT)56-0.29280.23480.5275C61Wm Morrison Supermarkets plc (13,861 MT)40-0.29570.23190.5275C62Amorepacific (23,064 MT)69-0.31300.20000.5130	C52	Nestle SA (452,719 MT)	48	-0.1797	0.3043	0.4841
C54Dm-drogerie-market (11,684 MT)57-0.20580.22900.4348C55Denis Asia Pacific Pte Ltd (Ayam Brand) (698 MT)51-0.20870.24640.4551C56Lutosa SA (9,880)52-0.21160.20290.4145C57Asda Stores Ltd (17,693 MT)55-0.25800.2406-0.4986C58BASF (441,108 MT)54-0.26670.25800.5246C59COOP Denmark (825 MT)63-0.27830.22030.4986C60Aigremont (29,032 MT)56-0.29280.23480.5275C61Wm Morrison Supermarkets plc (13,861 MT)40-0.29570.23190.5275C62Amorepacific (23,064 MT)69-0.31300.20000.5130	C53	Dragsbaek A/S (26,771 MT)	41	-0.1913	0.2899	0.4812
C55Denis Asia Pacific Pte Ltd (Ayam Brand) (698 MT)51-0.20870.24640.4551C56Lutosa SA (9,880)52-0.21160.20290.4145C57Asda Stores Ltd (17,693 MT)55-0.25800.2406-0.4986C58BASF (441,108 MT)54-0.26670.25800.5246C59COOP Denmark (825 MT)63-0.27830.22030.4986C60Aigremont (29,032 MT)56-0.29280.23480.5275C61Wm Morrison Supermarkets plc (13,861 MT)40-0.29570.23190.5275C62Amorepacific (23,064 MT)69-0.31300.20000.5130	C54	Dm-drogerie-market (11,684 MT)	57	-0.2058	0.2290	0.4348
C56Lutosa SA (9,880)52-0.21160.20290.4145C57Asda Stores Ltd (17,693 MT)55-0.25800.2406-0.4986C58BASF (441,108 MT)54-0.26670.25800.5246C59COOP Denmark (825 MT)63-0.27830.22030.4986C60Aigremont (29,032 MT)56-0.29280.23480.5275C61Wm Morrison Supermarkets plc (13,861 MT)40-0.29570.23190.5275C62Amorepacific (23,064 MT)69-0.31300.20000.5130	C55	Denis Asia Pacific Pte Ltd (Ayam Brand) (698 MT)	51	-0.2087	0.2464	0.4551
C57Asda Stores Ltd (17,693 MT)55-0.25800.2406-0.4986C58BASF (441,108 MT)54-0.26670.25800.5246C59COOP Denmark (825 MT)63-0.27830.22030.4986C60Aigremont (29,032 MT)56-0.29280.23480.5275C61Wm Morrison Supermarkets plc (13,861 MT)40-0.29570.23190.5275C62Amorepacific (23,064 MT)69-0.31300.20000.5130	C56	Lutosa SA (9,880)	52	-0.2116	0.2029	0.4145
C58         BASF (441,108 MT)         54         -0.2667         0.2580         0.5246           C59         COOP Denmark (825 MT)         63         -0.2783         0.2203         0.4986           C60         Aigremont (29,032 MT)         56         -0.2928         0.2348         0.5275           C61         Wm Morrison Supermarkets plc (13,861 MT)         40         -0.2957         0.2319         0.5275           C62         Amorepacific (23,064 MT)         69         -0.3130         0.2000         0.5130	C57	Asda Stores Ltd (17,693 MT)	55	-0.2580	0.2406	-0.4986
C59         COOP Denmark (825 MT)         63         -0.2783         0.2203         0.4986           C60         Aigremont (29,032 MT)         56         -0.2928         0.2348         0.5275           C61         Wm Morrison Supermarkets plc (13,861 MT)         40         -0.2957         0.2319         0.5275           C62         Amorepacific (23,064 MT)         69         -0.3130         0.2000         0.5130	C58	BASF (441,108 MT)	54	-0.2667	0.2580	0.5246
C60         Aigremont (29,032 MT)         56         -0.2928         0.2348         0.5275           C61         Wm Morrison Supermarkets plc (13,861 MT)         40         -0.2957         0.2319         0.5275           C62         Amorepacific (23,064 MT)         69         -0.3130         0.2000         0.5130	C59	COOP Denmark (825 MT)	63	-0.2783	0.2203	0.4986
C61         Wm Morrison Supermarkets plc (13,861 MT)         40         -0.2957         0.2319         0.5275           C62         Amorepacific (23,064 MT)         69         -0.3130         0.2000         0.5130	C60	Aigremont (29,032 MT)	56	-0.2928	0.2348	0.5275
C62         Amorepacific (23,064 MT)         69         -0.3130         0.2000         0.5130	C61	Wm Morrison Supermarkets plc (13,861 MT)	40	-0.2957	0.2319	0.5275
	C62	Amorepacific (23,064 MT)	69	-0.3130	0.2000	0.5130

	Company name	Action ranking	Phi	Phi+	Phi–
C63	REMA 1000 Denmark (2,109 MT)	33	-0.3159	0.2290	0.5449
C64	Colruyt Group (112,600 MT)	60	-0.3217	0.2000	0.5217
C65	AAK AB (1,238,493 MT)	62	-0.3710	0.2203	0.5913
C66	Bayer AG (13,384 MT)	64	-0.3797	0.2232	0.6029
C67	Puratos Group NV (97,128 MT)	68	-0.3797	0.2348	0.6145
C68	S Group (1,443 MT)	66	-0.4145	0.1797	0.5942
C69	Chocoladefabriken Lindt & Sprungli AG (6,944 MT)	70	-0.4348	0.1884	0.6232
C70	2 Sisters Food Group (16,317 MT)	58	-0.4928	0.1275	0.6203



FIGURE 6: Sharpe ratio and CAL definition.



FIGURE 7: The GAIA analysis.



FIGURE 8: Efficient frontiers for screened and nonscreened portfolios.

For the means of the annual excess returns, Sharpe ratios of the best 20% portfolio are the best over the sample period. The observed Sharpe ratios for this period show that, in general, higher restrictions lead to a slightly lower riskadjusted return.

To broaden the perspective and leave the portfolios with target volatility behind, we further construct the efficient frontiers of these portfolios. Figure 8 shows the efficient frontiers for different portfolios according to the screening levels. The differences between the efficient frontiers tend to be significant, particularly between screened and nonscreened portfolios. The screened portfolios of the best 20% and best 50% are identical and turn out to be the most efficient frontiers. However, the efficient frontier of the best 50% portfolio shows a higher risk for a higher return. This could explain that a higher sustainability score in different criteria leads to more optimal portfolios in terms of risk and return. On the other hand, the nonscreened portfolio including all the stocks presents a less efficient frontier compared with all other portfolios. This finding confirms the existence of material return or material increase in risk if sustainability scores are included in the asset allocation process.

Figure 8 also presents the Sharpe ratio for each efficient frontier. The slope of the intersection of the CAL (Capital Allocation Line) with the diagram, which represents the Sharp ratio, has the highest for the best 20% efficient frontier and the lowest value for the ALL-efficient frontier.

#### 5. Conclusion

The main concerns of different parties in palm oil production and consumption including individuals and companies with respect to sustainability are CO2 emissions and environmental issues. Consequently, the responsible organizations such as RSPO will be under growing force to articulate more efficient policies for solving these issues. The tension caused by these concerns will not only affect palm oil suppliers but also affect the manufacturers of palm-based products. Hence, we can argue that although key initiatives in implementing sustainability solutions are taken by the most influential groups, the position of less powerful palm oil buyers could be significant.

Furthermore, investors increasingly incorporate sustainability aspects in their portfolios. Many investors are willing to own ethical companies in a sincere attempt to stimulate good corporate behaviour while expecting to not give up returns. In this study, we reviewed the existing, related studies and evaluated the developing shifts in manufacturers of palm-based products, underlining the significance of sustainability scores in the asset allocation decisions. We studied the effect of sustainability screening on optimal mean-variance portfolios for manufacturers of palm-based products according to their sustainability scores.

Our analysis was able to find a significant risk-adjusted return between portfolios. The findings show that the effects of changes in asset allocation in favour of high-rated sustainable investments significantly affect the adjusted risk returns of portfolios and show that sustainability integration can necessarily lead to higher returns and lower risk. Due to the increased risk, there is not much difference in the fluctuations. The big picture that emerges from our results is that screening investment portfolios for sustainability scores has a significant impact on portfolio returns, as well as an increase in Sharp ratios. Sustainable investment is becoming an emerging matter with the potential for long-term social and environmental impact. With the growing tendency in sustainable investment, financial capital might diverge into those companies that contribute to a cleaner environment and a better society. The manufacturing companies that are considering sustainable production would have a competitive advantage through utilizing opportunities and preventing risks on more and more sustainability-driven markets that lead them to a stronger financial and market performance. Our findings are obviously relevant to manufacturing companies, particularly manufacturers of palm-based products, considering the significance of sustainability scores in their market value. Fund managers and investment analysts might consider the implementation of sustainability screens in implying that it may enhance their performance. As there was no official database for some parts of cost elements, the estimations were asked to help. Considering the fact that COVID-19 has raised the awareness and concerns of sustainability, we expect that the sustainable investment perform even better in the post-COVID-19 world in comparison to the pre-COVID-19 era. Moreover, our findings could be useful to private and institutional investors in constructing and managing their portfolios. For future studies, these directions have been suggested: [44, 45].

- (i) Considering the Fuzzy inference system for forecasting the demand of palm buyer
- (ii) Considering uncertainty for input data such as price
- (iii) Considering other different scenarios for the palm buyer such as recession and market boom

#### **Data Availability**

Data are available in the article appendix.

The authors declare that they have no conflicts of interest.

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