

Essay

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SUBMITTED BY

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I. Introduction

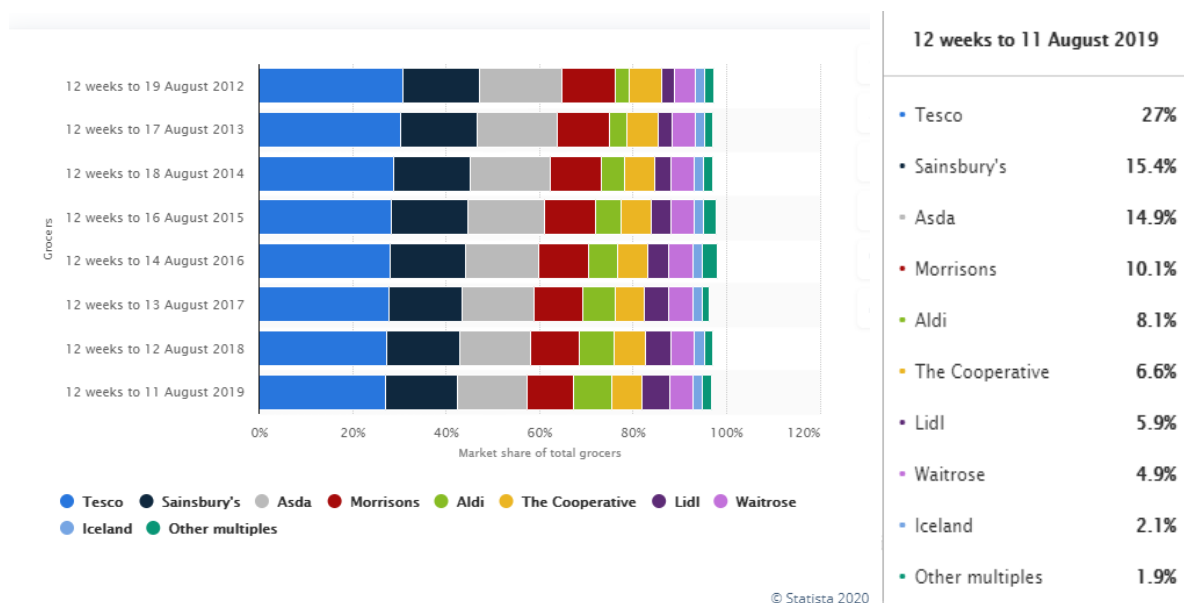
It was 101 years ago when Tesco founder, Jack Cohen sold his first surplus groceries on a market stall in the London Borough Hackney (Clark and Chan,2014). Thus, in the following years, an exemplary success story was written, manifesting Tesco as the UK's largest supermarket chain with a dominating market share of 27%. In the last six years, the company underwent difficult times, including accounting fraud, the loss of market share to the discounter rivalry, the highest profit loss in the UK history, and finally, the fading trust of customers and employees (cf. BBC,2019). The wind has turned with the recruitment of CEO Dave Lewis in 2014, who is referred to as 'the bloke that saved Tesco' (BBC,2019). In the framework of the latest announcement of Lewis' resignation as chief executive as of autumn 2020, it is worth taking a closer look at the financial position and development in the last five years. The first part of this paper will highlight the history, the business model, particularly the marketing strategy of the company, macro-environmental forces impacting its financial performance (including political, legal, and economic forces), the change in leadership, and the market place of Tesco in relation to its major industry rivals (Part A). In the second part, the financial health and performance of the Tesco company will be assessed through a financial ratio analysis focusing on inter alia the gross profit margin, the operating profit margin, the return on asset, return on equity, and the current ratio by evaluating Tesco's Annual Reports of the last five years (2016-2020). Tesco will be benchmarked against the ratios of Sainsbury's as the second-largest supermarket chain in the UK and Tesco's major competitor. As a source of comparison Sainsbury's Annual Report of 2020 will be consulted (Part B). In the last part of this essay, an investment decision will be demonstrated on basis of two mutually exclusive projects. The capital investment appraisal will comprise the common techniques, namely the payback period (PBP), the accounting rate of return (ARR), and the net present value (NPV). The factors will be determined and evaluated in Part C- 1 where a recommendation will be made which project should be adopted by the company concerned. In Part C-2 the PBP, ARR, NPV, and the Internal Rate of Return (IRR) will be critically analysed as generic techniques to evaluate capital projects.

Part A

Tesco, a British Public Limited Company (PLC) is a multinational food retail chain and general merchandiser with its headquarter in Hertfordshire, United Kingdom (Forbes,2020). The company history dates back to 1919 with founder Jack Cohen selling surplus groceries from a market stall in the East End of London (Clark and Chan,2014). In 1924 the Tesco brand was established, followed by the opening of a flagship store (1929), the construction of a headquarter and warehouse (1930) in North London, and the formation of a private limited company in 1932 (Clark and Chan,2014). Today, Tesco is the biggest retailer in the United Kingdom and the country's largest employer with a workforce of ca. 330,000 and operating in 12 countries in Europe and Asia (Winterman,2013. As of August 2019, Tesco's market share in the UK amounts to 27% (cf. Wunsch,2019). Tesco's biggest competitors in the UK are Sainsbury's with a market share of 15,4%, Asda with a market share of 14,9 %, and Morrison (10,1%) (status of August 2019, cf. Wunsch, 2019, Figure 1). In 2014 the former Unilever CEO Dave Lewis took the position as Tesco's Chief Executing Officer replacing Philip Clarke after the failure of business and withdrawal from the U.S. and Japanese market to increase

sales and growth in the UK market which comprised the Lion's share of the company's revenue (cf. Fletcher and Thesing,2014). The company experienced the worst decrease in sales for the last 40 years and Tesco shares suffered significantly losing about 30% of their value (Fletcher and Thesing,2014) and published a profit warning in December 2014 (BBC,2014). Moreover, after Lewis started his position as chief executive, Tesco was involved in an accounting scandal, a legacy of Lewis's predecessor, and experienced one of the worst losses in UK history of GBP 6,4 million (Vizard,2015) with the declining trust of the customers and market loss to the discounters (BBC,2019). Under the leadership of Lewis, the retailer opened the discount chain Jack in 2017 to take on the German discounters Aldi and Lidl (BBC,2019). Also in 2017, Tesco acquired wholesaler Booker (for GBP 3,7 bn.) resulting in an increase in sales of 2,3% in its first fiscal quarter in that year and reported the highest sales growth in the UK for the last 7 years. (Davey,2017). However, the rise of inflation and the currency devaluation of the GBP (macro-environmental forces) since the BREXIT referendum in 2016 impacted the retailer significantly in 2017. (Davey,2017). In October 2019 Lewis announced his resignation (Wood,2019), continuing his position until Walgreen Boots COO takes over as chief executive (which is expected by October 2019 (Wise,2020). Noteworthy, during the Covid-19 pandemic group sales increased by 8% to 13,4 billion (from March until May 2020) (cf. Bursby,2020). As the figures demonstrate Tesco is dominating the food retail market in Europe and presents a market leader in the UK (cf. Figure 1). Its business model has been dynamic and 'aggressive' in the last decades adapting consumer trends and expanding its business. The company understands how to satisfy the needs and wants of the mass market, particularly with the production of its own private label 'Value' Tesco (launched in 1993) generates an annual turnover of GBP 1 billion providing its customers with cost-effective groceries (Winterman,2013). Its marketing strategy comprises concentric and heterogeneous diversification in new markets, including banking, insurances, clothing, the mobile communication industry, petrol stations, but also its implemented distribution strategy of providing an online shop enabling consumers to shop from home (Tesco.n.d). Tesco is capitalising on the economy of scale and holds a tremendous bargaining power over large manufacturers and suppliers (Winterman,2013). The most significant sales promotion of the company is the introduction of the customer loyalty card, namely the Tesco Clubcard which resulted in great success (Winterman,2013). This loyalty and incentive scheme allowed gaining data to analyse customers buying behaviour and further adapt marketing strategies (Winterman,2013). Finally, firmly anchored in the corporate culture and history is the expansionism of Tesco unchanged until the present day. The philosophy of dominating through 'owning' shops dates back to company founder Cohen who acquired more than 500 new stores between 1955-1960, followed by a 'big deal' taking over the competitor 'Hillards' in 1987 (cf. Clark and Chan, 2014). In this framework two business models were decisive for Tesco's success story through which a competitive advantage was gained, the innovation of 'out-of-town-superstores in the 1990s and the small shops in-town, namely 'Tesco Metro' stores in 1994 which was expanded by 'Tesco Express' (Winterman,2013).

Figure 1: 'Market share of grocery stores in Great Britain from August 2012 to August 2019' (Wunsch,2019)



Part B (Financial Statement Analysis)

Financial ratio analysis is an instrument to examine and compare the performance of an organisation regarding a certain period of time benchmarked against at least another company in the same industry. In this part of the essay, the financial performance of Tesco PLC between 2016-2020 will be assessed.

▪ Research Methodology

The financial ratio analysis has been calculated on basis of the Annual Report (balance sheet and income statement) of Tesco PLC from 2014-2020 compared to the ratio of Sainsbury's in 2020 which presents the company's major rival in the same industry. The Annual Reports of both companies have been downloaded from the Tesco and Sainsbury's website and will comprise the major source underlying this analysis. On grounds of this data the profitability, liquidity, operational efficiency, and solvency of Tesco will be evaluated, after highlighting the market position of the company. Finally, the gearing ratios on basis of the Debt-to-Equity and Debt-to-capital ratio will scrutinised. The findings serve as a decision-making tool for (potential) investors analysts whether the profitability for investors can be affirmed according to the financial health of the company, namely its performance over time and anticipated development (cf.Bloomenthal,2020).

Tab 1. Ratio Analysis Tesco (2016-2020) and Sainsbury's (2020)

Tesco	2016	2017	2018	2019	2020	Sainsbury's
Gross profit margin	5.15%	5.40%	5.91%	6.60%	7.55%	7.91%
Operating profit margin	1.73%	2.29%	2.86%	3.45%	3.88%	0.88%

Net profit margin	0.65%	0.91%	1.49%	1.88%	1.44%	0.52%
Fixed asset turnover	3.04	3.09	3.10	3.36	2.48	2.11
Total asset turnover	1.25	1.23	1.29	1.31	1.24	1.04
Return on Asset	0.81%	1.11%	1.92%	2.46%	1.79%	0.54%
Return on equity	4.10%	7.90%	8.19%	8.11%	7.04%	1.96%
Current ratio	0.740185	0.783664	0.705739	0.607834	0.718414	0.629368
Quick ratio	0.616922	0.664032	0.588107	0.481286	0.582696	0.485598
Cash ratio	0.156336	0.198659	0.210989	0.141006	0.261393	0.089317
Debt to equity ratio	1,57	0,71	1,79	1,31	1,59	2,59
Debt to capital ratio	0,61	0,41	0,64	0,57	0,61	0,72

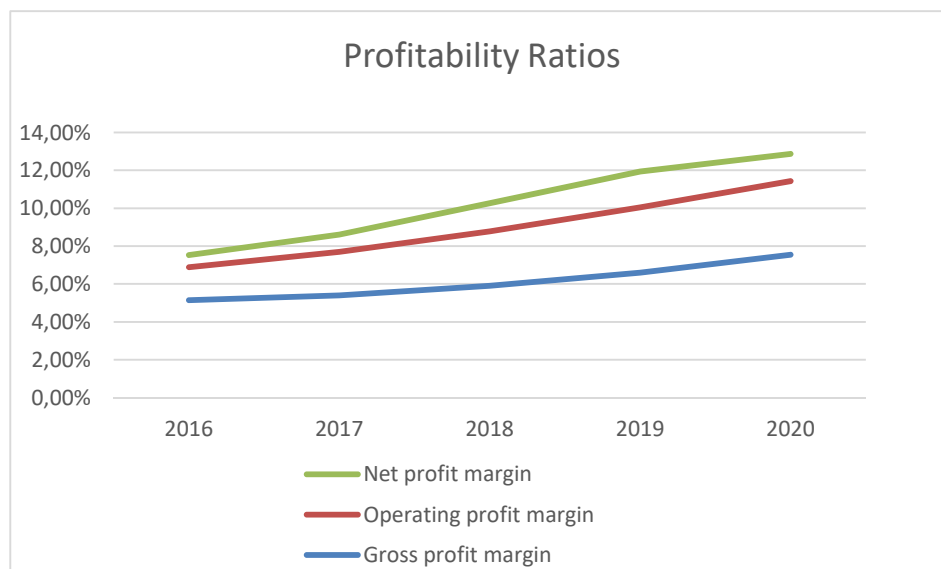
Source: Annual Financial Reports of Tesco and Sainsbury's

Profitability Ratios

The object and purpose of profitability ratios are the evaluation of the overall performance, namely, the efficiency and the effectiveness of the company regarding returns generated on sales and investment and revealing the operational health due to its activities (Goel,2016). The profitability ratios are classified in margins (converting sales into profit) and returns (the competence of gaining returns for the company's shareholders)(Goel,2016).

Tab. 2 Profitability ratio of Tesco (2016-2020) and Sainsbury's (2020)

Tesco	2016	2017	2018	2019	2020	Sainsbury's 2020
Gross profit margin	5.15%	5.40%	5.91%	6.60%	7.55%	7.91%
Operating profit margin	1.73%	2.29%	2.86%	3.45%	3.88%	0.88%
Net profit margin	0.65%	0.91%	1.49%	1.88%	1.44%	0.52%



Sales constitute a decisive factor to propel the gross and operating profit. According to the group retail statistics of Tesco the number of stores in the last five years has risen significantly from 6733 in 2016 to 7005 in 2020. Tesco's Gross Profit Margin and Operating Profit Margin gradually have risen in the last five years. This aforementioned internal factor may impact the sales growth of the company due to the opening 273 stores in the past five years. As of March 2019, the total Sainsbury's stores included 1428 grocery stores in the United Kingdom (Wunsch, Sainsbury's, 2019). While Tesco opened stores in the past five years, its major competitor Sainsbury's announced in September 2019 its intention to close 100 stores (inter alia 15 large supermarkets and additionally 70 Argos stores) which is reflected by its performance (Middleton, 2019). The results of Sainsbury's are, therefore, lower since the company is reducing market space reflecting a inferior market share and sales. Having regard to the demographic development in the UK in the last years the external factor needs to be taken into account since it impacted the demand and preferences of food products. Estimates reveal a rise of population to 73,2 million in 2035 resulting in a continuous increasing demand of groceries which self-explanatorily will lead to a constant increase in sales of the retailers. (McCorquodale, 2016).

However, it must be acknowledged that the profit margins in the retail food sector are low compared to other industries since they are operating on low prices, particularly regarding groceries (cf. Ross, 2020). Furthermore, the industry rivalry and the bargaining power of the buyer is very high since the consumer can choose from many food stores, especially discounters such as Aldi and Lidl. (cf. Ross, 2020). In the present case, Tesco increased its overall profitability gradually since the Net Profit Margin ratio rose constantly from 2016 - 2019, with a slight increase in 2020. The Net Profit Margin is the 'ultimate' indicator of the profit a firm generates, since this ratio reveals how much revenue is converted into profit (Goel, 2016).

The figures reflect that from every pound of sales Tesco made 1,88 p in 2019, while in 2020 it made 1,44p. A plausible reason for the decrease of the Net profit Margin could be an increase of sales costs or Tesco's Gross Profit Margin has increased on a slower pace than sales. Sainsbury's Net Profit Margin is significantly lower than Tesco's with 0,52%. Tesco's Gross Profit Ratio has also increased from 5,15 % in 2016 to 7,55 % in 2020 which is lower compared to Sainsbury's Gross Profit Ratio of 7,91 %. It demonstrates that for every pound

of sales Tesco made 7,55p gross profit in 2020. The Gross Profit Margin indicates the profitability of sales before any expenses are considered and is necessary for companies ability to pay its operating expenses (Goel, 2016). The higher the Gross Profit Margin the better for the company (Goel,2016).

The Operating Profit ratio is also referred to as operating expense ratio and illustrates the expenses the company made to cover its cost of operation and reflects therefore the company's management of efficiency to keep costs low while gaining revenue or sales (Murphy,2020). The lower the Operating Profit ratio the better the operating cost efficiency in case of decreasing revenue (cf. Goel,2016). The ratio, however, increased in the last five years which demonstrates that Tesco is operating on higher cost. Particularly, the Covid-19 pandemic led to an increase of the operating profit for the actual financial year (as of 29 February 2020) (cf. Marris,2020). On the contrary Sainsbury's Operating Profit Ratio is lower than Tesco's which enables them to operate on a lower cost.

Having regard to the accounting fraud and the loss of customer trust in 2014 and the change of leadership with Dave Lewis starting as CEO in 2014, the figures underline the gradual recovery from the scandal and its ramifications, particularly from 2016. In fact, in 2017, Tesco reported its highest sales growth in 7 years (Davey,2017). These factors effected Tesco's overall performance which was revived by measures taken by the leadership, particularly the purchase of wholesaler Brooker contractually finalised in January 2017. Furthermore, in order to battle the low prices of German discounters Lewis focused on low prices and new and streamlined product ranges, improvement of customer service and supplier relationship (Davey,2017). Tesco's stable market share in the last five years underlines the loyalty of its customers which was enhanced through marketing strategies such as the customer loyalty scheme (for example with the 'Tesco Clubcard') as mentioned above (cf. Figure 1).

Tab. 3 Liquidity Ratios of Tesco's (2016-2020) and Sainsbury's (2020)

Tesco	2016	2017	2018	2019	2020	Sainsbury's 2020
Current ratio	0.740185	0.783664	0.705739	0.607834	0.718414	0.629368
Quick ratio	0.616922	0.664032	0.588107	0.481286	0.582696	0.485598
Cash ratio	0.156336	0.198659	0.210989	0.141006	0.261393	0.089317

The liquidity reflects the capacity of an organisation to repay short-term debts (Mueller,2019). The higher the liquidity ratios the better the firm's working capital health and future prospects are (Goel,2016). On the other hand, the ratios shall not be too high since this would imply unutilised resources which are not implemented efficiently (cf. Collier,2009). The liquidity ratios comprising the 'current ratio', which 'measures the organisation's current assets against its current liability' and includes inventory as a current asset; a high ratio signifies that the company is able to meet its short-term debts whereas an extraordinary current ratio implies idle current assets (Goel,2016). The quick ratio, which concentrates on more liquid assets and does not include inventory would be ideal in a proportion of 1:1 (Bragg,2018). The cash ratio which is also known as super quick ratio, focuses on cash and cash equivalents (cf. Goel,2016).

Tesco as a retail chain has a large number of short-lived inventories comprising of groceries and other goods, which are sold quickly with cash in return. The latter leads to a generally low Current Ratio in the retail industry compared to other sectors.

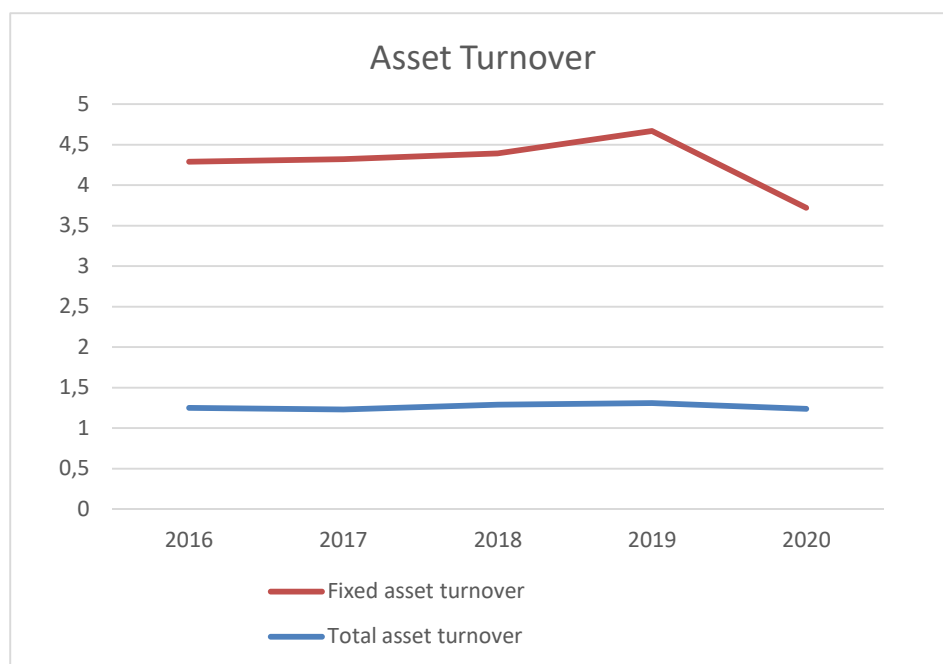
The liquidity ratio analysis of the selected companies Tesco and Sainsbury's are discussed in table 3. From 2016-2020 the current ratio of Tesco has decreased from 0.74 to 0.71 which is very minute. The quick ratio has shown a similar trend as the current ratio; a minor decline can be observed which can be considered as insignificant. The cash ratio gives high confidence to the investors and creditors the company has enough cash to meet its very short term obligations and dividend obligations.

When benchmarking against Sainsbury's the Tesco's liquidity ratios are higher. This could be caused by lower cash resources of Sainsbury and slow cash conversion. Furthermore, the reason might be the relatively higher accounts payable of Sainsbury in comparison to its sale.

▪ Efficiency Ratios

Tab. 4 Efficiency ratios of Tesco's (2016-2020) and Sainsbury's (2020)

Tesco	2016	2017	2018	2019	2020	Sainsbury's
Fixed asset turnover	3.04	3.09	3.10	3.36	2.48	2.11
Total asset turnover	1.25	1.23	1.29	1.31	1.24	1.04



The Fixed Asset Turnover Ratio is a tool to measure the effectiveness of a company utilising its fixed assets to create sales (Green,2019). The Total Asset Turnover (TAT) ratio measures

'how many dollars/GBP the company gains from each dollar/pound invested in its property, plant, and equipment (PPE) (Business Literacy Institute,n.d.). The higher the turnover the higher the efficiency of capital investments (Business Literacy Institute,n.d.)

The observed numbers of Tesco from 2016-2020 the numbers are exceptionally well. In the retail sector, these numbers are usually around 2. The reason behind the relatively better utilisation of Tesco is that it hasn't put in much investment in PPE but is however able to generate appropriate sales.

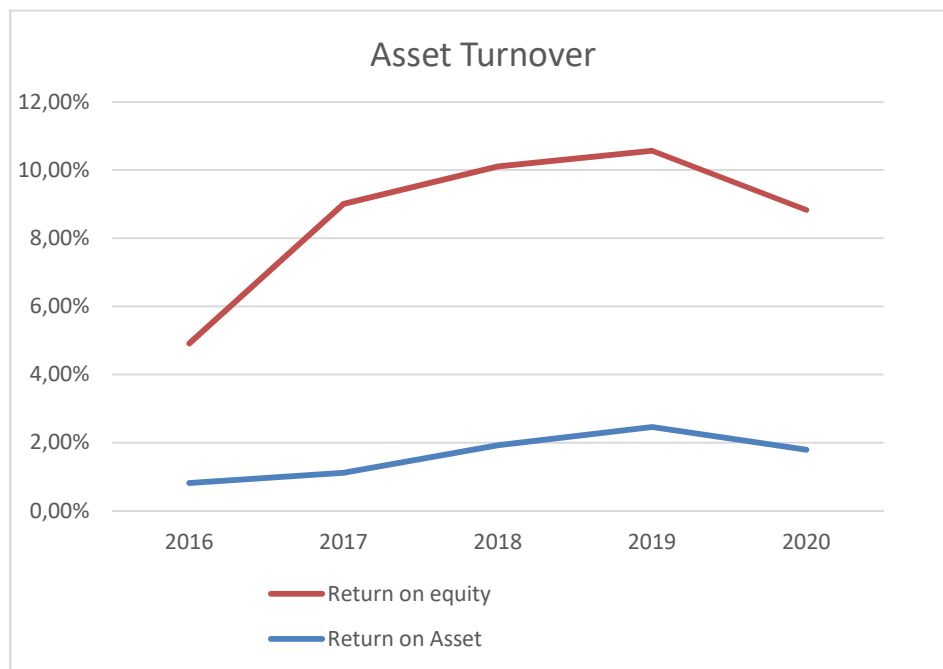
When these numbers are compared to Sainsbury it can be stated that Sainsbury isn't able to generate much sales from the large number of fixed assets employed. It is due to the inefficient utilisation of large property occupied by the company.

The TAT of both companies are relatively similar which means that both, Tesco and Sainsbury's perform on a similar efficiency level utilising their assets.

▪ Investment Ratios

Tab. 5 Investment Ratios of Tesco's (2016-2020) and Sainsbury's (2020)

Tesco	2016	2017	2018	2019	2020	Sainsbury's
Return on Asset	0.81%	1.11%	1.92%	2.46%	1.79%	0.54%
Return on equity	4.10%	7.90%	8.19%	8.11%	7.04%	1.96%



Shareholders have a legitimate interest regarding the profitability of their capital invested in a specific organisation. The Return on Assets (ROA) indicates the profitability of a company in relation to its total assets (cf. Hargrave,2020).

The Return on Equity (ROE) measures the company's financial performance regarding its net income divided by the shareholders' equity (Hargrave,ROE,2020).

In five years (2016-2020) the ROA of Tesco can be considered volatile started from 0.81%, increasing to 2.46%, and decreasing again to 1.79%.

On the other hand, the ROE of Tesco seems to be qualified as average for a retail company which usually amounts to 7-9% and should not alarm shareholders. The average figures, rather underline the fact that the company is on the right path utilising its equity and a mixture of debt financing and equity financing appropriately.

The increase of the ROE over the past years could be caused by the profit margin. The higher it is the higher the net income will be, which will improve the ROE. The increase in sales as a driving force inevitably will improve this ratio. In the retail (food) sector, the industry is quite competitive and the profit margin is relatively low. Increasing selling prices are not an option and would weaken the competitive advantage of the company. However, a higher productivity would lower the production costs and hence increase the margin. As mentioned above there are many internal and external factors which influenced the profit margin of Tesco in the past years (Changes of Leadership, recovering from the accounting scandal through implemented means etc.). Noteworthy, the fiscal year of Tesco's ended on 29 February 2020. Consequently, the ramification of the COVID-19 pandemic was in its beginning and did not impact the profit margin significantly. Compared to Sainsbury's Tesco's ROE is significantly higher and would raise the investors' interest in Tesco shares rather than Sainsbury's. Given the similarity of utilising the mixture of debt and equity financing, it demonstrates the inefficiency of Sainsbury's of creating earnings from its equity.

▪ Gearing Ratios

Tab. 6 Gearing Ratios of of Tesco's (2016-2020) and Sainsbury's (2020)

Tesco	2016	2017	2018	2019	2020	Sainsbury's
Debt to equity ratio	4.068245	6.09526	3.275483	2.299784	2.939887	2.594108
Debt to capital ratio	0.802693	0.859061	0.766108	0.69695	0.746186	0.721767

The Debt to Equity ratio is also referred to as leverage or gearing ratio. It is part of the solvency ratios where the company's ability is measured to repay its long-term debts and is an essential tool for financial risk analysis for the company to determine its survival perspective (cf. Goel,2016). The debt-to-equity ratio calculates compares the amounts of debts (from external sources) and financial liabilities with the utilised shareholder's equity to finance the growth of the company (cf. CFI,DtE,n.d).

A high debt-to-equity ratio reveals that the company has based its growth on a bulk of borrowed money, whereas lower equity shows that the company is utilising its equity financing its growth. However, the average debt-equity ratio should be 2:1, since a too low debt-equity ratio may underline that the company is not utilising increased profits from

financial leverage (Goel,2016). The debt-to-equity ratio of Tesco from 2016-2020 have been volatile with a tendency of a higher debt than equity. Consequently, the company is financing its assets through debts rather than through its the shareholder's equity which can be qualified as a risky practice in case of a business downturn.

In comparison, Sainsbury's debt-to-equity ratio is lower than the average figures of Tesco in the past five years. As a result, Sainsbury's is utilising its retained earnings to finance its assets rather than piling up debts.

The Debt-to-Capital Ratio measures the utilisation of debts compared to its external resources and shareholder equity (cf. Capital,2020). The debt-to-capital ratio is comprises a valuable tool to measure the level of risk since a high debt-to-capital ratio result in riskier prospects. For example, a downturn in sales may lead to solvency issues (cf. Efinance,n.d.). In 2016 and 2017 the the debt-to-captial ratio was quite high with 0,80 and 0,85 respectively. However, a declining trend until 2019 (with 0,69) can be observed. In 2020 the debt-to-capital ratio rose slightly and is at a similar high to its competitor Sainsbury's.

▪ Limitation of the ratios

In the framework of financial statement analysis, the ratio analysis presents an essential method to evaluate an indicator and trend of a company's financial status quo and future prospects (Goel,2016). This technique is a useful instrument analyse the profitability, efficiency, liquidity, and solvency of an organisation regarding a specific through the years serving as a decision-making tool for creditors, (potential) investors, and bankers (Goe,2016). It is necessary to compare the organisation concerned with another organisation of the same industry in order to evaluate its performance appropriately. Nevertheless, financial ratios hold several limitations which shall be discussed.

First of all the financial ratios rely on the source they are based on which are the financial statement of the firm concerned. Consequently, they are as 'reliable' as the source they are based on, namely the financial statement of the firm (Goel,2016). Furthermore, ratios reflect historical data to predict current and future development. In addition, some costs refer to historical data and some comprise more 'current costs', for example, the balance sheet reflects historical costs, whereas the income statement current costs which may lead to atypical results (Bragg,2019). Moreover, not all ratios are useful giving rather an indicator for the current situation than a reliable future perspective and might be considered as 'incomplete', particularly against the backdrop that even meaningful ratios are only valuable and informative if they are benchmarked with other companies in the same industry (Goel,2016). Another limitation comprises the definition of the ratios which can vary. Consequently, the parameters are not unified, particularly in different industries, which may lead to a limitation regarding the standards the ratio analysis is based on (Goel,2016). In this framework, it has to be mentioned that each industry may reflect typical industry-related results as for the food industry, for example, the profit margins are low. More specifically, each company is different, has various approaches and accounting policies, and diverse end dates of the financial year, hence cannot provide a sufficient comparative base which also may lead to insignificant results (cf. Bragg,2019).

- Conclusion and recommendations

In summary, the ratio analysis of Tesco Plc reveals that in the past five years (FY 2016-2020) the overall performance of the company can be qualified well and indicates a good future prospect. The time frame of this present analysis starts in 2016. Given the fact that Tesco announced its record annual loss of 6.4 bn. and had to deal with scandals and the figures can even be considered as exceptional. It emphasises that the leadership of this company utilised marketing and financial strategies to meet the external and internal forces threatening the company. Against the backdrop of the unprecedented times due to the COVID-19 pandemic, Tesco should keep amending its strategies. As mentioned beforehand, Tesco has a historical tradition in adapting to customer needs and is highly recommended to read the signs of the "new normal" and changes that our society is facing now. The changes in consumers' purchasing habits and behaviour will most likely remain post-pandemic with a boost of digital commerce (cf. Accenture,2020). Tesco implemented already an online shopping platform in the UK which has the potential to grow to meet the needs and wants of customers. This will be the future strategy to boost the growth of the company internationally and expand the online grocery shopping method in other countries besides the UK.

Part C

In this part, a capital investment appraisal will be assessed based on two mutually exclusive projects. The objective of an investment appraisal is the evaluation of the economic prospects of the suggested long-term investment project (Savvides,1994). Through this methodology, the estimated return is evaluated on grounds of predicted (incoming) cash-flows considering the project risk variables (Savvides,1994). There are different criteria on which a capital investment appraisal is based on, including the payback period, the accounting rate of return, and discounted cash flow techniques (Kenton,2020). These capital investment appraisal 'techniques' guide the decision whether a long-term investment in a project will generate either profit or results in cost savings during the period of the project to an amount that outnumbers the investment costs (cf. Kenton,2020). As a minimum prerequisite, the investors will expect is to recover the cost of an investment, however, the latter may lead to a loss due to the inflation rate. Besides the aforementioned techniques to evaluate an investment decision, other decisive factors need to be taken into account, such as the period of investments and external factors, including the interest and inflation rates (cf. Jones,2002). The underlying capital investment appraisal techniques to evaluate the present projects are the PBP, the ARR, NPV, and the IRR (cf. Kenton,2020). On these grounds, the decisions will be made regarding the adoption of a long-term investment project (cf. Kenton,2020).

1.

Project A

The Payback Period (PBP) for project A amounts to 2,75 years or 2 years and 9 months. The Net Present Value of project A amounts to 2,71 million GBP. The Accounting Rate of Return (ARR) for project A amount to 0,125 or 12,5 %.

Project B

The PBP for project B amounts to 3,19 years or 3 years 2,22 months. The NPV for project B amounts to 3,43 million GBP. The Accounting Rate of Return (ARR) for project A amounts to 0,11 or 11 %.

The maximum profit will be achieved with project B (22 million GBP) whereas the net cash inflow (total profit) of project A amounts to 15 million GBP after an investment period of 4 years. However, the PBP is lower in project A compared to project B. From a liquidity point of view project A is more favourable as it would decrease the risk (management). Due to the lack of further elaboration on the company potentially investing in the mutually exclusive project. No statements can be made regarding the status quo of liquidity of the investor concerned. However, as the investment reaches its break-even point already after 2 years and 9 months in comparison to project B where it takes 3 years and 2 months to recover from the investment costs which constitutes a difference from merely 5 months, project B may be more favourable on the basis that the liquidity health of the investor is given. It should be taken into account that Brexit and the Covid19 situation will have an external impact on the economic situation. There is no end in sight of the economic crisis while experts predict that the economy will only recover slowly from the impact of the crisis. This uncertainty of economic developments may be considered.

The NPV is higher in project B which emphasizes the decision to adopt this project. Since the NPV takes into account the time value of money and takes into account all the cash flows coming in during the life of the project (see below) it is more preferable to evaluate the capital investment with this method. The difference is significant regarding the NPV as it is GBP 3,43 million in project B and merely GBP 2,71 million in project A. Furthermore, it is a method that indicates the absolute measure of the benefits of the project which underlines the decision that project B should be adopted. The IRR does not present a wise technique when evaluating mutual projects. The IRR disregards the discount rate whereas the NPV considers the discount rate (see below).

The ARR is 1,5 % higher regarding project A. This technique focuses on the whole profitability of the investment project and provides a percentage return. The drawback of this investment appraisal method comprises that it does not take into account the time value of money. As mentioned beforehand the NPV seems to be the strongest technique for the present capital investment appraisal.

Since the ARR and PBP are flawed and is the more accepted method to evaluate the project value, it must be stated that project B is more favourable.

2. The Advantages and Disadvantages of PBP, NPV, and IRR

- **The Payback Period**

The Payback Period is a method that determines *'the amount of time to recover the cost of an investment'* (Kagan,2020).

The advantage of the Payback Period technique (PBP) is obviously a simple way to calculate and the economic merits are easy to comprehend (cf. Shaikh,n.d.). Therefore, it comprises a popular technique amongst managers to appraise investment projects since the PBP is quickly evaluated which enables swift managerial decisions (cf. Efinancemanagement,2020). Moreover, risk management is considered against the backdrop of uncertain industry developments, since early cash flows within a project with shorter payback periods provide certainty and reduces the chances of loss (Efinancemanagement,2020). Moreover, the PBP is calculated on basis of cash flows and not accounting net income which is considered as an advantage (cf. AccountingTools,2020). Finally, the method is an useful tool to focus on liquidity within the investment appraisal. Particularly, small businesses rely on the liquidity which was initially invested in a project with a short payback period. A shorter payback period decreases that risk as rapid recovery from the initial investment can be decisive for reinvestment in other projects (Maverick,2019).

The limitations of the PBP are as manifest as its advantages. Firstly, the incoming cash-flows are considered until the break-even point is reached. Consequently, the cash flows coming in after the initial investment is recovered are ignored which leads to failure to consider the overall profitability of the investment project concerned (cf. Maverick,2019). Therefore, the method is not taking into account all the investment risks, such as the inflation risk or the financing risks (cf. Shaikh,n.d.). The PBP method lacks taking into account the time value of money as the cash flows are not amended correspondingly (cf. Maverick,2019). Furthermore, the PBP analysis does not consider the "reality" of capital investments where

cash flows come in and can be steady or followed by cash outflows, particularly regarding the scope and timing of cash flows (Maverick,2019).

- The Net Present Value (NPV)

'The Net Present Value is the present value of the cash flows which are received in that the required rate of return of a project compared to your initial investment' (Gallo,2014). It is the 'difference between the present value of cash inflows' and outflows during the entire life of the project to evaluate the profitability of an investment project (Kenton,NPV,2020)

The advantage of the Net Present Value technique comprises the fact that this method considers the time value of money, and all cash flows (positive and negative) during the entire life of the capital investment project, discounted to the present (CFI,n.d.). It is taking into account the conventional and unconventional cash flows. It does take into account the time value of money and takes into account changes over the life of the project which is essential for long projects regarding risk management (cf. Mendell,2020). Like the PBP, the NPV is calculated on basis of cash flows and not accounting net income. It is a suitable method to conclude the capital investment appraisal for any size of investment projects, it is uncomplicated to calculate, focuses on cash flows rather than net earnings (Mendell,2020). It is considering conventional as well as non-conventional cash-flows.

The limitation of the NPV can be found in the determination of the discount rate which applies for the entire life of the project. The issue in this framework may lie in the instability of the discount rate with annual fluctuations and the cost of capital also may vary over the lifetime of the project.(Mendell,2020). In addition, the future cash flows cannot be predicted accurately, although this may be a shared limitation of all methods. Furthermore, it fails to consider other costs that can influence the value of money (Kenton,NPV,2020)

- Internal Rate of Return (IRR)

The IRR is like the PBP and NPV a metric to evaluate capital investment project. *It is a discount rate that makes the NPV of all cash flows (positive and negative) equal zero in discounted cash flow analysis.* (Hayes,IRR,2020).

The advantages of the IRR comprises that it is simple to apply and considers the time value of money. (Lanctot,2019). Another advantage presents the fact that the cost of capital is not required for this method restricting the risk of utilising an incorrect rate. It enables to choose projects where the IRR is outnumbering the cost of capital (Lanctot,2019).

A disadvantage concerns particularly, mutually exclusive projects since the IRR ignores the size of the projects since the method compares the amount of capital invested with the cash flows. This leads to insufficient results when the amount of capital invested involved, differs enormously and the smaller capital brings a higher IRR. For example, the project value of Project A is 1 million comprising an IRR rate of 18, whereas project B requires an investment of 10.000 USD with an IRR of 50%. This would lead to a less profitable result that the small project is qualified as preferable (with a profit of 5000 USD) although the benefit of Project A is 180.000 USD. (Efinancemanagement,IRR,n.d). Moreover, the IRR disregards future costs

of a project, for example, the investment in real estate inevitably brings maintenance costs which might change over time (Lancot,2019). Finally, the IRR method does not consider the reinvestment rate since it implies that cash flows can be reinvested at an equal IRR rate which lacks practicality.

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Appendix A - Formulas

Profitability ratios

- Gross Margin = Gross profit/sales
- Operating Margin = Operating Income/Sales
- Net Profit Margin = Net Income / Sales

Asset Efficiency

- Asset Turnover = Sales / Total Assets
- Fixed Asset Turnover = Sales / Fixed Assets

Investment Returns

- Return on Equity = Net income/ Book Value of Equity
- Return on Assets = Net income / Total Assets

Liquidity Ratios

- Current Ratio = Current Assets / Current Liabilities
- Quick Ratio = current assets-inventory
- Cash Ratio = cash/ current liabilities

Leverage (Gearing) Ratios

- Debt-to-Capital Ratio = Total Debt / Total Equity + Total Debt
- Debt-Equity Ratio = Total Debt / Total Equity