ISCTE Business School
Instituto Universitário de Lisboa

MARKET SEGMENTATION AND POSITIONING STRATEGIES

Huivue Shen

ISCTE Business School
Instituto Universitário de Lisboa

Goodwill Impairment: A Comparative Study Under US GAAP, IFRS, and China GAAP

Huiyue Shen

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Supervisor:

Prof. Maria do Rosário Costa e Silva da Veiga, Iscte- Business School, Departamento de Contabilidade (DC)

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ABSTRACT

According to the current international financial accounting standards (IFRS), goodwill is no longer amortized, but an impairment test should be performed at the end of each year. Once an impairment loss is confirmed, it cannot be reversed. This study aims to compare the causes and impact of the goodwill impairment losses with prior researches. The cases of Kraft Heinz Company, Dalian Zeus Entertainment Co., Ltd, and Bayer Group that disclosed impairment losses in the fiscal year 2018 reporting under US GAAP, China GAAP and IFRS are analyzed and compared. Our findings based on the ROE, ROA, ROS and goodwill-to-assets ratio analysis of these three companies are concluded as (1)goodwill impairment losses harm the overall corporate performance and show lagging information, and (2) goodwill impairment losses are relative with big bath, and (3) irrational mergers and acquisitions and large-scale write-offs prompt opportunistic management.

KEYWORDS: Goodwill accounting, impairment losses, financial performance

JEL CLASSIFICATION: M41, G34

RESUMO

De acordo com as atuais normas internacionais de contabilidade financeira (IFRS), o ágio não é mais amortizado, mas um teste de redução ao valor recuperável deve ser realizado ao final de cada ano. Uma vez confirmada, uma perda por redução ao valor recuperável não pode ser revertida. Este estudo tem como objetivo comparar as causas e o impacto das perdas por redução ao valor recuperável de ágio com pesquisas anteriores. Os casos da Kraft Heinz Company, da Dalian Zeus Entertainment Co., Ltd e do Bayer Group que divulgaram perdas por redução ao valor recuperável no ano fiscal de 2018 relatando sob US GAAP, China GAAP e IFRS são analisados e comparados. Nossas descobertas baseadas na análise de ROE, ROA, ROS e ágio / ativo dessas três empresas são concluídas como (1) as perdas por redução ao valor recuperável do ágio prejudicam o desempenho geral da empresa e

mostram informações atrasadas e (2) as perdas por redução ao valor recuperável são relativas com grande banho; e (3) fusões e aquisições irracionais e baixas em larga escala estimulam o gerenciamento oportunista.

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KEY TO ABBREVIATIONS

Abbreviation	Definition
AICPA	American Institute of Certified Public Accountants
ASBEs	Accounting Standards for Business Enterprises
ASU	Accounting Standards Update
CASs	China Association for Standards
CFA	Chartered Financial Analyst
CGUs	cash-generating units
CSRC	China Securities Regulatory Commission
EBIT	Earnings before interest and taxes
EBITDA	Earnings before interest, taxes, depreciation and amortization
FASB	Financial Accounting Standards Board
FY	Fiscal Year
GAAP	Generally Accepted Accounting Principles
IAS	International Accounting Standards
IASB	International Accounting Standards Board
IASC	International Accounting Standards Committee
IFRS	International Financial Reporting Standards
KHC	Kraft Heinz Company
M&A	Mergers and acquisitions
M&E	Media and Entertainment
NASDAQ	National Association of Securities Dealers Automated Quotations

PIR	Post-implementation Review
ROA	Return on Assets
ROE	Return On Equity
ROS	Return On Sales
S&P	Standard & Poor's
SFAS	Statement of Financial Accounting Standards
SMEs	Small and medium-sized enterprises

Tables & Graphs

Chapter 1: Introduction

The topic for the following study arose from the need to clarify why and how goodwill impairment losses affect company´s performance, which covers financial statement analysis.

Goodwill is one of the most controversial assets in the balance sheet and the debate around it has been ongoing from the nineteenth century until today (Ratiu & Tudor, 2013). In the history of goodwill accounting, there are two ways to measure goodwill, which are amortization and impairment testing. In 2001, the Financial Accounting Standards Board (FASB), United States (US) issued Statement 142 (SFAS 142) to introduce the impairment-only approach (FASB, 2001) banishing the amortization method. In 2004, the International Accounting Standards Board (IASB) issued IFRS 3 *Business Combinations* to replace IAS 22, which replaced the amortization of goodwill with a goodwill impairment test. China Association for Standards (CASs) followed the path from amortization to impairment-only approach. According to the Accounting Standards for Business Enterprises (ASBEs), No. 8 - Impairment of Assets (2006), goodwill and intangible assets with uncertain useful life resulting from a business combination should be tested annually for impairment regardless of whether there is any indication of impairment losses. The annual impairment testing method becomes the mainstream in global goodwill accounting.

After the implementation of the impairment-only method, the IASB has been questioned and criticized by various circles. The 2015 Post-Implementation Review (PIR) of IFRS 3 *Business Combinations*, which displayed the issue amortization and non-amortization of goodwill were perceived in two opposite ways, primarily because the impairment recognition for goodwill was still controversial.

In 2018, the “Black Swan” event happens in China stock market. "Black swan" always means that an event happens occasionally, beyond expectation, and has a great negative impact. Wind database (Xiao et al., 2019) shows that in 2018, the goodwill-to-assets ratio of the A-share has reached 4.70%, and the goodwill of 366 listed companies accounted for more than 50% of the assets. A total of 871 listed companies confirmed goodwill impairment losses of 165.86 billion yuan in the year, which was approximately 21 times the amount of 2015 (CNY 7.751 billion). To avoid more and more risks caused by goodwill impairment, China Securities Regulatory Commission (CSRC) issued Accounting Regulatory Risk Alert *No.8 Goodwill Impairment* in 2018, which indicated many companies did not have a reasonable judgment on whether there was a sign of goodwill impairment when conducting an impairment test.

In 2018, the US faced greater pressure on goodwill impairment than China, while the European market has declined. Chartered Financial Analyst (CFA) Institute estimates (CFA Institute, 2020) that the goodwill on U.S. companies' balance sheets was $5.6 trillion in 2018 representing 6% of total assets ($95.4 trillion), and 32% of the total equity ($17.6 trillion). Approximately 90% of all Standard & Poor's (S&P) 500 companies have goodwill balances and the latter also addresses that 25% of S&P 500 companies have goodwill in excess of equity. The Duff & Phelps *2019 US Goodwill Impairment Study* shows that total goodwill impairment (GWI) recorded by US publicly traded companies climbed 125% over the prior year, reaching $78.9 billion in 2018. Much of the leap was driven by General Electric's (GE) $22.1 billion GWI and Kraft Heinz Co.'s (KHC) $7.3 billion GWI (Duff & Phelps, 2019). However, this same study shows that the number of goodwill impairment events fell by 9%, which is 121 in 2016 and 110 in 2017. and Germany saw the largest increase in the proportion of companies recording a goodwill impairment, from 12.5% in 2016 to 19.7% in 2017.

André et al. (2016) examine the patterns of goodwill impairments in Europe and the US by observing 18,538 and 16,525 European and US firms, respectively. The study highlights some major differences between US firms and European firms with regard to goodwill impairment recognition. This study does not provide acknowledgment on the impact of goodwill impairment losses on the performance of US and European listed companies.

Given that companies in the US, China, and Germany all experienced an increase in goodwill impairment in 2018, following Rolf Johansson's *Case Study Methodology* (2007) that bridges the gap between quantitative and qualitative methods in the social sciences, our study uses empirical research method to analyze the causes and effects of goodwill impairment both qualitatively and quantitatively. We analyze three listed companies from the US, China, and Germany that disclosed significant goodwill impairment losses in 2018.

Although the recognition of goodwill impairments is relatively similar in the US, China, and Europe, companies exhibit very different financial results. We discuss some factors and conduct a comparison to explain the differences. Therefore the aim of this study is to unveil the reasons and effects of goodwill impairment on companies' performance.

The study develops in the following chapters. Chapter 2 reviews the relevant literature. We describe methodology in Chapter 3 and implement data analysis in Chapter 4, compare the differences and similarities of three sample companies in Chapter 5, and conclude in Chapter 6.

Chapter 2: Literature Review

2.1 Historical account of goodwill accounting standards

The only constant characteristic mentioned both by academics and institutions over time was the advantage brought by goodwill in a business combination (Ratiu & Tudor, 2012). It arises during business combination processes, and its development can be divided into two historical periods: goodwill amortization method before 2004, and from 2004 onwards the goodwill impairment testing method that has since been revised many times.

In 1985, IAS 22 *Accounting for Business Combinations* came into effect. This accounting standard introduces all aspects of the accounting treatment of business combinations and goodwill is one of the subjects required in IAS 22. IAS 22(1988) announced a new pooling of interests method and goodwill arising on the acquisition should be recognized as an asset and amortized over its useful life (IAS 22, p.44). Amortization will normally be on a straight-line basis (IAS 22. p.50)

In 2001, the International Accounting Standards Board (IASB) was established and replaced International Accounting Standards Committee (IASC). The project carried over from IASC also changed the designation of accounting standards - IASB issues a new International Financial Reporting Standard (IFRS), which takes a long process to renumber and revise all accounting standards.

In the same year, in the US, FASB replaced the amortization of goodwill that mandated no more than 40 years in *Opinion 17* with the goodwill impairment testing approach. The new impairment-only approach adopts a two-step process that is described in detail in *SFAS 142 Goodwill and Other Intangible Assets* issued in June 2001. Literature shows that the goodwill impairment testing approach is more favorable and supported the changes made by the FASB. Jarva (2008) investigates a sample of firms reporting goodwill impairments between 2002 and 2005 and finds that SFAS 142 has significant predictive ability for expected one- and two-year-ahead cash flows. Guler, L. (2018)'s finding suggests that SFAS 142 has improved the usefulness of goodwill numbers from investor perspective, and investors see through the differences in reliability of reported goodwill numbers.

To improve the quality of goodwill accounting and seek to achieve international convergence with FASB, IASB issued IFRS 3 *Business Combinations*, which completely replaced IAS 22. The new IFRS 3 clearly divides the recognition of other intangible assets and goodwill into two separate procedures. To achieve this, fair value can normally be measured with sufficient reliability for intangible assets to be recognized separately from goodwill (Deloitte, 2004). After the initial recognition of goodwill, IFRS 3 required goodwill to be recorded at cost less accumulated impairment charges (Brand Finance, 2010) and negative goodwill had to be recognized by the acquirer in profit or loss. After being revised as IAS 36 in 2004, goodwill had to be tested at least annually for impairment or any other time when there was an indication of impairment. Both indefinite-life intangible assets and goodwill were no longer amortized.

The newly adopted goodwill impairment testing approach is much more complicated than the old straight-line amortization regarding its calculation process. IAS 36 *Impairment of Assets* introduces how to perform an impairment test and how to measure and recognize the impairment losses. The basic principle of impairment testing is that the carrying amount must not be higher than the recoverable amount that is higher of its 'fair value less costs to sell' and its 'value in use'. The level of impairment testing for goodwill is a CGU or a group of CGU that is the lowest level of goodwill for internal management purposes. In the impairment calculation process, IAS 36 addresses a one-step method that only needs to compare the recoverable amount of a cash generating unit (CGU) with the carry amount to determine the impairment. If the carrying amount exceeds its recoverable amount, the excess part is recognized as impairment losses.

Unlike IFRS, US GAAP takes the reporting unit level that is either an operating segment or one organizational level below. FASB adopts a two-step approach for the calculation. Firstly, calculate the fair value of the reporting unit and compare to its carrying amount. If the fair value exceeds its carrying amount - which is considered as no impairment - the second step is unnecessary. If the fair value is less than the carrying amount, process step 2 to calculate the difference between the implied fair value of reporting unit goodwill and the carrying amount of that goodwill. The difference is so-called the impairment losses.

To better recognize and measure the goodwill acquired in the business combination or a gain from a bargain purchase, FASB issued *Revised SFAS 141 Business Combinations* in 2007 and *SFAS 160 Non-controlling Interests in Consolidated Financial Statements* in December 2008. Statement No. 160 (FASB, 2008) required the acquirer to recognize goodwill as of the acquisition date, measured as a residual. IASB issued a similar standard of IFRS 3 in 2008, which was a joint project between IASB and FASB, replaced IFRS 3 (2004) effective for business combinations on July 1, 2009. IFRS 3 (2008) aimed to improve the relevance, reliability and comparability of business combinations. It set out the recognition and measurement of acquired assets and liabilities, the determination of goodwill and the principle of disclosure. The measurement of goodwill in a step acquisition was simplified in this revised version and the acquisitions or disposals of Non-controlling Interests (NCIs) need to be accounted for as equity transactions (IASB, 2008). Basically, IFRS and US GAAP at this time are already very similar in accounting for business combinations. It is just that the FASB requires a more sophisticated method of goodwill calculation. The definition of scope and control and how to measure fair value and contingencies still differ from IFRS.

In April 2011, the FASB issued an Exposure Draft of a proposed Accounting Standards Update, Intangibles—Goodwill and Other (Topic 350), which allowed an entity to use a qualitative approach for testing goodwill for impairment to simplify goodwill impairment testing steps (FASB, 2011). An entity should take a qualitative assessment first to evaluate and determine if it is necessary to perform a two-step approach. The difference between the fair value of the reporting unit and its carrying amount is the decisive condition for step 1 to step 2. If the difference is zero or negative, the impairment test shall proceed directly to Step 2.

Pounder (2009) indicates that the IFRS for SMEs is a complete set of country-neutral financial accounting and reporting standards for entities that lack public accountability, which is typically smaller than entities that are publicly accountable. In July 2009, the IASB published the *International Financial Reporting Standard for Small and Mediumsized Entities.* According to IFRS for SMEs (IASB, 2009), goodwill must be amortized over its estimated useful life with a maximum amortization period of 10 years. Later in 2013, FASB endorsed the Private Company Council's (PCC) decision to give private companies an alternative to amortize goodwill on a straight-line basis over a period of up to ten years. American Institute of Certified Public Accountants (AICPA) released the "Financial Reporting Framework for Small and Medium-Sized Entities" (FRF for SMEs) which required goodwill amortization not impairment testing. The cost of goodwill impairment testing is always an issue for small and medium-sized entities. The appearance of new amendment is the response to the needs of private company to save the yearly cost.

Post-implementation Review (PIR) of IFRS 3 *Business Combinations* (2015) addressed high priority in solving the problem of effectiveness and complexity of testing goodwill for impairment and considered whether and how the costs of accounting for goodwill can be reduced without loss of information. Auditors also complained that the current process of impairment testing to calculate the drop in value is overly complex, costly to calculate, and results in information that investors and analysts largely already know (Nicola, 2019). The Board is still investigating methods to improve IFRS 3 and IAS 36 after feedback from the Post-implementation Review of IFRS 3.

The controversy about the current method of impairment-only and the previous straight-line amortization method has become increasingly popular in recent years. Hulzen et al. (2011) compare the amortization and the impairment-only method for goodwill accounting in using the market valuation model and earning return model with the sample of European firms. The results show that goodwill impairment is less value relevant than amortization but more timeliness. André et al. (2016) define the timeliness of goodwill impairments as the frequency of accounting impairments conditional to indications of economic impairments. They find that median levels of goodwill on the books between US and EU firms are relatively similar, and US firms recognize timelier impairments in early years of the financial crisis than EU firms.

There are even studies suggesting other alternatives to current goodwill accounting. Ryan, V. (2019) suggests that the requirement to assess goodwill at least annually could be removed, and the standard could only require that an entity assess goodwill for impairment following a change in circumstances or a "triggering event."

2.2 U.S. Generally Accepted Accounting Principles (US GAAP) treatment for goodwill

As to the recent impairment-only model of the subsequent goodwill accounting, not-for-profit stakeholders questioned the cost and complexity associated with the subsequent accounting for goodwill to the FASB. The board issues amendments as response to these concerns in 2018. According to the newest Exposure Draft Proposed Accounting Standards Update on Topic 350 issued on December 20, 2018 (FASB, 2018), goodwill related to not-for-profit entity shall be amortized on a straight-line basis over 10 years, or less than 10 years if the entity demonstrates that another useful life is more appropriate.

Goodwill is assigned to a reporting unit, which is defined as an operating segment or one level below an operating segment. According to the FAS 142 (2004), if the fair value of the entity (or the reporting unit) may be below its carrying amount (a triggering event), the entity shall perform the goodwill impairment test. If there are no triggering events, the further testing is unnecessary.

About when to perform the impairment testing, the US GAAP indicate that goodwill of a reporting unit shall be tested for impairment on an annual basis and between annual tests in certain circumstances. If the test is conducted at the same time each year, the annual goodwill impairment test can be conducted at any time during the fiscal year.

In conducting goodwill impairment testing, the entity may first assess the qualitative factors to determine whether a two-step goodwill impairment test is required. Before the adoption of *ASU 2017-04: Simplifying the Test for Goodwill Impairment*, the company could choose to perform a recoverability test first. This test compared the book value of the reporting unit with the fair value of the reporting unit. If the fair value of the reporting unit is lower than its carrying amount, a two-step impairment test is performed. The *Summary of Statement No. 142* (FASB, 2004) indicates that the first step is a screen for potential impairment, and the second step measures the amount of impairment, if any. The first step of the goodwill impairment test compares the fair value of the reporting unit with its book value of carrying amount and the second step is to calculate the difference of the implied fair value of the reporting unit and the carrying amount. The difference is the impairment loss that shows the loss in the goodwill account.

2.3 International Financial Reporting Standards(IFRS) treatment for goodwill

IAS 36 addressed that testing for impairment involves comparing the recoverable amount of a cash-generating unit with the carrying amount of the cash-generating unit (IASB, 2019). In accordance with IFRS 3 (IASB, 2008), goodwill of the acquisition date is measured and recognized as the excess of the aggregate of acquisition date fair value, non-controlling interest and previous equity interest over the net of the acquisition-date amounts of the identifiable assets acquired and liabilities assumed. The Standard requires goodwill acquired in a business combination to be allocated to cash-generating units (CGU).

IFRS 3 (IASB, 2008) uses the one-step approach that compares the adjusted carrying amount with the recoverable amount of the unit to determine whether the cash-generating unit is impaired. The one-step approach requires that if impairment indicators exist, an entity shall recognize a impairment loss.

2.4 China generally accepted accounting principles (GAAP) treatment for goodwill

According to the ASBEs No. 20 - Business Combinations (CSRC, 2007), goodwill is the difference between the cost of a business combination and the fair value of the identifiable assets and liabilities of the acquiree. Its existence cannot be separated from the enterprise itself, is not recognizable, and is not an intangible asset. The recognition of goodwill refers to “positive goodwill” and does not include “negative goodwill”.

ASBEs No. 8 – Impairment of Assets (2006) stipulates that Goodwill arising from a business combination and intangible assets with an indefinite useful life shall be tested for impairment annually, regardless of whether there is any indication of impairment.

The goodwill reflected in the consolidated financial statements does not include the goodwill of the subsidiaries attributable to the minority shareholders. However, when the relevant asset group (or combination of asset groups) is tested for impairment, the book value of the asset group should be adjusted to include the goodwill attributable to minority shareholders' equity. Based on the adjusted book value of the asset group and its recoverable amount, it is determined whether the asset group (including goodwill) has been impaired. If the asset group has been impaired, the impairment loss should be made and the relevant impairment loss cannot be reversed after the withdrawal in accordance with the Asset Impairment Criteria.

2.5 Similarities and differences in treatment for goodwill among US GAAP, IFRS and

China GAAP

Comparing the development of US GAAP, IFRS and China GAAP historical changes of accounting standards on the treatment and recognition of subsequent measurement of goodwill, it becomes evident that the three sets of standards follow the same pattern, i.e., the changing from amortization to impairment testing method. All US GAAP, IFRS, and China GAAP only consider the recognition of goodwill connected with a business combination transaction. Goodwill is never amortized in accordance with these three standards. All three criteria require goodwill to be tested for impairment at least annually, and more frequently, whenever any signs of impairment unfold. In addition, they are required to write down the amount of the impairment loss. The calculation of the impairment loss results from the confrontation of the excess of the carrying amount with its fair value, the same to all three sets of standards. But subsequent reversal of goodwill impairment loss is prohibited.

Goodwill accounting under US GAAP is assigned to a reporting unit that is either an operating segment or an organization level below, while goodwill in the IFRS and China GAAP is allocated at the cash generating unit (CGU) level. The difference between the two concepts is not clear and difficult to materialize. In terms of goodwill impairment testing calculations, US GAAP uses a two-step approach, while both IFRS and China GAAP use a one-step approach. US GAAP requires to recognize an impairment loss if the carrying amount excess the implied fair value, while IFRS and China GAAP compare the carrying amount of the CGU with its recoverable amounts and then allocates the loss to goodwill. It is worth noting that US GAAP can conduct a qualitative test before the impairment test to determine whether the next step needs to be implemented. Conversely, the qualitative test is not allowed in both IFRS and China GAAP.

2.6 Prior research on impairment losses

For assets carried at historical cost, impairment losses are recognized as an expense immediately in profit or loss (Ernst & Young, 2008). That is to say the impairment losses are recorded as an expense on the income statement.

Impairment of goodwill causes a decline in corporate performance (Zhang and Feng, 2016) and both investors and financial analysts revise their expectations downward after its announcement (Li et al., 2011). Li et al. (2011) tested whether the announcement of a goodwill impairment loss revealed new information to market participants and the result shows that goodwill impairment serves as a leading indicator of a decline in future profitability.

Reimbert and Karlsson (2016) conduct a study on telecommunication companies within Europe, which reveals the co-occurrence of goodwill impairments and big bath indications. Since the change of the impairment-only approach, big bath has often appeared with goodwill impairment losses. Gonçalves et al. (2019) compare 105 listed Portuguese and Spanish companies from 2007 to 2015 and find that impairment in goodwill is relevant in big bath practices, and there is great discretion in the use of this accrual. Big baths may be used to reflect declines in the values of assets due to poor performance, increased market competition, and changes in the economic environment (Hope & Wang, 2018). Jordan and Clark (2004) examine the Fortune 100 companies in the year of SFAS 142's adoption and prove that the big bath theory is a practiced method of managing earnings relative to goodwill impairment. Taking a big bath may bring financial data to a better performance in the years later, which is usually seen as a kind of earning management of CEO. Because recording the heavy charge now relieves future periods of the burden, thereby making it easier to reach earnings goals in later years (Henry & Schmitt, 2001; Jordan & Clark, 2015). Cheng et al. (2017) examined the long-term impact of goodwill impairment write-offs. They documented a 10.86 % abnormal return over 250 days post announcement and validated the big bath hypothesis. Their results find that companies with goodwill impairment increase non-recurring costs during the year of impairment, and then the non-recurring costs drop significantly and the overall profits improve in the next two years. But Lemans (2010) finds that there is no strong evidence indicating management indeed uses goodwill impairments to manipulate earnings.

Managers who participate in the estimates process of the fair value express their assumptions and expectations through the financial information, which can be suspected as opportunism. Lapointe-Antunes et al. (2008) prove an association between reported transitional goodwill impairment losses and managers' reporting incentives exists, and the audit committee has been identified as one of the primary constraints placed upon managerial opportunism. Managers will use the unverifiability in goodwill accounting rules to manage financial reports opportunistically (Ramanna & Watts, 2012). Korošec et al. (2016) conduct an empirical analysis of incentives for earnings management in Italian publicly traded between 2008 and 2010 and they suggest that market indicated a need for impairment of goodwill according to their results show that at least some opportunism is present in impairment of goodwill. Xiao et al. (2019) indicate that the manipulation of fair value recognition and the large scale of high premium M&A are the motive for opportunistic behavior and suggest the supervising agency ought to increase the cost of breaking laws and regulations by putting strict regulation and punishment on manipulating behavior on goodwill for public companies.

Chapter 3: Methodology

The primary purpose of this study is to improve knowledge about the causes of goodwill impairment losses that lead to poor performance.

A sample of three real cases, companies that reported significant goodwill impairment losses during fiscal year 2018 in US, China, and Europe allow to meet the above stated objective. The companies were identified and then selected from the listed companies of each region having to meet the following criteria:

- Goodwill existed on book for at least three years
- Public disclosure of the financial report
- Disclosure of goodwill impairment losses on financial statements of 2018.

The result of the search led to the selection of the Kraft Heinz Company from the U.S., Dalian Zeus Entertainment Co., Ltd. from China and Bayer Group from Germany. Although not a random sample, reasons for choosing such companies are as follows.

The Kraft Heinz Company (NASDAQ: KHC) is the third-largest food and beverage company in North America and the fifth-largest food and beverage company in the world (The Kraft Heinz Company, 2019). According to the statistics from Macrotrends, goodwill and intangible assets of Kraft Heinz Company (KHC) for the quarter ending December 31, 2018, were $85.971B, a 17.54% decline from 2017 (Macrotrends, 2018). KHC not only met the three selection criteria above, but also was a leader in the food and beverage industry, which provided persuasive data for this research.

Dalian Zeus Entertainment Co., Ltd. is the company with the highest amount of goodwill impairment losses in 2018 in the China´s A-share market (Tong, 2019). It disclosed a net loss of 7.522 billion yuan in the 2018 annual report. Additionally, ss mentioned before, China faced the Black Swan event of goodwill impairment in 2018, and therefore, Dalian Zeus Entertainment Co., Ltd., with the largest impairment loss in 2018, represents well the Chinese market.

Germany's Bayer Group, listed on Deutscher Aktienindex (DAX), acquired Monsanto Company in 2018 for $57 billion, upping its bet on the future of agriculture. The deal boosted goodwill by about $26 billion, bringing the total to $43 billion, or 30% of assets (Root, 2019). In the same year, Bayer Group recorded a 1,547 million Euros goodwill impairment losses in its 2018 annual report. With a record of goodwill generation and goodwill impairment in the same year, it was worthy to analyze how the hidden impairment losses had a certain impact on Bayer performance.

The data and information collected for the selected companies is both quantitative and qualitative. Therefore this study is developed within the framework of Hulzen et al. (2011), Jordan and Clark (2004) and Lapointe - Antunes et al. (2008).

Hulzen et al. (2011) indicated that impairment of goodwill was value relevant. They stressed an equation that had a higher explanatory power than the basic Ohlson-model (1995), which contained an impairment variable:

$$MVE_{it} = \beta_0 + \beta_1 BVE_{it} + \beta_2 NI_{it} + \beta_3 IMP_{it} + \varepsilon_{it}$$

Where MVE_{it} is the market value of the company, BVE_{it} is the book value of equity, NI_{it} is the net income number and IMP_{it} is the amount of goodwill impairment for the year.

Paul et al.'s model shows that goodwill impairment is one among other accounting information indicators investors use to predict the market value of the company. Thus, it is significant to analyze the effect of goodwill impairment losses on company performance.

When examining whether the recording of goodwill impairment appears to be related to the big bath theory of earnings management, Jordan and Clark (2004) address two measures, return on assets (ROA) and return on sales (ROS), to evaluate the earning levels of firms. Examining Fortune 100 companies, Jordan and Clark's study offered compelling evidence of the application of ROA and ROS. When calculating the Return on Equity (ROE), this thesis uses the formula of the DuPont analysis method. Thus, ROE = (1) Net Profit Margin * (2) Asset Turnover * (3) Equity Multiplier. Net Profit Margin is equal to Net income divided by Revenue. Asset Turnover is equal to Net sales divided by Average Total Asset. Equity Multiplier is equal to Total Asset divided by Stockholders' Equity. ROS refers to Return on Sales, which is equal to Operating income/(loss) divided by Net sales. Goodwill to Assets Ratio is equal to Goodwill divided by Total Asset.

In studying traditional goodwill impairment losses, Lapointe - Antunes et al. (2008) illustrated return on equity (ROE) is likely the most commonly examined ratio in the literature due to its contribution to the comprehension of overall firm performance and its use in the residual income valuation model. They used a multivariate tobit model to assess the determinants of transitional goodwill impairment losses, which contained ROE variables:

$$TGIL_i = \alpha_0 + \lambda_1 GOODWILL_i + \lambda_2 EXCGWILL_i + \lambda_3 RUNITS_i + \lambda_4 ROE1_i + \lambda_5 ROE3_i + \lambda_6 CDEBT_i + \beta_7 DEVROE_i\ (DEVROA_i,\ DEVLEV_i) + \beta_8 CHANGE_i + \beta_9 PERDOUS_i + \beta_{10} ITMEXERC_i + \beta_{11} FIN_i + \beta_{12} CLIST_i + \beta_{13} AC_i + \beta_{14} OWN_i + \beta_{15} SIZE_i + IND_i + \varepsilon_i$$

Where:

TGIL = Reported transitional goodwill impairment loss deflated by lagged total assets

ROE1 = Return-on-equity for year preceding the adoption of Section 3062

ROE3 = Annualized return-on-equity for the third or second year preceding the adoption of Section 3062

DEVROE = 1 if pre-TGIL adoption year ROE is lower than industry median, 0 otherwise.

DEVROA = 1 if pre-TGIL adoption year ROA is lower than industry median, 0 otherwise.

ROE1 and ROE3 account for past firm and acquisition performance, while DEVROE and DEVROA are also viewed as proxies for firm performance (Lapointe - Antunes et al., 2008). Therefore, ROE and ROA were significant to measure company performance.

Learning from the former experience, ROA, ROS, and ROE are considered as the main indicators to evaluating company performance in this study. Also, the goodwill-to-asset ratio is a significant fundamental indicator, which measures the amount of goodwill of a company relative to its total assets. These four indicators were used to discuss the causes and impact of the goodwill impairment loss on the performance of the selected companies.

To determine whether goodwill impairment losses affect the company ́ s performance, data on sample companies was extracted from fiscal year(FY) 2014 to FY2018, and collected from their 10-k financial reports available on the EDGAR database of SEC, Datastream, and CSMAR database. We perform data processing according to the following formulas:

ROE = Net Profit Margin * Asset Turnover * Equity Multiplier (DuPont)

ROS = Operating income / Net sales

ROA = Net Income / Average Total Assets

Goodwill to Assets = Goodwill / Total Assets

Each indicator was compared horizontally and vertically and performed in the form of tables and graphs. According to the existing literature, data of each company was compared both in terms of similarities and differences. The distinction among them can give more information about the causes and influence of goodwill impairment.

Chapter 4: The cases of companies reporting under of US, China and Europe accounting standards

This section presents the ratio analysis of the three selected companies using from 2014 to 2018. The Kraft Heinz Company adopts the U.S. generally accepted accounting principles (U.S. GAAP) and conducts a two-step impairment test in the second quarter of each fiscal year. Dalian Zeus Entertainment Co., Ltd. adopts China Generally Accepted Accounting Principles (China GAAP) and Bayer Group adopts International Financial Reporting Standards (IFRS).

4.1 Data Analysis of The Kraft Heinz Company (KHC)

The Kraft Foods Group Co., Ltd. ("Kraft") is a large food and beverage products company that produces and sells primarily in the United States and Canada. On July 2, 2015, Kraft merged with HJ Heinz Holding Corporation ("Heinz") (the "2015 Merger"). On January 3, 2016, Kraft Heinz Company listed on the NASDAQ under the ticker symbol "KHC". KHC reports under the US GAAP and takes the two-step impairment testing method in the second quarter of each fiscal year. According to the 10-k issued on March 3, 2016 (The Kraft Heinz Company, 2016), at the closing of the 2015 Merger the consolidated financial statements for the year ended January 3, 2016, is a 53 week period, including a full year of Heinz results and post-2015 Merger results of Kraft. Besides, the consolidated financial statements for the year ended December 28, 2014, is a 52 week period, including a full year of Heinz results. In the analysis below, data before January 3, 2016, are for reference only.

Table 1 presents financial data and indicators of the KHC. Goodwill falls to \$36,503 million in 2018, from its original value of \$44,825 million in 2017. And the goodwill impairment recognition in 2018 is \$7,008 million, which is the first impairment losses recognized since the KHC merger. Table 1 also provides an important message: that in 2018 KHC faces a net loss of \$10,254 million, accounted for -193.79% of 2017. Moreover, the operating loss - \$10,220 million, appears to be responsible for most of the net loss. This suggests that the negative operating income and the goodwill impairment loss occurred during the same period.

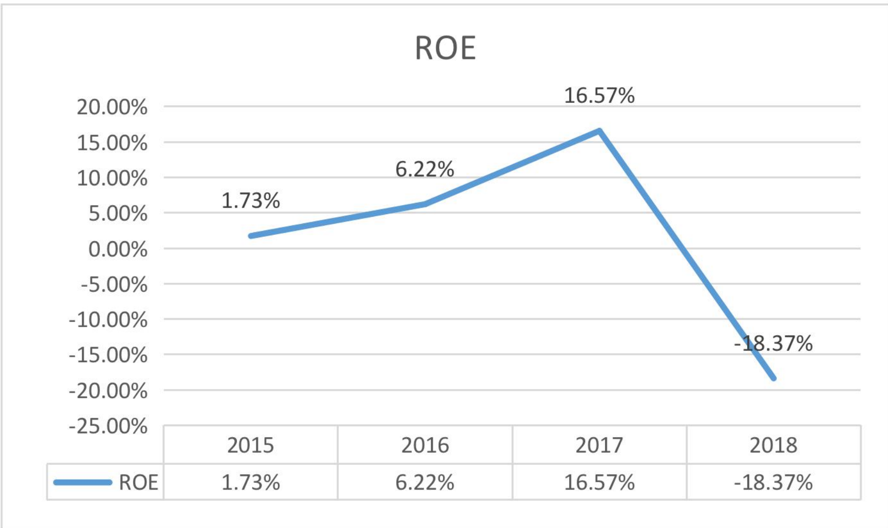
Table 1. Financial Accounting Data and Indicators of the KHC

(Millions of US $)	December 29, 2018 (FY 2018)	December 30, 2017 (FY 2017)	December 31, 2016 (FY 2016)	January 3, 2016 (53 weeks)	December 28, 2014 (52 weeks)
Goodwill	36,503	44,825	44,125	43,051	14,959
Net income	(10,254)	10,932	3,606	647	672
Net sales	26,268	26,076	26,300	18,338	10,922
Total Asset	103,461	120,092	120,480	122,973	36,571
Stockholders' Equity	51,657	65,863	57,358	57,685	7,117
Operating income/(loss)	(10,220)	6,057	5,601	2,639	1,568
Goodwill impairment losses	7,008	-	-	-	-
ROE = (1) * (2) * (3)	-18.37%	16.57%	6.22%	1.73%	-
(1) Net Profit Margin	-39.04%	41.92%	13.71%	3.53%	6.15%
(2) Asset Turnover	0.24	0.22	0.22	0.23	-
(3) Equity Multiplier	2.00	1.82	2.10	2.13	5.14
ROA	-9.91%	9.10%	2.99%	0.53%	1.84%
ROS	-38.91%	23.23%	21.30%	14.39%	14.36%
Goodwill to Assets	35.28%	37.33%	36.62%	35.01%	40.90%

Table 1 presents significant data of the Kraft Heinz Company from Fiscal Year (FY) of 2014 to Fiscal Year of 2018. All of the data is extracted from the 10-k form of each year. As of January 3, 2016, the Kraft Heinz Company's common stock is listed on The NASDAQ Global Select Market ("NASDAQ") under the ticker symbol "KHC". The data before January 3, 2016 is for reference only and is not used for analysis purposes.

In Graph 1 below, the ROE evidences a drastic fluctuation in the four year period, showing that ROE indeed rises in the three years following the merger of the "2015 Merger". ROE level is at its highest of 16.57% in 2017. Since ROE is often used to measure a company's profitability and potential growth, an increase of approximately 14.84% in ROE from FY2015 to FY2017 indicates that the company is profitable and sustainable. But ROE starts to decline after 2017 and drops directly to -18.37% in 2018 for the negative net profit margin. This is suggesting that corporate operating efficiency is disappointing.

Graph 1. Return on Equity of Kraft Heinz Company (KHC) changes from 2015 to 2018

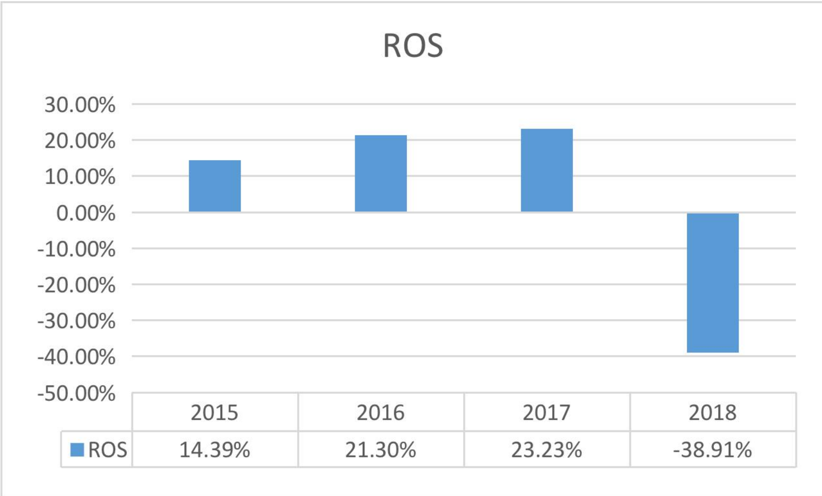


Note. This graph shows the data selected from the Table 1 under the subject of ROE.

Graph 2 below shows the changes in return on sales (ROS). From 2015 to 2017, ROS grew steadily year on year, which seems that KHC would perform much better in 2018. However, in 2018 ROS suddenly dropped to -38.91%. ROS equals operating income divided by net sales, which is to evaluate a company' s operating efficiency. Table 1 shows that from 2016 to 2018, net sales remain constant at around $26 billion.

Thus, the operating income must be negative in 2018. The income statement of FY2018 (See Appendix A) explains the reason for the operating loss. KHC impaired $7,008 million of goodwill (See Appendix A, Line 5 Goodwill impairment losses) in 2018 while there was no recognition in both FY2016 and FY2017. Negative growth in ROS may remind stockholders that KHC is transferring the gain on sales into losses.

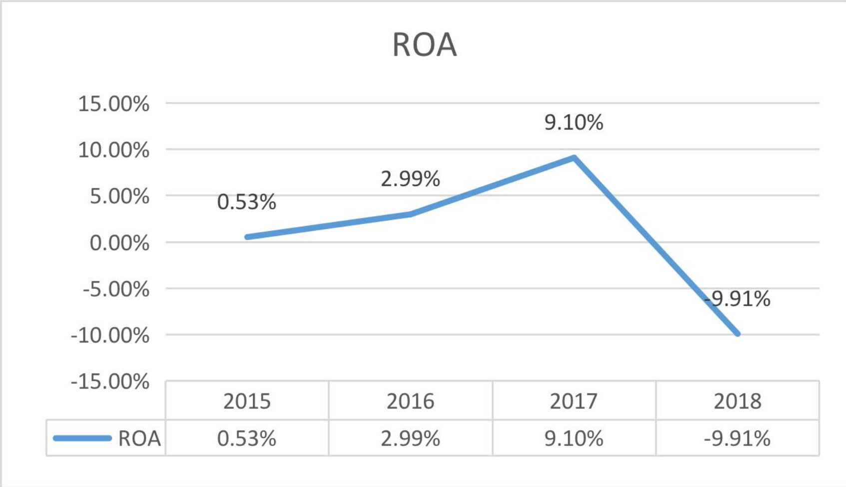
Graph 2. Return on Sales of Kraft Heinz Company changes from 2015 to 2018



Note. This graph shows the data selected from the Table 1 under the subject of ROS.

A similar pattern as the ROS is observable for the ROA situation. Graph 3 below shows the changes in ROA from 2014 to 2018. ROA is a ratio to measure profitability, which instructs a company on how to use its assets by determining its profitability relative to its total assets. From 2014 to 2017, ROA increased rapidly from 0.53% to 9.1%. During this period, KHC performed well with low debt pressure. However, ROA plummeted to -9.91% in 2018. The culprit is the net loss on the income statement. Goodwill impairment is a reduction of the goodwill account and is recognized as a loss on the income statement. Therefore, the huge amount of impairment losses has to be responsible for the lower value of gross profit. The number of ROA is a direct reflection on how efficiently companies use its assets to generate revenue. The negative ROA of KHC in 2018 indicates that KHC is unable to commit the revenue expectation so that it is necessary to recognize losses on goodwill impairment.

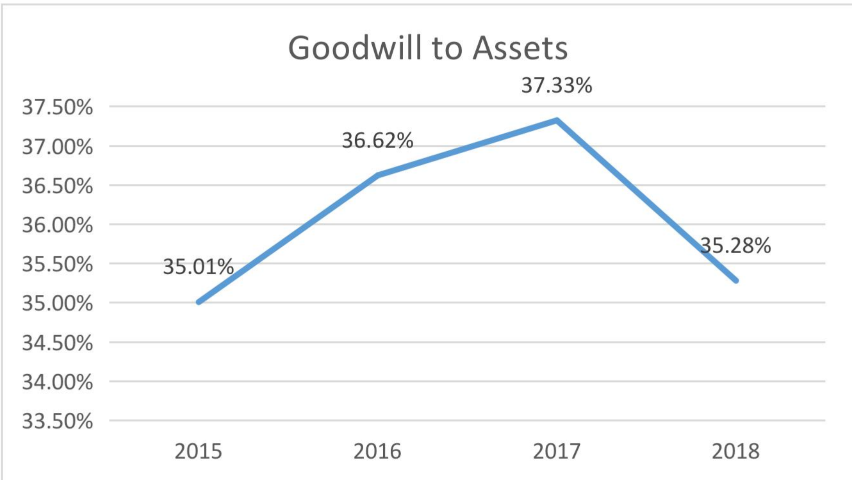
Graph 3. Return on Assets of Kraft Heinz Company changes in recent 4 years



Note. This graph shows the data selected from the Table 1 under the subject of ROA.

Graph 4 below presents the change in the goodwill to assets ratio from 2015 to 2018. The pattern shows fluctuation a steadily increase between 2015 and 2017, and a drop to 35.28% in 2018, to the level of 2015. Ignoring the changes in the curve, we can focus on the value of goodwill-to-assets. André et al. (2016) examine the 6,873 US firms on the level of goodwill on the books over the period from 2006 to 2015 and the result shows that average and median goodwill/total assets in the US are 16.8% and 12.2%, respectively. The average goodwill-to-assets ratio of KHC is more than 35%, which is much higher than the average level of US firms.

Graph 4. Goodwill to Assets Ratio of Kraft Heinz Company changes in recent 4 years



Note. This graph shows the data selected from the Table 1 under the subject of Goodwill to Assets Ratio.

The above analysis demonstrates that KHC has a decline in ROE, ROS, and goodwill-to-assets because of the impact of the net loss of $ 10 billion in 2018. The company implemented an impairment test in the fourth quarter of 2018 and recognized an impairment loss of $7,008 million, which was detrimental to the net income.

The “2015 Merger” had generated goodwill of $30,462 million. The recognition of goodwill was produced by business consolidation, based on the assumption of future performance. And KHC utilizes the discounted cash flow method under the income approach to estimate the fair value of reporting units.

Table 2 below presents the changes in the carrying amount of goodwill by segment in 2018. Although the North American region has been the main market for the KHC, the most significant impairment losses segment arose in the United States and Canada. In the segment of Rest of World, the impairment losses are recorded -$957 million, which means the carrying amount of goodwill in this region down 36.25% to $1,394 million. The 10-k of 2018 also noted that KHC recognized a non-cash impairment loss of $133 million in selling, general and administrative expense (SG&A) related to its Australia and New Zealand reporting unit within the Rest of World segment for anticipated and sustained margin declines in the region.

Table 2. Changes in the carrying amount of goodwill, by segment, were (in millions):

	United States	**Canada**	**EMEA***	**Rest of World**	**Total**
Balance at December 30, 2017 (As Restated)	33,701.00	5,246.00	3,238.00	2,640.00	44,825.00
Impairment losses	(4,104.00)	(1,947.00)	-	(957.00)	(7,008.00)
Reclassified to assets held for sale Acquisitions	-	(496.00)	-	(173.00)	(669.00)
Acquisitions	-	16.00	-	25.00	41.00

Translation adjustments and other	-	(381.00)	(164.00)	(141.00)	(686.00)
Balance at December 29, 2018	29,597	2,438	3,074	1,394	36,503

**Note: "EMBA" means Europe, Middle East, and Africa. Source: adapted from: Consolidated Results of Operations, 2018 Annual Report for The Kraft Heinz Company. Retrieved from https://www.sec.gov/Archives/edgar/data/1637459/000163745919000049/form10-k2018.htm*

Table 3 below presents the changes situation of the goodwill carrying amount of the reporting unit in each segment. KHC wrote off all the goodwill in Southeast Asia and Other Latin America. Although the goodwill impairment loss in the United States accounts for only 36.28% of its total goodwill, its value is $4.1 billion. Besides, Canadian and Northeast Asian subsidiaries recognized losses of $1.9 billion and $302 million, respectively. This suggests that KHC encountered difficulties in operating business in the whole world, including the native North American region.

Table 3. The goodwill carrying amount of reporting unit (Fiscal Year 2018 Compared to Prior):

The goodwill carrying amount of reporting unit	**FY2018**	**Prior**	**Impairment Losses**	**Impairment Percentage**
U.S. Refrigerated	$7.2 billion	$11.3 billion	$4.1 billion	36.28%
Canada Retail	$2.1 billion	$4.0 billion	$1.9 billion	47.50%
Southeast Asia	0	$315 million	$315 million	100.00%
Northeast Asia	$89 million	$391 million	$302 million	77.24%
Other Latin America	0	$207 million	$207 million	100.00%

Source: adapted from: Consolidated Results of Operations, 2018 Annual Report for The Kraft Heinz Company. Retrieved from https://www.sec.gov/Archives/edgar/data/1637459/000163745919000049/form10-k2018.htm

Table 4 below shows the comparison of the operation results between FY2017 and FY2018 and FY2016 and FY2017. Although net sales decreased by 0.9% to $26.1 billion in 2017 compared to $26.3 billion in 2016, the operating income increased 8.1% to $6.1 billion in 2017 compared to $5.6 billion in 2016, while diluted EPS increased 220.5% to $8.91 in 2017 compared to $2.78 in 2016. The growing data shows that the operation efficiency of KHC is in a good statement. But when net sales increased by 0.7% to $26.3 billion in 2018 compared to $26.1 billion in 2017, the operating income turned into a loss and decreased 268.7% to -$10.2 billion in 2018 compared to income of $6.1 billion in 2017, and the diluted EPS decreased 193.8% to a loss of $8.36 in 2018 compared to earnings of $8.91 in 2017. KHC fell into a downturn in operations, and losses were caused by poor operations.

Table 4. Consolidated Results of Operations

From FY 2016 to FY 2018: (in millions, except per share data)

	December 29, 2018	**December 30, 2017**	**% Change**	**December 30, 2017**	**December 31, 2016**	**% Change**
Net sales	26,268	26,076	0.7%	26,076	26,300	-0.9%
Operating income/(loss)	(10,220)	6,057	-268.7%	6,057	5,601	8.1%
Net income/(loss) attributable to common shareholders	(10,192)	10,941	-193.2%	10,941	3,416	220.3%
Diluted EPS	(8.36)	8.91	-193.8%	8.91	2.78	220.5%

Source: adapted from: Consolidated Results of Operations, 2018 Annual Report for The Kraft Heinz Company. Page 30. Retrieved from https://www.sec.gov/Archives/edgar/data/1637459/000163745919000049/form10-k2018.htm

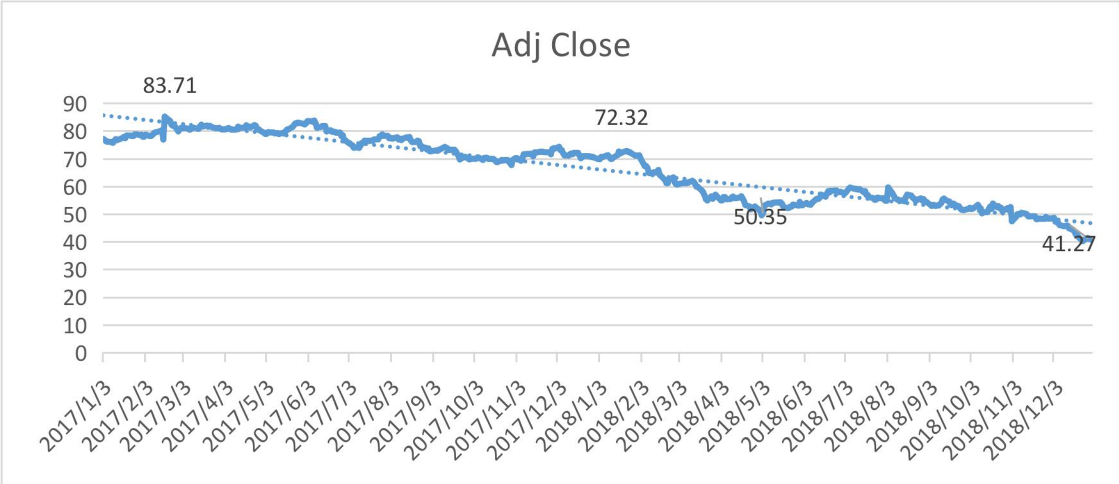
We identify the main factors affecting KHC's impairment of goodwill in 2018:

- Sustained decrease in share price, which leads the market value lower than the book value of net assets. Graph 5 below presents the share price trend from the beginning of 2017 to the end of 2018. In general, the stock price of 2018 has been in decline.

- Increased competition pressure and higher supply chain costs. The supply chain cost for natural cheese and meats categories in US Refrigerated reporting unit increased. KHC has always maintained a competitive advantage in the market with a low price strategy. Once the cost of the supply chain rises, profits will shrink instantly.
- Low growth and margin expectation for 2019. As shown in Table 4, from 2016 to 2017, operating income increased by 8.10%, and diluted earnings per share increased from $ 2.78 to $ 8.91. On the contrary, the operating income in 2018 turned into a loss, which decreased by -268.70%. Diluted earnings per share in 2018 also fell to negative numbers. Declining margin and net sales in global market segment brought pessimistic forecasts.
- The sale of certain assets, which changed the composition and use of the remaining assets and brands in the associated reporting unit. KHC dropped out of Canada's natural cheese market.
- Fluctuations in foreign exchange rates in certain countries. Foreign exchange rate declined in Japan and Korea.
- Increased interest rates.
- Increased and prolonged economic and regulatory uncertainty in the United States and global economies.

Additionally, based on the illustration of KHC's annual report (The Kraft Heinz Company, 2018), the discount rates, long-term growth rates, and royalty rates also affect the valuation of fair value. The report indicates that KHC utilize the discounted cash flow method, the excess earnings method, and the relief from royalty method under the income approach to estimate the fair value of our reporting units, largest brands, and remaining brands, respectively. The discount rate based on the benchmark rates from the Federal Reserve increased fourfold in 2018. The higher the discount rate, the lower the fair value. When the fair value exceeds the book value, impairment occurs and losses would be recorded..

Graph 5. Adjusted closing price of KHC from January 1, 2017 to December 31, 2018



Source: adapted from Yahoo Finance. Retrieved from https://finance.yahoo.com/quote/KHC/history?p=KHC&.tsrc=fin-srch

4.2 Data Analysis of Dalian Zeus Entertainment Co., Ltd.

Founded in 2010, Dalian Zeus Entertainment Co., Ltd. (referred to as Tianshen Entertainment Group) is a pan-entertainment industry group that covers games, application distribution platforms, advertising and film industries. It was formerly known as Beijing Tianshen Interactive Technology Co., Ltd., and was officially renamed Dalian Zeus Entertainment Co., Ltd. (stock symbol: 002354) in April 2015. The company adopts China Generally Accepted Accounting Principles (China GAAP).

Table 5 below, presents financial accounting data and indicators of the Dalian Zeus Entertainment company. The value of goodwill rose steadily from FY 2015 to FY 2017 and fell to CNY¥ 2,618 million in FY 2018. It seems that the company took a big bath in 2018. Dalian Zeus Entertainment has recorded CNY¥ 4,060 million of goodwill impairment losses in the consolidated income statement of FY 2018. Write-offs in 2018 accounted for 62.53% of goodwill in 2017. From 2016 to 2017, the company's net income and net sales grew at an average annual rate of more than 50%.

Generally, increasing net income and net sales are a sign that the company is in the growth stage and favored by investors. However, in 2018 both operating income and net income turned into a negative number and meanwhile the sale performance declined. The total assets of Dalian Zeus Entertainment accumulated to ¥14,608 million at the end of 2017. From 2015 to 2017, goodwill, total assets, total liabilities, and shareholder equity have all increased at the same time. When it comes to the fiscal year 2018, total assets decreased to ¥8,570 million, stockholder's equity decreased to ¥2,344 million, while total liabilities increased to ¥6,226 million. It is worth mentioning that the debt asset ratio has risen to 72.65%, which is suggesting that the ability of the long-term solvency of the company is weakening. With a net loss of ¥ 6.978 billion and a debt asset ratio, financial leverage may also exacerbate the deterioration of financial conditions.

Table 5. Financial Accounting Data and Indicators of Dalian Zeus Entertainment Co., Ltd.

(Millions of yuan ¥)

	December 31, 2018	December 31, 2017	December 31, 2016	December 31, 2015
Goodwill	2,618	6,541	4,553	3,664
Net income	(6,978)	1,237	546	356
Net sales	2,599	3,101	1,675	941
Total Asset	8,570	14,608	7,390	7,306
Total Liabilities	6,226	5,065	1,707	2,363
Stockholders' Equity	2,344	9,543	5,683	4,943
Operating income/(loss)	(5,345)	1,355	561	369
Goodwill impairment losses	4,090	30	14	-

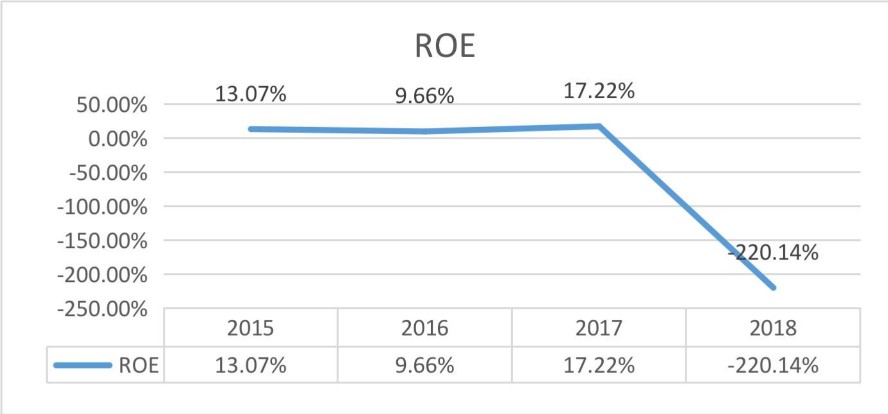
ROE = (1) * (2) * (3)	-220.14%	17.22%	9.66%	13.07%
(1) Net Profit Margin	-268.49%	39.89%	32.60%	37.83%
(2) Asset Turnover	0.22	0.28	0.23	0.23
(3) Equity Multiplier	3.66	1.53	1.30	1.48
ROA	-81.42%	8.47%	7.39%	4.87%
ROS	-205.66%	43.70%	33.49%	39.21%
Goodwill to Assets	30.55%	44.78%	61.61%	50.15%

Note. This table presents the significant data of Dalian Zeus Entertainment Company from Fiscal Year of 2015 to Fiscal Year of 2018. All of the essential data is from the company's annual report of each year.

Dalian Zeus Entertainment Company was established in March 2010, and was approved by the China Securities Regulatory Commission in July 2014. The stock code is 002354. All data units in the original financial statements are in yuan. The figures shown in this table are rounded off and the unit is in millions yuan.

For the return on equity (ROE) trend shown in Graph 6 below, it is clear that there is a significant decline in 2018. The net profit margin is -268.49%, which also results in a negative ROE. This implies that the revenue received from selling products or services is not enough to cover the costs and expenses. The equity multiplier in 2018 is much higher than in the previous three years, which further reduces the return on equity. Compared to 2017, the equity multiplier in 2018 increased by 139%. The equity multiplier ratio or financial leverage illustrates the company's debt financing strategy. The balance sheet shows that the company also has ¥ 6,226 million in debt, while the total equity is only ¥ 2,344 million, which means more assets are raised through debt rather than equity. Therefore, Dalian Zeus Entertainment is considered to be highly leveraged and high risk.

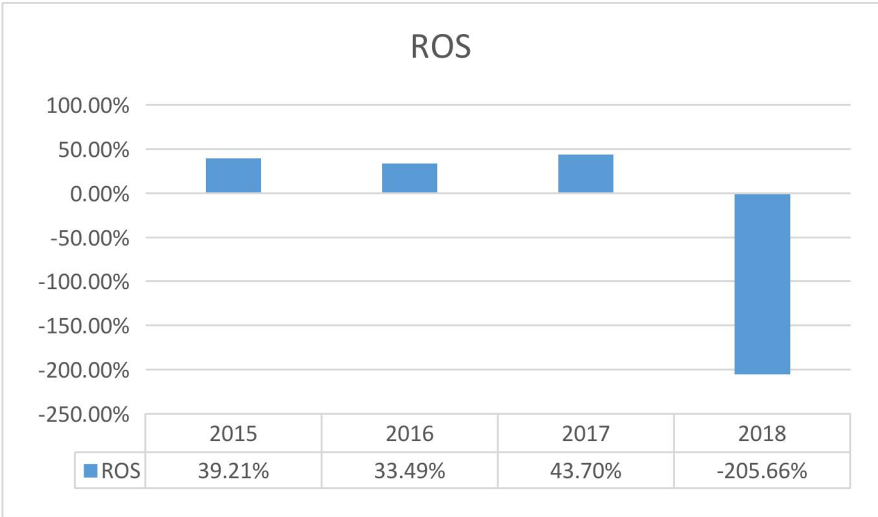
Graph 6. Return on Equity of Dalian Zeus Entertainment Co., Ltd. changes in recent 4 years



Note. This graph shows the data selected from the Table 5 under the subject of ROE.

Graph 7 below provides a bar chart of changes in ROS from 2015 to 2018. In this graph, the part where from 2015 to 2017 represents the ROS is above zero. In 2018, the negative operating income prompted the ROS to fall to -205.66%. The changes in 2018 put in evidence that the corporate profitability and operating efficiency is extremely poor, which also means that the sales are not able to cover expenses and costs.

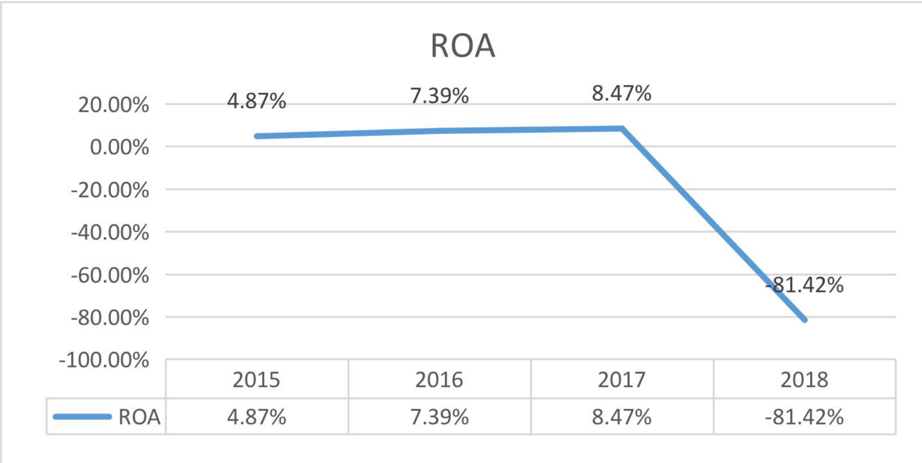
Graph 7. Return on Sales of Dalian Zeus Entertainment Co., Ltd. changes in recent 4 years



Note. This graph shows the data selected from the Table 5 under the subject of ROS.

Graph 8 below presents the changes in ROA of Dalian Zeus Entertainment Co., Ltd. The ROA increased slowly from 2015 to 2017. ROA is one of the core indicators of profitability, which reflects the ability of an enterprise to make profits by investing in capital. Based on the ROA performance of the previous three years, the company is profitable. However, the ROA ratio falls to -81.42% because of the net loss in 2018.

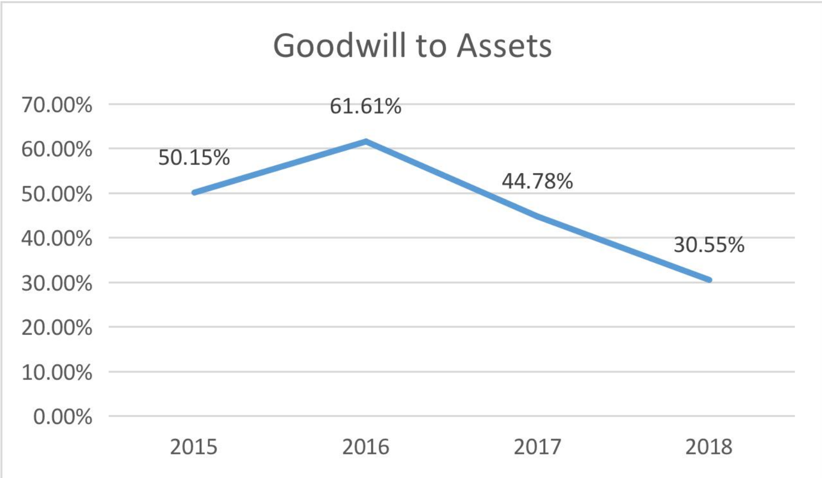
Graph 8. Return on Assets of Dalian Zeus Entertainment Co., Ltd. changes in recent 4 years



Note. This graph shows the data selected from the Table 5 under the subject of ROA.

Graph 9 below presents changes in the goodwill-to-assets ratio between 2015 and 2018. The ratio fluctuates over these years. In the beginning, the company has had an over 50% goodwill-to-assets ratio. Goodwill takes more than 50% of the assets, which is noting that corporate intangible assets are more than tangible assets and indicates that a significant portion of corporate assets is attributed to goodwill. If any impairment of goodwill must be recorded, the company may face the risk of this portion of assets to be quickly cleared. The goodwill to assets reach 61.61% in 2016 and then keep going down to 44.78% in 2017 and 30.55% in 2018. But when we look at Table 5, it is clear that goodwill rises constantly until 2018, whereas the goodwill-to-assets ratio decreases by 16.83% in 2017. The total assets in 2017 are almost twice of those in 2016. The balance sheet illustrates that in 2017 not only the goodwill and other intangible assets increased but also tangible assets. The declining trend of the goodwill-to-assets ratio continued in 2018. In this year, goodwill decreased by 59.98% and total assets decreased by 41.33%. The write-down of goodwill accounted for 62.52% of goodwill in 2017 and 67.24% of total assets reduced in 2018.

Graph 9. Goodwill to Assets of Dalian Zeus Entertainment Co., Ltd. changes in recent 4 years



Note. This graph shows the data selected from the Table 5 under the subject of Goodwill to Assets Ratio.

To sum up, Dalian Zeus Entertainment is underperforming and unprofitable in terms of the changes in ROE, ROS, ROA, and goodwill-to-assets in 2018. From its 10-k in 2016 and 2017, we find evidence that Dalian Zeus Entertainment was keen on generating high goodwill out of the merger and acquisition. Table 6 below shows that from 2015 to 2017 the company launched 8 single-billion-yuan mergers and acquisitions with a total transaction amount of CNY¥ 11.368 billion. Dalian Zeus Entertainment acquired Beijing Miaoquhengsheng Network Technology ("Miaoquhengsheng") in 2015 and Oasis Games in 2017 for CNY¥ 589 million and CNY¥ 3,417 million, respectively. Table 7 below presents the performance of major subsidiaries in the FY2019 semi-annual report. It shows that both Miaoquhengsheng and Oasis Games are facing difficulties in operating. Those two subsidiaries have net operating losses in first half year of FY2019 for -CNY¥ 21.45 million and -CNY¥ 32.22 million, respectively. From a successful merger to a net loss, the two subsidiaries only spent 4 and 2 years respectively. Especially noteworthy is the Oasis

Games. In 2017, Dalian Zeus Entertainment paid a high price to buy it, but Oasis Games sunk into a net loss in less than two years. Therefore, it is worth explaining what leads the company to impair goodwill and the reasons are as following:

- The performance commitment failed to be fulfilled. In China, performance commitment refers to the profit commitment that based on the estimated profitability of a certain period in the future made by the acquired company to the acquirer during the merger and acquisition (M&A) process. If the actual operating profit of the acquired company does not reach the promised amount when the commitment period expires, the difference shall be compensated to the acquirer. Table 6 shows that in 2015 Rayjoy Holdings Limited ("Rayjoy"), which was acquired by Dalian Zeus Entertainment for CNY¥ 880 million. According to the 2015 annual report of Dalian Zeus Entertainment, Rayjoy had estimated and promised that the net profit would reach no less than CNY¥ 63 million in 2015, CNY¥ 78.75 million in 2016 and CNY¥ 98.44 million in 2017. However, the actual net profit of Rayjoy issued on the Dalian Zeus Entertainment annual report for FY2015, FY2016, and FY2017 were about CNY¥ 30.41 million, CNY¥ 87.6 million, CNY¥ 88.2 million, respectively. This is suggesting that Rayioy acquisition case did not meet the expectations and remained far below the estimation. Table 6 also shows that in 2015, Dalian Zeus Entertainment acquired Beijing Miaoquhengsheng Network Technology for 589 million yuan, while table 7 presents that Miaoquhengsheng had already lost CNY¥ 50.89 million in the semi 2019.
- The goodwill impairment losses recorded in 2018 can be seen as a big bath.. In 2018, Dalian Zeus Entertainment impaired goodwill by 4.09 billion, accounting for 62.53% of the goodwill of 6.54 billion in 2017. Correspondingly, table 5 shows that total assets have also dropped from 14.608 billion to 8.57 billion. The level of goodwill on book was on average 52.18% from FY 2015 to FY 2017. As of December 21, 2018, there were

3583 listed companies in China. According to the database of China Securities Times (2018), most companies with high goodwill come from the media and entertainment (M&E) industry and in FY 2018 a total of 44 M&E companies had a goodwill to asset ratio exceeding 50%. In other words, only 1.2% of M&E companies in China have a goodwill to asset ratio higher than 50%, and Dalian Zeus Entertainment is one of the few. Dalian Zeus Entertainment only spends three years (FY2015 - FY2017) to carry out 8 M&A projects and accumulated high goodwill, and then write off nearly two-third of that in one year - FY2018. After experiencing rapid growth from 2015 to 2017, the total assets in 2018 nearly return to the situation before the business combinations - as 8,570 in 2018 and 7,306 million in 2015 - which looks like a big bath. The company may hope that after the huge write-off, they will have the opportunity to improve the financial performance in next fiscal year.

- The two main business areas, gaming, and filming (both belong to the M&E industry) are under pressure from new policies. The Wind database shows that in 2018, the A-share mobile game sector fell 52%, and the online game sector also fell 40%. Tighter policies have put pressure on the market and severely hit M&A in the M&E industry.

Table 6. Single-billion-yuan M&A project of Dalian Zeus Entertainment Co., Ltd. from 2015 to 2017

Year	Company	Transaction consideration (Millions of yuan)
2015	Avazu Inc.	2,070
	Rayjoy Holdings Limited	880
	Beijing Miaoquhengsheng Network Technology	589
2016	Yihua Tech	986
2017	Oasis Games	3,417

Dotc	2,215
Herun Media	742
Jiaxing Lewan Network Technology	469

Source: adapted from: FY2015 - FY2017 Annual Report of Dalian Zeus Entertainment Company.

Table 7. Data of Major subsidiaries that have a net profit impact of more than 10% (in yuan) from Dalian Zeus Entertainment Co., Ltd. semi-annual report for 2019, were:

Company	Type of company	Total assets	Net assets	Operating income/loss	Net income/loss
Avazu Inc.	subsidiary	2,286,465,419	1,000,706,264	77,148,963	45,515,191
Oasis Games	subsidiary	1,636,612,678	1,499,137,468	(32,216,591)	(32,736,409)
Herun Media	subsidiary	471,270,487	287,506,226	6,740,135	5,785,647
Jiaxing Lewan Network Technology	subsidiary	303,111,496	216,583,870	88,955,604	79,489,121
Rayjoy Holdings Limited	subsidiary	132,100,934	122,072,940	9,533,966	10,158,149
Beijing Miaoquhengsheng Network Technology	subsidiary	109,475,892	97,863,644	(21,447,949)	(21,447,949)

Source: adapted from: 2019 semi-annual report of Dalian Zeus Entertainment Company, Page 22.

4.3 Data Analysis of Bayer Group

Bayer Group is dedicated to the life sciences field, specializing in the development of pharmaceutical, agricultural and chemical products with operations all over the world. According to the annual reports from 2014 to 2018 for Bayer Group, all the consolidated financial statements were prepared by Bayer Group according to the International Financial Reporting Standards (IFRS) issued by the International Accounting Standards Board (IASB), London, United Kingdom, in force at the end of the reporting period, and the interpretations of the IFRS Interpretations Committee (IFRS IC) as endorsed by the European Union.

Table 8 below presents the financial accounting data and indicators of Bayer Group between 2014 to 2018. As of December 2018, Bayer Group reported revenue of 39.586 billion Euros, an increase of 13.1% compared to FY2017. The operating margin decreased to 9.9% in FY2018, compared to 16.9% in FY2017. According to the 2018 annual report, the net margin of 4.3% for FY2018 was quite lower compared to 21% for FY2017. Overall, the company kept sales growth but did not meet the expectation for the operating performance and the profitability. After the acquisition of Monsanto Company in 2018, Bayer recognized and accumulated high goodwill by about $26 billion. The direct impact on the financial performance was an increase in the amount of total assets. According to the Bayer Group Consolidated Statements of Financial Position of nearly 5 years, there is evidence to demonstrate the main reason for the increase in the total assets of 2018, that is to say, the huge goodwill generated by this acquisition.

Table 8. Financial Accounting Data and Indicators of the Bayer Group

(Millions of Euro €)

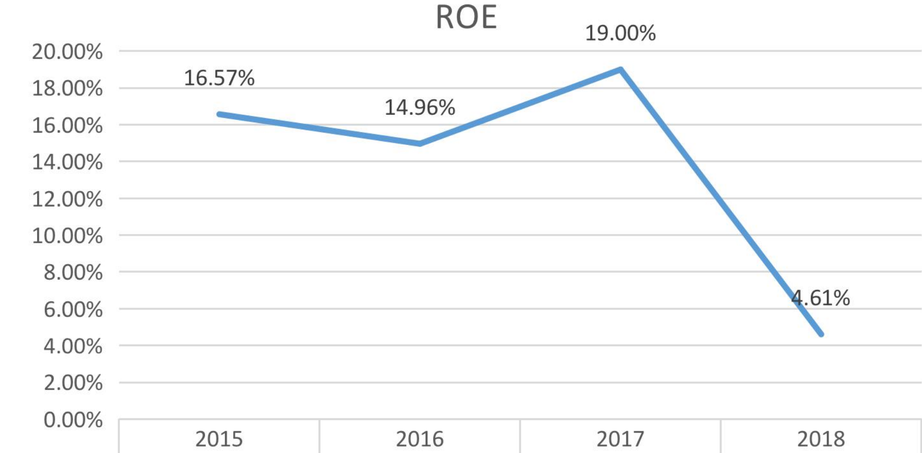
	December 31, 2018	December 31, 2017	December 31, 2016	December 31, 2015	December 31, 2014
Goodwill	38,146	14,751	16,312	16,096	15,347
Net income	1,695	7,336	4,531	4,110	3,426
Net sales	39,586	35,015	34,943	46,085	41,399
Total Asset	126,285	75,087	82,238	73,917	70,234
Stockholders'	46,148	36,861	31,897	25,445	20,218

Equity					
Operating income/(loss), EBIT	3,914	5,903	5,738	6,241	5,395
Goodwill impairment losses	1,547	-	-	-	6
ROE = (1) * (2) * (3)	4.61%	19.00%	14.96%	16.57%	-
(1) Net Profit Margin	4.28%	20.95%	12.97%	8.92%	8.28%
(2) Asset Turnover	0.39	0.45	0.45	0.64	-
(3) Equity Multiplier	2.74	2.04	2.58	2.90	3.47
ROA	1.34%	9.77%	5.51%	5.56%	4.88%
ROS	9.89%	16.86%	16.42%	13.54%	13.03%
Goodwill to Assets	30.21%	19.65%	19.84%	21.78%	21.85%

Note. This table presents the significant data of Bayer Group from Fiscal Year of 2014 to Fiscal Year of 2018. All of the essential data is from the company's annual report of each year. All data units in the original financial statements are in Euros.

In Graph 10 below, ROE fluctuates over the years, with the worst year being 2018. From 2015 to 2017, ROE remains around 15% to 20% and the net profit margin in Table 8 above also shows a gradual climb. From the perspective of net income € 7,336 million (maximum value in five years) and operating income €5,903 million, Bayer Group delivered an excellent transcript to investors in 2017. With a 20.95% net profit margin, the company's ROE is at the top level of 19.00% in 2017. However, the situation became complicated in 2018 for the acquisition of the Monsanto Company. Total assets increased by 68.18%, which turned into the lowest net profit margin of 4.28% during the period of four years under analysis. ROE also dropped to 4.61% due to the decline in the net profit margin.

Graph 10. Return on Equity of Bayer Group changes in recent 4 years

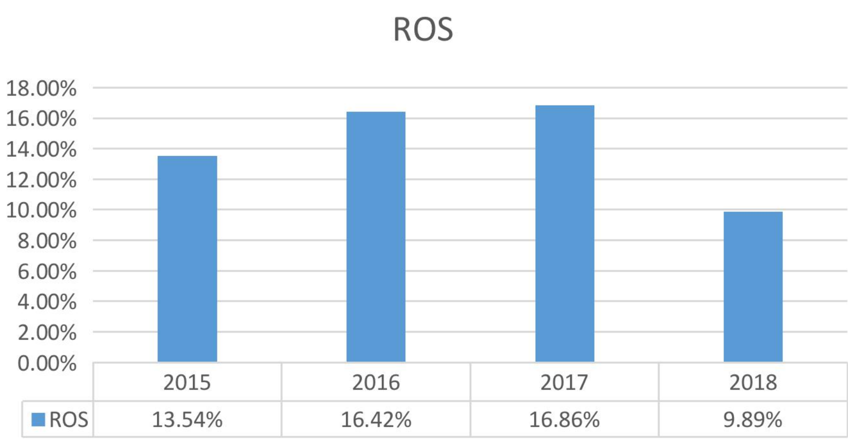


	2015	2016	2017	2018
ROE	16.57%	14.96%	19.00%	4.61%

Note. This graph shows the data selected from the Table 8 under the subject of ROE.

Graph 11 below presents the changes in ROS between FY2015 to FY2018. Bayer's net sales for the past five years were very impressive, reaching a maximum in FY2015, although sales in both FY2016 and FY2017 have declined. When looking at the period 2016 to 2017 in Graph 11 below, Bayer Group had an excellent ROS performance and reflected well on the stock market. Graph 12 below presents the adjusted closing price of Bayer Group covering the period 2015 to the third quarter of 2019. The first point to note is that the stock price declined sharply from 2017 to 2018. Though the sales performance of 2018 showed signs of recovery, the stock price still dropped to 16.60 Euros by the end of 2018. This provides evidence that the market value has evaporated. Although the net sales in 2018 were greater than in 2017, the net income yield the opposite result. We can see that net income swell from 2016 to 2017, peaking in 2017 with €7,336 million. However, net income in 2018 accounted for 1.695 billion euros, a sharp decline of 76.89% year-on-year, which resulted in a 9.89% ROS, much lower than in 2017. The operating income in 2018 is also the lowest during these five year period. When coupled with the income statement footnotes information, we find that the increase in miscellaneous operating expenses includes a €1.547 billion impairment loss recognized on the goodwill of Consumer Health. This may serve to explain, at least in part, the losses on goodwill impairment do harm to ROS.

Graph 11. Return on Sales of Bayer Group changes in recent 5 years



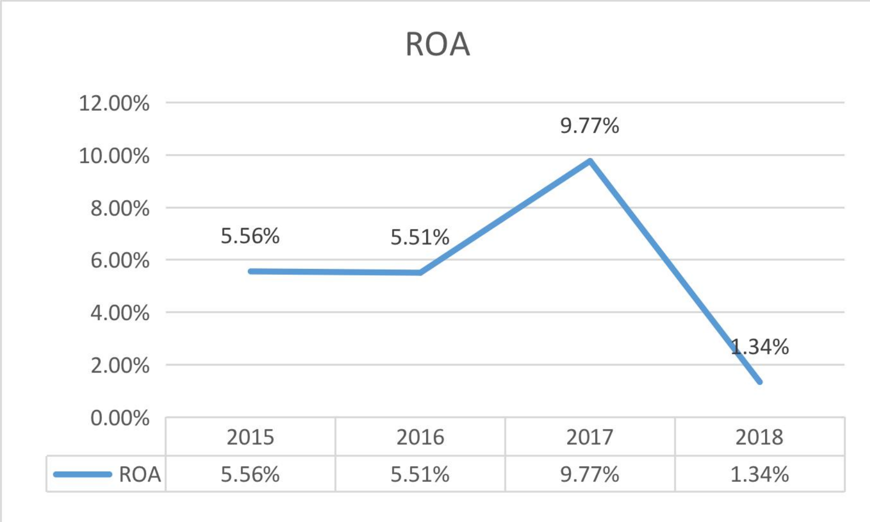
Note. This graph shows the data selected from the Table 8 under the subject of ROS.

Graph 12. Adjusted closing price of Bayer Group from December 31, 2014 to October 31, 2019

Source: adapted from: Yahoo Finance. Retrieved from *https://finance.yahoo.com/quote/BAYRY/history?p=BAYRY&.tsrc=fin-srch*

Graph 13 below displays that ROA remains stable during the period of 2014 to 2016. But when it comes to figures for 2017 and 2018 we see a different trend emerging. With the increase of net profit in 2017, ROA reached a peak of 9.77%. But in 2018, ROA dropped dramatically to 1.34% for the severely declined net income. A decreasing ROA can be an indication that the company's performance is deteriorating.

Graph 13. Return on Assets of Bayer Group changes in recent 5 years

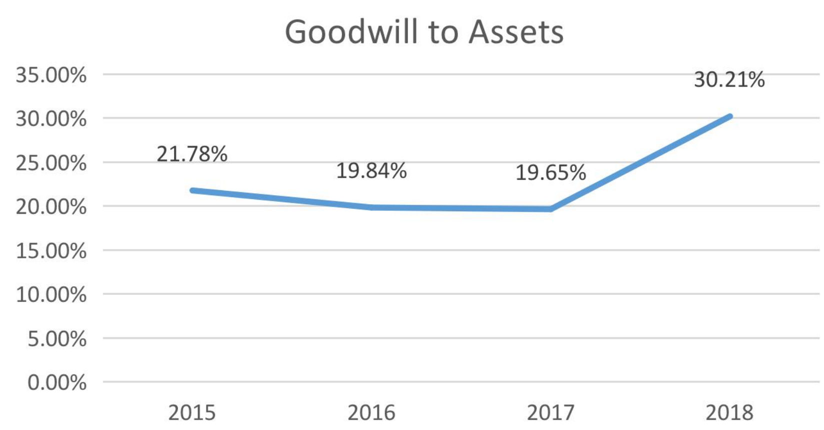


	2015	2016	2017	2018
ROA	5.56%	5.51%	9.77%	1.34%

Note. This graph shows the data selected from the Table 8 under the subject of ROA.

Graph 14 below clearly showed that under the premise of the impairment loss in 2018, the ratio of goodwill to assets had increased significantly compared with previous years. After the acquisition of Monsanto Company in 2018, Bayer recognized and accumulated high goodwill by about $26 billion. At the same time the company also recorded impairment losses on goodwill of Consumer Health in the amounts of €1.5 billion.

Graph 14. Goodwill to Assets of Bayer Group changes in recent 4 years



Note. This graph shows the data selected from the Table 8 under the subject of Goodwill to Assets Ratio.

In conclusion, in the year of goodwill impairment recognition, in the FY2018, Bayer Group has the lowest ROE, ROS, and ROA compared to the prior four years.

From 2015 to 2018, Bayer's ROE fluctuates and declines to only 4.61%. ROS encountered a depressing increase of 9.89% in 2018 compared to the outstanding performance of 16.86% in 2017. According to the note to the financial statements of FY2018, the Consumer Health Segment contributed a goodwill impairment loss of € 1,547 million, which was the result of the annual Group-wide impairment testing (2017: € 0 million) (Bayer Group, 2018). This was the first time that Bayer accounted for impairment losses. It indicated that unexpected performance on the Consumer Health Segment directly influenced the operating income and the ROS. The decreasing ROS and ROE hinted that Bayer Group was not able to meet the expectation of the FY2018 and had to record an impairment loss in the impairment testing. Some reasons that Bayer puts forward to explain the impairment in the Consumer Health segment in 2018, are:

- The further intensification of competition
- Consumer Health business transformation caused by changes in consumer behavior
- Higher procurement costs

According to Marketline's analysis (Marketline, 2019, November 4), the weak operational performance of Bayer could affect its ability to pursue growth and expansion plans. Under tremendous pressure, Bayer's acquisition of Monsanto may regain investor and shareholder confidence. But the unpredictability of the market and the inevitable high-risk factors of the global economic downturn might be an obstacle for Bayer to keep promises for the sales growth and profitability in two years to come.

Chapter 5: Comparative Discussion

5.1 General effect on corporate performance

Li et al. (2011) demonstrated that the announcement of goodwill impairment reveals negative information about the firm to the market. Zhang and Feng (2016) indicate that impairment of goodwill will cause a decline in corporate performance. For all three companies, there is evidence available to illustrate that goodwill impairment in 2018 leads to the under-performance in terms of low ROE, ROS, and ROA. These results indicate that goodwill impairment losses reflect and promote the poor performance of enterprises.

In FY2018, both KHC and Dalian Zeus Entertainment have trouble in management effectiveness. The ROE, ROS, and ROA of KHC are -18.37%, -38.91%, and -9.91%, respectively. The ROE, ROS, and ROA of Dalian Zeus Entertainment are -220.14%, -205.66%, and -81.42%, respectively. Although Bayer's 10-k does not present a negative value, there is no doubt that Bayer attains the worst ROE, ROS, and ROA outcome in FY2018. However, before the goodwill impairment appeared all three companies showed a good performance in these three indicators. Li and Sloan (2017) suggest that goodwill impairments reflect a lagged indicator of goodwill expiration rather than a leading indicator of expected future cash flows, and goodwill impairment decisions by management probably convey little new information to the public. Our results indicate that goodwill impairment is lagging. In 2018 all three companies are under pressure of higher cost, lower sales margin, and increased competition, which results in a decreased net income disclosed on the annual report. Management of all three companies from different countries only adopts impairment measures if the performance cannot meet the target.

Under the fact that companies with a higher proportion of goodwill are more likely to record the impairment of goodwill (Korošec et al., 2016) and the average goodwill-to-assets ratio is 16.8% in Europe, 16.7% in the US (André et al., 2016), and 4.10% in China (Wu, 2019), we compared the goodwill-to-assets ratio of Bayer

Group (EU), KHC (US) and Dalian Zeus Entertainment (PRC) with the average ratio. Between 2015 and 2017, the average goodwill-to-assets ratio of KHC, Dalian Zeus Entertainment and Bayer Group are 36.32% (> 16.7%), 52.18% (> 4.10%), and 20.42% (> 16.8%), respectively. It is suggesting that all three companies have a high level of goodwill on the book before the write-off happened. In 2018, the goodwill impairment losses of KHC, Dalian Zeus Entertainment, and Bayer Group are $7,008 million, CNY¥ 4,090 million, and € 1,547 million. Our results show that all three companies with higher goodwill values recognized impairment losses in annual goodwill impairment tests several years after M&A was completed.

5.2 Negative income and big bath behavior

The depressed earnings could be viewed as a signal that the company no longer enjoys the operational advantages that once upon a time gave rise to its goodwill (Jordan & Clark, 2004). For all three companies, operating income has decreased in 2018 compared to the prior 3 years. Both KHC and Dalian Zeus Entertainment have recorded a negative operating income and a net loss. Although Bayer remained with a positive net income, it reduced 2 billion euros in earnings before interest and taxes (EBIT) in 2018. Henry and Schmitt (2001) note that companies with negative earnings may be more prone to take big hits than companies with positive earnings. André et al. (2016) indicate that having negative earnings before interest, taxes, depreciation and amortization (EBITDA) leads to a greater frequency and level of goodwill impairment, which may also be viewed as big bath behavior. Our results suggest that the negative operating income of KHC and Dalian Zeus Entertainment results in a greater level of goodwill impairment losses and under-performance than Bayer Group.

Both goodwill impairment and big bath are a result of actions taken by managers and they can utilize both simultaneously (Reimbert & Karlsson, 2016). Furthermore, Gonçalves et al. (2019) stressed that impairment in goodwill is relevant in big bath practices. Management may clean the books (André et al., 2016) in the years of poor performance through earnings management, to leave opportunities for future financial data to improve. Cheng et al. (2017) find that investors perceive goodwill write-offs as positive news in the long term, but the firm operating performance only slightly improves after the write-off. Our results indicate that decreased net income appears with goodwill impairment in the same year and earnings do not suffer in years before the year of the impairment loss. In other words, our results are in line with Jordan et al. (2007) who indicate that depressed earnings only in the year of impairment losses suggest big bath earnings management occurred. But the result does not display whether the financial performance will improve after the big bath.

5.3 Opportunistic behavior

Literatures (Lapointe-Antunes et al., 2008; Ramanna & Watts, 2011; Korošec et al., 2016) indicate that managers have incentives to act opportunistically when implementing a goodwill impairment test to recognize transitional impairment losses. Compared with KHC in the US and Bayer in Germany, Dalian Zeus Entertainment from China has more large-scale M&A cases in the short term (see Table 6). The asset-light business model has appealed to many investors, making the company show good financial ratios from 2016 to 2017. However, the parent company had to write off some unprofitable subsidiaries. We consider the act of business manipulation of goodwill through M&A as opportunistic behavior. This result is also consistent with the study on samples of the Chinese market (Xiao et al., 2019) which indicates that both the irrational high-premium mergers and acquisitions and goodwill manipulation can be seen as opportunistic behavior. Our results suggests that Chinese enterprises that focus too much on short-term benefits may overlook the potential risks of long-term harm.

Chapter 6: Conclusion

We compare the causes and consequences of the goodwill impairment of three companies reporting under the US, China, and German jurisdictions in 2018, that is, the year for China's goodwill black swan event. Our sample includes The Kraft Heinz Company (U.S), Dalian Zeus Entertainment Co., Ltd. (China), and Bayer Group (German). We examine the changes in ROE, ROS, ROA, and goodwill-to-assets over the period from 2015 to 2018 by using both quantitative and qualitative approaches.

The results of our study confirm the findings of Li et al. (2011) and Zhang and Feng (2016) emphasizing that the goodwill impairment not only discloses the negative information to the outside market but also destroys the inner performance. The results are also aligned with Li and Sloan (2017) by indicating that the effect of goodwill impairment losses on companies' performance is lagging, which means the impairment losses only show a description of the status quo rather than a future forecasting. The results of goodwill-to-assets reveal that all the sample companies have a high goodwill-to-assets ratio based on the studies by Korošec et al. (2016) and André et al. (2016). We suggest that companies with a higher percentage of goodwill are more likely to apply a write-off. In accordance with Henry and Schmitt (2001) and André et al. (2016), our results also show that companies with a net loss are more likely to impair greater goodwill than the companies with a net income. Other studies (Reimbert & Karlsson, 2016; Cheng et al., 2017; Gonçalves et al., 2019) demonstrated that impairment in goodwill is relevant with big bath practices and goodwill impairment and big bath take place simultaneously. The results confirm the findings of the big bath theory (Henry & Schmitt, 2001; Jordan et al., 2007; Jordan & Clark, 2015) which emphasizes that managers implement the earnings management method called "big bath" in the impairment year. But there is no evidence confirming whether the financial performance will improve after the big bath.

Since the performance of Chinese enterprise with light assets has made more deals on high premium M&A than companies in the US and Germany, our results are consistent with Xiao et al. (2019) who indicates that both the irrational high-premium mergers and acquisitions and goodwill manipulation can be seen as opportunistic behavior. Given the frequent occurrence of the Chinese goodwill black swan event in 2018, we believe that the strengthening of accounting supervision will help combat the opportunism of listed companies, improve the asset quality of listed companies, and reduce the occurrence of big bath.

The present empirical analysis contributes to financial report analysis by offering knowledge in the area of the causes and impacts of goodwill impairment losses. Accordingly, the study contributes to the literature in the field of goodwill accounting in European companies reporting under IFRS, the US companies reporting under US GAAP, and Chinese companies under China GAAP. In addition, the comparative analysis also offers references for companies reporting in any other jurisdiction . This does not go without mentioning the limitation of our findings as far as the sample companies are concerned: different industries, and industry differences, may affect the accuracy of the results. Thus, our results can only broadly reflect the typical financial performance of goodwill-impaired companies in the United States, China, and Germany in 2018. At this stage, future research could focus on developing and extending this to put forward countermeasures to avoid the risk of goodwill impairment.

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ANNEXES

Appendix A

The Kraft Heinz Company

Consolidated Statements of Income

For the Fiscal Year Ends in December

(in millions, except per share data)

	2018	2017
Net sales	$26,268	$26,076
Cost of products sold	17,347	17,043
Gross profit	8,921	9,033
Selling, general and administrative expenses, excluding impairment losses	3,205	2,927
Goodwill impairment losses	7,008	-
Intangible asset impairment losses	8,928	49
Selling, general and administrative expenses	19,141	2,976
Operating income/(loss)	(10,220)	6,057
Interest expense	1,284	1,234
Other expense/(income), net	(183)	(627)
Income/(loss) before income taxes	(11,321)	5,450
Provision for/(benefit from) income taxes	(1,067)	(5,482)
Net income/(loss)	(10,254)	10,932
Net income/(loss) attributable to noncontrolling interest	(62)	(9)
Net income/(loss)	(10,254)	10,932
Net income/(loss) attributable to noncontrolling interest	(62)	(9)

Net income/(loss) attributable to Kraft Heinz	(10,192)	10,941
Preferred dividends	-	-
Net income/(loss) attributable to common shareholders	($10,192.00)	$10,941
Per share data applicable to common shareholders:		
Basic earnings/(loss)	($8.36)	$8.98
Diluted earnings/(loss)	(8.36)	8.91

Source: adapted from: 2018 Annual Report for The Kraft Heinz Company. Page 62. Retrieved from: https://www.sec.gov/Archives/edgar/data/1637459/000163745919000049/form10-k2018.htm

Appendix B

Bayer Group

Income Statement

For the Fiscal Year Ends in December

(in millions, EUR)

	31-Dec-18	**31-Dec-17**
Revenue	39,586	35,015
Total Revenue	39,586	35,015
Cost of Revenue, Total	17,010	11,382
Gross Profit	22,576	23,633
Selling/General/Admin. Expenses, Total	15,494	13,258
Research & Development	5,246	4,504
Interest Exp.(Inc.),Net-Operating, Total	(8)	(33)
Unusual Expense (Income)	(3,598)	124
Other Operating Expenses, Total	1,528	(123)
Total Operating Expense	35,672	29,112
Operating Income	3,914	5,903
Interest Inc.(Exp.),Net-Non-Op., Total	(2,250)	(1,439)
Other, Net	654	113
Net Income Before Taxes	2,318	4,577
Provision for Income Taxes	607	1,329
Net Income After Taxes	1,711	3,248
Minority Interest	(16)	1
Net Income Before Extra. Items	1,695	3,249
Total Extraordinary Items	0	4,087
Net Income	1,695	7,336

Income Available to Com Excl ExtraOrd	1,695	3,249
Income Available to Com Incl ExtraOrd	1,695	7,336
Diluted Net Income	1,695	7,336
Diluted Weighted Average Shares	941	885
Diluted EPS Excluding ExtraOrd Items	2	4
DPS - Common Stock Primary Issue	3	3
Diluted Normalized EPS	4	5

Source: adapted from: 2018 Annual Report for Bayer Group. Page 165.