

Measuring Financial Reporting Quality Case Study of Volkswagen Group during the Period 2007-2021

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Received: 18/08/2023 ; **Revised:** 25/11/2023 ; **Accepted:** 29/12/2023

Summary: This study aimed to measure financial reporting quality using "Eckel model", for this purpose, we applied the model to a sample of financial statements issued by the German company Volkswagen during the period 2007-2021, by applying the model using the company's income before taxes, and the income after taxes, the study concluded that there are no statistically indicators of financial statements manipulation during the period studied, so that Volkswagen group followed a successful strategy to restore customer confidence, so it is an example of financial honesty and a successful strategy to increase profits.

Keywords: Financial; Reporting; Quality; Eckel; Volkswagen Group.

Jel Classification Codes : M41, G34.

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I- Introduction :

Accounting is an art concerned with recording and classifying economic events for business entities, then it developed to a science governed by a framework of principles and concepts, and since accounting is an art, it is through the accountant's understanding of the nature of the stock market and the behavior of its dealers, he can come up with the number of profits that the management desires, and he is guided in that by its motives to maximize current or future bonuses, and what the big owners expect in terms of cash distributions or in the form of shares, so when companies realized that laws only tell you what you cannot do, they decided to choose what they can make a game to achieve their own purposes, if you cannot make profits, you can at least invent them, it is the "financial numbers game", it is the art of inventing Earnings, and it requires belief in accounting as an art first, looking at the financial statements as a single piece of art whose lines and colors must be consistent, because accounting numbers require many judgments and estimates, regardless of the size of the company and its strict control capabilities.

The financial numbers game is one of the latest practices of accounting manipulation that is practiced by exploiting accounting flexibility, the multiplicity of alternatives, methods and accounting policies, so that it affects the financial reporting quality by distorting them and misleading the users of the financial statements without violating laws and accounting standards, these practices are legitimate, and considered as deception and misleading covered by laws (Feddaoui, 2014).

The financial reporting is a process influenced by a many factors, including technological, political, cultural, economic, and business environments, the national commission on fraudulent financial reporting named "Treadway commission" divided financial reporting system into three elements:

- Companies, directors, officers,
- Independent accountants,
- Oversight bodies.

The figure (1) explain the relationships of the three elements of the financial reporting system and their relationship with users of such a system (Rezaee, 2010).

The financial statements game can be distorted through what is known as cooking books or creative accounting, it is defined as follows: "Creative accounting in a publicly quoted company is about manipulating the financial numbers to arrive at an answer that meets the needs of the company management, rather than providing objective information for the external recipients – primarily shareholders", one point to stress at this early stage is that creative accounting, like all wrongdoings, will never be erased entirely. If the management of a company is determined to deceive its auditors and shareholders, it will probably get away with it, at least in the short term.

The managers control the data and have the power and the opportunity to deceive, so it is likely that there will always be a few who take advantage. But the application of good accounting principles, backed up by effective auditing, will reduce the chances and make it more difficult for those who wish to be creative.

It is also a question of degree. If we were to look at the history of most, and probably all, companies, there would be some examples of creative accounting, for example:

We have had a good year, let's increase the doubtful debt provision, and give ourselves a head start for next year.

We cannot afford to make a provision for obsolete stocks this year, let us wait until next time, I know our depreciation rates need changing but this is not a good year to do it.

This kind of judgement – often referred to as 'income smoothing' – is commonplace and usually acceptable, as long as it is not part of an intention to deceive over the long term (Kevin, Alan, 2005). "Mulford & Comiskey, 2002", defined income smoothing that is "A form of earnings management designed to remove peaks and valleys from a normal earnings series, including steps to reduce and "store" profits during good years for use during slower years" (Mulford, Comiskey, 2002).

From above definitions, we can conclude that income smoothing practices is the management of a desired income to eliminate the fluctuations in the income path and involves the steps of income reduction in high-income years for transfer to low-income years, it affect the quality of financial reporting by distorting it with the aim of misleading investors and giving a fake picture of the company's position.

There are many other terms used in connection with financial numbers game, according to "Jones, 2011" we can distinguish the following:

Aggressive accounting: it involves the use of accounting rules to give a particular result, by working within the regulatory system.

Earnings management: it involves using the accounting flexibility to give predetermined gains.

Impression management: this represents an attempt by management of the firm to give to users the impression of the firm which managers want (Jones, 2011).

Through the foregoing, we can conclude that the financial numbers game is the use of accounting flexibility and different accounting methods and policies in order to distort financial reporting to suit the purposes of management in presenting a fake picture of the company's activity or maximizing management rewards and incentives at the expense of shareholders' interest, while accounting fraud practices is a distortion of financial reporting through violation of accounting laws and principles, and this is through double billing of expenses and revenues or deliberate accounting errors in accounting records, which negatively affects the financial reporting quality, In this study, we aim to answer to the following question:

How can measure financial reporting manipulation?

For this purpose, we followed an analytical descriptive approach to measure the income smoothing practices using the "Eckel" model in the German Volkswagen Group for the automotive industry, during the period 2007-2021, the hypotheses of our study were formulated as follows:

The nihilistic hypothesis (H0): There are no statistical indicators of financial reporting manipulation in the German Volkswagen Group during the period 2007-2021 .

The Alternative Hypothesis (H1): There are statistical indicators of financial reporting manipulation in the German Volkswagen Group during the period 2007-2021

II– Methods and Materials:

In order to measure financial statements quality we chose to study the case of the German Volkswagen Group for the automotive industry, during the period 2007-2021, and for that we used the Eckel model to measure income fluctuations and find out the extent to which the company practiced smoothing income during the period studied.

"Eckel, 1981" model is one of the widely used models for measuring Financial statements quality, this model is used for comparing income variance with the sales variance to determine if the company smoothed its income.

The income behavior index is calculated by dividing the absolute value of variance coefficient variable of income between two years by the absolute value of variance coefficient variable in sales change between two years, according to the following mathematical equation:

$$SB = |CV\Delta S| / |CV\Delta I|$$

|CV\Delta I|: The absolute value of variance coefficient change in income between year *n* and year *n-1*.

|CV\Delta S|: The absolute value of variance coefficient change in sales between year *n* and year *n-1*.

SB: smoothing behavior, or income smoothing index between year *n* and year *n-1*.

The practice or non-practice of the company to smooth its income is evaluated according to the following rule:

If the SB index is less than 1 between the year *n* and the year *n-1*, the company practiced income smoothing.

If, however, the SB index is equal to or greater than 1 between the year *n* and the year *n-1*, the company didn't practice income smoothing.

In order to apply the Eckel model in Volkswagen Group for automotive industry, we used the consolidated financial statements issued by the company during the period 2007-2021, the income statement was relied upon, and in order to ensure the accuracy of measurement, the model was applied in two cases:

The first case: measuring income-smoothing practices before calculating tax on profits.

The second case: measuring income-smoothing practices after calculating the tax on profits.

Then were summarized the results in tables using Microsoft Excel and SPSS statistical packages program.

In order to test the hypothesis of income smoothing practices in Volkswagen Group for automotive industry during the period 2007-2021, we applied the model "Eckel, 1981" using the income value before taxes, and the income after taxes according to the following steps:

Step 1: Analysis of the evolution of pre-tax income and post-tax income as well as sales volume in the Volkswagen Group during the period 2007-2021.

In this step, we used the curve chart during the period 2007-2021 to analyze the path of income before and after taxes, and the path of sales development in the studied company.

Step 2: The calculation of income smoothing index during the period 2007-2021.

By dividing the absolute value of variance coefficient of change in income before taxes between year *n* and year *n-1* on the absolute value of variance coefficient of change in sales between year *n* and year *n-1* in the period studied.

Step 3: Determine the frequencies and percentages of income smoothing practices during the studied period.

If the income smoothing index is less than one, there are indications of income smoothing practices, so we give to the company an imaginary variable (1), if the index is equal to or greater than one, the company is classified as non-practiced for income smoothing and we give an imaginary variable (0) (Feddaoui, 2018).

These methods and tools must be presented precisely and clearly without exaggeration so that other researchers can re-examine or verify them. The author can describe the tools and methods used in the form of a scheme, table or diagram to explain methods used (BEKHITI, 2022, p.330), this section is divided into sub-sections, where its contents vary according to the subject matter of the article.

III- Results and discussion :

Based on the graphic curve shown in **Figure 2**, which shows the evolution of the volume of pre-tax profits of the Volkswagen Group during the period 2007-2021, it is clear that the studied company witnessed a remarkable development during the period in the volume of profits before tax, as it recorded the lowest value of sales starting from the year 2006 at a value of 45 million euros, then it recorded an increase in the value in 2007 to 2811 million euros, the profits experienced a fluctuation between rise and fall during the period 2007 to 2015, where a loss of -4819 million euros was recorded, which was soon remedied in the following year, and the highest value of the company's profits before taxes was recorded in 2019, with a value of 10,638 million euros.

As for the profits achieved after paying taxes, they also witnessed a noticeable fluctuation during the period studied, so that the company recorded the highest value of profits in 2012 estimated at 6,380 million euros, and recorded the lowest value of profits after paying taxes in 2015 with a value of -5515 million euros.

As for the volume of sales, the graphic curve shows that sales of Volkswagen experienced a variation during the period, so that sales reached their peak in 2019 with a value of 80,621 million euros, this explains the large value of profits before taxes for that year which was estimated at 10,638 million euros, but the volume of taxes was heavy on the shoulders of the company in 2019, which led to a decrease in its profits to 4958 million euros in the same year.

The results recorded above can be interpreted as follows (Samir ,2015):

The large loss recorded for Volkswagen in 2015, estimated at 5,515 million euros, can be explained by the crisis that struck the company during that period, as customers' confidence in the company was shaken because Volkswagen stated, in a statement issued to it, that the emissions test deception device had been used in 11 million cars, they cheated their diesel emissions tests. The US Environmental Protection Agency revealed that there are approximately 482,000 cars equipped with this tool that deceives emissions gauges in the United States, "A3 Audi" manufactured by Volkswagen, "Jetta 2009 and 2014", "Beetle" and "Volkswagen", "Golf", and the "Volkswagen Passat" in 2014 and 2015, while the company, "Volkswagen," stated that there are approximately 11 million cars around the world equipped with cheating devices, and it is expected that Volkswagen will incur losses amounting to 18 billion dollars, which is a fine for "environmental deception." The company's situation in this period has become in a major impasse and a state of confusion, as the company's president in the United States, Michael Horn, says, "We have made a grave mistake."

The former CEO of the company, "Martin Winterkorn," said that the company has lost the confidence of its customers and the confidence of public opinion, and the company's leaders refused to comment on the crisis. He said that the company is currently conducting an extensive internal investigation, while the transport authorities in several countries have announced the opening of their own investigations into the case. And after "Matthias Mueller" was appointed CEO of the German "Volkswagen" company for the auto industry, and in the first statements of "Mueller" he said: Restoring the reputation of "Volkswagen" comes at the top of his priorities in his new position.. He also announced extensive changes in The company's management style, including granting regional divisions a greater degree of autonomy (Samir ,2015).

Volkswagen quickly dealt with this crisis in the following period, and regained its customers' trust, the profits of the German Volkswagen Group rose strongly at the beginning of 2019, and the positive results came in light of the recovery of sales in China - the largest single market for the company - with customers moving towards the most profitable models in the company's lineup, in addition to the increase in sales of electric cars by more than doubling.

First-quarter profit figures improved from €517m (\$622.8m) in the same period in 2020, when the coronavirus pandemic caused dealerships and factories to close, so earnings before tax also rose significantly to €4.5 billion (\$5.42 billion), bringing preferred share earnings to a solid €6.51 (\$7.85).

Sales revenue in the first quarter of 2021 rose 13% to €62.3 billion (\$75 billion), supported by a strong rebound of 61.4% in unit sales as China's markets reopened after being hit hard by the pandemic in the first quarter of 2020, and increased Deliveries increased by 21.2% year-on-year, to 2.4 million vehicles, and electric vehicle sales more than doubled to 133,300 units.

The company also expects a significant increase in sales to customers compared to the previous year, after the expected success in containing the Corona pandemic (Kadri ,2021).

Based on the **Table (1)** , **Table (2)**, **Table (3)**, and **Figure (3)** :

Through the results obtained, we found that the proportion of income smoothing practices (before taxes) during the period 2007-2021 is estimated at 50%, by 5 out of 10 periods, so we found that the proportion of income smoothing practices (after taxes) during the period 2007-2021 is estimated at 40%, by 4 out of 10 periods.

And based on curve graph No. 3 that determines the evolution of the income smoothing behavior index before and after tax payment during the studied period, it is clear that the highest index of income smoothing behavior was recorded at 412,88 its peak during the period 2017-2018 and then decreased from 2019.

In order to test our hypothesis of statistically indicators of income smoothing practices In the company studied during the period 2007-2021, we used "Binomial Test", through this test we have given two imaginary variables (0.1) for a default mean of 0.5.

According to the results of binomial test, the company studied have practiced income before taxes smoothing during the period 2007-2021 by 50% with 5 out of 10 views, while the percentage of non-practice is 50% with 5 views.

Therefore, the results of the binomial test show that the company have practiced income after taxes smoothing during the period 2007-2021 by 40% with 4 out of 10 views, while the percentage of non-practice is 60% with 5 views.

For the advantages of this test, the value of Sig= 0, 824 is more than 0,05, Thus, the alternative hypothesis was rejected and the nihilistic hypothesis is accepted, so we can conclude that:

There are no statistical indicators of financial reporting manipulation in the German Volkswagen Group during the period 2007-2021 .

These results can be explained by the successful strategy of Volkswagen, as it was able to overcome the crisis it went through in 2015, by following many measures that led to regaining its position in the market, the confidence of its customers, and increasing the volume of its sales and profits, without resorting to accounting manipulation techniques by transferring income from high-income years to low income years. Volkswagen's strategy in overcoming its crisis included the following(<https://p.dw.com/p/7lbt>):

The company decided to adopt a new production and marketing strategy that takes into account the different regional and cultural requirements in its content, From this initiative, the company's management envisages finding a possible way out of the financial crisis experienced by Volkswagen, as the giant Volkswagen sought to upgrade from the "car of the German people" to "the car of all the peoples of the world" to achieve a jump in profits that would enhance its global leadership among automakers. In this context, Wolfgang Bernard, who is in charge of the various models in Volkswagen, revealed this project during a press conference held in Los Angeles, USA. This announcement coincided with a cooperation agreement to produce a joint car model between the German company Volkswagen and Chrysler.

IV- Conclusion:

From the above, we can draw the following results:

- Financial reporting is the outputs of accounting system, it reflect the true picture of financial position and result of the company's activity.

- Some companies resort distorting their financial reporting in order to disclose a fictitious image to mislead investors and stakeholders.

- The financial numbers game is one of the latest methods of distorting financial accounts, through accounting flexibility and difference in accounting methods are used, as well as accounting principles in a way that enables management to maximize its reward at the expense of the interest of the owners, or for a purpose of deliberately amplifying or reducing the number of profits, These practices differs from accounting fraud in that it is practiced by violating accounting laws and principles.

- There are many forms of financial numbers game, the most prominent is known as creative accounting, earnings management by increasing or decreasing income, income smoothing by transferring income from high income years to low income years, in order to mislead the financial report.

- Volkswagen is a major German industrial company, founded in 1937, in Germany, and affiliated with the Volkswagen Group of Companies. The company produces Volkswagen cars, one of the best-selling cars, as it now represents the second largest car producer in the world, after Toyota.

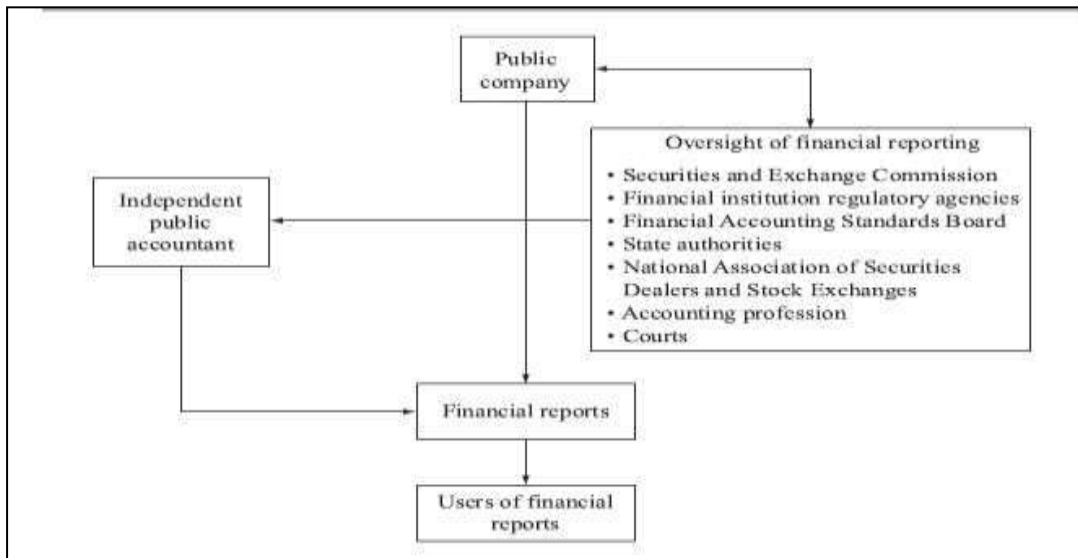
- Like the other companies, Volkswagen went through a crisis that affected its reputation in 2015, but it quickly rectified the matter and regained its market position by relying on modern strategies to bring customers and increase profits volume.

- Through our measurement of accounting manipulation on Volkswagen financial statements using income smoothing model named Eckel, it was found that there are no statistically significant indicators of the company's practice of any income manipulation during the period covered by its crisis, so that the studied period extends from 2007 to 2021, which indicates that the company has overcome its crisis without using any misrepresentations or manipulation on its income chain.

Finally, we hope that future studies will deepen this subject and try to move from measuring financial reporting manipulation to searching the effective solutions to reduce and limit manipulation practices in accounting profession.

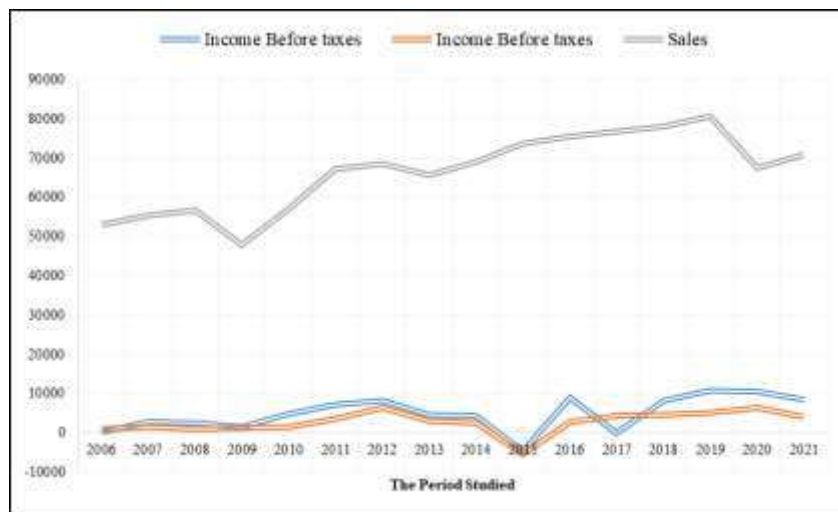
- Appendices:

Figure (1): Financial Reporting System



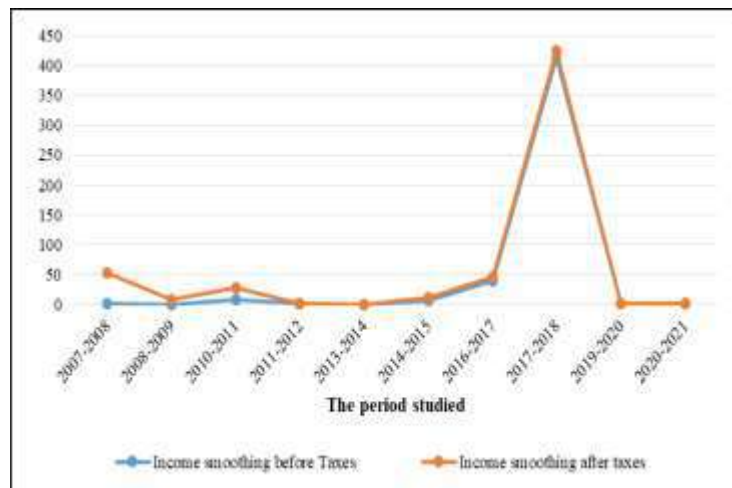
The Source: Zabihollah Rezaee, Richard Riley, Financial statement fraud , prevention and detection, John Wiley & Sons, Inc, Hoboken, Canada, 2010, pp 31-32.

Figure (2): Income and sales growth of Volkswagen Group during the period 2007-2021.



Source: Excel outputs.

Figure (3) : Income Smoothing Index of Volkswagen Group during the period 2007-2021.



Source: Excel outputs.

Table (1) : Income Smoothing Index (Before & after Taxes) of Volkswagen Group during the period 2007-2021.

PERIOD	IS INDEX BEFORE TAXES	IS PRACTICES	IS INDEX AFTER TAXES	IS PRACTICES
2007-2008	1,749367149	0	51,35116679	0
2008-2009	0,113889478	1	6,860367051	0
2010-2011	7,408920173	0	20,8186533	0
2011-2012	0,512804461	1	0,76133283	1
2013-2014	0,078871541	1	0,068508444	1
2014-2015	6,288519172	0	4,744185118	0
2016-2017	40,02521643	0	5,787800542	0
2017-2018	412,8846023	0	12,54047302	0
2019-2020	0,763328868	1	0,404165926	1
2020-2021	0,498608023	1	0,357399951	1
Total		10 periods		

Source: Excel outputs.

Table (2) : Income Smoothing Practices (Before & after Taxes) during the Period 2007-2021

The period	Income smoothing practices			
	Before taxes		After taxes	
	frequency	percentage	frequency	percentage
Smoothed income	5	% 50	4	% 40
Non-smoothed income	5	% 50	6	% 60

Source: Excel outputs.

Table (3) : Binomial test results.

		Category	N	Observed Prop.	Test Prop.	Exact Sig. (2-tailed)
IS Before taxes	Group 1	0	5	0,50	0,50	1,000
	Group 2	1	5	0,50		
	Total		10	1,00		
IS After taxes	Group 1	0	6	0,60	0,50	0,754
	Group 2	1	4	0,40		
	Total		10	1,00		
IS	Group 1	0	11	0,55	0,50	0,824
	Group 2	1	9	0,45		
	Total		20	1,00		

Source: SPSS program outputs.

Referrals and references:

- [1] Amani Samir (2015), *azma fuliks fajn fi amrika tuhadid kubraa alsharikat al'almaniat lisinaeat alsayaarat wasuisra tabda alhazra.. shiear "snae fi 'almania" yataearad li'azmat thiqatin.. walkhawf ealaa daymlar wamarsids wa BMW*, from: <https://www.youm7.com/story/2015/9/29, 29-09-2015>.
- [2] Amor Kevin, Warner Alan(2005), *Uncovering Creative accounting*, 1st edition, Pearson education: London, Great Britain, p3.
- [3] Dina Kadri(2021), *arbah fuliks faghin tantaeish ilaa 4.1 milyar dular fi 3 ashhur*, from: <https://attaqa.net/2021/05/06, 06-05-2021>.
- [4] Feddaoui Amina(2018), *Using "Eckel" Model to Measure Income Smoothing Practices: The Case of French Companies*, International Journal of Economics and Management Engineering, Vol:12, N:10, p1285.
- [5] Feddaoui Amina(2014), *Dawr Rakayiz Hawkamat Alsharikat Fi Alhadi Min Mumarasat Almuhasabat Al'iibdaeiyaat - Dirasat Eayinat Min Alsharkaat Almasahimat Alfaransia Almusajalat Bi mushr SBF250*, PhD thesis, Badji Mokhtar university, Annaba, Algeria, pp. 2-3.
- [6] *Fulsfagh: min sayaat alshaeb al'almanii 'ilaa sayaat kuli alshueub*, from: <https://p.dw.com/p/7lbt> .
- [7] Jones Michael John(2011), *Creative accounting, fraud and international accounting scandals*, 1st edition, John Wiley & Sons Ltd publication: Chichester , England, p9.
- [8] Mulford Charles, Comiskey Eugene (2002), *The financial numbers game, detecting creative accounting practices*, 1st edition, John Wiley & Sons Inc: New Jersey, Canada, p16.
- [9] Zabihollah Rezaee, Richard Riley(2010), *Financial statement fraud , prevention and detection*, john wiley & Sons, Inc, Hoboken, Canada, pp 31-32.