

Accrual adjustment: applying the Modified Jones model to selected companies listed on the stock exchanges in Poland and Chile

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Abstract

Purpose: Information from the accounting system should secure the proper development of business and the capital markets. On the other hand, fraud in the accounting sphere significantly distorts the image of an economic unit, which directly affects the level of social trust, as the trust of the interests of the recipients of financial statements is violated. On a global scale, such activities are developing rapidly. The aim of the article is to try to identify accrual adjustments as an accounting tool using the modified Jones model in Polish and Chilean listed companies. **Methodology/approach:** A modified Jones model was used to study accrual adjustments. The research sample consisted of 30 selected business entities listed on the stock exchange in Poland and Chile that published financial statements in accordance with IAS/IFRS between 2013 and 2017. In total, 60 listed companies were surveyed. **Findings:** Poland makes accrual adjustments to lower its operating result, while Chilean economic operators rely on accrual adjustments to increase their operating results. Chilean economic operators show a greater dispersion of discretionary accrual adjustments. Therefore, they show more cases of accounting manipulations than Polish companies. **Research limitations:** The main limitation of the study was the number of companies and the period covered by the study. **Originality/value:** In the authors' opinion, no studies have been conducted that compare the two countries, Poland and Chile.

Keywords: creative accounting, accrual adjustments, earnings management, modified Jones model.

Streszczenie

Korekty memorialowe: zastosowanie zmodyfikowanego modelu Jones w wybranych spółkach notowanych na giełdach papierów wartościowych w Polsce i Chile

Cel: Informacje pochodzące z systemu rachunkowości powinny zapewnić prawidłowy rozwój pomiotu gospodarczego i rynków kapitałowych. Natomiast nadużycia w sferze rachunkowej w znaczący sposób zaburzają obraz jednostki gospodarczej, które wpływają bezpośrednio na poziom społecznego zaufania,

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gdyż dochodzi do naruszenia zaufania interesów odbiorców sprawozdania finansowego. W skali ogólnoświatowej można zauważyć szybki rozwój tego rodzaju działań. Celem artykułu była próba identyfikacji korekt memoriałowych jako narzędzia rachunkowości za pomocą zmodyfikowanego modelu Jones w polskich i chilijskich spółkach giełdowych. **Metodyka/podejście:** Do badania korekt memoriałowych wykorzystano zmodyfikowany model Jones. Próba badawcza składała się z 30 wybranych podmiotów gospodarczych notowanych na giełdzie papierów wartościowych w Polsce i w Chile publikujących sprawozdania finansowe zgodne z MSR/MSSF w latach 2013–2017. Łącznie przebadani 60 spółek giełdowych. **Wyniki:** W Polsce dokonuje się korekt memoriałowych w celu obniżenia wyniku operacyjnego, podczas gdy chilijskie podmioty gospodarcze polegają na korektach memoriałowych, aby zwiększyć swój wynik operacyjny. Chilijskie podmioty gospodarcze wykazują większe rozproszenie uznaniowych korekt memoriałowych. Dlatego wykazują więcej przypadków manipulacji księgowych niż firmy polskie. **Ograniczenia badania:** Podstawowym ograniczeniem badania była liczba wyselekcjonowanych spółek oraz okres objęty badaniem. **Oryginalność/wartość:** Zdaniem autorów nie przeprowadzono dotychczas żadnych badań porównujących oba kraje: Polskę i Chile.

Słowa kluczowe: rachunkowość kreatywna, korekty memoriałowe, zarządzanie zyskami, zmodyfikowany model Jones.

Introduction

Information from the accounting system is recognized as, and confirmed to be, an important business resource, and it is a key building block for managerial decision-making. However, accountancy, which is meant to measure value, exhibits vulnerabilities which are even more exposed by strong business changes, such as the internationalization of enterprises, the number of stakeholders who use the financial information, and the speed of financial markets (Höllander, Morales, 2017). Hence, the weaknesses of accounting primarily include the lack of a uniform appraisal of balance sheet items. The standards only propose how to report selected economic events. In many cases, the same rules enable the use of alternative solutions for measurement in accounting; sometimes, the rules are not clear enough, which makes them freely interpretable by bookkeepers. As a consequence, the same economic events are accounted for in different ways.

Measurement in accounting can never be considered fully objective. Usually, its accuracy depends on the efforts and willingness of the accountant (Surdykowska, 2004). The reality that exists in the standards is referred to as creative accounting, and it is often used by business managers to manipulate their business performance data, depending on what they want to achieve at that moment. According to Morales and Höllander (2009), a certain degree of creative accounting can, therefore, be found in every part and every item of a financial statement, i.e., both in the balance and in the P&L account. It may also affect the measurement and/or disclosure of information in a financial statement – which provides many opportunities for doing so – as clearly described by Stłowy and Breton (2004).

On the other hand, such an adjustment may result in improving or deteriorating the financial condition (in any part of the financial statement), depending on what the

fraudulent bookkeeper intends to do. Note that in order to obtain the desired financial statements, creative accounting essentially relies on the ingenious use of standards rather than on other forms of manipulation. In that context, accrual adjustments, defined as the difference between the profits the accountant is aware of and the cash flow, can be based on different variables or accounting entries that enable the management to transfer the profits from one period to another. However, accrual adjustments do not result in the total financial statement being distorted; according to Reguera, Laffarga, and Fuentes (2015), some adjustments depend on the economic context or are required under specific regulations (Healy, 1985).

The originality of this article is based on the presentation of original research results on accrual adjustment in a sample of Polish and Chilean companies that prepare financial statements in accordance with international balance sheet law, i.e., International Accounting Standards (IAS)/International Financial Reporting Standards (IFRS). In the empirical study, the Jones model (1991), as proposed by Dechow et al. (1995) (hereafter: the modified Jones model), was used for the first time for Polish companies. So, the methodology used in this paper to determine the existence of accrual adjustments is based on the difference between the operating result and the operating cash flow.

Thus, the purpose of the research is to determine the presence or absence of accrual adjustments for a sample of business entities from Poland and Chile between 2013 and 2017 using the modified Jones model.

1. Review of the literature

Castillo and San Martin (2008) provided a summary of some of the essential definitions of creative accounting based on research by Shipper (1989) and Healy and Whalen (1999). They first define creative accounting as an intervention in the financial and accounting data preparation process with a clear intention to obtain personal profits. Similarly, Healy and Whalen (1999) believe that earnings management takes place whenever managers rely on their discretionary judgment when preparing financial statements in order to affect how investors or creditors perceive their business activity.

An identical definition is provided by Apéllaniz and Labrador (1995), who believe it to be a choice made by an economic operator to obtain the desired level of profits based on flexibility, which is allowed under accounting rules (policy) as generally accepted in legal regulations of different countries. In turn, based on a literature review, Cornejo and Guíñez (2016) present a summary of the reasons why economic operators distort their economic performance information. They include contractual motivation, regulatory policy, rules and methods of measuring in accounting, and manipulations related to the tax base. Interestingly, the authors do not move away from the Latin American point of view based on cultural, economic, developmental, and capital

concentration aspects, which usually differ from the Anglo-Saxon and European models. In that sense, Latin America is not affected by this phenomenon.

From 2006 to 2014, Cardona (2018) analyzed a sample of 925 economic operators, including 854 from Latin America (the rest being based in Caribbean countries). The research found that the study period witnessed a decrease in the number of discretionary (anomalous) accrual adjustments. This was caused by several reasons, including the application of IFRS by the companies surveyed. This means earnings management is used to a smaller extent, i.e., there is a considerable quality improvement in financial reporting.

Similar empirical studies can be found in a paper by González and García-Meca (2014), who carried out a research project between 2006 and 2009 with economic operators listed on Latin American stock exchanges in Argentina, Brazil, Chile, and Mexico. The following conclusions could be drawn from their studies: an economic environment with a high capital concentration (which prevails in Latin American enterprises) has an adverse effect on the quality and transparency of financial reporting information. This suggests that capital concentration could be a driver of manipulative practices. Furthermore, capital concentration is a mechanism that, despite the differences in corporate governance systems, may reduce discretionary accrual adjustments in a defined operating context for economic operators.

A similar view is adopted by Mellado and Saon (2018), who confirm that majority shareholders attempt to derive private benefits from earnings management at the expense of minority shareholders. In their study, Mellado and Saon (2018) analyzed 631 Latin American economic operators and found that control executed by the majority holder plays a key role in reducing the manipulation of profits. Another conclusion was that there is room to improve certain particularities of the ownership structure of Latin American enterprises, such as privileged information from the accounting system. The reasons cited by these authors encourage a more in-depth examination of the situation of economic operators based in Chile and Poland (which are emerging markets) compared to other markets around the globe that can also be affected by earnings management.

The observations made by Cardona (2018) when comparing the number of discretionary accrual adjustments (based on models by Dechow et al., 1995, and Jones, 1991) between economic operators listed in Brazil and Chile, on the one hand, and those based on the UK, Australia, France, and Germany, on the other, suggest that Latin American undertakings reported a lower quality of accounting operations in 2011 and 2012. These results provide an even greater motivation to make a comparative study of Latin American and European countries.

In Chile, the “La Polar” case became a symbol of bad accounting practices that affected corporate governance. Based on an accounting and financial analysis of the “La Polar” case, Cornejo et al. (2017) concluded that one-sided accountancy improved the appearance of the company’s financial statements and financial ratios. After the case was revealed, the price of the company’s shares declined sharply. This contributed to the decision to audit other companies who also manipulated their financial data.

The Chilean case was reflected in empirical projects by Jara, Gallegos, and Arias (2011), who examined the impact of conservative accounting attitudes found in companies listed on the Santiago de Chile stock exchange from 1999–2010 based on financial data from 95 economic operators active in twelve sectors. Their research found that, on average, companies from the Chilean market asymmetrically report their profits or exhibit conservative accounting attitudes; this was true both for companies who comply with IFRS and those who comply with the Generally Accepted Accounting Principles (GAAP). The authors also demonstrated that accounting gains are more sensitive to bad news from the business environment of the companies or, in other words, that profits are recognized asymmetrically. Although conservative accounting approaches were adopted in both cases, this can be more evident in economic operators who prepare their financial reports in accordance with IAS/IFRS.

In turn, Martellotto (2016) analyzed 25 entities active in Argentina between 2008 and 2012. The author herself calls her findings into question, suggesting that changes in the financial reports of Argentinean companies may result not only from earnings management but also from the first application of new reporting standards (IAS/IFRS). She also notes that the study sample is too small to make conclusive statements.

In summary, all of these factors lead to a decrease in the quality of information covered by the financial reports of the companies considered, i.e., there is a deterioration in the qualitative features of financial reports. If these features are complied with, the decisions made by the business managers are based on reliable reporting information, and they can provide a basis for future economic forecasts. Most of all, they contribute to improvements in the capital market and, thus, in the entire economy.

Just like in Argentina, similar research was conducted in Brazil to examine the adjustments made to financial reports. It resulted in the identification of two types of adjustments: normative and discretionary. The study covered 235 listed Brazilian companies in the financial years 2009 and 2010 (Cardoso et al., 2015). One of the key findings needs to be highlighted: the change in the accounting policy from the British GAAP to IAS/IFRS had a significant impact on the accounting of discretionary adjustments in Brazilian companies. This approach may lead to a methodological error because entities with different accounting standards were tested.

Another study, which covered a smaller number of companies with a larger amount of financial data from 2004 to 2015, was also carried out with Brazilian companies from a very specific sector, i.e., civil construction. These companies used national standards and IAS/IFRS. Evidence of a conservative accounting approach was observed before the adoption of IAS/IFRS but was not observed after the implementation. This suggests that Brazilian undertakings covered by the study tend to be less and less conservative in their behavior.

Previous research failed to clearly answer the question of whether the adoption of IFRS by the selected economic operators improves the quality of accounting information, including the qualitative features of financial reports. Economic, political, and social factors affected the results to a different extent, depending on the region, legal

system, economic outlooks (e.g., symptoms of economic crisis), and other extremely important characteristics, which is the econometric model used in the study. In other words, various factors may be regarded as a reference point for understanding why no pattern exists to explain the impact of IFRS adoption (Santiago et al., 2015).

Da Silva and Wagner (2015) carried out research with 442 economic operators in two countries. The investigation covered 382 Brazilian entities from 2004 to 2012 and 60 Portuguese financial reports from 2001 to 2009. The economic operators surveyed were found to use a performance or profit management measure based on the variation in operating profits and net profits. In the first case, it was found that after the unification of the reporting systems, there was a smaller variation in profits than before the unification. While this pattern was true for both Brazilian and Portuguese companies, it was statistically significant only for Brazil. The research found that after harmonizing financial reporting standards, there was increased interest in performance management compared to the period before the application of the new financial reporting standards. By measuring the net financial result in relation to the operational volatility of cash flows, the results for both countries presented lower ratios, but not significant, in the period after the introduction of new accounting standards compared to the period when national accounting standards were applied. Based on these studies, it cannot be unequivocally determined that there was an increase in performance management levels during the introduction of the new financial reporting standards.

Generally, there are only a few studies that address the issue of accrual adjustments in Latin American countries. Therefore, the authors agree with Cornejo and Guiñez (2016) that the literature on earnings management in less developed countries is still emerging, and that little research effort is dedicated to this topic, especially regarding Latin America.

Many papers were written between 2011 and 2015, and the most important are described below. Rodrigues et al. (2011) assessed that entities with higher rates of income tax were found to reduce earnings to nearly zero. Other entities with higher average income tax rates were more likely to manipulate their earnings than other firms.

Research conducted by Hadaniet et al. (2011) indicates that the number of shareholder proposals received by firms is positively related to subsequent earnings management. Yet, concurrently, monitoring by the largest institutional owners is negatively related to earnings management.

The next interesting study examined ownership concentration and earnings management practices of Nigerian listed conglomerates. It proxied earnings management using the modified Jones model using 30 firm-year paneled observations. The result shows a significant negative relationship between ownership concentration and earnings management. The Hausman specification test shows that the panel result after controlling for random best suits the population as the fixed effect hypothesis was rejected by the Wald/Ch 2 test. Of the control variables, only returns on assets is significant. Leverage and firm size were not significant. Hence, we conclude that ownership concentration

indeed moderates the practice of earnings management in Nigerian listed conglomerates. Further studies may be carried out to include earnings management with real cash-flow consequences (Usman and Yero, 2012).

Hoet al. (2015) investigated the prevalence of both accrual- and activities-based earnings management for Chinese A-share firms surrounding the adoption of substantially IFRS-convergent accounting standards. Since 2007, all listed A-share firms in China have been required to comply with a new set of accounting standards that substantially conform to IFRS. Based on a sample of 4,050 firm-year observations from 2002 to 2011, we find that Chinese firms in the post-IFRS period (2007–2011) are less likely to engage in accrual-based earnings management. The magnitude of discretionary accruals also declines after IFRS adoption. In response, we see firms turning to real activities manipulation as a substitute for upward earnings management. The reduction in accrual-based earnings management could stem from higher quality accounting standards associated with IFRS adoption and/or concurrent changes in the governance regimes introduced with the IFRS mandate. A further analysis, however, indicates that the benefits of IFRS adoption in curbing upward accrual-based earnings manipulation are not evenly distributed across firms.

2. Research sample and method

The purpose of this study is to discover the presence or absence of accrual adjustments in a sample of Polish and Chilean economic operators from 2013–2017. The Chilean sample includes 30 listed companies that represent the local market; they are chosen from SPXIPSACL-30, the leading Chilean index. In Poland, the sample included agricultural enterprises that prepare financial statements comprising the balance sheet, P&L account, and cash flow statement. Polish financial statements were retrieved from the EMIS database based on the following selection criteria: 30 companies from the agri-food industry with the highest total incomes (Table 1). All companies are listed on the stock exchanges in Poland and Chile.

Table 1. Research sample

Country	Year					Total
	2013	2014	2015	2016	2017	
Chile	30	30	30	30	30	150
Poland	30	30	30	30	30	150
Total	60	60	60	60	60	300

Source: authors' own elaboration.

The methodology used in this paper to determine the existence of accrual adjustments is based on the difference between the operating result and the operating cash flow, presented as follows:

$$AD_{it} = RO_{it} - FEO_{it}$$

Where:

AD_{it} : accrual adjustments of company i in period t ,

RO_{it} : operating result of company i in period t ,

FEO_{it} : operating cash flow of company i in period t .

The accrual adjustment (AD_{it}), may be positive or negative; if positive, it means that the company's operating result is greater than its operating cash flow. This can be explained as a situation where positive results (profits) are generated only to create an accrual. In the opposite situation, i.e., if the adjustment is negative, the company's operating result is lower than its operating cash flow. This implies that the accrual adjustment is used to generate the result (financial loss).

Accrual adjustments can be divided into discretionary and non-discretionary adjustments, expressed as:

$$AD_{it} = ADD_{it} + ADnD_{it}$$

Where:

AD_{it} : accrual adjustments of company i in period t ,

ADD_{it} : discretionary accrual adjustments of company i in period t ,

$ADnD_{it}$: non-discretionary accrual adjustments of company i in period t .

Accrual adjustments AD_{it} correspond to a value that depends on the size of the company, and therefore, it is necessary to present it in relative terms to make comparisons between economic operators. This can be done by dividing the adjustment by total assets:

$$ADR_{it} = \frac{AD_{it}}{ACT_{i(t-1)}}$$

Where:

ADR_{it} : relative accrual adjustments of company i in period t ,

AD_{it} : accrual adjustments of company i in period t ,

$ACT_{i(t-1)}$: assets of company i in period $t-1$.

The modified Jones model, as used in Table 2 below, provided the following results:

$$\frac{AD_{it}}{ACT_{i(t-1)}} = \beta_0 \frac{1}{ACT_{i(t-1)}} + \beta_1 \frac{\Delta VTAS_{it}}{ACT_{i(t-1)}} + \beta_2 \frac{PPE_{it}}{ACT_{i(t-1)}} + \varepsilon_{it} \quad (\text{Equation N}^\circ 1)$$

Where:

AD_{it} : accrual adjustments of company i in period t ,

$ACT_{i(t-1)}$: assets of company i in period $t-1$,

$\Delta VTAS_{it}$: sales growth in company i in period t ,

PPE_{it} : property, plant, and equipment of company i in period t ,

ε_{it} : random effect of the model for company i in period t .

To estimate the parameters, equation N°1 presented above will be formulated using the mathematical method of least squares. Parameter estimators will be derived from the matrix expression $\hat{\beta} = (X'X)^{-1}X'Y$. An assumption is made that non-discretionary accrual adjustments ($ADnD_{it}$) are calculated based on annual changes in sales and in property, plant, and equipment. The calculations were carried out for each of the economic operators surveyed. Additionally, the term $ACT_{i(t-1)}$ is used as a deflator to put the amounts in relative terms. First, parameter estimators for the two last mathematical expressions and functions are calculated. Then, equation N°2 can be considered; it will be put in a relative form by dividing it by $ACT_{i(t-1)}$ and by substituting its terms with corresponding results derived from $\hat{\beta} = (X'X)^{-1}X'Y$. The equation is solved to obtain the relative discretionary accrual adjustments, which can be expressed in the following final form:

$$\left| \frac{ADD_{it}}{ACT_{i(t-1)}} \right| = \frac{AD_{it}}{ACT_{i(t-1)}} - \hat{\beta}_0 \frac{1}{ACT_{i(t-1)}} - \hat{\beta}_1 \frac{\Delta VTAS_{it}}{ACT_{i(t-1)}} - \hat{\beta}_2 \frac{PPE_{it}}{ACT_{i(t-1)}} \quad (\text{Equation N}^\circ 2)$$

After the amounts of discretionary accrual adjustments $\left(\left| \frac{ADD_{it}}{ACT_{i(t-1)}} \right| \right)$ are calculated, they will be tested for normality based on a graphical method, both for Polish and Chilean data. Afterward, the non-parametric Wilcoxon rank-sum test will be used to determine whether the discretionary accrual adjustments (ADD_{it}) are different or the same in both countries.

3. Results of the study

Table 2 below shows preliminary results based on data retrieved from the financial reports of the economic operators sampled and on accrual adjustments prepared for that purpose.

Table 2. Relative accrual adjustments for Poland and Chile

Year	Poland		Chile	
	Average relative annual accrual adjustments (RAA)	Percentage of companies with positive AA	Average relative annual accrual adjustments (RAA)	Percentage of companies with positive AA
2017	-0.151	27.6	0.174	85.2
2016	-0.366	20.7	0.098	74.1
2015	-0.030	37.9	0.117	77.8
2014	-0.050	41.4	0.367	85.2
2013	-0.002	31.0	0.422	81.5

Source: authors' own elaboration.

As shown in Table 2, the average relative accrual adjustments in Poland were negative in each of the cases covered by this analysis, and they varied in the range of -0.366 (in 2016) to -0.002 (in 2013). Meanwhile, the average values calculated for the Chilean companies were positive and varied in the range from 0.098 (in 2016) to 0.422 (in 2013). Another finding is that in Chilean companies, the operating result was, on average, higher than operating cash flows because of the use of accruals. Conversely, it was the opposite for Poland.

A hypothesis is therefore advanced that the relative accrual adjustments are statistically equal for Poland and Chile, versus an alternative hypothesis that a statistical difference exists between them. The non-parametric Wilcoxon rank-sum test was performed and yielded the following results.

Table 3. Testing the hypothesis for the comparison of relative accrual adjustments

Year	P-value Null hypothesis: the two medians are equal Statistical significance 5%	Conclusions
2017	p-value for two-tailed test = 1.41582e-005	The null hypothesis of equal means is rejected. Therefore, a difference in medians for relative accrual adjustments exists between Chile and Poland
2016	p-value for two-tailed test = 0.000956737	
2015	p-value for two-tailed test = 0.000388455	
2014	p-value for two-tailed test = 4.62286e-006	
2013	p-value for two-tailed test = 0.000104944	

Source: authors' own elaboration.

As shown in Table 3, all p-values, or the (two-tailed) statistical significance, are below 5%. Therefore, the null hypothesis is rejected for each year of the study period, and a significant difference in relative accrual adjustments exists between Polish and Chilean economic operators.

Table 4. Descriptive statistics for relative accrual adjustments

Year	Country	Mean	Median	Std. dev.	Pearson coefficient of variation
2017	Chile	0.17402	0.11122	0.23335	1.34094
	Poland	-0.15058	-0.062541	0.61259	4.06820
2016	Chile	0.098076	0.13207	0.62778	6.40095
	Poland	-0.28609	-0.047215	1.3132	4.59016
2015	Chile	0.11713	0.14393	0.72987	6.23128
	Poland	-0.02987	-0.036519	0.70893	23.73385
2014	Chile	0.36744	0.19773	0.69134	1.88150
	Poland	-0.04991	-0.0019756	0.26628	5.33520
2013	Chile	0.42187	0.17205	1.1431	2.70960
	Poland	-0.00201	-0.057734	0.84207	418.94030

Source: authors' own elaboration.

The amount of accrual adjustments of Chilean companies changes noticeably and follows a downward trend from 2013 to 2017 (Table 4). On the other hand, in Polish companies, the absolute value of accrual adjustments grows over the analysis period. Relative accrual adjustments, which include both a discretionary and a non-discretionary component, are estimated using the function and equation N°1 presented above, both for Poland and Chile, in order to subsequently compare the discretionary components of accrual adjustments.

The modified Jones model was used to calculate the relative non-discretionary accrual adjustments, as presented in equation N°1. The following results were obtained for Poland.

Table 5. Statistics results for the modified Jones model for Polish economic operators

	Coefficient	Std. dev.	t-statistic	p-value
β_0	-5.21230	2.21903	-2.349	0.0205
β_1	0.00498199	0.0199437	0.2498	0.8032
β_2	0.133745	0.0198409	6.741	0.0000
	R-squared value 0.467993 Akaike criterion -268.4619		F(3, 116) 34.30730 p-value (for the F-statistic) 5.55e-16	

Note: We used the Fisher distribution of F.

Source: authors' own elaboration.

As shown in Table 5, in the model for Polish companies, the p-value for the F-statistic is below 5%, which means that the model is significant as a whole (but not at the level of specific parameter estimators which are not covered by this study). Below is the same analysis of the model adjusted for the Chilean companies (Table 6):

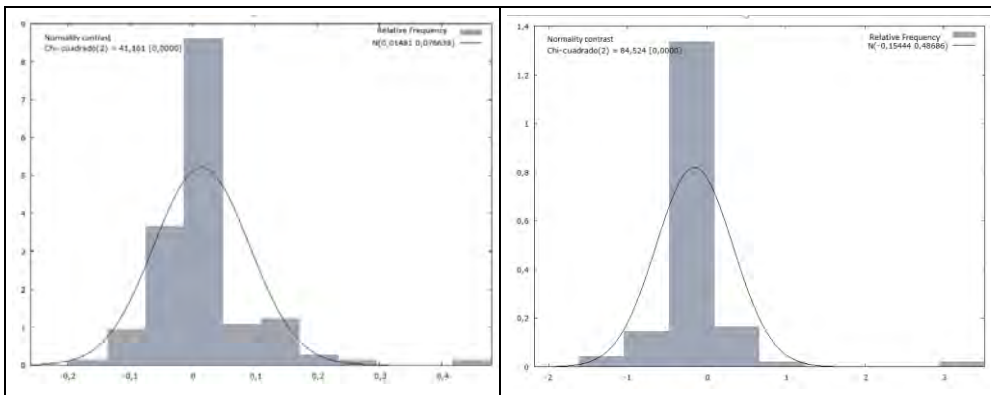
Table 6. Modified Jones model for Chilean economic operators

	Coefficient	Std. dev.	t-statistic	p-value
β_0	-0.77618	0.068113	-0.3039	0.0000
β_1	0.295930	0.280802	1.608	0.2950
β_2	0.0810476	0.0314514	0.03548	0.0118
	R-squared value 0.334150 Akaike criterion 122.0127		F(3, 82) 3.949954 p-value (for the F-statistic) 0.011020	

Source: authors' own elaboration.

Table 6 shows the results of the model for Chilean companies; the p-value for the F-statistic is below 5%, which means that the model is significant as a whole (but not at the level of specific parameter estimators which are not covered by this study). Then, discretionary accrual adjustments (put in relative terms with the function used in this study) will be calculated in the same way the parameter estimators were obtained for relative non-discretionary accrual adjustments. First, the results were tested for normality; in both cases, the test demonstrates that data retrieved in Poland and Chile do not follow a normal distribution (see Graph 1).

Graph 1. Hypothesis of normality for relative discretionary accrual adjustments in Poland and Chile



Source: authors' own elaboration.

As shown in Graph 1, the null hypothesis of normality for relative discretionary accrual adjustments is rejected in both countries based on normality tests.

The atypical results obtained in this study provide a basis for comparing the discretionary adjustments between Polish and Chilean companies using the non-parametric Wilcoxon rank-sum test.

Table 7. Wilcoxon test

Test of differences between Chile and Poland	$n1 = 85, n2 = 120$ w (rank sum, sample q 1) = 10831 $z = (10831 - 8755) / 418.45 = 4.96117$ $P(Z > 4.96117) = 3.50346e-007$ P value for two-tailed test = 7.00691e-007
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Note: Null hypothesis: the two medians are equal.

Source: authors' own elaboration.

As shown in Table 7, the p-value is below 5%, and therefore the null hypothesis of equal medians is rejected. This demonstrates the existence of significant differences between Chilean and Polish companies in discretionary accrual adjustments. It can, thus, be argued that the countries differ in how they use discretionary manipulations. Table 8 presents the descriptive statistics for the comparison between the two countries.

Table 8. Descriptive statistics for relative discretionary accrual adjustments

Country	Mean	Median	Minimum	Maximum	Std. dev.	Pearson coefficient of variation
Chile	-3.5714e-008	-0.084152	-0.32702	2.9357	0.38114	1067.20054
Poland	5.1492e-007	-0.016335	-0.11970	0.42297	0.074109	14.39233

Source: authors' own elaboration.

The final finding is that Chilean economic operators demonstrate a great dispersion of relative discretionary accrual adjustments, which means they manipulate their accounting data to a greater extent than Polish businesses.

Conclusions

This study used the modified Jones model proposed by Dechow et al. (1995). The study sample consisted of 30 selected entities active in Poland and Chile (60 entities in total). The purpose of the research was to determine the presence or absence of accrual adjustments for a sample of business entities from Poland and Chile between 2013 and

2017. Such research has never been conducted in Poland before. Based on the research, the following conclusions can be drawn:

1. The methodology developed by Jones (1991) and proposed by Dechow et al. (1995) makes it possible to compare accounting manipulation practices. In this study, a comparison was made between Poland and Chile.
2. The objective of this methodology was to differentiate between non-discretionary and discretionary accrual adjustments.
3. The growth in sales and in property, plant, and equipment was used as the estimator of accrual adjustments.
4. In Polish companies, accrual adjustments are negative in each year covered by the analysis. Conversely, they are positive in Chile. This means that in Poland, accrual adjustments are made to reduce the operating result, whereas Chilean economic operators rely on accrual adjustments to increase their operating result.
5. In Chilean companies, the use of accrual adjustments followed a downward trend from 2013 to 2017. On the other hand, Polish enterprises witnessed an increase in absolute amounts of accrual adjustments over the study period.
6. In Chilean companies, the variability of accrual adjustments follows a downward trend over the study period, whereas it is the opposite for Polish companies.
7. Chilean economic operators demonstrate a greater dispersion of discretionary accrual adjustments. Therefore, they exhibit more cases of accounting manipulations than Polish companies.

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