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An international perspective on the misstatements and reliability of financial statements

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Abstract

This article examines the importance of ensuring the reliability of financial statements, the causes of distortions, and the possibility of minimizing them in different countries, such as the USA, UK, Japan, Kazakhstan, and China. The purpose is to emphasize the importance of reliable financial reporting and to find the best methods for identifying financial reporting misstatements when comparing different countries. The research includes a literature review that reveals the role of international standards in preventing financial fraud and building confidence in financial reporting. This section selects studies that emphasize the need to study this topic due to the level of manipulation of financial reporting data, regional and cultural differences, and the importance of company ethics and internal controls. Research methods include quantitative methods, analytical methods, literature review, statistical methods, and case study comparisons, in particular, studies of companies in Kazakhstan and Japan. The study reveals that financial statement distortions are affected by multiple factors, such as regulatory supervision, corporate governance, and transparency mandates. The practical application of the Benford statistical method is considered using the example of companies in Kazakhstan and Japan. The use of Benford and Chi-square methods to analyze financial data is very beneficial and shows their relationship and applicability in companies in different countries, particularly Kazakhstan and Japan, to identify data bias, but when working only with certain and preferably larger samples of data types for better results. The article outlines methods for identifying and preventing financial reporting misstatements through internal controls, regulatory oversight, and statistical analysis. The necessity of compliance with accounting standards to maintain transparency and economic stability is emphasized.

Keywords: Benford's law, Control, Distortion, Fraud, IFRS, Manipulation, Reliability, Reporting, State audit.

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1. Introduction

In today's world, financial statements are among the main documents demonstrating a company's financial position and the results of its activities over the past year, and provide data for an in-depth analysis of its activities [1]. Financial statements are prepared for several purposes, such as:

- Implementation of laws and reporting to government agencies;
- Informing users, such as financial directors, economists, founders, shareholders, investors, and auditors, about the financial condition of the company and its results for making management decisions;
- Analysis of the financial condition for making decisions on further business development (for this, it is possible to create management reports based on an accounting report);
- Search for international partners [2].

The research topic was chosen based on these considerations. The need for reliable financial statements is highlighted in the research sections, as they are crucial for informed decision-making both locally and internationally. Additionally, the international perspective on the accuracy and potential distortion of financial reports is a central element of today's business environment. When it comes to compiling comprehensive financial statements and presenting them to interested users, various companies around the world work in different legal fields. To control budget and tax policy and collect analytical data, government agencies develop rules for the preparation and disclosure of financial statements [3].

The integrity of financial reporting is crucial to stakeholders, but not limited to investors, creditors and companies. And this confusion comes from the fact that there are no uniform standards in place in the nation. Disparities in accounting practices prevent effective decision-making, which can cause financial losses and erode public confidence. Complying with IFRS, GAAP in a globalized marketplace is imperative for achieving transparency and comparability among countries.

A good example is the application of International Unified Accounting and Auditing Standards by organizations. They must be understood as their aim is to attract investors and borrow funds, and to make profitable agreements with partners, the experts of international finance such companies dealing with a common language [4]. The International Financial Reporting Standards (IFRS) are developed considering the needs of investors, lenders and other stakeholders across the globe. Nevertheless, there's still been the issue of unreliable financial information despite the work of iconic international organizations.

One of the basic principles of IFRS is the reliability of the information provided in the financial statements of companies. This requirement is aimed at ensuring the trust of investors and other users of financial statements. Standard-setting bodies encourage enterprises to use transparent accounting and disclosure methods [5].

This topic is relevant because it explores effective ways to stop financial statement fraud while giving different viewpoints intended to solve the difficulties businesses confront because of this fraudulent activity. This underscores the acute need to maintain the quality and reliability of financial data, essential to trust and transparency in corporate reporting.

It is becoming increasingly critical to examine accuracy and distortion in financial statements in today's world of globalization, where the functions of life are interwoven and intertwined. An international perspective on this development is emerging as an important component for transparency and reliability in the statements of companies. Financial information can be distorted due to many causes; also, there are international standards to ensure that information is reliable. Different types of distortion exist too (manipulation, veiling, and misrepresentation).

2. Literature Review

The distortion of financial data often stems from a combination of personal motives and systemic shortcomings. Managers may manipulate reports, either to present a more favorable or worse financial picture, taking advantage of flaws in accounting frameworks and inconsistencies in legislation that allow such actions to go unnoticed [6]. Identifying the causes of these distortions can be challenging, highlighting the importance of systematically classifying and disclosing corrections in financial statements to mitigate risks of oversight during audits [2]. Additionally, deliberate falsification, typically aimed at inflating profits or assets, underscores the ongoing need for enhanced oversight and stricter financial reporting standards to safeguard transparency and reliability [7].

The US National Commission on Falsification of Financial Statements defines falsification of financial statements as "intentional or unintentional action or omission that leads to a material distortion of financial statements". The Association of Certified Accountants for the Detection of Fraud in Financial Statements characterizes the falsification of financial statements as "a deliberate distortion or concealment of material facts of economic activity, which misleads users, and sometimes influences their decisions [8].

And modern research confirms that the problem of distortion of financial statements remains relevant. For example, N. Lashchinskaya and P. Nesterov in their work emphasize that the use of forensic specialists allows for effective identification of fraud risks and improves the reliability of reporting data Lashchinskaya and Nesterov [9]. Roszkowska [10] in her paper on financial reporting and auditing to prevent fraud, discusses how technologies such as blockchain and artificial intelligence directly improve the reliability of financial reporting and prevent fraud by increasing transparency and investor confidence [10].

From the above analysis, it is evident that the distortion of financial statements significantly influences investors' evaluation of an enterprise's prospects. Therefore, many managers resort to deliberate distortion of information in the report to improve the financial picture, which, on the contrary, can adversely affect the reputation of the company if auditors discover incorrect accounting and filling out of financial statements.
Additionally, we explored the topic from different points of view of other authors.

2.1. Viewpoint 1 - International Standards

Table 1 presents a brief overview of modern foreign authors who comprehensively study the problem of reliability and misstatements of financial statements. In Table 1, we demonstrate the importance of adapting financial statements to international standards or local regulations.

Table 1.
Literature review in terms of the importance of international standards.

Literature source	Author	Contribution / description
"The Effect of IFRS Adoption on the Business Climate: A Country Perspective"	Penela, et al. [11]	One of the key ideas of this study is that the adoption of IFRS contributes to improving the transparency of financial statements and enhances the comparability of financial statements of companies around the world. Compliance with the standards will also reduce costs for investors, attract foreign investors, and increase confidence.
"Accounting Reporting Complexity and Non-GAAP Earnings Disclosure"	Brown, et al. [12]	The authors examine how firms' use of non-GAAP earnings is affected by stricter accounting disclosure requirements. They argue that companies are more likely to disclose non-GAAP earnings while the reporting requirements under these standards are becoming complex, allowing them to hide real financial performance and leading to misleading financial statements.
"Financial reporting quality in international settings: A comparative study of the USA, Japan, Thailand, France, and Germany"	Rahman, et al. [13]	Based on reviews conducted for countries like the USA, Japan, Thailand, France, and Germany, there are various drivers for the quality of reported information. The range of stringency in accounting law tends to affect the quality of financial statements; for example, more detailed legislation in the US and Germany compared with others. In many areas, other sources of regulation abrogate the fundamental principles, such as the SEC in the US and the FSA in Japan, that are involved in ensuring that the report is given value.
"Global Comparability of Financial Reporting Under IFRS: Does Comparability Enhance Value Relevance of Earnings Across Countries?"	De Luca and Phan [14]	As put down by one of the studies, enforcing IFRS does indeed enhance accounting profit's comparability and, is value relevant particularly for those jurisdictions with strong audit and enforcement procedures. By adopting and utilizing IFRS on an ongoing basis, financial data provided by the company would compare better for an investor's interest, and which increases the clarity with reliability of the financial statements.
"International Financial Reporting Standards: Prospects and Challenges"	Kumar [15]	The author explains what problems may arise during the transition to the standards and what benefits they grant. Problems include actions deviating from standards due to legal and regulatory requirements, the economic environment, the level of preparedness, and conceptual differences. Benefits: growing cross-border investment and distribution of financial products.

The research examples from the literature review provide an in-depth look at international vision on the reliability and distortion of financial statements, enriching the understanding topical issues in this area. The studies prove that international standards have a positive impact on the reliability of financial statements and can be applied in all countries of the world. The identical standards would favor the comparison of companies from different countries in the same language.

The study describes open and unbiased information reporting as one of the greatest contributors to investor trust in financial statements and thus to global financial market capacity, especially under IFRS and other international standards.

Additionally, it addresses how economic and cultural differences between countries, alongside various factors influencing financial statement reliability and accounting practices, impact the accuracy and consistency of financial reporting

2.2. Viewpoint 2 - Manipulating Financial Indicators

Sh. Gao and J. Gao, in "Earnings Management: A Literature Review," discuss the issue of profit management through the prism of its motivations, mechanisms, methods, and effects. The authors discuss the different methods of earnings management, which include the different types of accruals and real activities, detailing their explanations of how managers contrive financial statements to meet those targets [16]. Also, the authors recommend that better corporate governance should

be put into place to tighten up on earnings quality, thus limiting manipulation, with suggestions for more research on real activities earnings management for better transparency in accounting information

Further, Ramírez-Orellana, Martínez-Romero, and Mariño-Garrido discuss the issue of fraud and earnings management in family businesses, highlighting the way in which these peculiar firms manipulate earnings while enhancing family values. They maintain that the closeness usually associated with family businesses makes it more difficult to perceive fraud, hence recommending strong governance and auditing. They used the Beneish model to confirm their theories in a case study of a Spanish company, demonstrating its potential in the matter of detection in these settings [17].

Using these studies it also helped scientists to learn that manipulating financial reporting indicators can cause legitimate and illegal misrepresentation of financial statements.

2.3. Viewpoint 3 - Cultural Differences

J. Gierusz and K. Kolesnik, in their research, analyze how cultural characteristics of different countries can influence the structure and content of financial statements [18]. International standards help best in understanding different companies and country financial results owing to different cultural norms, values, and perceptions guiding their respective disclosure in financial statements.

S.T. McGuire and his co-authors examined the impact of religious judgments on the reliability of financial statements in the article The Impact of Religion on Financial Reporting Irregularities. The hypothesis of the study was the influence of the judgments of religions on the distortion in reports of companies. That is to say, religious companies are less likely to commit financial reporting violations. The results of the study showed that enterprises located in areas with high religious and social standards are more likely to face financial reporting violations [19].

This review highlights how important it is to take cultural differences into account when analyzing reports. An analysis of financial reporting irregularities between countries can reveal common and different patterns in the prevalence and consequences of distortions around the world.

2.4. Viewpoint 4 - Ethics and the Importance of Internal Control of the Company

Ethical accounting behavior is crucial for maintaining the credibility of financial statements. Recent research examines the role of ethical leadership and organizational culture in reducing risks in accounting [20] and emphasizes the importance of auditor independence for ensuring reliability [21]. Studies link auditor independence directly to audit quality, which is vital for transparency and trust in financial reporting.

This literature review integrates global perspectives on the reliability and misstatement of financial statements, offering insights into the challenges and solutions for addressing reporting distortions. It explores how cultural, technological, and environmental factors, along with the role of small businesses, influence the reliability of financial statements.

Thus, the work is presented based on a literary review by local and foreign authors studying the problem of falsification of financial statements and the need for data reliability in terms of the implementation of international standards, audit procedures, and cultural differences between regions.

The purpose of the study is to examine the importance of reliable financial reporting as a tool for assessing the company's performance and a reliable market counterparty, and to identify and reduce reporting distortions influenced by the company's country of origin. The hypothesis of the study is that the use of a wide range of methods for detecting financial reporting misstatements, applied and borrowed from different countries, increases the reliability of financial reporting.

3. Materials and Methods

This study is based on quantitative research methods, which include the collection and analysis of data collected from primary and secondary sources. Based on the primary data collected by audit companies, we highlighted the growing problem of financial reporting distortions and other frauds faced by global companies.

Based on secondary resources, a literary review was selected from the research of long-standing and modern authors. To conduct this study, a literary review was conducted, including educational literature, news sites, a statistical review of audit companies, publications in scientific journals, and articles on reliability issues and problems arising from the distortion of the financial statements of companies as economic entities in the market. The literature review showed that the problem of distorted financial and accounting information was and remains relevant. The criteria for studying the need for reliable financial reporting included the issues of data unification according to international standards, the growth and causes of financial reporting manipulation, cultural differences between countries, as well as the principles of ethics and internal control, which can affect the reduction of data distortion.

The study primarily relied on statistical analysis, case study descriptions, and data application to identify instances of financial misstatements and their impact on firms in the international market. Using two company examples, revenue data from financial statements was analyzed with the Benford method, showing no manipulation. The SWOT analysis highlighted the strengths and weaknesses of the statistical approach.

Finally, the conclusion was a comparative analysis based on the cases, which focused on the reliability of financial statements and possible actions to ensure it. The article includes tables, graphs and conceptual apparatus to clarify results.

The combination of the aforementioned methods allows us to provide an extensive overview of the problems caused by the inaccuracy of financial indicators and suggest more effective methods to solve these problems.

4. Results and Discussion

The auditing company Ernst & Young (EY) in 2020 highlighted the detection of financial reporting fraud in the data of their global anti-fraud study. This study examined data on fraud and corruption in the financial statements of more than 2 500 company executives in 55 countries [22].

The key results of the study included the following:

1. 44% of the study participants admitted that corruption and fraud are serious problems in their countries.

2. Unreliable financial performance reports were the most common methods of fraud (29% of respondents), misuse of assets (26%) and bribery of officials (20%).

3. Russia, China, India, and Brazil were named countries with high levels of fraud and corruption.

The examples show how audit companies study and analyze statistics on corruption and fraud in various countries to identify the main trends, methods, and signs of financial reporting misstatements.

Another example is the regular PricewaterhouseCoopers (PwC) Global Economic Crime and Fraud Survey, which collects data and analysis of economic crimes and fraud in various countries.

The PwC report in the same year led to the following key results:

1. 47% of the companies surveyed reported economic crimes in 2022-2023.

2. Financial and accounting fraud, data and information fraud, and corruption and bribery were the most common types of crimes.

3. North America, Europe and Central Asia were the areas with the highest number of economic crimes [23].

The early 2000s saw a number of scandals involving the publication of falsified financial statements. Worldwide losses from corporate fraud are projected to be in the trillions of dollars, according to ACFE Reports to the Nation on Occupational [24].

Audit firms analyze fraud and economic crimes across countries, identifying trends and methods for detecting misstatements in financial statements. Common fraud signs include frequent management changes, poor reputation, inconsistent revenues, significant losses, high receivables, and unusual profits. Auditor rotation and hard-to-access branch locations are also red flags [25]. In Kazakhstan, financial statement reliability depends on compliance with accounting regulations, with auditors responsible for detecting misstatements.

Thus, accurate financial reporting is essential for doing business in all countries and is required for external users' understanding as well. Currently, auditors are tasked with determining if financial statements are reliable, despite who regulates the company's finances and accounting. And auditors are frequently unable or unwilling to recognize that financial statements have been altered artificially, which is a kind of fraud [23]. The question arises why companies resort to such sophistication to artificially and unfairly improve the picture of their financial condition.

Table 2 shows the reasons for the misstatement of financial statements in different countries.

Table 2.
Causes of misrepresentation of financial statements from different countries of the world.

Country	Causes of misrepresentation
USA	A complex tax system and management pressure to achieve financial performance
Japan	The desire to maintain credibility because of cultural characteristics and hide the profit and loss statement
Great Britain	There is a lot of competition in the market and a complex accounting and auditing system
China	Heterogeneity of the legal system and a high level of corruption
Kazakhstan	Low transparency and weak oversight by supervisory authorities

Based on the table, we can see that financial statement fraud conditions differ between countries. The presented cases illustrate broad patterns that can be intensified by additional variables depending on each country's specific situation.

Independent audits performed regularly and outsourced accounting services [5] together with improvements in accounting and internal control systems [26] and the alignment of accounting and tax systems to local and international standards combined with standardized audit practices to avoid mistakes and investment in employee training programs [27, 28] and state audits [29] serve as typical approaches to strengthen financial statement reliability based on our analysis.

The degree of skewed information in financial data and reports can be reduced through enhanced audit processes alongside strengthened internal controls and employee training programs.

Specific methods for identifying misstatements in financial statements may vary by country, legislation, industry standards, and other factors, but the general principles for analyzing financial statements remain similar. Table 3 provides an overview of some of the techniques utilized in various nations.

Table 3.
Global methods for detecting distortions in financial statements.

Detection methods	USA	Japan	China	UK	Kazakhstan
Analysis of the variety of indicators	✓ (ratio analysis)	✓ (analysis)	✓ (transaction)	✓ (market-based)	✓ (related party transactions)
Verification of compliance with accounting standards	✓	✓ (corporate governance)	✓ (corporate structure)	✓ (audit committee)	✓ (long-term financial planning)
Analysis of financial transactions	✓ (cash flow analysis)	✓ (international comparison)	✓ (transaction)	✓ (internal control)	✓ (internal control)
Statistical data analysis	✓	✓	✓	✓	✓
Automated technologies	✓ Artificial Intelligence (AI)	✓	✓ (AI)	✓ (AI)	✓

Note: Author's own elaboration based on [29-33].

Table 3 is a summary of the methods that may be specific to each country when it comes to misstatements of financial statements. However, it should be noted that the use of these methods may vary depending on the conditions and standards of auditing in each country.

For instance:

- In the United States, the "indicator diversity analysis" refers to the analysis of financial indicators such as liquidity ratios, profitability, and others [13].
- In Japan, the "corporate governance analysis" includes an assessment of the work of the audit committee and an assessment of the company's compliance with corporate governance rules [34].
- In China, the "financial transaction analysis" refers to the analysis of transactions made by a company [35].
- In the United Kingdom, "market performance analysis" refers to evaluating a company's market worth and contrasting it with financial indicators [28].
- In the Republic of Kazakhstan, "related party analysis" is the term used in Kazakhstan to describe the examination of transactions between a business and its affiliated partners [27].
  A universal technique for spotting anomalies and distortions that can point to fraud is the statistical method for financial manipulation detection.

The statistical method is a universal system for detecting financial manipulation by identifying anomalies and distortions that may signal fraudulent activities. The method enables large-scale data analysis and pattern recognition, which traditional verification methods might miss. This article evaluates the method by analyzing data from Kazakh and Japanese companies, which occupy distinctive global positions, to gather valuable research and practical insights.

This study targets Japan and Kazakhstan because these countries provide unique insights from their distinct economic and governance contexts.

- Different approaches: Japan adopts a distinctive corporate governance framework that focuses on "agreement" and "consent", while Kazakhstan demonstrates modern auditing practices and auditor challenges in its developing economy as reported by Song et al. [31].
- Geopolitical importance: Kazakhstan has significant influence as a major Central Asian power, while Japan remains economically significant globally.
- Practical relevance: The findings of accounting and auditing research in these countries provide audit firms, government agencies, and shareholders with important insights that contribute to the development of effective risk management strategies. Japan’s commitment to long-term business success creates pressure on companies to achieve significant profits whereas Kazakhstan’s reliance on natural resources creates opportunities for financial misreporting to secure investments [36].

Thus, from academic and practical points of view, researchers and professionals in the field of accounting and auditing may find it interesting to study approaches to identifying differences in financial reporting in Kazakhstan and Japan.

5. Practical Application of the Falsification Detection Method in the Cases of Kazakhstan and Japan

Benford's law was based on an observation by astronomer Newcomb [37] who noticed that the pages of logarithmic tables starting with small digits were more commonly used in a few numbers. He concluded that in many datasets found in nature, numbers starting with the digit "1" are more common than others. This theory was further worked upon by Benford [38] when he examined a vast collection of data sets and formalized the law [39]. Benford's research has led to the use of the law to identify anomalies, such as financial fraud, and it is currently widely utilized in auditing and financial data analysis.
In our study, we present this model as an illustration of the statistical method.

The law has been widely used in the United States for auditing reasons, especially in identifying false financial statements and tax evasion. For example, the falsified data from the Enron case revealed notable departures from Benford's expected distribution, requiring further investigations. In comparison, Benford's Law is considered a familiar forensic accounting technique in Europe, especially in Germany and the UK, which have rigid corporate audit systems [40]. Benford's Law is said to have been used to detect fraudulent financial or economic activities in China and Russia, countries that have historically suffered from a lack of business transparency. Studies show that although Benford's Law is applied more often in the West, its use is expanding in these areas and improving the reliability of financial reporting [41].

Newcomb-Benford Law explains that the distribution of first digits in many datasets follows a logarithmic pattern, where the probability of the first digit being 1 is about 30%, and the probability of 9 is only 4.6% [42]. This law is used to detect financial fraud in datasets such as demographics, tax filings, and accounting records. Notable cases of financial statement falsification prompted us to test this hypothesis using the Benford method.

Table 4 shows the descriptions of the Japanese and Kazakh companies. To compare business cases, data from Olympus Corporation, a Japanese manufacturer of optical and medical equipment, and the Kazakhstan Institute for Support of Agriculture "KazAgro" are presented.

Table 4.
Financial scandals of companies in Kazakhstan and Japan.

	Kazakhstani company	**Japanese company**
Line of business	Maintaining state grain reserves, providing loans, investing in financial leasing of the agricultural sector.	The company develops medical and healthcare equipment, including endoscopes, video systems, microscopes, cameras, printers, barcode scanners, and industrial endoscopes.
Charter capital	530.80 billion tenge KZT (1.1 billion USD)	124.64 billion YEN (0.831 billion USD)
Real result of the audit	According to the results of the audit, financial violations totaling 47.1 million KZT were revealed, inefficient use of financial resources and assets of the quasi-public sector - 392.5 billion KZT.	In 2011, CEO Michael Woodford accused Olympus of hiding $1.7 billion in losses over decades. The independent investigation that followed his dismissal fraudulently confirmed the crime, leading to the arrest of top executives and an 80% drop in market capitalization. As of 2024, Olympus is still doing business in Japan, although the company has changed its structural composition and financial activities.

Note: Author's own elaboration based on [43-46].

In both cases, the consequences have been dire. The Japanese company has lost a significant portion of its market capitalization, and its management is under intense scrutiny. The Kazakhstani firm also incurred losses and was eliminated in 2020 due to mismanagement, debt load, and significant political pressure on the firm to enhance transparency and efficiency. Thus, both scandals highlight the importance of transparency and effective governance in large corporations, especially those involving public funds.

Based on these two companies' selection, an independent Benford method study of the two companies' financial statements for three years was conducted and is presented in Table 5.

Table 5.
Revenue of companies.

Kazakhstani company				**Benford's probability for the combined method.**	**Japanese company**				**Benford's probability for the combined method.**
Period	**mln. KZT**	**USD as of 31.12.2023**	**Growth rate**		**Period**	**mln. YEN**	**USD as of 31.12.2023**	**Growth rate**	
2016	31 898.27	70.17	-	0.0138	2021	750 123.00	1 650.22	-	0.0058
2017	18 121.70	39.87	56.81%	0.0235	2022	881 923.00	1 940.17	117.57%	0.0049
2018	47 704.28	104.95	261.11%	0.0091	2023	936 210.00	2 059.60	106.15%	0.0046

Note: Author's own elaboration based on [47].

The income data of KazAgro's financial statements for three years before the liquidation of the company due to the scandal and the last three years after the scandal in Japan involving the Olympus company were selected from the reporting data. To estimate the reliability of a report using the Benford method, we used the following sequence of actions for the computations and applied a pre-made probability table based on Benford's law.

Step 1: Get the revenue and write down the first digit.

In this step, we capture the first digit of each revenue from the data matrix and log it in other places.

Step 2: Analyze the frequency of the first digit.

We analyze how many times one of the digits from 1 to 9 appears after collecting the first digit for every revenue.

Step 3: Compare the expected values according to Benford's laws.

We calculate the frequency of occurrence of the first digits and compare the values obtained with the expected values of Benford's law. The formula for the theoretical value of frequencies is represented by the following formula:

$$P(d1) = log10\ (1 + 1/d),$$

- where *d* is the first digit (from 1 to 9) [42].

Step 4: Apply the same principle to allocating the second value of the income number for calculation.
Step 5: Calculate the frequency of occurrence of the second digits and compare the values obtained with the expected values of Benford's law. The formula for the theoretical value of frequencies is represented by the following formula:

$$\boldsymbol{P(d2) = log10(1 + 1/(d2 + 10d1))},$$

- where *d* is the second digit (from 0 to 9) [42].

Step 6: Combine the data on the first and second digits of the value.
Step 7: Check the correspondence using the Chi-square criterion, as a statistical test, to check how much the actual data corresponds to the theoretical distribution according to Benford's law.

$$\boldsymbol{\chi 2 = \sum((Oi - Ei)2/Ei)},$$

- where O_i is the observed value, E_i is the expected value for each digit.

For each digit from one to nine, the following distribution is expected, as shown in Table 6:

Table 6.
The result of the frequency of values according to Benford's law.

Rate	The first digit					The second digit				
	Expected frequency	Kazakhstan		Japan		Expected frequency	Kazakhstan		Japan	
		Observed in the report	Actual frequency	Observed in the report	Actual frequency		Observed in the report	Actual frequency	Observed in the report	Actual frequency
0						0.1197	0	0.00	0	0.00
1	0.301	1	0.33	0	0.00	0.1139	1	0.33	0	0.00
2	0.176	0	0.00	0	0.00	0.1088	0	0.00	0	0.00
3	0.125	1	0.33	0	0.00	0.1043	0	0.00	1	0.33
4	0.097	1	0.33	0	0.00	0.1003	0	0.00	0	0.00
5	0.079	0	0.00	0	0.00	0.0967	0	0.00	1	0.33
6	0.067	0	0.00	0	0.00	0.0934	0	0.00	0	0.00
7	0.058	0	0.00	1	0.33	0.0904	1	0.33	0	0.00
8	0.051	0	0.00	1	0.33	0.0876	1	0.33	1	0.33
9	0.046	0	0.00	1	0.33	0.085	0	0.00	0	0.00

The results of the study allow to determine to what extent the financial data of each organization corresponds to the expected distribution of figures according to Benford's law.

The results of the Kazakhstani company report demonstrated that the first three digits appeared with proportional frequency. A similar pattern, though with different income values, was observed in a Japanese company. The second values of the numbers of both companies also have a value of no more than 0.33 frequency. This data is also represented in Figure 1

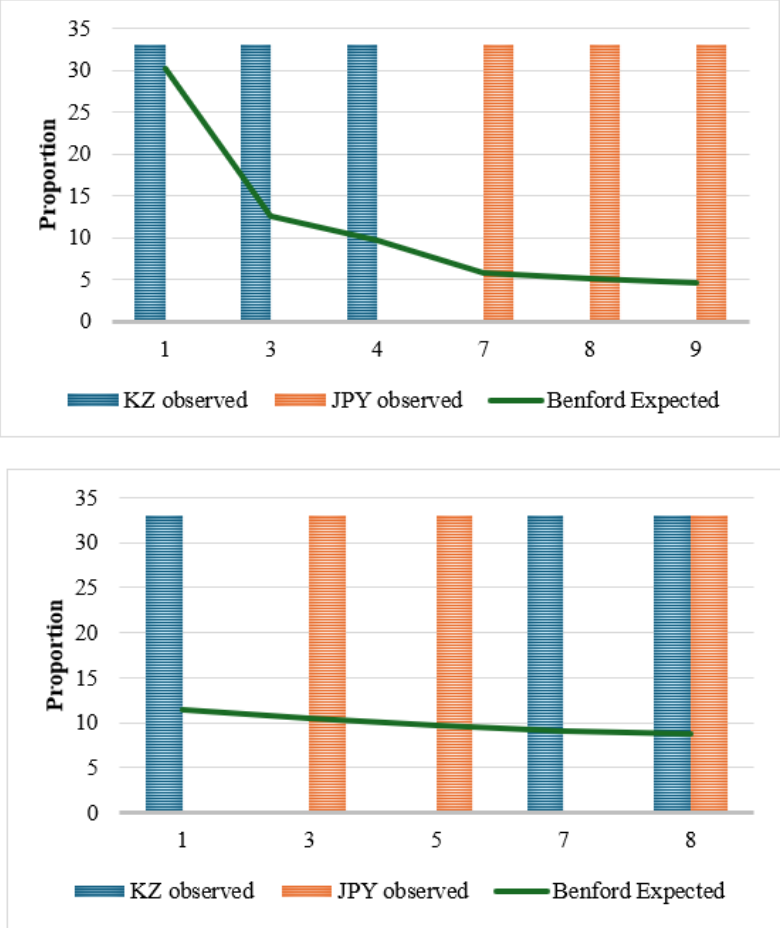

Figure 1.
Deviations of the first and second reporting indicators according to Benford's law.

Schematic representation shows that the number of observed values is identical in both companies. However, this is not the end of the calculation to reflect the result. Since the sample periods are small, it will be necessary to identify outliers in the probability indicators. In our example, we have chosen the Chi-square calculation. In the penultimate step, we combine the frequency values from the two calculations and proceed to the calculation of the Chi-square based on formula 3. Despite the small sample, we thoroughly carried out the calculation using statistical methods in three ways: calculation by the first values of the report (in most cases, this is sufficient), by the second values (for additional verification), and a combined method using the first two numbers (applied for a larger sample). To facilitate the calculation process, it is possible to use specialized programs, electronic calculators, or Excel software to create formula insertions. However, we will limit ourselves to manual calculation for visualization.

Kazakhstani company:

1) $x^2 = \frac{(1-0.903)^2}{0.903} + \frac{(1-0.375)^2}{0.375} + \frac{(1-0.291)^2}{0.291} \ldots;$

2) $x^2 = \frac{(1-0.3)^2}{0.3} + \frac{(1-0.3)^2}{0.3} + \frac{(1-0.3)^2}{0.3} \ldots$ - *equal distribution;*

3) $x^2 = \frac{(1-0.0414)^2}{0.0414} + \frac{(1-0.0705)^2}{0.0705} + \frac{(1-0.0273)^2}{0.0273} \ldots$

x^2= *0.0104+1.0417+1.725=2.777 (*< 15.51),
x^2= *1.63*3=4.9 (*< 16.92),
x^2= *22.2+12.27+34.7=69.17 (*< 112.02).

Japanese company:

x^2= *3.92+4.69+5.38=13.99 (*< 15.51),
x^2= *1.63*3=4.9 (*< 16.92),
x^2= *55.49+66.04+70.48=192.01 (*> 112.02).

Critical Chi-squared values presented are indicated at $\alpha = 0.05$ level of significance according to the table of critical Chi-Square values [48]. At the final stage, we compare the Chi-Square value with this critical value. If the Chi-square is greater than the critical value, then the deviations are significant; if less, they are insignificant.

As a result of the Benford method of revenue research, the Kazakhstani company did not show serious manipulations and deviations in financial statements; the Japanese company, even though the data sample was small, showed a strong likelihood of financial statement manipulation. The probability of deviation of Japan's data is slightly higher than Kazakhstan's, which could be alarming. The recommendation is to increase the sample size to calculate income indicators by year or factor in company expenses. That is, in the case of the Japanese company, the calculation of the Benford method with Chi-square transformation confirmed the deviation of values, which confirms the news data on financial statement misstatements. More sampling data is required for the first values method and the combined method to corroborate news reports of misreporting in the Kazakhstani company.

The advantage of this method is its versatility, since it can be used not only in samples of Kazakh and Japanese data, but also in other countries, because there are no restrictions. We may also use a large amount of data in the sample thanks to this strategy. This acted as a constraint on our model because thorough research requires longer review time. Combining the analysis of the first and second tests that we attempted is made possible by the statistical approach. We believe that the method's disadvantage is that it is difficult to determine precisely which balance sheet items as well as what combinations, to use for the audit's sampling. It is consequently necessary to check each indicator separately for distortion and manipulation, which also requires considerable time and care with a large amount of data.

Economic literature suggests that a violation of Benford's Law does not always indicate intentional data distortion but may result from business inefficiency. The theoretical frequencies in reports do not account for the total frequency index of each digit, which may warrant future formula adjustments. Estimating financial violations in Kazakh and Japanese organizations is challenging due to their differing business environments, with Japan’s income scale much higher than Kazakhstan's. Thus, it is better to analyze results separately. However, Benford’s Law remains useful for auditors and analysts in detecting unusual cases of data fraud.

6. Conclusion

In conclusion, this study emphasizes the importance of reliable financial reporting as a tool for assessing a company's market performance, as well as identifying and reducing reporting distortions depending on the country of origin, which was the objective of the study. An analysis of the causes of misstatements of financial statements in different countries revealed a few common factors, such as management pressure to achieve financial performance, insufficient control over compliance with rules and standards, as well as complex accounting and auditing systems. Nonetheless, every country has its own specific features that impact the nature of distortion.

From our analysis, the principal elements which result in financial data distortion are:

- Complex regulations: Missing or poorly defined legislation allows for window dressing in countries where financial reporting controls are weak.
- Corruption and undue influence: Corruption on the scope often translates to financial reporting being used for personal or political benefits.
- Absence of a control or oversight: Ineffective control of processes and business opacity provide an opportunity for financial statement fraud.
- Cultural and social organizational aspects: Various organizational cultures shape differently the perception of ethicality.

To eliminate misstatements, it is essential to improve the controls, increase transparency, and define the measures in the accounting and auditing practices that must be followed. The public sector needs to work with companies and auditors to ensure compliance with regulations and raise public awareness of such an obvious vice as financial fraud.

The use of the Benford and Chi-square methods for analyzing financial data in our research helped to show their interrelationship and applicability in companies across countries. Benford's law monitors the distribution of important figures to look for anomalies in a few areas such as financial analysis, tax auditing, and scientific work. It has become well-known abroad because of its great relevance in audit and tax control. Following Nigrini’s work, the methodology has become widely known for validating corporate reports in the USA and is now also used in Germany and France for the supervision of financial activities. Chi-square testing has a worldwide scope to prove the distribution of financial data. As practice has shown in our study, this method is also compatible with Benford's law and can be used in Kazakh and Japanese companies.

We summarize the clear advantages and limitations of the Benford method.

Some of the advantages are:

- Effectiveness and ease of use: large data sets are straightforward to work with, as the method requires almost no calculations other than comparing predicted digit distributions with actual frequency.
- Detection of fraud: Benford's law assists in the detection of distorting or interfering changes made to the data.
- High versatility: It can be used for many diverse datasets, including financial and demographic data, as well as in audit and election monitoring.
- Independence of scale: The method is applicable regardless of the size or unit of the data being processed, which greatly expands the scope of information it can be employed.

The study of Benford's method limitations include:

- Limited usefulness: This law only works with specific types of data and fails to function with artificially created or scoped data (such as phone numbers).

- Not an indicator of fraud all the time: A lack of compliance with Benford's law does not automatically imply fraud. There may be anomalies because of shifts in data or changes in accounting policies that were put in place.
- Need for careful interpretation: The technique must always be subjected to analysis and reasonable explanations for deviations made to avoid drawing unwarranted conclusions. Moreover, we observed that the analysis can be implemented at the point of calculating the first values and merged. Computation based on the old values is supplementary in nature; therefore, it is possible to constrain the mentioned two with a huge volume of data, however, for several time periods, so that the computation can be more precise.

This study deepens our understanding of the mechanisms of financial statement distortions and helps develop effective methods to mitigate them. Additional work is required to improve models for assessing the risk of misstatements and to explore various ways to prevent and detect such actions.

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