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Introduction

In this report, I will investigate firms' earnings quality on U.S. stock exchanges. To estimate earnings quality, I will employ financial data from Compustat and restatement data from Audit Analytics, spanning 2012 to 2022. I will also estimate abnormal accruals using various models, including the Jones, Modified Jones, and Teoh et al models, to enable comparison and improve accuracy. Furthermore, I will explore the factors contributing to predicting whether a company will restate its earnings and discuss why certain factors may not perform as anticipated. The report will be structured into four sections, each addressing a fundamental question outlined in the project description. This comprehensive analysis will provide valuable insights into earnings quality and the factors influencing restatements, ultimately enhancing our understanding of the financial landscape for U.S. listed firms.

Part I

The Jones, Modified Jones, and Teoh et al models are widely used to calculate abnormal accruals, which proxy earnings quality. Jones Model uses a cross-sectional approach to estimate non-discretionary accruals by regressing total accruals on changes in revenue and property, plant, and equipment (PPE). The residuals from the regression represent the estimated discretionary accruals, which are abnormal. In addition to Jones Model, Modified Jones Model aims to improve the accuracy of discretionary accrual estimation by adjusting the change in revenue for the change in accounts receivable. This modification helps to control the effects of credit sales, which might be subject to manipulation. Moreover, Teoh et al Model adjust the total accruals for only the total current accruals since the PPE is challenging to manipulate.

Table 1 demonstrates the accruals predicted by three models for two versions of restaement. There are clear differences between restatement and non-restatement firms, and the differences are statistically significant under 10% significance level.

There are also slight variations among the different models in predicting accruals. The Jones model yields the highest predicted accrual values among the three models for restatement firms, encompassing all types of restatements and SEC investigation restatements. Conversely, the Teoh et al model produces the highest predicted accrual values for non-restatement firms, including all types of restatements and SEC investigation restatements. The Modified Jones model consistently generates values that fall between the Jones and Teoh et al models.

Table 1: Mean Abnormal Accruals by restatement and non-restatement firms by models

Mean Abnormal Accruals	All Types of Restatement		SEC Investigation Restatement	
	Non-restatement Firms	Restatement Firms	Non-restatement Firms	Restatement Firms
Jones	2.05	2.96	2.15	1.09
Modified Jones	1.64	2.43	1.73	0.9
Teoh et al	2.24	2.54	2.27	0.91

The average accruals measured by the Jones model are higher than those measured by the Modified Jones and Teoh et al models mainly due to the model's assumptions and the factors it considers when estimating abnormal accruals. The Jones model estimates abnormal accruals by accounting for changes in revenues and fixed assets. While it attempts to control for the effects of a firm's operating performance, it does not consider the potential manipulations of revenues or other discretionary actions that might influence accruals. As a result, the Jones model may overestimate abnormal accruals, leading to higher average values when compared to the other two models. On the other hand, the Modified Jones and Teoh et al models include additional factors, such as account receivable, to better account for earnings management techniques.

Part II

In addition to abnormal accruals, I add other firm-level predictors, such as annual prior stock performance, P/E ratio, book-to-market ratio, leverage ratio, company size, industry, ROA, and ROE. The regression results show that abnormal accruals, annual prior stock performance, company size, industry, and ROA are statistically significant in predicting whether a company will have any restatement in the corresponding year. Meanwhile, only the annual prior year return and company size are statistically significant in predicting if the company will have SEC investigation restatement.

As shown in the regression table in the code, a company with a more extraordinary prior stock performance will be less likely to restate in the next year; conversely, poor stock performance may increase the possibility of a restatement. Several reasons lead to such consequences. Firstly, managers may feel pressure to meet or surpass market expectations, especially if the company has a history of strong market performance. They might manipulate earnings to ensure the company meets earnings targets and avoid disappointing investors. Secondly, managers may have incentives to manipulate earnings to maintain or increase the share price, which can be particularly relevant if their compensation is tied to stock performance or if they hold substantial personal investments in the company's stock. Also, managers may manipulate earnings to outperform industry peers or benchmarks, mainly if the company has been performing well in the market. By manipulating earnings, they aim to demonstrate that the company is a market leader and keeping pace with competitors.

In addition, a larger company may have a higher probability of predicting whether a company will have a restatement. Larger companies tend to have more complex operations, with numerous subsidiaries, divisions, and geographical locations. This complexity increases the likelihood of errors and irregularities in financial reporting, which could eventually lead to restatements. Also, larger companies are often subject to greater regulatory scrutiny, given their more significant impact on the economy and financial markets. This heightened scrutiny may lead to a higher likelihood of regulators identifying and requiring restatements.

Moreover, companies with lower ROA may be more likely to have restatements. Companies with lower ROA may face pressure from investors, analysts, and other stakeholders to improve their financial performance. This pressure might incentivize management to manipulate earnings and financial reporting to meet or exceed expectations, increasing the risk of restatements. Also, a lower ROA may indicate a weaker financial position or operational inefficiencies, which could increase the likelihood of financial reporting errors or irregularities. Due to these issues, companies with weaker financial health might be more prone to restatements.

Although P/E ratio, book-to-market ratio, leverage ratio, and ROE are commonly used financial metrics, they might not be statistically significant in predicting restatements. These financial ratios might correlate with other variables in the regression model, making isolating their effects on restatement prediction difficult when highly correlated multiple variables can lead to unstable and insignificant coefficient estimates. In addition, various factors can affect financial ratios, such as changes in accounting standards, industry-specific factors, and firm-specific events. These factors can introduce noise into the data, making it challenging to identify a clear relationship between these ratios and restatements.

Part III

Based on the first two parts mentioned above, I used the abnormal accruals calculated by each of the three models, annual prior stock performance, ROA, firm size, and industry, to predict whether a company will restate each year from 2019 to 2021. For simplicity, when referring to the results of models, I use the model's name that calculates abnormal accruals.

In general, the predictions made by all three models are not as great as expected. The Jones model, on average, correctly predicts ten firms that actually restate from 2019 to 2021, while the Modified Jones model and the Teoh et al models, on average, correctly predict three firms that actually restate. This consequence could be caused by the predicted probability generated by the Modified Jones and the Teoh et al models being relatively lower than that generated by the Jones model.

In addition, the predicted firms, by the Jones model, that have restatements are mostly from the industries of the Heavy Construction, the Rubber and Miscellaneous Plastic Products, the Wholesale Trade, and the Home Furniture, Furnishings, and Equipment Stores. Industries such as heavy construction and rubber and miscellaneous plastic products might have complex

operations, leading to accounting errors, misinterpretation of accounting standards, or even intentional manipulation. In addition, industries like heavy construction and manufacturing often have a high asset base, making them more capital-intensive. This could lead to greater complexity in accounting for assets, depreciation, and other related aspects, increasing the likelihood of restatements. Moreover, industries such as wholesale trade and home furniture, furnishings, and equipment stores often have complex supply chains. Managing inventory, accounts payable, and accounts receivable could be challenging, increasing the possibility of accounting errors or misstatements.

In comparison, the predicted firms, by the Modified Jones model and the Teoh et al model, that have restatements are mostly in the Business Services sector. Business services companies often have complex revenue recognition policies, including long-term contracts, multiple deliverables, or deferred revenue. This complexity can increase the likelihood of errors in financial statements and the potential for restatements. In addition, many business services companies proliferate organically or through acquisitions. Rapid growth can strain internal controls and financial reporting systems, increasing the probability of errors in financial statements. Additionally, integrating acquired companies can lead to consistency in accounting policies and practices, increasing the risk of restatements. Most importantly, companies in the business services sector often rely on estimates and judgments to recognize revenue, especially in long-term contracts. These estimates can be subject to manipulation or errors, leading to a higher probability of restatements.

Part IV

By re-estimating the probability of having restatements of each firm in 2021 using the EM index, I find five firms that are most likely to have restatement in 2021, which are Amazon.com Inc, Netflix Inc, IQVIA Holdings Inc, Fresenius Medical Care AG & Co, and China Petroleum & Chemical. All five firms have relatively high EM_index values, which indicates a higher risk of earnings manipulation. Most of them have positive prior-year stock returns, which might pressure management to maintain or exceed market expectations. Below is my justification for choosing the five companies.

In 2021, Amazon experienced tremendous growth due to increased demand for e-commerce and cloud computing services. However, this rapid growth could lead to potential financial reporting issues such as incorrect revenue recognition, especially for complex contracts or bundled services. Additionally, with its extensive global operations, Amazon faces risks associated with foreign currency translation and the management of its international tax structure.

Netflix's subscriber base grew in 2021, leading to higher revenues. However, the company also invested heavily in content creation, which involves complex accounting for content costs and amortization. Errors in content costs' recognition, capitalization, or amortization could lead to

financial restatements. Furthermore, as a global company, Netflix faces risks in foreign currency translation and tax-related issues.

IQVIA Holdings, a leading provider of advanced analytics and contract research services, may face potential restatement risks related to revenue recognition for its long-term contracts, particularly with varying performance obligations. Also, its global operations expose the company to foreign currency translation and global tax risks.

Fresenius Medical Care, a global healthcare company specializing in dialysis products and services, could face restatement risks due to complex revenue recognition for its bundled services and long-term contracts. Additionally, the company may need help accurately accounting for inventory valuation, especially given the potential for obsolescence or waste in the medical supplies industry. Furthermore, its international operations expose Fresenius to risks in foreign currency translation and global tax management.

As one of the largest oil and gas companies globally, China Petroleum & Chemical (Sinopec) faces potential restatement risks due to the complexity of accounting for oil and gas reserves, production, and exploration costs. Additionally, the volatile nature of commodity prices could lead to challenges in valuing assets and determining impairments. The company also faces risks related to foreign currency translation and international tax issues.