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Is depreciation fraud detectable using ADTFA and DAAT financial models? A case study

Sunil Kumar
ICFAI University Tripura, India
drsunilaz@gmailk.com

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Abstract

Purpose: Financial statement fraud, which is usually committed by insiders, aims to present a company positively and benefit fraudsters. Insiders commit fraud to deceive investors or hide their mistakes. This occurs in companies with weak control and unethical leaders. Prevention is important; however, early detection is crucial. Depreciation fraud manipulates the depreciation schedule to make financial statements look better. This involves inflating asset values and reducing expenses. Detecting depreciation fraud is difficult, and has severe consequences. Such activities can lead to penalties for both individuals and companies. Companies require accurate records, and auditors must review statements thoroughly to prevent and uncover fraud. New models were used to identify depreciation fraud in defaulting companies.

Research methodology: Forensic accountants may analyze depreciation fraud. We use Depreciation Accumulated after Tax (DAAT) to accurately find depreciation fraud by the company. A comparatively low or negative impact indicates depreciation fraud. The ADTFA and DAAT financial models can be used to trace depreciation fraud.

Results: The results are remarkable and should be tested in further depreciated fraud companies to detect their financial health position early.

Limitations: Detecting depreciation fraud is difficult because of various factors, including complex accounting methods, subjective estimates, and lack of external verification.

Contribution: This helps to account for users and investors, researchers detect depreciation fraud earliest, and present its financial accounting report.

Novelty: The researcher may adopt and push validated reliability through ADTFA and DAAT tests to detect depreciation fraud.

Keywords: *Introduction, Research Hypothesis, Research Methodology, ADTFA and DAAT financial models and Conclusion*

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1. Introduction

Depreciation, the gradual and perpetual decline in the recorded worth of fixed assets, is rooted in the cost of assets employed by an enterprise, rather than their market value.

The following are the three principal characteristics of depreciation.

1. Depreciation refers to a reduction in the recorded value of a fixed asset.
2. Depreciation occurs when assets lose value and become obsolete over time.
3. Depreciation is a process that continues until the end of an asset's life.

1.1 Causes for Depreciation

Wear and Tear Due to Use or Time: Wear and tear is the process of deterioration resulting in a decrease in an asset's value because of its use in generating revenue for the business.
Expiration of Legal Rights: Certain categories of assets lose their value once the agreement governing their use in a business ends after a predetermined period has elapsed.
Obsolescence: Obsolescence is another factor that leads to depreciation of fixed assets. In simple terms, obsolescence refers to becoming "out-of-date." Obsolescence refers to an actual asset becoming outdated because of the availability of a better asset type.

Abnormal Factors: Abnormal factors can cause a decrease in the use of an asset, specifically accidents such as earthquakes, fires, and floods. Accidental losses are permanent but not ongoing. Depreciation fraud is a form of financial fraud that involves deliberately manipulating a company's depreciation schedule. Depreciation is an accounting process that allocates the cost of an asset to its useful life. This process helps reduce the purchase value of a company's balance sheet and calculate the amount of expenses that should be recognized in each period.

Companies engaging in depreciation fraud may manipulate the value of assets or depreciation schedules to reduce the expenses recognized in a period. T

There are several forms of depreciation fraud, including misclassifying assets, understating helpful lives, and not recording depreciation expenses. Detecting it is challenging because it can be subtle and requires detailed financial statements and accounting record analysis, which is a serious violation that can lead to substantial financial penalties, reputational damage, and legal repercussions. Firms must maintain precise and transparent accounting records, and auditors must perform comprehensive evaluations of their financial statements to identify and prevent fraud.

Depreciation deception entails purposefully distorting or controlling the worth of possessions in a company's financial records by incorrectly modifying depreciation expenditures. Depreciation is a bookkeeping approach employed to distribute the expense of concrete assets (such as apparatus, gear, and construction) over their practical life span. This is an authentic procedure that mirrors the gradual reduction in the worth of these assets over time.

Depreciation fraud can manifest in diverse ways as follows:

1. The intentional underreporting of depreciation expenses can be considered fraud that might lead to an overstatement of a company's net income and assets. In turn, this could create a false impression of a company's financial health.
2. On the other hand, over-reporting depreciation expenses might result in understated net income and assets, which could mislead investors or reduce tax liabilities. This type of fraud may occur when a company intentionally records depreciation expenses higher than necessary.
3. Fraudsters may also manipulate the estimated useful lives of assets to either extend or shorten the period over which depreciation is calculated. This can affect the amount and timing of depreciation expenses, ultimately leading to inaccurate financial statements.
4. Some companies might capitalize on expenses as assets instead of properly recording them. These assets depreciate over time, artificially inflating the company's asset value and profit.
5. Finally, companies might continue to depreciate assets that no longer exist or have already been fully depreciated, creating ghost assets. This can lead to an overstatement of assets and understatement of expenses.

Depreciation fraud is a grave misdeed that can cause severe legal and financial repercussions. Its repercussions include erroneous financial reporting, negative impact on decision making, and loss of trust from stakeholders such as investors, creditors, and regulators. Regulatory bodies such as the U.S. The Securities and Exchange Commission (SEC) and international accounting standards organizations have established guidelines and rules to counteract such fraudulent activities.

If we discover or have reason to suspect depreciation fraud within an organization, we must report it to the appropriate authorities or regulatory bodies. If we are employees, we may want to discuss our concerns with our supervisor, internal audits, or legal departments. As investors, we can bring our concerns to regulatory authorities by overseeing financial reporting and securities markets.

2. Literature review

"Financial Statement Fraud: Insights from Empirical Research"' is a review article written by Beneish and Vorst (2022).This article presents a summary of important discoveries made through empirical research on financial statement fraud, particularly focusing on cases involving the manipulation of depreciation. This study offers a valuable understanding of the typical signs and techniques employed in financial fraud schemes. "Depreciation Frauds: Types, Detection, and Prevention " by Hendieh, Schneider, and Sakr (2023). This study comprehensively summarizes depreciation fraud, including the methods used to manipulate depreciation expenses. It also includes detection and prevention techniques in forensic accounting. "Detecting Depreciation Manipulation: An Examination of Machine Learning Approaches" by Chen and Wu (2022).

This study explores the use of machine learning methods to identify depreciation fraud. It examines different models and data sources for detecting abnormal depreciation patterns, and offers insights into the efficacy of these approaches. "Earnings Management Through Real Activities Manipulation: The Case of Depreciation" is an article authored by Roychowdhury (2006). Although not exclusively focused on depreciation fraud, this seminal study explores the broader concept of earnings management, encompassing the manipulation of depreciation as one of its facets. This study delves into the underlying motivations behind such activities and examines their repercussions on financial statements. Detecting Earnings Management" in Dechow, Sloan, and Sweeney (1995).We concentrate on various techniques employed for the detection of earnings management, a practice that may include the perpetration of depreciation fraud. This study extensively discusses the utilization of accruals and real activities manipulation as a means of misrepresenting financial performance. "(J. T. Wells, 2011).Sheds light on the methodologies and ethical considerations surrounding the identification of accounting fraud, encompassing the intricate issues associated with depreciation manipulation.

This article delves into the various factors that drive the manipulation of financial statements, including the manipulation of depreciation. Companies can commit fraud by misrepresenting assets or claiming longer holding periods because depreciation is a non-cash transaction based on management's discretion. Depreciation expenses affect the assets on the balance sheet, net income, and stockholders' equity. Companies can skew their market-to-market representation using depreciation calculations, which is a non-cash representation. Distortion can occur if the asset's depreciation is based on book value rather than actual market value (Saint-Leger, 2017). Crafting precise and trustworthy financial reports is crucial for the foundation of our markets because inauthentic financial data undermines investor trust and damages the market. Research has been conducted (Juric, O'Connell, Rankin, & Birt, 2018), and the Securities and Exchange Commission accused Waste Management of inflating its profits by reporting $1.7 billion in fake earnings. The SEC claims that the company manipulated its financial results to meet predetermined earnings targets. To achieve this, Waste Management uses improper accounting practices to eliminate and defer current period expenses. The SEC charges Waste Management by avoiding depreciation expenses on garbage trucks and assigning arbitrary salvage values to other assets.

The SEC discovered that fraud occurred at the company's headquarters because of a lack of control. The executive team reduced expenses and inflated earnings through "top-level adjustments." This study discovered that the whistleblowing system and internal controls impact fraud prevention in PT Pos Indonesia (Persero) in Bandung City. This study aimed to assess the influence of the whistleblowing system and internal controls on fraud prevention (Kuncara, 2022). The Association of Certified Fraud Examiners (ACFE) published a comprehensive study on occupational fraud and abuse, providing insights into perpetrators, their motivations, and how companies can protect themselves. The study found that fraud threats to Commonwealth can arise from both internal and external sources, with losses

decreasing in 2018-19 compared with previous years (Westhausen, 2016). External auditors play an important role in adding value to management's financial statements. However, they may not always detect fraud committed by the management during general audits. The procedures and scope of audit work for financial statements differ from those used to detect fraud (Heliantono, Gunawan, Khomsiyah, & Arsjah, 2020). Internal audits and controls are vital in preventing fraud by reducing business risks and ensuring the integrity of financial statements.

Implementing measures such as job rotation, training, and surprise audits can decrease fraudulent events and losses; however, businesses often prioritize fraud detection over prevention and proper internal controls (Handoyo & Bayunitri, 2021). Financial statement analysis is fundamental for evaluating company performance and making investment decisions. It offers valuable insights into a company's financial condition, enabling realistic valuations of investment, lending, mergers, and acquisitions (Olayinka, 2022). The role of accountability is crucial in accounting development, especially in sustainability accounting and corporate responsibility. However, the use of accounting technologies during the progressive era in the United States has failed to bring about significant corporate reforms (Omodero, 2015).

Accounting scandals have had devastating effects on investors, employees, and the economy. Companies lose 38% of their market share when financial misrepresentation is disclosed. Congress passed the Sarbanes-Oxley Act to protect investors in response to Enron and WorldCom scandals. The Sarbanes-Oxley Act ensures accurate and reliable financial statements, focusing on management responsibilities. Subsection 404 of the SOX emphasizes internal controls in financial reporting. Companies must perform internal control tests, hold management accountable for financial statement accuracy, and have independent auditors attest to disclosure assessments. Despite being in effect for almost 20 years, fraud persisted under SOX 404.

Hertz, a leading car and equipment rental company, operated in 150 countries. In February 2019, Hertz paid $16 million to file false financial statements and disclosures, as ordered by the SEC. The company misstated its pre-tax income due to accounting errors in various business units for two years. Hertz restated its financial results in 2015, identifying $235 million in the previously reported pre-tax income that was treated inappropriately. The SEC found that inaccurate reporting resulted from a corporate environment that prioritized meeting internal budgets, business plans, and earnings estimates.

During 2013, Hertz did not correctly disclose the extension of holding periods for its U.S. rental car fleet, resulting in a positive impact on its financial statements in the short term and carrying long-term risks. PricewaterhouseCoopers provided clean audit reports for Hertz from to 2011-2013 period.

Previous studies have also investigated fraud.
In their study, 'The Causes and Consequences of Accounting Fraud,' Gerety and Lehn (1997) explored the reasons for fraud based on the idea that it is a rational choice. They identify external and internal factors as leading causes of fraud. Donald Cressey, a sociologist and criminologist from 1950, created the Fraud Triangle theory to explain why violators commit fraud within their occupation. This theory includes three factors: opportunity, pressure, and rationalization.

Audit regulators support Cressey's Fraud Triangle; however, critics argue that it cannot explain fraud alone. Kassem and Higson propose using three models and suggest an extension of Cressey's model. It is essential to consider both the internal and external factors that drive people to commit fraud.

In the article "Comprehending the Causes and Consequences of Top Management Deceit," Zahra, Priem, and Rasheed (2007) explored various types of fraud perpetrated by upper-level executives and correlated them with diverse categories of white-collar crime. White-collar crimes are characterized by compelling financial incentives, the engagement of individuals regarded as esteemed members of society, and the absence of physical aggression. Upper management fraud can manifest in numerous forms, such as misappropriation of funds, insider trading, self-serving behavior, falsification of facts,

withholding information, malfeasance, concealment, and misrepresentation of financial reports (Zahra et al., 2007). The impact of upper management fraud is far-reaching and affects shareholders, employees, the community, and society. This research centers on external factors such as societal, industrial, and organizational elements that coerce top-level managers into committing fraud. At the organizational level, most fraud pressures arise from board composition, senior leadership, and organizational culture. From an industrial perspective, this study identifies several factors that influence upper management fraud, including industry cultures, norms and histories, industry-level investment horizons, payback periods, financial returns, industry concentration, environmental hostility, environmental dynamism, and environmental heterogeneity (Zahra et al., 2007). Like Cressey's internal factors that drive individuals to commit fraud, this study initially examines the characteristics that may contribute to an individual's propensity for deceit, such as age, experience, gender, self-discipline, and education. While considering these individual factors, this research determines that upper management fraud primarily stems from societal-level pressures based on the underlying concept of cultural deviance. These societal-level pressures are engendered by an organization's culture, norms, histories, concentrations, and environmental dynamics, whereby organizational and industry-level pressures play a significant role in its creation.

Just as Zahra et al. delved into the significance of industry-level pressures, Crutchley, Jensen, and Marshall (2007) bear witness to these industry-level forces and beyond in their research entitled "Climate for Scandal: Corporate Environments that Contribute to Accounting Fraud." This study explores how corporate governance, earnings quality, growth rate, dividend policy, and compensation interact to establish an environment conducive to fraud. After scrutinizing each of these elements, they conclude that "the corporate milieu most likely to lead to an accounting scandal is typified by rapid growth, high earnings smoothing, fewer outside directors on the audit committee, and overcommitted outside directors" (Crutchley et al., 2007).

Understanding the driving factors behind fraudulent behavior is crucial for evaluating potential risks and implementing effective preventive measures (Wells, 2001). A review of the literature on the subject shows that motivations for fraudulent actions can be attributed to internal and external forces. External factors stemming from societal, industry, and organizational influences, along with non-shareable financial difficulties, often shape an individual's perception of their workplace. Conversely, internal factors such as an employee's view of their job, pressure levels, opportunities for wrongdoing, rationalization, and personal characteristics can all motivate fraudulent behavior.

While depreciation is not a cash expense, it is a crucial accounting transaction that allows for a gradual reduction in tangible asset values over time. As assets are used, the calculated depreciation amount is expensed annually until the asset is written off entirely. This process decreases the asset's value on the balance sheet and the corresponding expenses on the income statement. Calculating depreciation expenses is essential to determine the adjusted net income for tax purposes. Consequently, depreciation expenses can result in lower asset values and net income, which can be manipulated through fraudulent practices, particularly in financially distressed companies (Collins, n.d.).

The literature emphasizes accurate accounting records and strong corporate governance to prevent and detect depreciation fraud. Auditors also play an essential role in identifying and reporting fraudulent activities.

2.1 Worldwide Depreciation Fraud Appears

Depreciation fraud transpires when a firm deliberately falsifies its asset value by exaggerating depreciation expenses or downplaying the useful life of assets. This act could be a ploy to lower taxable income or artificially inflate a company's financial statements. Several instances of depreciation fraud are presented below:

1. **WorldCom:** In 2002, WorldCom was found to be guilty of fraudulent accounting practices that inflated its earnings by $11 billion. One practice involved overstating depreciation expenses, which devalued the company's assets. Despite promising benchmarks for the year, WorldCom had

disastrous market ratios. This was not unexpected, given the company's financial situation, with a crushing debt of $41 billion and improperly booked expenses of $3.8 billion. Consequently, the company filed for bankruptcy. The aftermath was a shocking ROROA of 1.33 and ROE of 2.39%, compared with the S&P 500 benchmark of 10% for both ratios. Although top-line growth was negative at 10%, the company maintained its CA ratio at 0.99. Market performance reveals an internal disaster.

2. **Tyco:** In 2005, Tyco International was convicted of inflating earnings by $2 billion through fraudulent accounting practices. One such practice was to overstate depreciation expenses, which lowered the value of a company's assets.
3. **Enron:** In 2001, Enron, an energy corporation, was convicted of inflating earnings by $74 billion through fraudulent accounting. A fraudulent practice overstated depreciation expenditures, which decreased the value of assets and created the illusion of profitability, despite losses.
4. **Xerox:** In 2002, Xerox Corporation, a multinational document management company, was convicted of increasing its profits by $6.4 billion through dishonest accounting methods. The company overstated depreciation expenses, resulting in a decrease in asset value.

2.2 Purpose of Study

The purpose of studying depreciation fraud is to identify and prevent fraudulent activities related to depreciation accounting. Depreciation is a non-cash expense that represents a decrease in asset value over time. Accurate accounting for depreciation is essential to ensure that financial statements are presented fairly and that investors and other stakeholders have reliable information.

Depreciation fraud can occur when individuals intentionally misstate the value of assets, either by inflating the value of investments to make a company appear more profitable, or by understating the value of investments to hide losses. This can be achieved through various methods, such as manipulating depreciation schedules, altering asset records, or misrepresenting the useful life of assets.

Depreciation fraud severely affects both investors' and companies' reputations. By studying this, accounting professionals, auditors, and regulators can improve their ability to prevent and detect fraudulent activities and maintain financial reporting integrity.

2.3 Detecting Potential Depreciation Fraud

Depreciation fraud is difficult to detect because of its various forms and factors. However, specific steps and considerations may help identify potential fraud.

1. Various methods have been used to calculate depreciation, including straight-line, declining balance, and production units. Each method has its own formula and assumptions, which can help identify discrepancies or inconsistencies in the depreciation calculations when understood correctly. Therefore, it is essential to understand the depreciation method used.
2. Analyzing depreciated asset records can provide significant insights into their condition, usage, and lifespan. Detecting asset impairments through excessive repairs, usage patterns, or physical changes is crucial.
3. Comparing depreciation calculations with industry benchmarks can identify potential anomalies or discrepancies. This can include a purchase depreciating significantly faster than similar assets in the industry, which may indicate fraud.
4. We search for uncommon patterns or trends when examining depreciation data over time to detect potential fraud. For instance, a sudden or specific-year decrease in depreciation expenses may imply manipulation.
5. Engage in conversations with pertinent staff: Interacting with those in charge of asset records and depreciation calculations can diverge valuable perspectives regarding their techniques and decision-making procedures. This may aid in detecting possible warning signs or irregularities suggesting fraudulent activity.
6. Uncovering depreciation fraud requires expertise in analysis, industry insights, and investigative strategies.

2.4 When Depreciation Fraud Occurs?

Depreciation fraud intentionally exaggerates or alters the worth of a company's assets to deceive stakeholders such as investors or creditors. Methods are available to identify this type of fraud.

1. Analyzing a company's asset depreciation patterns makes it possible to detect potential fraudulent activities. Anomalies can be identified, such as using a uniform depreciation rate for all purchases regardless of their condition or valuable life, which may indicate questionable practices.
2. Examining maintenance records can yield valuable information regarding the state of an asset and its actual lifespan. If a company experiences substantial depreciation despite proper maintenance, it may be indicative of fraudulent activity.
3. Physical inspections can uncover discrepancies in reported depreciation and asset conditions. Fraud may be indicated if high depreciation levels are claimed for seemingly well maintained purchases.
4. To assess unusual depreciation levels, we compared a company's practices with industry benchmarks. Significant differences may indicate fraud.
5. Examining financial statements can reveal irregularities that suggest depreciation fraud. An indication of fraud may be a company's high depreciation rates paired with low capital expenditures.

Depreciation fraud cannot be conclusively identified by any method alone. Other detection techniques such as data analytics and internal controls should be used concurrently to detect and address potential fraud. Nevertheless, the ADTFA and DAAT tests are reliable for detecting depreciation fraud at an early stage.

2.5 Hypothesis For Depreciation Fraud

Research outcomes depend on the specific context and focus. Depreciation fraud is a term used to describe fraudulent practices that manipulate depreciation expenses in financial statements. This can be achieved by overestimating the useful life of assets or inflating the value of investments to reduce depreciation expenses.

H_1: There is a noteworthy correlation between internal controls and organisational depreciation fraud. This hypothesis proposes that adequate internal controls can reduce the risk of organizational depreciation fraud.

H_2: Depreciation fraud hampers financial reporting quality. This hypothesis suggests that financial statements may suffer from inaccuracies caused by depreciation fraud, which could adversely affect investors and stakeholders.

3. Research methodology

These are only a few examples of depreciation fraud committed by large companies. It is essential for companies to report their financial statements accurately, and for investors and regulators to be vigilant in detecting and preventing fraud. However, some companies in India are also involved in depreciation fraud. Below are some examples of depreciation fraud committed by Indian companies. The ratio that is typically helpful in detecting depreciation fraud is the Accumulated Depreciation to Fixed Assets Ratio (ADTFA). This ratio measures the depreciation recorded relative to the value of a company’s fixed assets. Suppose that the percentage is significantly lower than the industry averages or the company's historical rates.

In that case, it may indicate that the company does not record enough depreciation expenses, which could be a sign of fraud or accounting irregularities. Alternatively, the ratio is supposed to be significantly higher than the industry averages or the company's historical percentages. This overstates depreciation expenses, which could also indicate fraud or accounting irregularities. Therefore, forensic accountants may analyze depreciation fraud. Here, we practice Depreciation Accumulated after Tax (DAAT) to find accurate depreciation fraud by the company using ADTFA divided by tax percentage. The result, which is comparatively less than that of the other years or has a negative result, will show depreciation fraud. One can easily trace depreciation fraud using Both ADTFA and DAAT financial models.

3.1 Research Gap

The realm of exploration for researchers is the "Depreciation Fraud." It should be noted that these suggestions are based on existing trends and gaps until September 2021, and the terrain may have transformed. The researcher intends to delve into novel financial techniques that employ ADTFA and DAAT models to unveil depreciation fraud. These models are applied to companies engaged in depreciation fraud, rendering it an innovative approach. However, this approach requires further investigation and in-depth analysis.

4. Result and discussion

4.1 Exploring innovative financial models by testing

Satyam Computer Services: In 2009, Satyam Computer Services, a prominent Indian IT services firm, was convicted of inflating its earnings by over $1 billion through deceitful accounting methods. One of these methods involves prolonging depreciation expenditures, making the company's assets undervalued.

Table 1. ADTFA

Year	2006	2007	2008	2009	2010	2011	2012	Total
Fixed Assets = Gross Block	1114	1234	1440	2086	1750	1950	2076	**11650**
Accumulated Depreciation	804	930	1062	1404	1286	1407	1392	**8285**
ADTFA	72	75	74	67	73	72	67	**71**

Source: Authors' elaboration

In this ADTFA, the average is 71, except for 2009 and 2012, when it is 67, implying fraud in Satyam Computer Services.

Table 2. DAAT

Year	2006	2007	2008	2009	2010	2011	2012
ADTFA	**72**	**75**	**74**	**67**	**73**	**72**	**67**
TAX%	**14%**	**10%**	**12%**	**-2%**	**-29%**	**-73%**	**4%**
DAAT	**514**	**750**	**617**	**-3350**	**-252**	**-99**	**1675**

Source: Authors' elaboration

DAAT unveils a case of depreciation fraud with ADTFA divided by the tax percentage, resulting in significantly lower or negative values. This occurred in 2009, with a depreciation fraud of -3350.

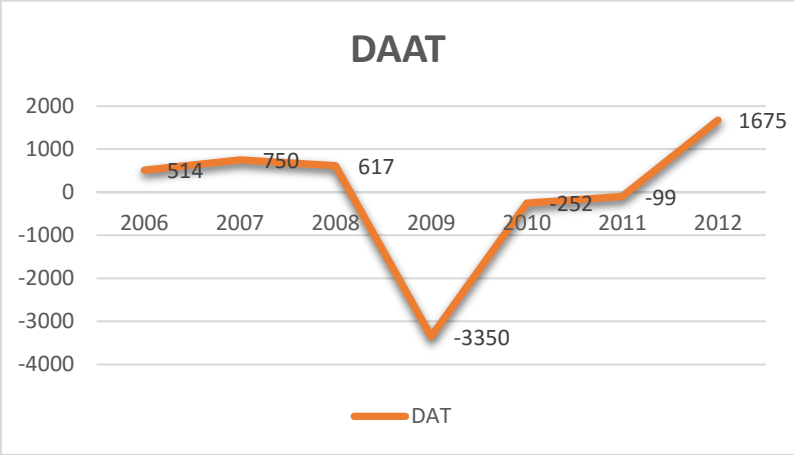


Figure No. 1. DAAT

When examining the data, it not only confirms the outcome, but also detects fraud related to depreciation.

Table 3.

Year	2006	2007	2008	**2009**	2010	2011	2012
Net Profit	1,240	1,423	1,716	**-7,935**	-71	-128	1,203
EPS in Rs.	0	21.33	25.59	**-117.75**	-0.61	-1.08	10.22
Dividend Payout %	18%	16%	14%	**-1%**	0%	0%	0%
ROCE %	0	31%	30%	**4%**	30%	24%	43%
TAX%	14%	10%	12%	**-2%**	-29%	-73%	4%

In the above table, some of the data extracted from annual reports are important for knowing that the company is defaulting and going in a different direction by observing Taxes, ROCE, Dividend pay-out ratio, and EPS. In 2009, all began to become negative. This also indicates fraud or misrepresentation in financial accounting.Mahindra Satyam, formerly Satyam Computer Services, faced a fraud scandal 2009 involving the company's founder and top executives. Fraud was uncovered with the help of critical data analysis.

Inflated Revenue: The fraudulent activity at Satyam centered on the company's financial statements, specifically inflated revenue figures. The revenue growth rate was much higher than that of other companies in the same industry, raising concerns and prompting further investigation.

Fictitious Clients: Upon further examination of Satyam's financial statements, it was found that they increased their revenue by creating false clients and projects. By analyzing the company's list of clients and project details, it was discovered that a significant amount was either non-existent or highly exaggerated.

Accounting Irregularities: A crucial data analysis reveals fraudulent accounting practices in the company. The investigators find that the company falsified accounting records to conceal fraud. They discovered that the company had produced counterfeit bank statements and financial documents.

Ricoh India: In 2016, Ricoh India, a subsidiary of the Japanese multinational imaging and electronics company Ricoh, engaged in fraudulent accounting practices that overstated its earnings by over $60 million. The company employed various fraudulent practices, including overstating depreciation expenses, which resulted in misrepresentation of the value of its assets.

Table 4. ADTFA

Year	2012		2013	2014	2015	2016	2017	2018	2019	Total
Fixed Assets =Gross Block	80		86	105	139	104	104	77	70	**765**
Accumulated Depreciation	49		57	41	80	41	45	35	40	**388**
ADTFA	**61**		**66**	**39**	**58**	**39**	**43**	**45**	**57**	**51**

Source: Authors' elaboration

The ADTFA average is 51, yet it shows 39 as a typical result in 2014 and 2016, suggesting depreciation fraud in Ricoh, India.

Table 5. DAAT

Year	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**
ADTFA	**61**	**66**	**39**	**58**	**39**	**43**	**45**	**57**
TAX %	-5%	438%	43%	33%	-1%	2%	0%	0%

DAAT	**-1220**	**15**	**91**	**176**	**-3900**	**2150**	∞	∞

Source: Authors' elaboration

DAAT shows a case of depreciation fraud caused by dividing ADTFA with Tax percentage, leading to significantly fewer results than others and damaging present depreciation fraud. The year 2016 saw a depreciation fraud of -3900.

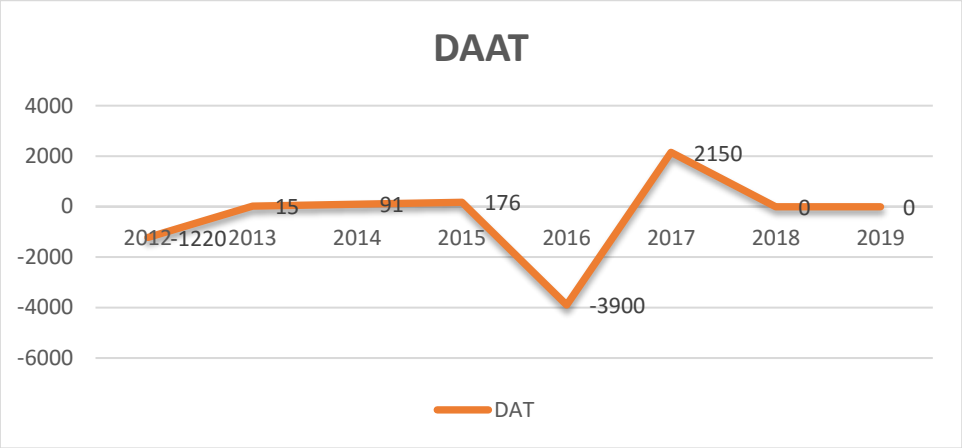


Figure No. 2. DAAT

When examining the data, it not only confirms the outcome, but also detects fraud related to depreciation.

Table 6.

Year	2011	**2012**	2013	2014	2015	**2016**	2017	2018	2019
Net Profit	16	**-3**	-1	17	34	**-1,118**	-327	-894	-163
EPS in RS.	4.12	**-0.66**	-0.33	4.33	8.52	**-281.06**	-82.11	-224.83	-40.95
Dividend Payout %	0%	**0%**	0%	0%	12%	**0%**	0%	0%	0%
ROCE %	21%	**2%**	5%	14%	20%	**-24%**	-14%	-36%	-10%
TAX%	36%	**-5%**	438%	43%	33%	**-1%**	2%	0%	0%

In the above table, some of the data extracted from annual reports are important for knowing that the company is defaulting and going in a different direction by observing Taxes, ROCE, Dividend pay-out ratio, and EPS. In 2012, and again in 2016, all started to fall negative. This also indicates fraud or misrepresentation in financial accounting.

HDIL: In 2019, HDIL, a real estate development company, was convicted of fraudulent activity, resulting in an earnings overstatement of $200 million.

Table 7. ADTFA

Year	2014	2015	2016	2017	2018	2019	2020	2021	Total
Fixed Assets= Gross Block	202	146	16	137	136	135	148	147	**1067**
Accumulated Depreciation	34	34	11	28	35	38	60	62	**301**
ADTFA	17	23	66	21	25	28	40	42	**28**

Source: Authors' elaboration

The average ADTFA was 28, but dropped to 17, 23, 21, 25, and 28 in 2014, 2015, 2017, 2018, and 2019, respectively. This suggests depreciation fraud in HDIL from the beginning.

Table 8. DAAT

Year	2015	2016	2017	2018	2019	2020	2021	2022
ADTFA	**17**	**23**	**66**	**21**	**25**	**28**	**40**	**42**
TAX%	**26%**	**-19%**	**16%**	**-60%**	**18%**	**0%**	**0%**	**0%**
DAAT	**65**	**-121**	**412.5**	**-35**	**139**	∞	∞	∞

Source: Authors' elaboration

DAAT shows a case of depreciation fraud due to division with tax percentages, resulting in lower values and adverse outcomes. In 2016 and 2018, fraud resulted in -121 and -35.

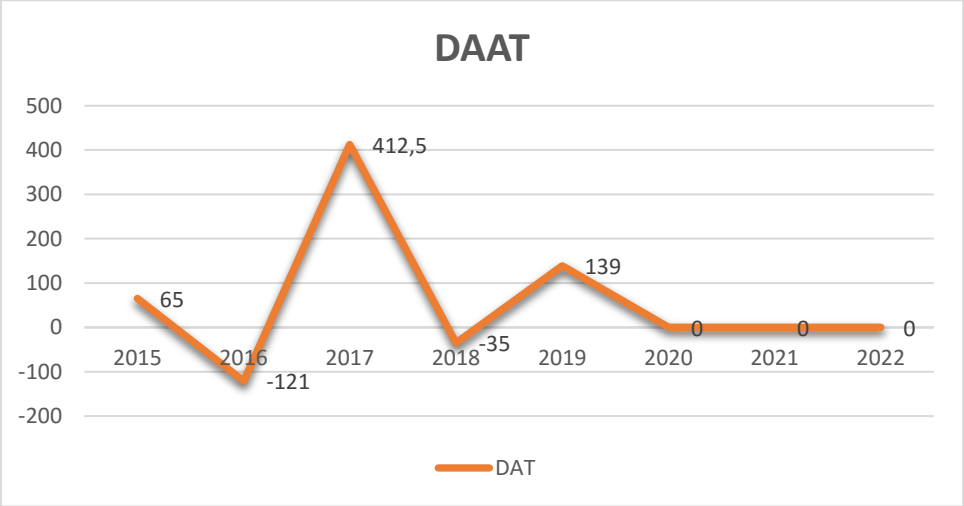


Figure No. 3. DAAT

Observing the provided data is crucial for confirming the results and identifying depreciation fraud.

Table 9.

Year	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**
Net Profit	**226**	**340**	**175**	**95**	**96**	**-13,967**	**-12**	**-12**
EPS in RS.	**5.4**	**8.13**	**4.04**	**2.2**	**2.12**	**-294.67**	**-0.26**	**-0.26**
Dividend Payout %	**0%**	**0%**	**0%**	**0%**	**0%**	**0%**	**0%**	**0%**
ROCE %	**5%**	**5%**	**4%**	**2%**	**2%**	**-7%**	**-5%**	**-5%**
TAX%	26%	-19%	16%	-60%	18%	0%	0%	0%

In the above table, some of the data extracted from annual reports are important for knowing that the company is defaulting and going in a different direction by observing Taxes, ROCE, Dividend pay-out ratio, and EPS. In 2020, all started to fall to negative values. This also indicates fraud or misrepresentation in financial accounting.

Kingfisher Airlines: In 2012, the defunct Indian airline, Kingfisher Airlines, was accused of inflating its assets and liabilities to secure bank loans. It overvalued its aircraft by not factoring in depreciation, making them appear more valuable.

Table 10. ADTFA

Year	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**Total**
Fixed Assets = Gross Block	247	341	322	1,892	2,048	2,254	2,239	1,341	10684
Accumulated Depreciation	16	34	44	316	494	682	796	629	3011
ADTFA	**6**	**10**	**14**	**17**	**24**	**30**	**36**	**47**	**28**

Source: Authors' elaboration

This enterprise began in 2008 but struggled with bank loans. The ADTFA rate provides an accurate view; however, fluctuating data suggest operational issues.

Table 11. DAAT

Year	2006	2007	2008	2009	2010	2011	2012	2013
ADTFA	**6**	**10**	**14**	**17**	**24**	**30**	**36**	**47**
TAX%	**-1%**	**-1%**	**72%**	**25%**	**32%**	**32%**	**32%**	**0%**
DAAT	**-600**	**-1000**	**19.4**	**68**	**75**	**93.75**	**112.5**	∞

Source: Authors' elaboration

In 2006-07, DAAT yielded negative results. However, in 2012, it consistently showed 32% taxes on ADTFA from to 2010-2012 with a DAAT of 112.5. This fluctuation suggests that fraud has occurred in the company.

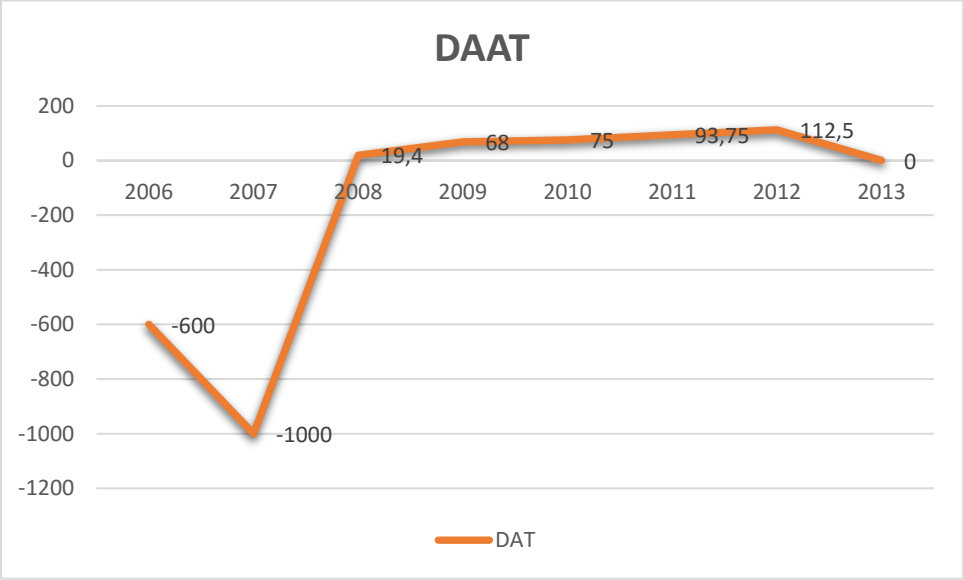


Figure No. 4. DAAT

To confirm this result, examining the provided data is crucial and aids in identifying fraud related to depreciation.

Table: 12.

year	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**
EPS (Rs.)	-30.97	-13.85	-60.5	-61.95	-20.64	-40.3	-53.18	-59.81
Net Profit	-341	-420	-188	-1,609	-1,647	-1,027	-2,328	-4,301
Dividend Payout %	0%	0%	0%	0%	0%	0%	0%	0%
ROCE%	0	-66%	-73%	-59%	-25%	-3%	-56%	-4575%
TAX%	-1%	-1%	72%	25%	32%	32%	32%	0%

In the above table, some of the data extracted from annual reports are important for knowing that the company is defaulting and going in a different direction by observing Taxes, ROCE, Dividend pay-out ratio, and EPS. From 2006 to 2013, almost all cases started to fall negative. This also indicates fraud or misrepresentation in financial accounting.

Electro Steel Steels Ltd: In 2018, an Indian steel maker, Electro Steel Steels, was charged with inflating profits by underreporting depreciation costs on some assets. Over several years, the company was discovered to have overstated its earnings by almost $700 million.

Table 13. ADTFA

Year	2012	2013	2014	2015	2016	2017	2018	2019	**Total**
Fixed Assets = Gross Block	1,016	1,018	2,914	3,977	8,176	8190	8310	8183	**42,217**
Accumulated Depreciation	35	102	175	388	209	688	1,222	1,504	**4328**
ADTFA	**3.44**	**10.02**	**6.01**	**9.76**	**2.56**	**8.40**	**14.71**	**18.38**	**10.25**

Source: Authors' elaboration

The average ADTFA is usually 10.25, but it was lower in 2012, 2014, 2016, and 2017, with fluctuations, indicating depreciation fraud.

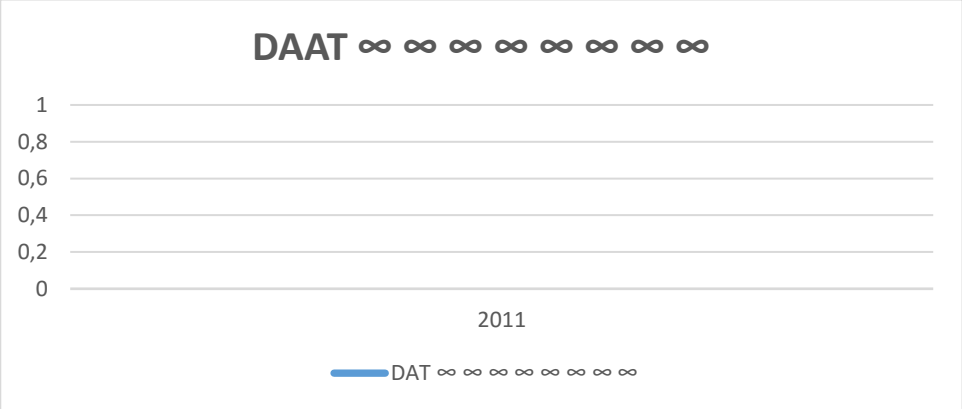
Table 14. DAAT

Year	2011	2012	2013	2014	2015	2016	2017	2018	2019
ADTFA	**1.15**	**3.44**	**10.02**	**6.01**	**9.76**	**2.56**	**8.4**	**14.71**	**18.38**
TAX%	**-0%**	**-0%**	**-0%**	**-0%**	**-0%**	**-0%**	**-0%**	**-0%**	**-0%**
DAAT	∞	∞	∞	∞	∞	∞	∞	∞	∞

Source: Authors' elaboration

Discovering DAAT's whereabouts is effortless and the possibilities are boundless. Consequently, this enterprise is not thriving.

Figure No. 5. DAAT



Examining the data helps confirm the outcome and identifies cases of depreciation fraud.

Table 15.

Year	2011	2012	2013	2014	2015	2016	2017	2018	2019
Net Profit	-6	-150	-280	-291	-624	-368	-1,463	-6,139	1,188
EPS in RS.	-0.03	-0.74	-1.28	-1.33	-2.59	-1.53	-6.07	-25.48	6.06
Dividend Payout %	0%	0%	0%	0%	0%	0%	0%	0%	0%
ROCE %	0%	-1%	-2%	-1%	-2%	-1%	-3%	-2%	11%
TAX%	-0%	-0%	-0%	-0%	-0%	-0%	-0%	-0%	-0%

In the above table, some of the data extracted from annual reports are important for knowing that the company is defaulting and going in a different direction by observing Taxes, ROCE, Dividend pay-out

ratio, and EPS. From 2011 to 2018, all started to fall to negative values. This also indicates fraud or misrepresentation in financial accounting.

5. Conclusion

Depreciation fraud is a financial crime that manipulates asset value for higher payouts. Detection of this fraud can be made more accessible through new modelling versions, such as ADTFA and DAAT analysis. Therefore, preventive measures and responses to suspected incidents are necessary to combat this crime. Suggestions for overcoming depreciation fraud are provided.

1. Implement internal controls: Companies must implement internal controls to ensure asset valuation accuracy in financial statements. These controls may involve inventory counts, asset tagging, and independent appraisal.
2. Conduct regular audits: Regular audits can reveal discrepancies in asset valuation and expose potential fraud.
3. Educate employees: Workers must comprehend the significance of precise asset assessments and the outcomes of depreciation decline. They need to learn to recognize and notify others of any doubtful behavior.
4. Implement a whistleblowing system: Businesses ought to implement a mechanism for whistleblowing that enables workers to report occurrences of asset fraud anonymously without fear of revenge.
5. Work with external auditors: External auditors aid in detecting depreciation fraud and providing recommendations to prevent future occurrences.
6. Report suspected incidents: Companies must promptly notify law enforcement and fully cooperate with any investigation if they suspect depreciation fraud. In addition, they should report the occurrence to their insurance company and collaborate to recuperate any damage.
7. Stay vigilance: Companies must detect depreciation fraud even after taking preventive measures. This entails regularly examining financial statements, tracking inventory counts, and conducting unannounced audits.

5.1 Implication

Accounting standards and regulatory bodies address depreciation fraud through guidelines and frameworks. International Financial Reporting Standards (IFRS) emphasize accurate reporting. The International Accounting Standards Board (IASB) maintains the IFRS. Generally Accepted Accounting Principles (GAAP) provide rules for depreciation accounting in the US. The Financial Accounting Standards Board (FASB) set and updated the GAAP. Indian Accounting Standards (INDAS) in India converge with IFRS. The Institute of Chartered Accountants of India (ICAI) implemented the INDAS. The Sarbanes-Oxley Act (SOX) enhances corporate governance and requires internal controls over depreciation. The U.S. The Securities and Exchange Commission (SEC) oversees SOX compliance. Internal audit standards and professional organizations guide internal audits and detect fraud. Financial regulators and securities commissions investigate fraudulent financial reporting, including depreciation frauds. Detecting and preventing depreciation fraud involves compliance, internal controls, auditing, and oversight. These entities maintain financial reporting integrity and reduce fraud risks. Depreciation fraud may manifest when corporations manipulate their financial reports by distorting the representation of the depreciation of their assets. This can result in the dissemination of inaccurate financial information, which can have profound ramifications for investors and stakeholders. To address and prevent depreciation fraud, regulatory bodies such as the International Financial Reporting Standards (IFRS) organization can take various measures.

1. Augmented Disclosure Requirements: Regulatory bodies can mandate that corporations furnish comprehensive details regarding their depreciation policies, encompassing the methodologies employed, estimates of useful life, and residual values. This heightened transparency facilitates the identification of potential manipulation by investors and auditors.
2. Independent Audits: Compulsory independent audits of financial statements can serve as a means of detecting and forestall depreciation fraud. Auditors can scrutinize a corporation's depreciation methodologies and assumptions to verify their compliance with accounting standards and alignment with economic reality.

3. Intensified Scrutiny: Regulatory bodies can heighten their examination of corporations that are more prone to depreciation fraud. This might entail conducting targeted assessments of financial statements, particularly for corporations with substantial asset value, peculiar depreciation patterns, or frequent alterations in accounting policies.
4. Whistleblower Protection: Encouraging employees and other insiders to disclose suspicious accounting practices through whistleblower protection programs can prove to be an efficacious approach to exposing depreciation fraud.
5. Continuous Education and Training: Regulatory bodies can mandate that corporations and auditors undergo regular training in accounting standards and ethical practice. This can help ensure that professionals are cognizant of the risks associated with depreciation fraud and possess the necessary knowledge to prevent it.
6. Enforcement of penalties: Rigorous enforcement of penalties for accounting fraud, including depreciation fraud, can serve as a deterrent. Corporations and individuals who are culpable to manipulate depreciation figures face substantial fines, legal ramifications, and reputational harm.
7. Review and Update of Accounting Standards: Regulatory bodies such as IFRS can periodically assess and revise accounting standards to address emergent issues and close potential loopholes that might be exploited by fraudsters.
8. Utilization of Technology: Employing advanced data analytics and artificial intelligence tools to discern aberrant depreciation patterns or anomalies in financial statements can aid regulatory bodies and auditors in detecting fraud more effectively.
9. Establishment of Whistle-Blower Hotlines: The establishment of whistle-blower hotlines, which provide concerned individuals with the opportunity to anonymously disclose financial irregularities, can prove to be a highly effective approach towards the revelation of fraudulent activities.
10. Collaboration with Other Regulatory Entities: Regulatory bodies can collaborate with law enforcement agencies, securities regulators, and other pertinent authorities to thoroughly investigate and prosecute instances of depreciation fraud.

It is imperative to acknowledge that the prevention of depreciation fraud necessitates the implementation of a multifaceted approach that encompasses regulatory oversight, efficient auditing, corporate governance, and steadfast commitment to ethical financial reporting. The role played by regulatory bodies in the establishment and enforcement of regulations and standards that foster transparency and accountability in financial reporting is of utmost importance.Researcher bias can affect case studies; however, they lack scientific methods and accuracy. Detecting depreciation fraud is difficult because of complex accounting, subjective estimates, and a lack of verification. Challenges arise from data-quality issues, changing business environments, collusion, and advanced techniques. The difficulty in detecting depreciation fraud is also due to the volume and complexity of the data, behavioral adaptation, detection time lag, and limited historical data.

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