PINOCCHIO'S NOSE MAY BE GROWING: MISSTATEMENT RISK AT DISNEY

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ABSTRACT

Disney has been the investors dream company for decades with its impressive revenue growth and profits to match. Recently, however, there have been media reports concerning the quality of the firm's financial statements. In this study, we apply the work of Dechow et al. (2011) to evaluate the likelihood that Disney may be manipulating its financial results. We found that Disney's accruals have been increasing and various performance measures have been deteriorating in recent years. The evidence has been consistent with the general finding that accruals are rising during misstatement years and manipulation is being used to mask deteriorating performance. We then applied Beneish (1999a) to calculate the likelihood of earnings manipulation. We found that Disney's probability of misstatement jumped significantly in 2019 and has passed the threshold to be identified as a manipulator for investors who face relative costs of Type I to Type II errors at around 20:1 or higher. Our results sound the alarm that further scrutiny by authorities of Disney's financial statements may be warranted.

INTRODUCTION

On August 19, 2019, MarketWatch first reported that a former Disney accountant tipped the SEC that the company has materially overstated revenue for years. The whistleblower's filings included allegations such as recording fictitious revenue, double recording revenue, and flaws in accounting software that make tracing manipulation difficult. For example, the revenue from the parks-and-resorts business could have been inflated by as much as $6 billion for fiscal year 2008-2009 while the reported total was only $10.6 billion from the segment. Disney has dismissed the allegations and fired the whistleblower.

On February 26, 2020, CNBC reported that long-tenured Disney CEO Bob Iger made a stunning announcement that he would step down as Disney's CEO, effective immediately. Iger implied a desire to concentrate on the creative pipeline of the company as the reason for the move. Iger is still the executive chair of the company. However, as a February 2020 Vanity Fair article noted, "For an industry used to forcibly jettisoning executives amid a cascade of failures, it was strange and disorienting to see one leave when all was seemingly well."

In this paper, we evaluate the risk of a Disney misstatement of financial statements. It is impractical for us to conduct an SEC style investigation. However, the accounting research literature has identified several measures that can be used to evaluate earnings quality and detect misstatement risk. Most of these measures can be calculated using information from publicly

disclosed financial statements. We examine many of these measures to evaluate the risk of a Disney misstatement of its financial reports.

Our approach to testing the existence of accounting misstatement by Disney targets three groups of related factors. The first group is accruals. Accounting items such as receivables, inventories or depreciations, etc. are used to adjust or shift the recognition of cash flows over time. These items are examples of working capital or capital accruals which can be employed to adjust earnings or revenue numbers to better reflect a firm's business. However, estimation of accruals relies on assumptions on future cash flows, which leaves the door open to earnings management. When managers manipulate reported earnings, they typically do so through accruals management.

We examined unadjusted accrual measures (Dechow, Ge, Larson and Sloan, 2011) and discretionary accruals derived from various models including the cross-sectional modified Jones model (Dechow, Sloan and Sweeney, 1995), the performance-matched discretionary accruals model (Kothari, Leone, and Wasley, 2005), and the earnings quality metric (Dechow and Dichev, 2002). We then compare these accrual measures to those of Disney's industry peers.

The second group includes performance measures. It is argued that manipulations occur in order to hide declining firm performance (Dechow, Sloan, and Sweeney (1996), Beneish (1997, 1999b)). We thus calculate four performance measures that are found to be deteriorating prior to and during suspected misstatement years (Dechow et al., 2011).

Finally, we used Beneish eight-factor model to assess the likelihood of fraudulent reporting. We examined the time-series probability of misstatement for Disney over the past decade. We also calculated the time-series values of several individual factors that may suggest the possible source of misstatement.

LITERATURE REVIEW

Analyzing firms' earnings quality and identifying potential conditions that could enable (or possibly signal the likelihood of) fraudulent reporting is an extensive area in accounting research. Dechow, Ge and Schrand (2010) provide a comprehensive review of this literature. Here, we review key literature from which we apply methodology to evaluate Disney's misstatement risk.

Accruals are associated with various proxies for earnings quality. Various attempts have been made to model the accrual process and distinguish 'abnormal' from 'normal' accruals. The normal accruals are meant to capture adjustments that reflect fundamental performance, while the abnormal accruals are meant to capture distortions induced by the application of the accounting rules or earnings management. There have been numerous papers published using abnormal accruals to measure earnings quality (e.g. Jones, 1991; Dechow et al., 1995; Xie, 2001). Starting with Healy (1985), a large body of literature hypothesizes that earnings are primarily misstated via the accruals. Dechow, Ge, Larson and Sloan (2011) examine a large collection of data on the SEC's Accounting and Auditing Enforcement Releases (AAERs) and find that misstatement years are associated with unusually high accruals. Given that issues of earnings manipulation and quality of earnings do appear to cluster by industry, following

Dechow et al. (2011), we calculate a panel of accrual measures for Disney and compare them with industry distributions.

Additionally, researchers have conjectured that weak performance provides incentives to firms to engage in earnings management (Doyle, Ge, and McVay, 2007). Firms may employ accounting tactics to mask deteriorating performance. Therefore, we calculate a set of performance variables investigated in Dechow et al (2011) for Disney and compare them with its industry distribution.

Two pioneering papers that analyzed misstating firms are Beneish (1997) and Beneish (1999a). Beneish (1997) found that accruals, days sales in receivables, and prior performance are important to explain the difference between manipulators and non-manipulators. Beneish (1999a) used financial statement ratios to calculate an index to analyze the probability of misstatement risk. We apply Beneish's model to examine Disney's misstatement risk.

We contribute to the literature by applying findings from accounting research to scrutinize a prominent firm. As part of this review, we noted several areas that are worthy of future exploration.

First, our assessment of Disney's misstatement risk largely relies on the results of its reported accruals. Preliminary evidence from the literature has suggested that earnings management activities using accruals declined following Sarbanes Oxley Act (SOX). It also appears that firms increased the use of other mechanisms such as real earnings management activities and "expectation management" (Cohen, Dey and Lys, 2008; Koh Matsumoto and Rajgopal, 2008).

Regardless, it is still the general consensus that ceteris paribus, accruals management still impairs earnings quality, though it represents only one choice within the firm's portfolio of financial reporting options. Most importantly, Disney's accruals are rising relative to its own industry peers. SOX should have significant impact on firms' internal controls (Section 404 and Section 302), and internal control weakness is a documented proxy for earnings misstatement (e.g. Doyle et al., 2007; Ashbaugh-Skaife et al., 2008). If this is the case, future studies might investigate the SOX impact on Disney's internal control efficiency.

Second, another important tool used in this paper is the Beneish misstatement risk model. As far as we know, the model is still widely used and taught in business schools as a tool for detecting misstatement risk. We believe that the inclusion of the model in this study, along with other models, provides for a more robust assessment of the risks examined. However, it has to be pointed out that the model was developed based on violations prior to the mid-1990s. The business environment since that time has changed dramatically, particularly for technology-based companies. At this time, however, it is our view that the assessment of earnings manipulation risk should not be limited to the construction of financial ratios.

ANALYSIS

Data and Sample

The data is from the COMPUSTAT U.S. firms. The sample firms chosen had to have positive assets, sales, and shares outstanding data available. We also required firms to have positive fiscal year-ending closing prices for them to be included in the sample. Table 1 reports statistics of the calculated measures in this paper for fiscal year 2018[2].

Methods and Results

To assess the risk of misstatement by Disney, we first apply the work of Dechow et al. (2011) who examined accrual accounts and performance measures that help identify manipulation risk. We then calculated thee Beneish manipulation index to assess the likelihood of earnings manipulation. Beneish (1997) developed an eight-factor model which uses financial characteristics of firms to evaluate the risk of fraudulent reporting.

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[2] In accrual and performance examinations, we follow the convention, contrasting Disney's results with its own industry. Mis-statement probability is not industry specific; we contrast Disney's number with COMPUSTAT U.S. firms' universe. Most our examinations are focusing on Disney's recent fiscal years (2016-2019). About two-third firms in the universe have reported 2019 fiscal year results. The distribution of the variables is similar in recent fiscal years. We select listing distributions of 2018 which is the most recent fiscal year with complete reporting.

Table 1: Statistics of Calculated Values Used for Fiscal Year 2018						
COMPUSTAT Universe						
	N	Min	Q1	Median	Q3	Std.	Max
WC_Accrual	4106	-0.748	-0.020	0.003	0.030	0.128	0.480
RSST_Accrual	4106	-1.599	-0.037	0.013	0.069	0.288	1.040
Change in Receivables	4077	-0.226	-0.003	0.007	0.034	0.066	0.298
Change in Inventory	4049	-0.146	0.000	0.000	0.005	0.038	0.204
% of Soft Assets	4140	2.27%	36.76%	67.51%	88.27%	29.39%	98.94%
Change in Cash Margin	3437	-2121.41%	-4.57%	0.24%	5.42%	308.10%	1504.45%
Change in ROA	4106	-116.40%	-2.50%	0.28%	3.54%	40.13%	297.98%
Change in Free Cash Flow	3904	-143.20%	-2.10%	0.41%	3.37%	30.56%	184.23%
Abnormal Change in Employees	3739	-213.73%	-10.38%	-1.39%	6.77%	37.70%	100.06%
Probability of Manipulation	4307	0.00%	0.14%	0.56%	1.84%	19.43%	100.00%

Non-Financial Firms						
	N	Min	Q1	Median	Q3	Std.	Max
WC_Accrual	2991	-1.096	-0.019	0.004	0.032	0.173	0.731
RSST_Accrual	2991	-2.141	-0.052	0.017	0.082	0.361	1.143
Change in Receivables	2977	-0.251	-0.005	0.005	0.024	0.058	0.246
Change in Inventory	2948	-0.170	-0.001	0.000	0.011	0.044	0.227
% of Soft Assets	3155	2.20%	30.52%	57.24%	77.67%	27.58%	97.78%
Change in Cash Margin	2796	-2121.41%	-3.69%	0.27%	4.62%	339.40%	2196.36%
Change in ROA	2991	-149.54%	-4.13%	0.63%	5.05%	80.04%	686.34%
Change in Free Cash Flow	2844	-232.37%	-3.82%	0.69%	4.53%	53.30%	380.18%
Abnormal Change in Employees	2839	-239.43%	-10.90%	-0.46%	8.50%	41.72%	109.54%
Probability of Manipulation	3158	0.00%	0.09%	0.40%	1.04%	20.06%	100.00%

Communication Industry (2-Digit SIC=48)						
	N	Min	Q1	Median	Q3	Std.	Max
WC_Accrual	81	-0.535	-0.007	0.005	0.019	0.746	6.667
RSST_Accrual	81	-66.000	-0.035	0.005	0.056	7.343	1.332
Change in Receivables	81	-0.440	-0.001	0.002	0.017	0.057	0.143
Change in Inventory	79	-0.052	0.000	0.000	0.000	0.015	0.111
% of Soft Assets	82	1.27%	50.39%	70.17%	84.82%	24.70%	100.00%
Change in Cash Margin	79	-70.04%	-2.04%	0.75%	3.99%	24.49%	173.12%
Change in ROA	81	-487.61%	-5.68%	-1.25%	3.37%	179.39%	1513.67%
Change in Free Cash Flow	79	-447.03%	-4.91%	-0.92%	3.36%	3019.58%	26802.80%
Abnormal Change in Employees	77	-413.29%	-10.30%	-2.90%	5.03%	70.94%	174.73%
Probability of Manipulation	82	0.00%	0.15%	0.39%	0.95%	21.73%	100.00%

Notes: The difinitions of variables are provided in Appendix.

Accruals and Earnings Quality

Earnings are usually not equal to the actual realization of cash flows. Accruals are the adjustments that reconcile earnings to cash flows from operations. Earnings are supposed to reflect the underlying economics of business activities. Procedures, such as allocating depreciation over the periods during which equipment and other assets are utilized, are attempts

to capture the underlying economics for any given period. By the same token, firms recognize sales when they are entitled to payment rather than receiving payment. These procedures require judgement and estimation to implement. As it turns out, managers introduce bias into their discretionary estimates with respect to accounting choices, such as recognition of accounts receivable (and revenues), depreciation expenses, inventory (and cost of goods sold), and various accrued liabilities (and expenses). A large body of accounting literature has found that earnings are misstated primarily via the accrual component of earnings. (e.g. Healy,1985; Dechow, Sloan and Sweeney, 1995; Dechow and Dichev, 2002)

Large positive accruals are generally regarded as bad. Large earnings could be driven by earning increasing accruals which are not persistent and will be reversed. Similarly, large negative accruals should be appreciated since lower earnings could be driven by earning decreasing accruals which are also less persistent and will be reversed.

Dechow, Ge, Larson and Sloan (2011) examine a large collection of data from the SEC's Accounting and Auditing Enforcement Releases (AAERs) and found that misstatement years are associated with unusually high accruals. We calculate all but one accrual quality measure investigated in Dechow et al. (2011)[3]. We found that in recent years, all the examined accrual measures have been increasing for Disney. Our findings are suggestive of increasing risk of Disney misstatement in recent years.
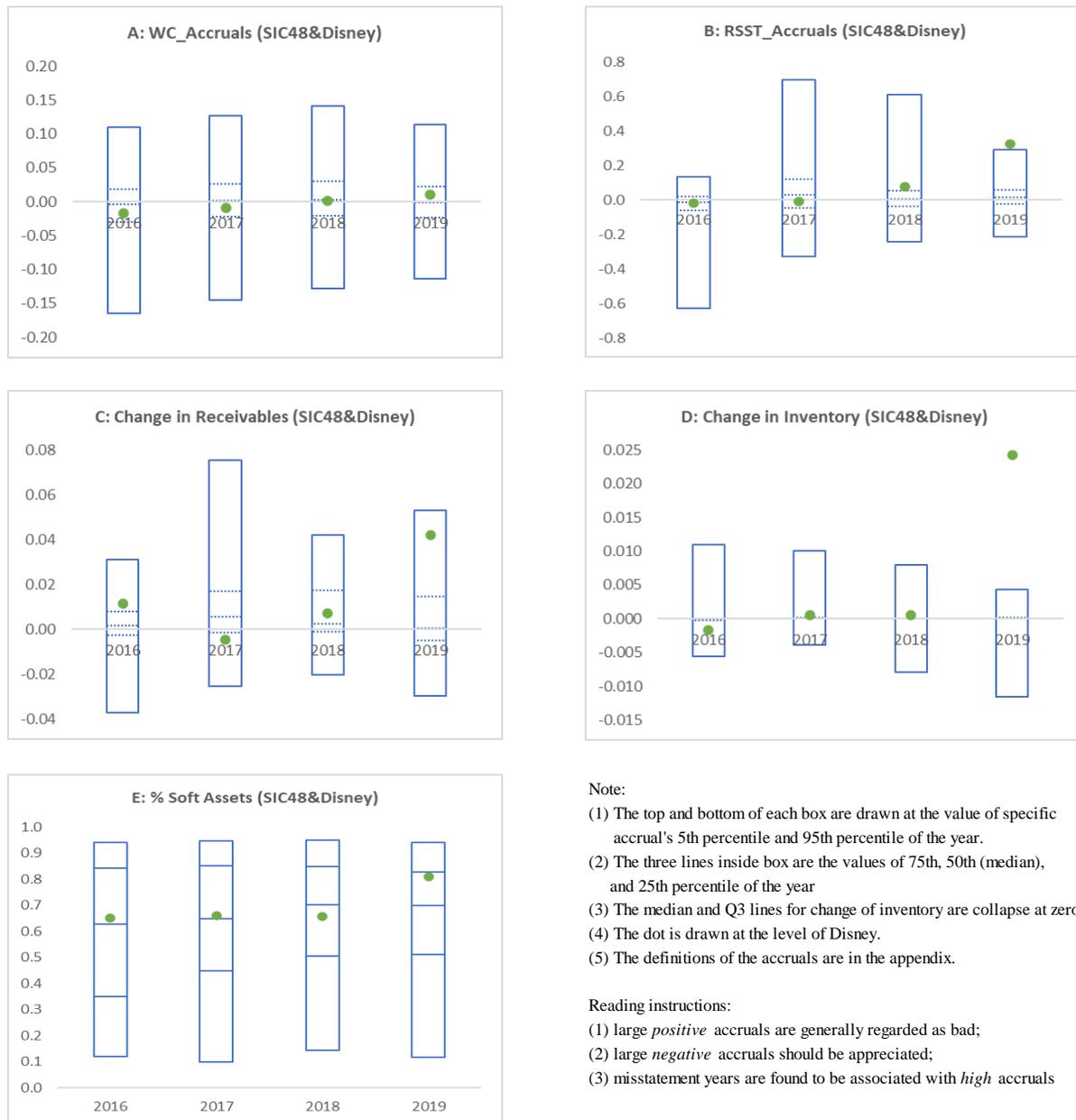
Following the practice of earnings manipulation research that contrasts manipulators with non-manipulators in the same 2-digit SIC industry, we contrasted Disney's accrual measures to those of its industry peers (the communication industry, 2-digit SIC is 48).

In Figures 1-3, we report accrual and performance measures in a box-style format. The bottom of each box is the fifth percentile value of the communication industry. The top of the box is the 95th percentile. The three lines in the middle are the first, median and third quartiles of the industry distribution. The Disney position in the industry distribution is represented by a green dot[4]. We use the same notation of reported measure as in Dechow et al. (2011).

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[3] We did not use the studentized DD residuals as it is not often used in the literature.

[4] We repeated the same exercises using non-financial firms or COMPUSTAT U.S. firms as contrasts. The results are qualitatively the same. The Disney's position is more extreme within the industry, followed by U.S. firms' universe and then non-financial firms.

Figure 1: Communications Industry (2-digit SIC: 48) Accruals Comparison and Disney's Value

Note:
(1) The top and bottom of each box are drawn at the value of specific
    accrual's 5th percentile and 95th percentile of the year.
(2) The three lines inside box are the values of 75th, 50th (median),
    and 25th percentile of the year
(3) The median and Q3 lines for change of inventory are collapse at zero.
(4) The dot is drawn at the level of Disney.
(5) The definitions of the accruals are in the appendix.

Reading instructions:
(1) large *positive* accruals are generally regarded as bad;
(2) large *negative* accruals should be appreciated;
(3) misstatement years are found to be associated with *high* accruals

Unadjusted Accruals

1.Working Capital Accruals (WC accruals)

We first focused on working capital accruals. Dechow et al. (2011) excluded depreciation because Barton and Simko (2002) argue that managing earnings through depreciation is more transparent due to the required disclosure of the effects of changes in depreciation policies.

Figure 1A shows working capital accrual of Disney and its position in the communication industry for the period of 2016-2019[5]. Disney's WC accrual has been increasing over the period. More importantly, the value has turned from negative to positive in 2019. Its relative position in the industry has also changed from the first quartile in 2016 to the third quartile in 2019. If it is true that misstatement years are associated with high accruals, Figure 1-A indicates that earnings quality may have worsened in recent years for Disney.

2. RSST Accruals

This measure is from Richardson, Sloan, Soliman, and Tuna (2005). Non-current accruals such as capitalized expenditures on long-term assets and long-term operating liabilities are included in this measure.

Figure 1B shows that RSST accruals have been increasing for Disney over the period of 2016-2019. Even more dramatically, its level is above the 95th industry percentile in 2019. RSST accruals show the trend consistent with our WC accruals findings.

3. Changes in Receivables and Inventory

Dechow et al. (2011) examined two other accrual components: changes in receivables and changes in inventory. Misstatements of receivables have the effect of boosting sales growth, a metric closely followed by investors. Misstatements of inventory could improve gross margins, another metric followed by investors. Both measures mirror the pattern of RSST accrual: Disney's level has been increasing in recent years and the level is close to or above the top 95th percentile in the industry (See Figure 1C&D).

4. Percent of Soft Assets

Assets that are neither cash nor PP&E (property, plant & equipment) are classified as soft assets. Barton and Simko (2002) provide evidence that firms with greater proportion of soft assets have more accounting flexibility to report positive earnings surprises. Figure 1E shows that Disney's portion of soft assets has increased slightly during 2016-2017 (65.27% to 66.13%) but took a large jump in 2019 to 81% of total assets. Its relative position in the industry has also moved from around the median level to close to the third quartile. The trend in soft asset proportions further supports our concern noted in our assessment of accrual measures.

Some may argue that Disney is a company that has a relatively larger proportion of intellectual property than peers. This interpretation is not strongly supported for the following reasons. First, under U.S. GAAP, firms expense the cost of internally developed intangibles in the period they occur. Thus, while Disney spends millions of dollars each year promoting its brand, it is not permitted to recognize its brand as an asset. Disney's intangible assets or goodwill largely result from acquisitions in the industry. Second, since our comparison is done within industry, firms have relatively homogenous asset structures. Third, we emphasize that the soft asset proportionality trend is alarming not so much the absolute level for Disney.

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[5] About two-thirds of companies (either in COMPUSTAT U.S. universe or the communication industry) have reported 2019 fiscal-year statements.

5. Summary on Unadjusted Accruals' Results

To sum up, all the unadjusted accrual measures for Disney have increased in recent years. Their relative positions in the industry have also risen. The trend is concerning since rising accruals are regarded as a sign that management is increasingly engaging in earnings-related activities that will not persist in the future.

In 2019, all the measures have either almost reached or exceeded the third quartile (Q3) level in the industry. To get an idea on the likelihood that a firm's unadjusted accruals moving above the Q3 level in the industry in any year, we calculated the average proportion of firms with such changes over the past decade. Specifically, for each year, we calculated the percentage of firms in the industry that have a certain accrual measure jumping over its industry Q3 level and then we averaged the fraction over the past decade[6] for the industry. We report the summary results for all the non-financial industries that have more than fifty eligible observations each year in Table 2. The list of such industries can be found in Table 4.

By and large, the average percentage of firms with such jumps is no more than 17% among the examined industries for the period 2010-2018. For example, the range for WC accruals' over-Q3 jump is 13.70% to 17.62%. That is, among the examined industries, on average, there will be no more than 17.62% of firms whose WC accruals will move above its industry third quartile level in any given year. For the communications industry in which Disney resides, on average, 16.84% of firms in the industry have their WC accrual crossing its industry third quartile level in any given year. The range for percentage soft assets measure is much narrower, ranging from 2.38% to 6.92%. That is, on average, there will be no more than 6.92% of firms in the industry who experience this measure passing its industry third quartile level in any given year. For the communications industry, 5.71% of firms will have the measure passing the industry's Q3 level in any given year.

Taken together, the statistics reveal that Disney-style accrual position changes would not be expected to occur in 80-90% of the cases.

Dichev, Graham, Harvey and Rajgopal (2013) survey results indicated that about 20% of firms manage earnings so as to misrepresent economic performance. If the earnings are misstated via accruals, then Disney's accrual trend makes earnings look questionable.

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[6] Fiscal year 2019 is separately listed since there are only two-thirds of firms reporting for 2019.

Table 2: Proportion of Firms with Calculated Accrual Measures Moving Above Q3 Level In The Two-Digit SIC Industry

Accrual Name	2010-2018 Avg. Range	2019 Range	SIC2=48 2019	SIC2=48 2010-2018 Avg.
WC_accrual	13.70% - 17.62%	10.67% - 21.21%	21.21%	16.84%
Rsst_accrual	11.52% - 16.34%	7.03% - 21.15%	16.67%	16.09%
Change in receivables	12.58% - 17.45%	8.62% - 18.18%	16.92%	15.13%
Change in inventory	6.77% - 17.01%	1.72% - 17.17%	7.94%	11.27%
%Soft Assets	2.38% - 6.92%	1.64% - 9.52%	5.97%	5.71%

Note:

The industries are non-financial and are selected if there are more than 50 eligible firms each year.

The definition of each accrual measure is provided in Appendix. Disney belongs to communication industry which has 2-digit SIC=48.
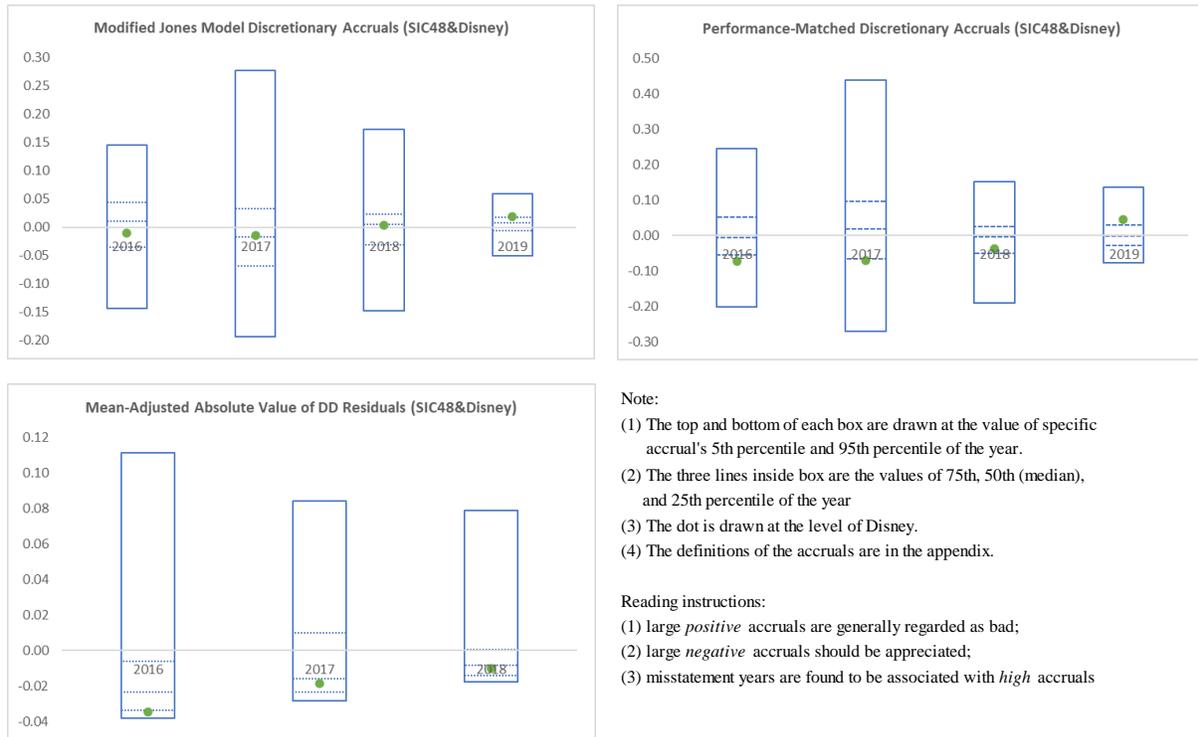
Discretionary Accruals

We report three out of four discretionary accruals from models used in Dechow et al. (2011): (1) modified Jones model discretionary accruals, (2) performance-matched discretionary accruals, and (3) mean-adjusted value of DD[7] residuals. The approach and related definitions are detailed in the appendix.

Figure 2, panels A-C, show the box-style results. Disney's discretionary accruals have been increasing in recent years. Its position in the industry has been close to or beyond the third quartile level in two out of three measures. If as argued in numerous literatures, the abnormal accruals represent the distortion or management of earnings, revealing lower quality of earnings for Disney.

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[7] Dechow and Dichev (2002).

Figure 2: Communication Industry (2-Digit SIC: 48) Regression of Discretionary Accruals Comparison and Disney's Value

Note:
(1) The top and bottom of each box are drawn at the value of specific accrual's 5th percentile and 95th percentile of the year.
(2) The three lines inside box are the values of 75th, 50th (median), and 25th percentile of the year
(3) The dot is drawn at the level of Disney.
(4) The definitions of the accruals are in the appendix.

Reading instructions:
(1) large *positive* accruals are generally regarded as bad;
(2) large *negative* accruals should be appreciated;
(3) misstatement years are found to be associated with *high* accruals

Performance

It has been documented that managers misstate their financial statements to mask deteriorating performance (Dechow, Sloan and Sweeney, 1996; Beneish, 1999). We calculated four performance variables examined in Dechow et al. (2011). These variables can be calculated using information from publicly-disclosed financials.

The first variable we calculate is the change in cash margin. Cash margin is equal to cash sales less cash cost of goods sold. This measures performance purged of receivable and inventory misstatements. Dechow et al. (2011) predicted that when cash margins decline, managers are more likely to make up for the decline by boosting accruals. Figure 3, panel A, indicates that Disney's cash margin has been declining in recent years. In 2017, the level was at the third quartile level in the communications industry, while in 2019, it had dropped to the level of the 5th percentile.

The second performance measure is the change in return on assets (ROA). Graham, Harvey, and Rajgopal (2005) report that managers appear to prefer to show positive growth in earnings. Our calculation shows that Disney's ROA change has moved from the relatively high end of the industry (at the third quartile in 2016) to the low end (below the first quartile in 2019). In 2018, the change in ROA was about 3.4% from 2017. Taking a negative turn, it becomes -5.8% in 2019.

The third performance measure is Disney's change of free cash flow, which generally hovers around zero percent in 2016-2017. In 2018-2019, the measure has been declining from positive to negative and from at third quartile to below the industry median.

Finally, we calculate one of the non-financial measures examined in Dechow et al. (2011). It has been argued that managers attempting to mask deteriorating financial performance will reduce employee headcount in order to boost the bottom line. The reason is that, unlike capital expenditures, most expenditures on labor must be expensed as incurred. Following Dechow et al. (2011), we calculated the abnormal change in the number of employees as the percentage change in the number of employees less the percentage change in total assets. It has been predicted that there is a negative association between abnormal change in employees and misstatements. The result of this measure is very alarming. Disney's abnormal change of employees has declined from positive in 2016 to slightly negative in 2017-2018 and then a dramatic drop to below -85% in 2019[8].

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[8] We ruled out this extremity as being caused by the acquisition of 21st Century Fox by Disney. The acquisition took place on March 20, 2019. However, both companies reported their 2019 fiscal year results separately.

Figure 3: Communication Industry (2-Digit SIC: 48) Performance Comparison and Disney's Value
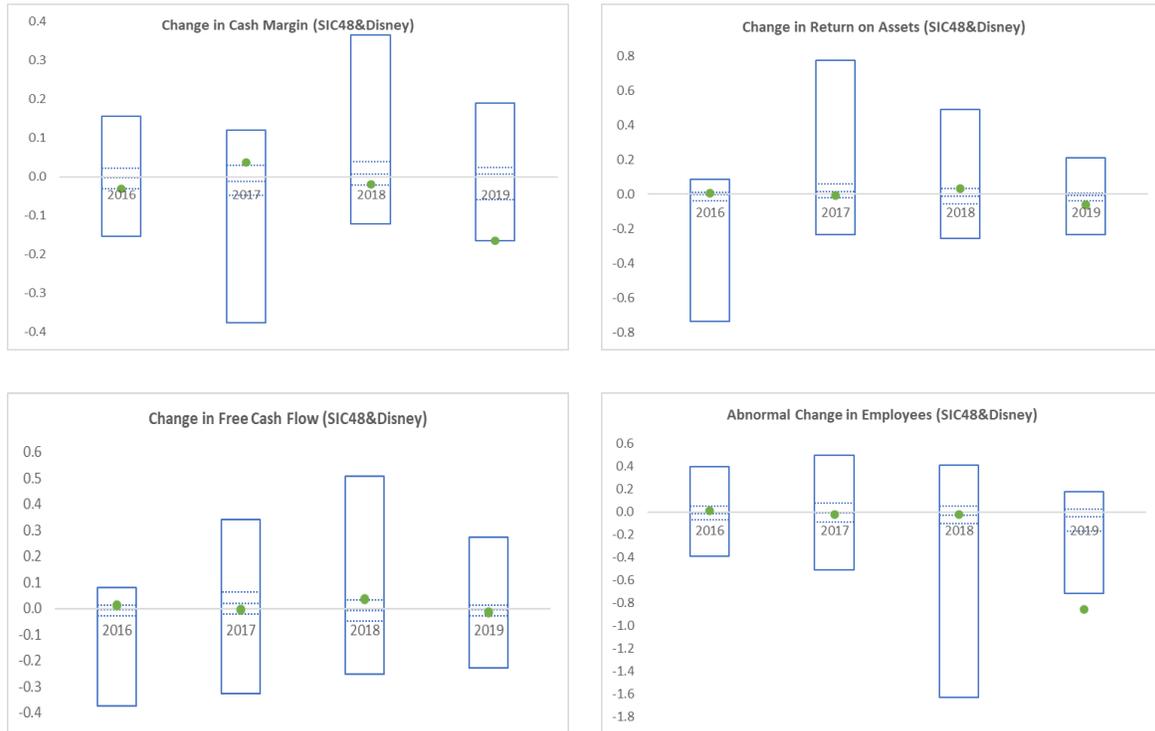
Note:

(1) The top and bottom of each box are drawn at the value of specific accrual's 5th percentile and 95th percentile of the year.

(2) The three lines inside box are the values of 75th, 50th (median), and 25th percentile of the year

(3) The dot is drawn at the level of Disney.

(4) The definitions of the performance are in the appendix.

Reading instruction: deterioration of performance provides incentive in earnings manipulation.

Taken together, accrual measures calculated directly using financial variables or models indicate not only a rising trend but also, in some cases, a disturbingly high level of accruals for Disney. The finding is in line with the literature that misstatement years are associated with unusually high accruals. Furthermore, the financial performance measures for Disney has been declining and, in some cases, stand at the lowest level in its industry. This puts Disney in a very suspicious situation given the research to date which indicates that managers tend to misstate their financial statements in order to mask deteriorating performance. These findings suggest Disney maybe using accruals to manipulate its increasingly disappointing earnings. Next, we apply the Beneish model to assess the probability that Disney maybe engaging in earnings manipulation.

Beneish Model

Beneish's model is an empirical approach to identify the financial characteristics of firms that are likely to engage in earnings manipulation. The eight-factor version of the model uses only financial statement items.

Beneish's Eight Factors and Rationale for Inclusion[9]

1. Days Sales in Receivable Index (DSRI)

This index relates the ratio of accounts receivable at the end of the current year as a percentage of sales for the current year to the corresponding amounts for the preceding year. A large increase in accounts receivable as a percentage of sales might indicate an overstatement of accounts receivable and sales during the current year to boost earnings. Such an increase also might result from a change in the firm's credit policy (for example, liberalizing credit terms).

2. Gross Margin Index (GMI)

This index relates gross margin (that is, sales minus cost of goods sold) as a percentage of sales from the previous year to the gross margin as a percentage of sales for the current year. A decline in the gross margin percentage will result in an index greater than 1.0. Firms with weaker profitability the current year are more likely to engage in earnings manipulation.

3. Asset Quality Index (AQI)

Asset quality refers to the proportion of total assets comprising assets other than (1) current assets; (2) property, plant, and equipment; and (3) investments in securities. The remaining assets include intangibles for which future benefits are less certain than for current assets and property, plant, and equipment. The AQI equals the proportion of these potentially lower-quality assets during the current year relative to the preceding year. An increase in the proportion might suggest an increased effort to capitalize and defer costs the firm should have expensed.

4. Sales Growth Index (SGI)

This index equals sales of the current year relative to sales of the preceding year. Growth does not necessarily imply manipulation. However, growing companies usually rely on external financing. The need for low-cost external financing might motivate managers to manipulate sales and earnings.

5. Depreciation Index (DEPI)

This index equals depreciation expense as a percentage of net property, plant, and equipment before depreciation for the preceding year relative to the corresponding percentage for the current year. A ratio greater than 1.0 indicates that the firm has slowed the rate of depreciation, perhaps by lengthening depreciable lives, thereby increasing earnings.

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[9] We quote the textbook (p.388-389), 'Financial Reporting, Financial Statement Analysis, and Valuation' 9th edition, by Wahlen, Baginski and Bradshaw (2017).

6. Selling and Administrative Expense Index (SAI)

This index equals selling and administrative expenses as a percentage of sales for the current year to the corresponding percentage for the preceding year. Firms attempting to manipulate earnings would defer costs, and the index value would be less than 1.0.

7. Leverage Index (LVGI)

This index equals the proportion of total financing comprising current liabilities and long-term debt for the current year relative to the proportion for the preceding year. An increase in the proportion of debt likely subjects a firm to a greater risk of violating debt covenants and the need to manipulate earnings to avoid the violation.

8. Total Accruals to Total Assets (TATA)

Total accruals equal the difference between income from continuing operations and cash flow from operations. Beneish used this variable as an indicator of the extent to which earnings result from accruals instead of from cash flows. A large excess of income from continuing operations over cash flow from operations indicates that accruals play a large part in measuring income. Accruals can serve as a means of manipulating earnings.

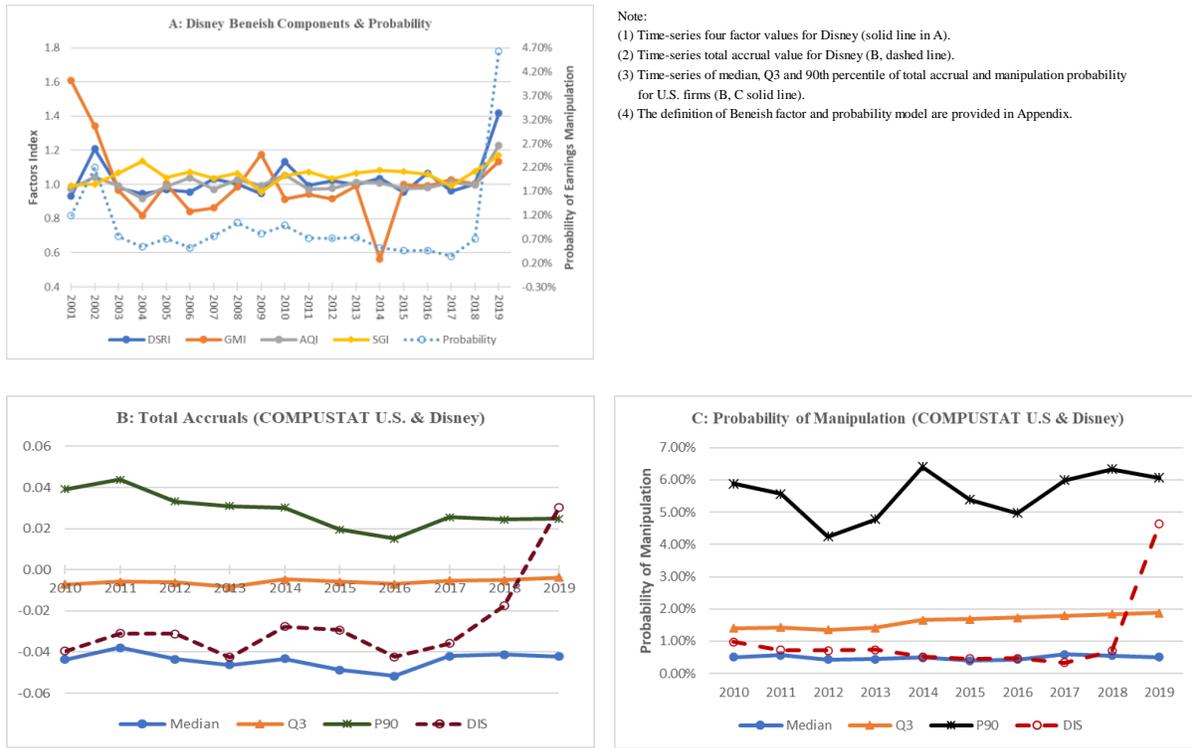The value to calculate Beneish's probability of earnings manipulation is as follows:

$$y = -4.840 + 0.920(DSRI) + 0.528(GMI) + 0.404(AQI) + 0.892(SGI) + 0.115(DEPI) - 0.172(SAI) - 0.327(LVGI) + 4.670(TATA)$$

We have calculated the eight factors and corresponding Beneish probability of earnings manipulation for Disney for the past 10 years. We found that five of eight factors provide evidence of manipulation in recent years.

Figure 4, panel A, shows DSRI has increased and passed the 1.0 threshold, indicating overstatement of account receivables in recent years. The change of GMI indicates weaker profitability. The increase to over 1.0 of AQI indicates an increase in proportion of lower quality assets. The rise to over 1.0 of SGI suggests growing sales, which may imply the need for manipulation to acquire the low-cost external financing to sustain the sales growth trend.

Panel B shows the total accrual factor in the Beneish model. As a contrast, we also show the median, Q3 and 90th percentile level for the COMPUSTAT Universe of U.S. firms. Over the past decade, before 2016, Disney's total accrual has generally been slightly above the median level. Starting from 2016, however, total accruals have been on the rise. In 2019, Disney's total accruals were positive and reached the 90th percentile level. In contrast, the median and third quartile level for all U.S. COMPUSTAT firms have been relatively stable over the past decade. The 90th percentile has declined from 0.04 at the beginning of the decade to around 0.02 at the end, a nearly 50% drop. This suggest that as the universe of U.S. firms reduce the total accrual level, Disney has done the opposite.

Figure 4: Time-Series of Beneish Eight-Factor Manipulation Probability for Disney (dashed line in A and C)

Note:
(1) Time-series four factor values for Disney (solid line in A).
(2) Time-series total accrual value for Disney (B, dashed line).
(3) Time-series of median, Q3 and 90th percentile of total accrual and manipulation probability
    for U.S. firms (B, C solid line).
(4) The definition of Beneish factor and probability model are provided in Appendix.

Beneish's probability calculation indicates a sharp increase in risk of earnings manipulation for Disney in 2019. The probability of manipulation has risen from below 0.7% to 4.63%. The absolute value is still less than 90th percentile for the U.S. COMPUSTAT Universe. However, we provide two pieces of evidence to show that this change is alarming.

First, with a 4.63% probability, can we classify Disney as earnings manipulator? In attempts to distinguish manipulations, Beneish (1999) calculates the cutoff probabilities associated with different costs of making classification errors. There are two types of errors: (1) classifying a company as a non-manipulator when it manipulates (a Type I error), or (2) classifying a company as a manipulator when it does not manipulate (a Type II error). The probability cutoffs that minimize the expected costs of misclassification depend on costs associated with the relative cost of making an error of either type.

The cutoff probabilities for various relative mixtures of Type I and Type II error costs from Beneish (1999)[10]:

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[10] The long version of the table is from Beneish (1999) (p.32). The short version here is exhibited in 'Financial Reporting, Financial Statement Analysis and Valuation', 9th edition by Wahlen, Baginski and Bradshaw (2017) (p.391). Since we did not create the table, it is not included in our table numbering.

Cost of Type I Error Relative to Type II Error	Cutoff Probability
10:1	6.85%
20:1	3.76%
30:1	3.76%
40:1 or higher	2.94%

Investors are likely to have high Type I error costs because the investment loss associated with the discovery of the manipulation is dramatic, whereas their Type II error costs would be low because of the availability of substitute investments. A regulator's objective function, however, requires balancing the protection of the investing public against the costs of falsely accusing a company. Their relative costs cannot be measured, but it is likely that their Type II error costs are higher than those of investors which is consistent with the fact that companies that are subject to accounting enforcement actions by SEC are actually rare[11]. According to the above cutoffs, investors would conclude that Disney is a manipulator under the assumption of the cost of Type I to Type II errors is around 20:1 or higher.

Second, from the distribution of year-over-year probability change for the universe of U.S firms, the magnitude of change is beyond the 90th percentile level in recent years. Statistically, the chance for Disney's type of magnitude change is less than 10%. Consistent with this finding, we report the proportion of firms in major industries that have a 3% or above change each year is also generally less than 10% over the past decade. Results are reported in Tables 3 and 4.

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[11] According to Beneish (1999) data, Accounting and Auditing Enforcement Releases (AAERs) from 1987 – 1993, the fraction of manipulators is only 0.0069 out of the whole population.

Table 3: Manipulation Probability Distribution
(COMPUSTAT U.S. firms) for Fiscal Years 2016-2019)

Year	Firms	P5	Q1	Median	Q3	P90	P95
2016	4584	0.00%	0.09%	0.43%	1.73%	4.98%	31.19%
2017	4435	0.00%	0.14%	0.59%	1.79%	6.00%	33.86%
2018	4307	0.00%	0.14%	0.56%	1.84%	6.33%	35.15%
2019	3744	0.00%	0.13%	0.51%	1.87%	6.07%	30.62%

Year	Firms	P5	Q1	Median	Q3	P90	P95
2016	4400	-21.24%	-0.32%	0.00%	0.40%	2.99%	19.58%
2017	4213	-14.54%	-0.27%	0.05%	0.60%	3.69%	21.38%
2018	4106	-17.56%	-0.46%	0.00%	0.48%	3.57%	20.57%
2019	3610	-19.44%	-0.45%	0.00%	0.44%	3.67%	19.75%

Note:

(1) Top panel is the manipulation probability distribution for COMPUSTAT U.S. firms for the fiscal years 2016-2019.

(2) The bottom panel is the distributuin for annual manipulation probability *change* for COMPUSAT U.S. firms for the fiscal years 2016-2019.

(3) The probability is calculated using Beneish eight-factor model.

(4) The detail of the model is provided in Appendix.

Table 4: Proportion of Firms Manipulation Probability Moving by 3% in Two-Digit SIC Industry.

SIC2	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2010-2018 Average	Industry
13	0.0833	0.0850	0.0986	0.0900	0.1388	0.0565	0.1737	0.1856	0.1056	0.0385	11.30%	Oil Gas & Extraction
20	0.0594	0.0792	0.0583	0.1121	0.0816	0.0404	0.0957	0.0602	0.0800	0.0351	7.41%	Fodd & Kindred Products
28	0.1711	0.1617	0.1693	0.1261	0.1850	0.1911	0.1758	0.1856	0.1836	0.2339	17.21%	Chemical & Allied Product
34	0.0545	0.0545	0.0000	0.0784	0.0577	0.0377	0.0577	0.0392	0.0800	0.0476	5.11%	Fabricated Metal Products
35	0.1194	0.0746	0.0402	0.0881	0.0521	0.0398	0.0549	0.0881	0.0588	0.0530	6.84%	Industrial Machinery & Equipment
36	0.1186	0.0811	0.0705	0.0792	0.0667	0.0865	0.0524	0.1157	0.1000	0.0963	8.56%	Electronic & Other Electric Equipment
37	0.0909	0.1485	0.0505	0.0404	0.1122	0.0306	0.0645	0.0345	0.0581	0.0400	7.00%	Transportation Equipment
38	0.0698	0.0637	0.0528	0.0741	0.0709	0.1084	0.0868	0.0809	0.0812	0.1268	7.65%	Instrument & Related Products
48	0.0551	0.1000	0.0268	0.0885	0.0288	0.0594	0.0326	0.1011	0.0610	0.1029	6.15%	Communications
49	0.0467	0.0350	0.0563	0.0625	0.0473	0.0588	0.0647	0.0677	0.0252	0.0727	5.16%	Electric, Gas & Sanitary Service
50	0.1163	0.1364	0.0595	0.0864	0.0482	0.0253	0.1233	0.0423	0.0492	7.84%	Wholesale Trade - Durable Goods
51	0.1754	0.1552	0.0526	0.0702	0.0345	0.0690	0.1000	0.0893	0.0182	0.0952	8.49%	Wholesale Trade - Nondurable Goods
58	0.1111	0.0769	0.0755	0.0556	0.0645	0.0938	0.0484	0.0167	0.0727	0.0233	6.83%	Eating & Drinking Places
59	0.0400	0.1324	0.0597	0.0857	0.0286	0.0606	0.0984	0.0820	0.0877	0.0698	7.50%	Miscellaneous Retail
73	0.0966	0.0751	0.0614	0.0802	0.0835	0.0481	0.0543	0.0591	0.0819	0.0653	7.11%	Business Services
80	0.0581	0.1013	0.0380	0.1071	0.0759	0.1125	0.0541	0.0857	0.0645	0.0357	7.75%	Health Services
87	0.0548	0.0625	0.0484	0.0615	0.1014	0.1406	0.0938	0.1167	0.0000	0.1087	7.55%	Engineering & Management Services

Note:

(1) The industries are non-financial and are selected if there are more than 50 eligible firms each year.

(2) The calculation of manipulation probability using Beneish model is provided in Appendix.

(3) Disney belongs communication industry which has a two-digit SIC 48.

Window of Dramatic Probability

What is the window between the showing of significant level of manipulation risk and needing of enforcement correction? We do not know of enough incidences to evaluate this with more certainty nor of a model to predict this. However, to give some sense of the potential

violation, we conclude this section with three anecdotal examples from the 9th edition of "Financial Reporting, Financial Statement Analysis, and Valuation" by Wahlen, Baginski and Bradshaw (2017).

Micro-Strategy (Ticker: MSTR) founded in 1989 and became a public company via an IPO in June 1998. The company is a provider of software that enables businesses to conduct transaction data through various channels and to examine information about customers, partners, and supply chains. In the latter part of the 1990s, the company aggressively recognized revenue upon signing a contract with customers (and often before that). The company had to restate 1998 financial statements. It announced this in 2000.

In 1997, the calculated Beneish probability was 0.58% and total accrual was -0.224. In 1998, the Beneish probability jumped to 22.03% and total accrual rose to 0.155, a value that was remarkably high.

The second example is Enron. In 2001, Enron had to restate its financial statements for early years, because it reported several items beyond the limits of U.S. GAAP. According to Wahlen et al. (2017) calculations, the Beneish probability for Enron in 1998, 1999 and 2000 were 0.9%, 2.4% and 29.5%, respectively. The corresponding total accruals for those three years are -0.032, -0.006 and -0.058.

The third example is Sunbeam Corporation which is a private company. Sunbeam manufactures countertop kitchen appliances and barbecue grills. Its sales growth and profitability slowed considerably in the mid-1990s. According to the originally reported numbers, the probability of manipulation was 0.143% in 1996 and 3.386% in 1997. The SEC instituted a formal investigation into the possibility of manipulation. Sunbeam responded in October 1998 by restating its financial statements from the fourth quarter of 1996 to the first quarter of 1998. The restatements revealed that Sunbeam had engaged in various actions that boosted earnings for the period.

CONCLUSION

Inspired by the MarketWatch news item about the whistle-blower's accusation of Disney's inflation of earnings and revenue, this research examined several measures commonly regarded as indicators of earnings misstatement.

We found that Disney's accrual measures have been increasing in recent years, indicating a deterioration of earnings quality. The relative position of accruals of Disney to its industry has also worsened. The probability for these types of changes occurring in normal business operations are typically less than 10%. Disney's performance measures indicate deteriorating performance. The situation suggests that incentives are in place for earnings manipulation by Disney management.

Beneish factor dynamics provided a similar picture reflected by using accrual measures. Beneish probability calculations indicate a sudden jump in manipulation risk. The calculated probability for Disney in 2019 has passed the cutoff with a mild or higher mixture of Type I to Type II error cost. This implies investors who face investment loss with the discovery of manipulation would conclude Disney is a manipulator.

Given these findings, we have reasons for concern regarding the quality of Disney's earnings in recent years. We believe further investigation is warranted. Pinocchio's nose knows.

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APPENDIX

Accrual quality variables from Dechow et al. (2011)

WC accruals: [[Δcurrent assets – Δcash and short-term investments] – [Δcurrent liabilities – Δdebt in current liabilities – Δtaxes payable]] / Average total assets

RSST accruals: (ΔWC + ΔNCO + ΔFIN) / Average total assets. WC = [current assets – cash and short-term investments] – [current liabilities – debt in current liabilities]; NCO = [total assets – current assets – investment and advances] – [total liabilities – current liabilities – long-term debt]; FIN = [short-term investments + long-term investments] – [long-term debt + debt in current liabilities + preferred stock]

Change in receivables: ΔAccount receivables / Average total assets

Change in inventory: ΔInventory / Average total assets

% soft assets: (total assets – PP&E – cash and cash equivalent) / Total assets

Dechow et al. (2011) performance variables

Change in cash margin: percentage change in cash margin. Cash margin: 1 – [(cost of good sold - Δinventory + Δaccounts payable) / (sales - Δaccounts receivable)]

Change in return on assets: [Earnings$_t$ / Average total asset$_t$] – [Earnings$_{t-1}$ / Average total asset$_{t-1}$

Change in free cash flows: Δ[Earnings – RSST accruals] / Average total assets

Abnormal change in employees: percentage change in the number of employees – percentage change in assets

Discretionary accruals from industry cross-sectional regressions:

Modified Jones discretionary accruals:
$$WC\ Accruals = \alpha + \beta \left(\frac{1}{Beginning\ Assets}\right) + \gamma \left(\frac{\Delta Sales - \Delta Receivables}{Beginning\ Assets}\right) + \rho \left(Gross \frac{PPE}{Beginning\ Assets}\right) + \varepsilon$$ The model is estimated cross-sectionally each year using all firm-year observations in the same two-digit SIC code. The residuals are used as the modified Jones model discretionary accruals.

Performance-matched discretionary accruals: the difference between the modified Jones discretionary accruals for firm *i* in year *t* and the modified Jones discretionary accruals for the matched firm in year *t*, following Kothari et al. 2005; each firm-year observation is matched with another firm from the same two-digit SIC code and year with the closest return on assets.

Mean-adjusted absolute value of DD residuals: the following regression is estimated for each two-digit SIC industry:
$$\Delta WC = b_0 + b_1 CFO_{t-1} + b_2 CFO_t + b_3 CFO_{t+1} + \varepsilon.$$ The mean absolute value of the residual is calculated for each industry and is then subtracted from the absolute value of each firm's observed residual. All variables scaled by average of total assets. ΔWC is – sum of (change of accounts receivable, change of inventory, change of accounts payable, change of income taxes, change of other assets and liabilities). CFO is the cash flow from operation.

Beneish eight factors and value for probability of manipulations at year t

DSRI: (Account Receivable/Sales)$_t$ / (Account Receivable/Sales)$_{t-1}$

GMI: [(Sales – Cost of Goods Sold)/Sales]$_{t-1}$ / [(Sales – Cost of Goods Sold)/Sales]$_t$

AQI: [(Total Assets – Cash and Short-term Investments – PP&E)/Total Assets]$_t$/[(Total Assets – Cash and Short-term Investments – PP&E)/Total Assets]$_{t-1}$

SGI: Sales$_t$ / Sales$_{t-1}$

DEPI: [Depreciation/(Depreciation + PP&E)]$_{t-1}$ / [Depreciation/(Depreciation + PP&E)]$_t$

SAI: (SGA/Sales)$_t$/(SGA/Sales)$_{t-1}$; SGA: Selling, General & Administration

LVGI: [(Current Liability + Long-term Debt)/Total Assets]$_t$ / [(Current Liability + Long-term Debt)/Total Assets]$_{t-1}$

TATA: (Net Income – Cash Flows from Operation)$_t$ / Average of Total Assets

All the financial data in calculation are from COMPUSTAT annual. The sample are limited in U.S. firms only. To be included in the sample, the firm must have positive total assets, sales, fiscal year-end closing stock price and number of shares outstanding. Each 2-digit SIC industry are winsorized at 1st and 99th percentile for the 10-year period.