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The Influence of Forced CEO Turnover on Analyst Consensus Recommendations: Empirical Insights from US Firms

Master Thesis in Accounting, Auditing and Control

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Abstract

This study employs DiD regression models to investigate the influence of *forced* CEO turnover (as opposed to *regular* CEO turnover) on analyst recommendations for BUY, HOLD, and SELL for US firms from 1994 to 2019. Analyzing a 1-to-1 matched sample of 192 firms with a 2-year pre and post turnover time window, the results reveal that forced CEO turnover impacts BUY and HOLD recommendations. The analysis indicates a minor decrease in BUY recommendations by 3.6 percentage points (7.4% of the average treated firm's BUY value), while SELL recommendations show a contrasting pattern, with a significant increase of 1.952 percentage points (32.1% of the average treated firm's SELL value) during the post-turnover period. HOLD recommendations are unaffected by forced CEO turnover. Additional tests, with varying time windows around the CEO turnover, partly support the main results. The findings emphasize analysts' cautious approach towards stocks impacted by forced CEO turnover.

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1. Introduction

From the revolving doors of corporate power to the predictions that shape investment decisions, the intriguing dynamics of CEO turnover and analyst consensus recommendations have captivated researchers and investors alike.

CEO turnover and analyst consensus recommendations are two important constructs that have garnered significant attention in research. CEO turnover has been extensively studied, with a focus on examining the circumstances surrounding forced and voluntary turnover. Studies have found that forced CEO resignations can lead to a positive market response, indicating that the stock prices of companies often benefit from such turnover. Factors such as board independence, institutional monitoring, and changes in regulations like the Sarbanes-Oxley Act have been explored in relation to CEO turnover. Forced CEO turnover has also been found to be influenced by CEOs' levels of optimism, with overly optimistic or pessimistic CEOs facing a higher likelihood of being forced to leave their positions. On the other hand, analyst consensus recommendations play a crucial role in providing guidance to investors. Research has shown that analysts tend to favor stocks with strong momentum and growth potential. Analysts' recommendations are also influenced by factors such as earnings forecasts, industry relations, and the level of expertise and accuracy of the analysts. The influence of analyst recommendations on stock prices can vary depending on the level of consensus among analysts and the time between consecutive recommendations.

To the best of my knowledge, there is no research on the direct effect of forced CEO turnovers to the analysts' consensus stock recommendations, while at the same time, the relation of the two constructs is not clear *prima facie*. In this thesis, I am utilizing four databases: COMPUSTAT, I/B/E/S, EXECUCOMP, and the Forced CEO Turnover dataset developed by Peters and Wagner (2014) and Jenter and Kanaan (2015). The sample consists of 192 US firms which have experienced one forced CEO turnover from 1994 to 2019, matched with firms from the same population but with regular CEO turnovers. Each firm is allowed 2 yearly observations before and after the year in which the turnover took place; the turnover year itself is assigned to the *post* period.

Employing three Difference-in-Difference (DiD) models, results show that treated firms experience a post-turnover decrease in BUY recommendations by 3.558 percentage points (significant at 5%) and an increase in SELL recommendations by 1.952 pp (also significant at 5%); the effect on HOLD is positive, however statistically nonsignificant at conventional levels.

The rest of this study is organized as follows: Section 2 presents the theoretical background and relevant studies, and develops my hypotheses. Section 3 discusses the sample selection process, the control variables, the matching process, and the DiD models specification. Section 4 presents the main results and discusses the findings. Section 5 concludes.

2. Theoretical Background & Hypothesis Development

In this section, I will introduce the relevant background literature and hypotheses derived from the gap identified in the existing literature. The two components of the research

question outlined above are the Forced CEO turnover and analyst consensus recommendations. It is worth mentioning that the specific relation between the dependent and independent variable is important to be explored further because to my knowledge it provides valuable insights into investor decision-making process, corporate governance practices, market efficiency, and the accountability of the financial industry.

2.1 CEO Turnover

To begin with, the topic of the CEO turnover is particularly popular among the researchers due to the volume of publications made throughout the years and as a result CEO's turnover has been examined in many papers. It is noticeable to mention that the biggest percentage of these papers are examining all the circumstances that arise from a CEO turnover (forced, voluntary turnover). For instance, the article by Dherment-Ferere et al. (2000) explores how changes in top management affect the stock prices of companies. The study distinguishes between different types of CEO turnover, including forced resignation, voluntary departures, and age-related retirements. According to their results the market responds positively to announcements of forced CEO resignations, resulting in a small but statistically significant abnormal return of 0.5%. Another research made by Huson et al. (2001) supports the notion that poorly performing companies experience more external market discipline in CEO turnover decisions and they mention that both the frequency of forced CEO turnover and outside succession have increased. Furthermore, they found that there is an inconsistency between their findings and the existing literature which states that a more active takeover market leads to enhanced internal control mechanisms. On the other hand, Linn et al. (2005) present evidence on the role of institutional monitoring in CEO turnover decisions through the equity issuance process. The researchers discovered that discipline through distressed issues of new equity in the capital market offers a chance for financial institutions to dismiss underperforming managers from their positions and thus increase the performance and the efficiency of the company by hiring a more highly skilled manager. The most important finding which is relevant to this research as well is the fact that through their analysis, the authors found evidence that suggest that a greater board independence leads to increased rates of forced CEO turnover, but this occurs irrespectively of the firm performance.

Meanwhile, Wang et al. (2010) use the Sarbanes-Oxley Act law that the US Congress passed in 2002 which scoped to investor's protection from the possibility of fraud in the financial statements by the firms. They found that CEOs become more risk averse following the enactment and their evidence suggest that financial restatements have contribution on CEO tenure and influence the probability of a forced CEO turnover. Additionally, Huang et al. (2014) choose to examine the relationship between CEO turnover and audit fees, suggesting that forced CEO turnover poses higher business and audit risks for audit firms than voluntary turnover, leading to higher audit prices. Guo et al. (2015) use the NYSE and NASDAQ listing rules for board and committee independence to examine the causal relations between board structure and CEO monitoring, while Dasgupta et al. (2016) explore the effect of competition shocks on forced CEO turnover. Ellis et al. (2020) study changes in independent director behavior and labor-market outcomes after the experience of a forced CEO turnover. The authors found that independent directors exhibit a greater propensity to take decisive actions in underperforming firms, such as dismissing underperforming CEOs, recruiting external CEOs

following a termination, and promoting improved attendance of board meetings by fellow directors. Furthermore, the shareholders of firms with poor performance respond positively to the appointment of experienced directors to the board. While these independent directors do incur some additional costs, in terms of acquiring more directorships, the magnitude of the cost is comparatively lower than that of directors who do not take steps to remove an underperforming CEO.

2.2 Forced CEO Turnover

I chose to focus on the examination of the forced CEO turnover to make sure that my variables are more specific. Moreover, I believe that sometimes the Forced turnover functions to the investor's as a shock because the shareholders and the board are called to decide the capability of the former CEO to be in the leadership, and if judged to be inadequate to remove him/her to improve the company's performance or restore its reputation. This shock except investors who are called to take the correct decision, influences also the analysts' recommendations according to prior literature.

Relevant studies such as the study conducted by Rosenberg et.al (2000) explores a potentially significant outcome of CEO turnover, specifically the impact on equity volatility. In a separate study by Allgood et al. (2000), the effect of CEO tenure on the relationship between firm performance and forced turnover is analyzed. Meanwhile, Farrell et.al (2000) discovered a higher probability of outside director turnover following forced CEO succession, particularly among directors closely aligned with the outgoing CEO, who own little equity and make poor replacement decisions. As mentioned above Dherment-Ferere et.al (2000) in their findings indicate that the market reacts positively to forced CEO resignation announcements, resulting in a small but significantly positive abnormal return of 0.5%. The above finding means that, in financial markets, when a company's CEO is forced to resign, it can have a favorable impact on the company's stock price. The positive abnormal return equal to 0.5% refers to the change in the company's stock price following the announcement of the CEO's forced resignation. The abnormal return represents the difference between the actual return and the expected return based on the market's overall performance. In this case, the abnormal return is 0.5%, which indicates that although the magnitude of this positive reaction is relatively small, it is still considered significant from a statistical standpoint. Walsh and Seward (1990), in their relevant research also concluded that regardless of incorporated costs such as the search and hiring costs of new management, a forced managerial turnover is expected to lead to significant share price increases.

Searching through the first studies that carried out regarding the impact of the Forced CEO turnover in the United States on prices, Furtado and Rozeff (1987) in their results concluded to a positive but not statistically significant price increase. On the other hand, Worell et al. (1993) confirm a price increase of 2.3% and their results are statistically significant at the 1% level. Denis and Denis (1995) in their relevant research studied 69 forced resignations and the results showed that the dismissal of underperforming management is greeted favorably by the market with a positive market reaction equal to 2.25% on the announcement day for companies which experienced a reduction in performance over a three-year period prior to the managerial change.

Huson et.al (2001) report evidence on CEO turnover during the period of 1971 to 1994, revealing that CEOs with relatively low or high optimism are more likely to experience forced turnover than moderately optimistic CEOs, assuming that board of directors acts in the interests of shareholders. CEOs' levels of optimism (high, moderate, and low) refer to their personal outlook or confidence in the company's prospects. A high optimism CEO is the one who is very positive and optimistic about the company's potential future growth, while low optimism indicates that a CEO tends to be more pessimistic or cautious regarding firm's future. This means that CEOs who are overly optimistic or overly pessimistic may face a higher likelihood of being forced to leave their positions compared to CEOs who demonstrate a more balanced or moderate level of optimism. The reasons behind the increased likelihood of a forced turnover may vary. On the one hand CEOs with excessively high optimism may set unrealistic goals or make overly aggressive decisions, leading to poor performance or financial difficulties for the company, while on the other hand, low optimism CEOs may be viewed as lacking confidence or not being proactive enough in driving the company's growth. These extremes tend to create concerns among shareholders or board members, leading to a higher chance of forced turnover. In a similar analysis, Campbell et al. (2010) analyzed the probability of a forced turnover taking place regarding the CEO's optimism. According to their research, the criteria used to measure CEO's optimism are almost the same as Huson et.al. (2001) analysis. The authors there are three categories of optimism high, low, and moderate. A moderate level of CEO optimism which is the most balanced, can lead the CEO to choose the best investment level. The other two extreme forms of optimism (low/high) lead the risk-averse CEO to underinvest or overinvest respectively. Their results showed that the effects optimism has on forced turnover were economically significant.

Kaplan and Minton (2012) investigated CEO turnover - both internal (board-driven) and external (through takeover and bankruptcy) - for a sample of large US companies between 1992 and 2007. On their analysis they mention that on times of crisis when the industry or the economy performs poorly, the decision to hire a new CEO tends to be efficient and creates a positive response to the new industry and improves the market conditions. So, as a result the forced CEO turnover acts as a lifeboat for the companies when times are stressed.

2.3 Analyst Consensus Recommendations

The second variable under consideration is analyst consensus recommendations. This specific variable refers to the measurement or rating which reflects the aggregated recommendation or opinion of financial analysts regarding a specific stock or investment, with the purpose of providing guidance to investors and traders. The consensus recommendation most often is represented on a scale, such as a numerical rating or a classification system to provide a consistent and precise summary of the analyst's opinions. The scale of measurement tends to vary depending on the source or platform used, but the most common categories included are for instance "Buy," "Hold," "Sell," or their equivalent. It is also important to mention that the analyst's recommendations do not guarantee the future performance of a company and they tend to change over time as new information becomes available.

Analyst recommendations has always been an important research topic for the researchers. For instance, Jegadeesh et.al. (2002) in their relevant research, they examine the relation of analyst's recommendations regarding other available public information, and they

focus on variables that according to prior literature contain predictive power for the future returns of a company's stock. Their findings suggest that most analysts tend to show a preference for stocks with strong momentum and those that exhibit growth potential. They observed that the portion of stocks that gets favorable recommendation by analysts appeared to have a more positive price, a higher trading volume, higher expected growth, and performance. Regarding the firms that own these stocks with favorable momentum, the study shown that they tend to outperform the least favorable firms. Analyst's recommendations are considered crucial because they can capture qualitative aspects of a firm's operations and operational performance. Moreover, by examining the relation between a stock's characteristics and future returns, analysts could possibly conclude to more precise recommendations. Lustgarten et. al. (2008) analyzed the association between earnings forecasts and stocks recommendations and found a positive relation. The researchers mention that analysts who provide earnings forecasts exceeding the consensus are essentially predicting positive earnings surprise. They observed that these analysts generally offer stock recommendations that are more favorable compared to the consensus. Furthermore, they noted that the relationship between forecasts and recommendations becomes more pronounced when considering longer-term forecasts. Lastly their evidence aligns with the theory suggesting that recommendations and forecasts are driven by analysts' intention to assist investors in maximizing their wealth, rather than merely aiming to increase trading activities, follow the crowd, or pursue self-serving motives. Although engaging in activities that boost trades and serve self-interest may yield short-term benefits for analysts, the long-term viability of the financial analyst profession relies on delivering advantages to investors. By satisfying their clients, analysts cultivate a devoted clientele that safeguards their long-term prosperity.

On the other side, Loh and Stulz (2010) investigate when the analysts' changes tend to be influential and they find that the probability of an influential recommendation is higher for leader analysts, star analysts, away-from-consensus revisions, revisions issued contemporaneously with earnings forecasts, analysts with greater relative experience, and those with more accurate earnings estimates. This happens because these categories of analysts have more power in comparison to other individual analysts, and as a result they have the power to alter the perspective of how a firm is viewed by the outside world. The above perspective is consistent with the prior literature and more specifically with the study of Hong et al.(2007), who explore the consequences of learning within an environment where the actual representation of the world is a multivariate model. However, agents, in their updating process, rely solely on simple univariate models. As substantial evidence gathers against the current simplistic model, agents transition to an alternative simple model, resulting in a paradigm shift that is reflected in the movements of stock prices. On the other side Costello et. al. (2011) adopt a research method designed to isolate the incremental impact of analyst recommendation changes, independent of factors which jointly impact upon both analysts and fund managers. Their results suggest that analysts who are considered influential tend to have persistent influence on the trading process of mutual funds.

Firth et. al. (2013) investigate whether the business relations between mutual funds and brokerage firms influence sell-side analyst recommendations. Their results suggest that when an analyst's brokerage firm has mutual fund clients who hold a particular stock, the analyst's recommendation for that stock, compared to the consensus, is significantly higher. In addition,

they observed that analysts tend to prioritize the promotion of stocks that have lower visibility among other institutional investors. This strategic approach aims to safeguard the interests of mutual fund clients while mitigating the significant risks associated with potential reputation loss. Another important finding suggests that when negative news events are followed, analysts exhibit a notable decrease in issuing negative ratings for stocks held by mutual funds associated with their clients. Moreover, client mutual funds display less responsiveness in their portfolio decisions towards optimistic recommendations provided by these business-related analysts. Notably, favorable stock recommendations from analysts unaffected by client pressures generate significantly higher abnormal returns, both during the announcement period and in the long run, compared to equally favorable recommendations from business-related analysts. As a result, their research concluded to the fact that analysts tend to be under pressure by institutional investors who are clients of the analysts to publish optimistic biased ratings on the stocks that are contained in the clients' portfolios.

Farooq (2017) in his research showed that recommendation upgrades (downgrades) relative to consensus recommendation are followed by significantly positive (negative) short-term returns whenever consensus recommendation represents convergence of analysts' opinions. To be more specific, the researcher concluded that when the consensus recommendation among analysts is similar and there is not much disagreement (small standard deviation), any change in recommendation relative to that consensus contains value. As a result, if an analyst's recommendation differs from what most other analysts predict, it can provide useful information for investors. However, if there is a high level of disagreement among analysts (large standard deviation), recommendation changes relative to the consensus become less valuable. This suggests that when analysts tend to have diverse opinions about a stock, changes in recommendations may not be as reliable or informative, due to the plethora of different opinions which eventually create confusion for investors. Moreover, when this situation does occur, normally a substantial information is already known and factored to the market and as a result, upgrades or downgrades in recommendations may not have as much impact because the market has already incorporated that information. Lastly, if the time between consecutive recommendations is short, a change in recommendation holds more value. However, if the time between recommendations is long, the value of a recommendation change decreases and therefore does not entail much value.

The main subject of Papakroni, (2018) is to distinguish whether the forecast dispersion anomaly is due to Miller (1977) overpricing hypothesis or idiosyncratic risk, by conditioning the sample on "buy" and "sell" consensus recommendations. A variety of regression analyses are conducted to examine the predictive power of option implied measures, and the ordered probit model is used to test the tipping hypothesis of analyst recommendations. This study's results show that the option market impounds the "valuable" firm-specific news; thus, the pre-event option market is strongly related to stock returns around recommendations even though recommendation changes are largely "unscheduled". At the same time, these results suggest that upside (good) and downside (bad) implied volatilities contain distinctive information on subsequent stock returns. This study provides new evidence that an increase in upside (downside) volatility around analyst recommendation changes would increase the probability that analysts upgrade (downgrade) the stock (Wang et. al., 2021). Barth et. al. (2021) address whether analysts bias earnings forecast revisions and convey the bias using forecast revision

consistency, i.e., the extent to which analyst reports with earnings forecast revisions include stock recommendation and target price revisions consistent in sign with the earnings forecast revisions, the sign of which is the sign of earnings forecast revision.

The paper from Wright et.al. (2010), provides findings that align with the prior literature. The authors in their research found that during times of Forced CEO turnovers, the market tends to react in favor of these turnovers and as a result the price of the stock rises. Additionally, these turnovers tend to create a challenging forecasting environment for analysts and as the research shown, analysts appear to create recommendations which are more optimistic for the firms that hold the stocks. As a result, the findings of Jegadeesh et.al. (2002) align with the ones from Wright et.al. (2010).

2.4 Hypotheses Formulation

Given the extant literature and to my best knowledge, there is no study regarding the direct effect of forced CEO turnovers (as opposed to a regular CEO change) to the analysts' consensus recommendations. Moreover, the relation between the two constructs is not obvious – a forced CEO turnover may be perceived as the ending of a bad management or as an increase of uncertainty in the firm's strategic decision making and future activities. Therefore, the following (null) hypotheses are formulated as non-directional.

H_1: Forced CEO turnover has no differential effect from the regular CEO turnover on the BUY analyst consensus recommendation.

H_2: Forced CEO turnover has no differential effect from the regular CEO turnover on the HOLD analyst consensus recommendation.

H_3: Forced CEO turnover has no differential effect from the regular CEO turnover on the SELL analyst consensus recommendation.

3. Research Design

This section lays out a detailed rundown of the sample selection process, the description of the variables used in the research, as well as the model specifications. Moreover, I provide a visual check for the validity of the parallel trend assumption – the key assumption of DiD models. I present the sample's yearly and industry distribution and lastly, I explain control variables and the reasons for including them, as well as the propensity score matching process.

3.1 Sample Selection

For the formulation of my sample, I use four databases, namely: COMPUSTAT, I/B/E/S, EXECUCOMP, and the Forced CEO Turnover developed by Peters and Wagner ("The Executive Turnover Risk Premium" by Florian Peters and Alexander Wagner, Journal of Finance, vol. 69, no. 4, pp. 1529-1563, 2014; "CEO Turnover and Relative Performance Evaluation" by Dirk Jenter and Fadi Kanaan, Journal of Finance, Vol. 70 (5), pp. 2155-2184, 2015). The treated group comes from the Forced CEO Turnover, whereas the control group from the EXECUCOMP. Outcome variables (i.e., analyst consensus recommendations) are

derived from the I/B/E/S, and the control (accounting) variables from COMPUSTAT North America. The sample consists of US firms, which report in USD, from 1994 to 2019 (the time period is chosen based on the data availability of the Forced CEO Turnover). The data frequency from I/B/E/S has been turned into yearly by summarizing the monthly firm values into mean year values.

After the merger of the four raw datasets, the firm-year observations come up to 104,612. Firms not reporting in USD are dropped because on the one hand, differences in currency units would distort the results (e.g., total assets and EBITDA are measured in monetary values), and from the other hand, searching for the corresponding foreign exchange rates (1993 to 2019) would not only be time-consuming and would make the research process more complicated , but would also increase the heterogeneity of the sample – the focus of this study lies on US firms; reporting on different currencies can imply another country of origin or main country of operations. The lost proportion comes up to 11.5%, thus the cost-benefit analysis dictates the drop of such observations.

Next, for the treated group, I drop the firms with more than one forced CEO turnover, because there is no fair justification in keeping one and dropping the other(s). To add to that, not only the majority of the multiple forced turnovers have taken place too close from one another, thus not allowing for the specified time-window (2 years before the turnover year and 2 afterwards),[1] but also multiple forced turnovers may be an indication of extreme turbulence within the firm, an issue which would distort the results. Conversely, for the control group, if a firm experiences multiple CEO turnovers, I allow for the more chronologically recent turnover to remain in the sample and drop the older ones. This degree of leniency is acceptable for the control group, as opposed to the treated, because this allows for a "richer" control subset that will later be matched to the treated one.

Additionally, missing values in the control variables and the Standard Industrial Classification (SIC) codes are excluded, and firms exhibiting multiple SIC codes are removed. The latter requirement is essential to prevent the presence of duplicated observations in the dataset, where the only distinguishing factor would be the SIC codes.

Lastly, I apply the desired time-frame (a 2-year window before and after the turnover year) and proceed with the matching (see section **3.4 Matching Process**). Table 1 provides a granular view over the sample selection process. The final sample consists of 1,920 firm-year

TABLE 1: SAMPLE SELECTION

	No. of observations	Forced CEO Turnover	Non-Forced CEO Turnover
Initial merged sample	104,612	11,253	93,359
Drop non-USD currency	92,631	11,251	81,380
Drop firms with zero or more than one CEO	25,635	8,513	17,122
Drop missing values from covariates and SIC	13,123	5,709	7,414

[1] The 2-year window is proposed in order to allow for any short-term firm turbulence, that could strongly tilt the consensus, to settle and therefore any potential effects to be as clean from noise as possible. 1- and 3-year windows are also tested.

"Cutting" the firm-level timeframe (PRE:2; POST:3)	2,775	1,125	1,650
Drop firms with more than one SIC code	2,565	1,060	1,505
Unmatched TREATED		*(100)*	
Unmatched CONTROLS			*(545)*
Matched sample	1,920	960	960

* *For the control sample, if a firm had more than one CEO turnover, the more chronologically recent CEO change has been kept.*

Table shows the number of observations per the whole, the forced CEO turnover, and the non-forced CEO turnover sample at the initial and final stage of the sample selection process. I use propensity score matching on the average pre-turnover covariates and SIC codes to obtain the final sample, using a probit model and caliper of .05, with no replacement. Unique firm per sub-sample are 192. See Appendix B, for the matching results.

observations, across all Fama & French-12 industries and is distributed from 1994 to 2019. The industry distributions between the treated and the control group are almost similar, apart from Consumer Non-Durables, Health, and Utilities, while the yearly distribution shows some dispersion; this is not something concerning. Given the research setting, the pre and post periods are relative to the CEO turnover year, which in turn is dispersed across the aforementioned time span. Table 2 shows the industry and yearly distributions in detail.

3.2 Control Variables

The control variables encompass features that have been previously identified in extant literature as having an established association with the forecast properties. Their inclusion aims to mitigate the possibility of any statistical significance observed in the experimental variable, specifically forced CEO turnover, being influenced by potential confounding factors. Following Choi et al. (2014), I control for firm size (*AT*) with the natural logarithm of total assets in USD thousands. The natural logarithm is taken due to the high skewness to the right of the variable's distribution. Prior research has shown that larger firms have a richer information environment (Kasznik and Lev, 1995). In a richer information environment, any given forced CEO turnover is expected to be accompanied with detailed

TABLE 2: SAMPLE DISTRIBUTIONS

Panel A: Industry Distribution

	TREATED		**CONTROLS**	
FF-12 Industry	Firm-years	Percent (%)	Firm-years	Percent (%)
Business Equipment	155	16.15	135	14.06
Chemicals	40	4.17	60	6.25
Consumer Durables	30	3.13	20	2.08
Consumer Non-Durables	60	6.25	35	3.65
Energy	35	3.65	25	2.60
Finance	30	3.13	35	3.65

Health	140	14.58	90	9.38
Manufacturing	165	17.19	190	19.79
Other	150	15.63	160	16.67
Shops	125	13.02	115	11.98
Telecommunications	5	0.52	15	1.56
Utilities	25	2.60	80	8.33
Total	**960**	**100**	**960**	**100**

Panel B: Yearly Distribution

	TREATED		**CONTROLS**	
Year	Firm-years	Percent (%)	Firm-years	Percent (%)
1994	5	0.52	7	0.73
1995	10	1.04	15	1.56
1996	21	2.19	21	2.19
1997	31	3.23	24	2.50
1998	47	4.90	30	3.13
1999	44	4.58	25	2.60
2000	44	4.58	20	2.08
2001	44	4.58	22	2.29
2002	45	4.69	25	2.60
2003	38	3.96	33	3.44
2004	42	4.38	37	3.85
2005	43	4.48	35	3.65
2006	41	4.27	34	3.54
2007	36	3.75	39	4.06
2008	36	3.75	45	4.69
2009	29	3.02	46	4.79
2010	41	4.27	48	5.00
2011	40	4.17	52	5.42
2012	45	4.69	62	6.46

TABLE 2 (continued)

2013	50	5.21	64	6.67
2014	59	6.15	62	6.46
2015	54	5.63	71	7.40
2016	46	4.79	58	6.04
2017	34	3.54	39	4.06
2018	24	2.50	29	3.02
2019	11	1.15	17	1.77
Total	**960**	**100**	**960**	**100**

reasons and granular analyst guidance regarding this matter, thus reducing the asymmetry and the stock price uncertainty.

EBITDA proxies the free cash flow to the firm; a vital measure for defining the "true" stock price. Lower free cash flows could plausibly lead to a lower price estimation, thus driving the consensus away from buy recommendations. In case of persistent decrease in free cash flow, it could also increase the chances of a forced CEO turnover.

Prior research uses total debt to total assets to control for leverage (see Choi et al., 2014). Nevertheless, this variable fails to capture the cost element of leverage, which is the primary reason for controlling for it in this particular context. For example, it is possible that higher leverage increases a firm's risk, thereby impacting the consensus recommendations. However, higher leverage could be desirable if it leads to greater profits through promising investment opportunities where the return on investment exceeds the cost of leverage. Therefore, a more suitable alternative is the interest coverage ratio (*ICR*), which reflects a firm's ability to meet interest payments. A relatively low *ICR* can influence both a firm's risk profile and consequently the analysts' recommendations. However, it may also elevate the underlying risk of default, which is unfavorable to the majority of shareholders, leading them to terminate the current CEO's tenure.

Growth is also controlled for and proxied by the market-to-book ratio (*MTB*). Dechow and Sloan (1997) find that forecast accuracy is related to various growth measures. Growing firms, as opposed to mature and well-established ones, may "suffer" from higher forecast variation within the analyst consensus, especially in bear-market. To add to that, growing firms may also expect more forced CEO turnovers, due to missing growth targets; this is less the case with mature cash-cows.

Firm performance is included as a control variable, as proxied by the return on assets (*ROA*). This metric is widely used in financial analyses and can potentially influence the consensus recommendations. It also depicts the CEO's ability in terms of firm profitability, thus affecting the likelihood of them remaining in position.

Lastly, a firm's ability to meet its short-term obligations is captured by the current ratio (*CR*). If a firm struggles to make ends meet, this might be alerting and thus affect the consensus recommendations.

Since all of the control variables involve accounting figures, and the audited accounting figures of the prior year are known several months into the current year, it is important to note that the covariates are lagging one year behind. For example, if a CEO is fired during 2015 it is probably because of the 2014's results.

Outliers within some controls (*EBITDA*, *ICR*, *ROA*) where partially tackled by winsorization at 5%. Handling outliers through winsorization is commonly used in the literature (e.g., Choi et al., 2014; Darandeli et al., 2021; Fiechter et al., 2022). This method of handling outliers allows to keep the extreme observation, however at bounded levels. The non-negative, highly skewed to the right distributions of total assets (*AT*) and market-to-book ratio (*MTB*) allowed for log-transforming: a technique that brings extreme observation closer to the distribution's center.

3.3 Matching Process

The matching between the treated and control firms is performed with a propensity score using the probit model on the average pre-turnover (*POST*=0) control variables and industry SIC codes.[2] Due to the relatively large number of covariates and the presence of continuous variables, I use the "nearest neighbour" (NN) method, since performing an "exact" match would be extremely difficult. However, this method relies on a "greedy" algorithm and can result in bias and poor matching quality (Haris and Horst, 2016). Matching with replacement is an option to mitigate the algorithm's greediness (Caliendo and Kopeinig, 2008; Stuart, 2010), however, matching with replacement is often considered less than ideal and rarely used, in part because the data are no longer independent (Austin, 2009; Caliendo and Kopeinig, 2008). Instead of matching with replacement, the technique of caliper adjustment is commonly used with NN to ensure that the intervention and comparison groups are matched with high quality (Austin, 2011; Caliendo and Kopeinig, 2008; Stuart, 2010; Stuart and Rubin, 2008a). With a caliper adjustment, only cases with propensity scores falling within a specified distance are matched, which is usually a fraction of a standard deviation of the logit of the propensity score. (e.g., .2 standard deviation; Austin, 2009). The lower the caliper, the greater the observation loss, therefore, when deciding upon a caliper distance, it is also important to keep in mind this tradeoff. In the case of this thesis, the sample size is already relatively small, thus a caliper of 0.05 standard deviation is used.[3]

I use the "MatchIt" library for this task. MatchIt implements the suggestions of Ho et al., (2007) for improving parametric statistical models by preprocessing data with nonparametric matching methods. It also implements a wide range of sophisticated matching methods, making it possible to greatly reduce the dependence of causal inferences on hard-to-justify, but commonly made, statistical modeling assumptions, such as the parallel trends in DiD.

Figure 1 illustrates a preliminary analysis of the average buy consensus percentage recommendation (*BUY*) *4 months* before and *4 months* after the month in which a CEO turnover took place, respectively, for the treated (forced CEO turnover) and the control (regular CEO turnover) group. The pre-treatment parallel movement can be loosely confirmed, since every downward movement by the forced turnovers is followed by a downwards movement by the non-forced turnovers and vice-versa. It is only that the treated group experiences greater steps; that might be evidence of the forced CEO turnover news being discounted among the analysts' community with greater impact, at least for the buy recommendations.

Figure 2 shows the 2-year window around the turnover year, based on the annualized data conversion. In this instance, the parallel trend is not supported by the graph, most likely due to the higher variation of the annualized *BUY* data (*nonforced*: 0.54 vs 1.93; *forced*: 1.64 vs 4.72).

[2] For binary treatment, model choice is not too critical (Caliendo and Kopeinig, 2008).
[3] For the matching result, see Appendix B.

FIGURE 1: 4-MONTH WINDOW AROUND TURNOVER

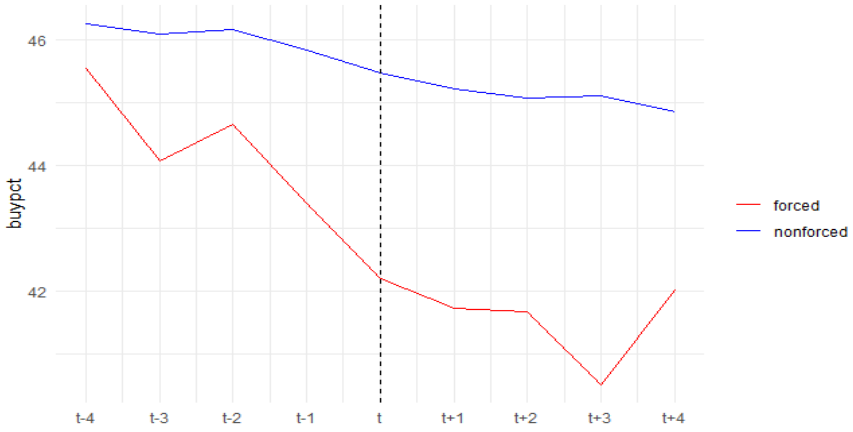
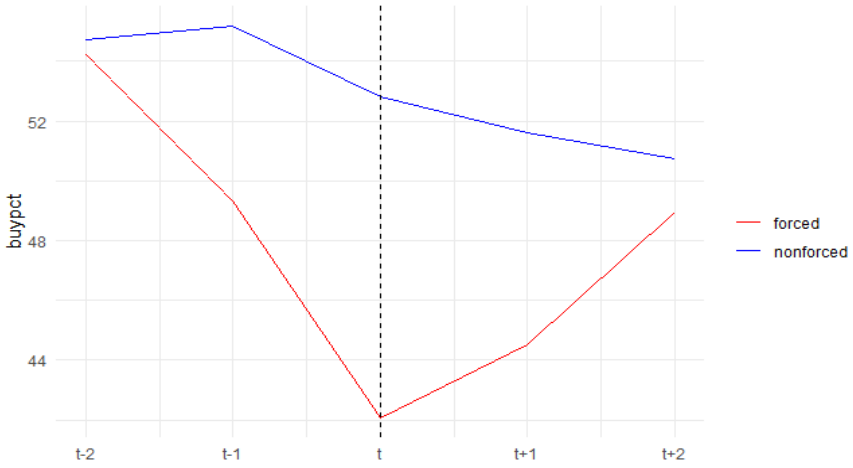


FIGURE 2: 2-YEAR WINDOW AROUND TURNOVER



3.4 Model Specifications

The hypotheses formulated in section **2.4 Hypotheses Formulation** are tested with the following models:

$$BUY = \beta_0 + \beta_1 TREATED + \beta_2 POST + \beta_3 TREATED \times POST + \sum_{j=4}^{9} \beta_j Controls_j + i + t + \varepsilon \quad (1)$$

$$HOLD = \beta_0 + \beta_1 TREATED + \beta_2 POST + \beta_3 TREATED \times POST + \sum_{j=4}^{9} \beta_j Controls_j + i + t + \varepsilon \quad (2)$$

$$SELL = \beta_0 + \beta_1 TREATED + \beta_2 POST + \beta_3 TREATED \times POST + \sum_{j=4}^{9} \beta_j Controls_j + i + t + \varepsilon \quad (3)$$

The firm and time subscripts are omitted for the sake of readability. Firm fixed effects are denoted with the letter *i*, while the year fix effects with the letter *t*, and ε is the error term.[4] The coefficient of interest is the β_3, which if shown statistically significant, provides evidence that the forced CEO turnovers have greater impact on the consensus recommendations, as opposed to the regular CEO turnovers.

4. Empirical Results

In this section, I present the descriptive statistics and correlations of the variables used in this study. Further, the regression output and the hypotheses tests are tabulated and I provide plausible interpretations of the empirical results.

4.1 Descriptive Statistics & Correlations

Table 3 reports the descriptive statistics for the treated and the control sub-samples. The average treated firm has total assets of 1,959 ($=e^{7.58}$) thousand USD, when the average control company has total assets of 2,154 ($=e^{7.675}$) thousand USD. In terms of earnings, the treated group has an average EBITDA of $665,000, whereas the control group has an average EBITDA of $652,000. However, both groups exhibit a high dispersion in this variable, with a standard deviation of almost $1 million, even after applying winsorization. The interest coverage ratio (*ICR*) differs significantly between the two groups (*treated*: 18.4 vs *controlled*: 24.8). The other control variables show similar values between the two groups. The average return on assets (*ROA*) for the treated firms is 3.9%, with a median of 4.1%, while the controlled firms have a mean and median *ROA* of 5.2%. The recommendation percentages for *BUY*, *HOLD*, and *SELL* range from 0% to 100%, except for the upper bound of *SELL* in the treated group, which is 72%. The mean values for the two groups are approximately 48%, 46%, and 6% for *BUY*, *HOLD*, and *SELL* recommendations in the treated group, and 52%, 43%, and 5% in the control group. The standard deviations for these percentages are similar in both groups. Untabulated statistics of the number of recommendations (*numrec*) reveal that the mean and standard deviation values are approximately equal, with values of 11.5 and 8.1, respectively. The maximum number of recommendations is 43, while the minimum is 1.

Table 4 provides the Pearson correlation matrix for the entire sample. The variable *TREATED* exhibits a significant negative correlation with *ICR* (interest coverage ratio), *ROA* (return on assets), and *BUY*, while it shows a significant positive correlation with *HOLD*. This indicates that firms that have undergone a forced CEO turnover tend to have lower interest coverage ratios, return on assets, and buy recommendations, but higher hold recommendations. On the other hand, the variable *POST* shows a positive correlation with *AT* (total assets), *HOLD*, and *SELL*, while it is negatively correlated with *ICR*, *CR*, and *BUY*. Regarding total assets, this suggests that firms in the sample generally increase in size over time, regardless of a CEO turnover. As for the recommendation percentages, it confirms the prevailing notion of

[4] Since *POST* depends on a relative time spot (the turnover year), the year fixed effects will not cause perfect multicollinearity or subsume it effect.

TABLE 3: DESCRIPTIVE STATISTICS

Panel A: TREATED

Statistic	N	Mean	S.D.	Min	25th Pctl	Median	75th Pctl	Max
TREATED	960	1.000	0.000	1	1	1	1	1
POST	960	0.600	0.490	0	0	1	1	1
AT	960	7.580	1.475	3.728	6.562	7.464	8.538	11.349
*EBITDA**	960	664.831	995.591	16.661	80.273	205.858	714.800	3,680.720
*ICR**	960	18.387	34.325	-0.870	2.629	6.442	14.231	156.695
MTB	960	0.909	0.865	-2.494	0.374	0.818	1.301	6.912
*ROA**	960	0.039	0.066	-0.104	0.006	0.041	0.077	0.159
CR	960	2.008	1.079	0.332	1.267	1.791	2.492	8.172
BUY	960	48.058	25.635	0.000	29.375	48.429	65.451	100.000
HOLD	960	45.855	22.425	0.000	31.725	46.240	59.194	100.000
SELL	960	6.087	10.375	0.000	0.000	0.984	7.704	71.625

Panel B: CONTROLS

Statistic	N	Mean	S.D.	Min	25th Pctl	Median	75th Pctl	Max
TREATED	960	0.000	0.000	0	0	0	0	0
POST	960	0.600	0.490	0	0	1	1	1
AT	960	7.675	1.380	4.003	6.755	7.598	8.489	11.796
*EBITDA**	960	652.267	935.818	16.661	105.439	268.438	672.772	3,680.720
*ICR**	960	24.842	42.032	-0.870	3.345	7.987	20.963	156.695
MTB	960	0.967	0.746	-0.936	0.494	0.857	1.348	6.411
*ROA**	960	0.052	0.060	-0.104	0.023	0.052	0.091	0.159
CR	960	2.071	1.168	0.202	1.266	1.876	2.612	9.404
BUY	960	51.843	24.934	0.000	33.850	51.721	69.447	100.000
HOLD	960	42.880	22.369	0.000	27.326	43.305	58.333	100.000
SELL	960	5.277	11.511	0.000	0.000	0.000	6.383	100.000

Table shows number of observations (N), mean (Mean), standard deviation (S.D.), minimum (Min), 25th percentile (25th Pctl), median (Median), 75th percentile (75th Pctl), and maximum (Max) of the variables used in this study for the TREATED and the CONTROL samples, separately. The distinction between the two sample is whether the CEO turnover was forced (*TREATED*=1) or regular (*TREATED*=0). The *POST* dummy was created on the premise of a 2-year window around the turnover year; the turnover year is classified as *POST*=1. *AT* is the natural logarithm of the lagged total assets in USD thousands. *EBITDA* is the lagged earnings before interest, tax, depreciation and amortization in USD thousands. *ICR* is the lagged interest coverage ratio. *MTB* is the natural logarithm of the lagged market-to-book value ratio. *ROA* is the lagged return on assets. *CR* is the lagged current ratio. *BUY*, *HOLD*, and *SELL* are the issued analyst recommendation percentages from I/B/E/S. See appendix A, for the detailed variable definitions. Variables with (*) are winsorized at 5%.

TABLE 4: CORRELATION MATRIX

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
(1) *TREATED*	1										
(2) *POST*	0.000	1									
(3) *AT*	-0.033	0.078***	1								
(4) *EBITDA**	0.007	0.037	0.796***	1							
(5) *ICR**	-0.084***	-0.038	-0.204***	-0.054*	1						
(6) *MTB*	-0.036	-0.013	0.058*	0.188***	0.184***	1					
(7) *ROA**	-0.108***	-0.102***	0.083***	0.226***	0.480***	0.380***	1				
(8) *CR*	-0.028	-0.034	-0.311***	-0.256***	0.336***	-0.062**	0.137***	1			
(9) *BUY*	-0.075**	-0.110***	-0.096***	0.011	0.085***	0.144***	0.125***	0.079***	1		
(10) *HOLD*	0.066**	0.096***	0.076***	-0.013	-0.062**	-0.123***	-0.074**	-0.070**	-0.902***	1	
(11) *SELL*	0.037	0.059**	0.066**	0.003	-0.070**	-0.080***	-0.137***	-0.039	-0.466***	0.038	1

*Significance at the 10% level; **significance at the 5% level; ***significance at the 1% level.

Table reports Pearson correlations between the variables used in the study. The *TREATED* dummy indicates whether the CEO turnover was forced or not. The *POST* dummy was created on the premise of a 2-year window around the turnover year; the turnover year is classified as *POST*=1. *AT* is the natural logarithm of the lagged total assets in USD thousands. *EBITDA* is the lagged earnings before interest, tax, depreciation and amortization in USD thousands. *ICR* is the lagged interest coverage ratio. *MTB* is the natural logarithm of the lagged market-to-book value ratio. *ROA* is the lagged return on assets. *CR* is the lagged current ratio. *BUY*, *HOLD*, and *SELL* are the issued analyst recommendation percentages from I/B/E/S. See appendix A, for the detailed variable definitions. Variables with (*) are winsorized at 5%.

lower “buy” recommendations and higher “hold” and “sell” recommendations. The negative correlation between total assets and *BUY* and the positive correlation with *HOLD* and *SELL* possibly indicate analysts' bullish inclination toward smaller firms in the sample, a notion further supported by the opposite correlation sign between growth (*MTB*) and the consensus recommendations. Furthermore, the issuance of buy reports shows a significant positive correlation with firm performance (*ROA*) and liquidity (*CR*), while “hold” and “sell” reports decrease as these metrics improve. Lastly, the exceptionally high correlation of 0.9 between *BUY* and *HOLD* implies that in the event of a firm's downturn, analysts are more likely to shift their stance from buy to hold, rather than to immediately sell.

4.2 Multivariate Analysis

Table 5 presents the results of three Ordinary Least Squares (OLS) regression models, specifically Difference-in-Differences (DiD) models, examining the impact of forced CEO turnover compared to regular CEO turnover on analyst consensus recommendations for BUY, HOLD, and SELL. The key variable of interest is the interaction term TREATED*POST, which represents the combined effect of forced CEO turnover and the post-turnover period. The p-values in parentheses indicate the statistical significance of the coefficients.

TABLE 5: THE EFFECT OF FORCED CEO TURNOVER ON ANALYST RECOMENDATIONS

	BUY	*HOLD*	*SELL*
Intercept	**113.494*****	-13.306	-0.188
	(0.000)	(0.385)	(0.979)
TREATED	**-25.331***	**22.953***	2.378
	(0.052)	(0.059)	(0.679)
POST	-1.809	1.583	0.226
	(0.285)	(0.316)	(0.761)
TREATED×POST	**-3.558****	1.606	**1.952****
	(0.045)	(0.331)	(0.012)
AT	**-4.970****	**4.377****	0.593
	(0.018)	(0.025)	(0.521)
EBITDA	**0.004***	-0.003	-0.001
	(0.059)	(0.116)	(0.333)
ICR	-0.023	0.022	0.001
	(0.256)	(0.241)	(0.925)
MTB	**8.244*****	**-6.394*****	**-1.850*****
	(0.000)	(0.000)	(0.000)
ROA	**47.989*****	**-33.719*****	**-14.270*****
	(0.000)	(0.002)	(0.006)
CR	-0.476	-0.133	0.610

	(0.577)	(0.867)	(0.105)
Firm fixed effects	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes
R^2	0.597	0.553	0.581
Adj. R^2	0.485	0.429	0.465
Num. obs.	1,920	1,920	1,920

*Significance at the 10% level; **significance at the 5% level; *** significance at the 1% level.
This table reports the coefficients and p-values (in parentheses) of three OLS regressions (DiD models). The distinction between the treated and control firms is whether the CEO turnover was forced (*TREATED*=1) or regular (*TREATED*=0). The *POST* dummy was created on the premise of a 2-year window around the turnover year; the turnover year is classified as *POST*=1. *AT* is the natural logarithm of the lagged total assets in USD thousands. *EBITDA* is the lagged earnings before interest, tax, depreciation and amortization in USD thousands. *ICR* is the lagged interest coverage ratio. *MTB* is the natural logarithm of the lagged market-to-book value ratio. *ROA* is the lagged return on assets. *CR* is the lagged current ratio. *BUY*, *HOLD*, and *SELL* are the issued analyst recommendation percentages from I/B/E/S. See appendix A, for the detailed variable definitions.

The results indicate that forced CEO turnover has a significant effect (regardless of pre or post period) on analyst consensus recommendations for BUY and HOLD. The coefficient for *TREATED* is -25.331 for *BUY* and 22.953 for *HOLD* – nonsignificant for *SELL* –, suggesting a decrease in the percentage of "buy" recommendations and an increase in "hold" recommendations compared to regular CEO turnover.

The coefficient for the *POST* variable represents the effect of the post-turnover period on analyst consensus recommendations. It is not statistically significant for any of the recommendation types, indicating that the post-turnover period alone does not have a significant impact on analyst recommendations. The coefficient for the interaction term *TREATED*POST* measures the differential effect of forced CEO turnover during the post-turnover period. It is statistically significant for *BUY* and *SELL* recommendations, but not for *HOLD* recommendations. A negative coefficient of -3.558 for *TREATED*POST* in the *BUY* regression indicates that forced CEO turnover during the post-turnover period leads to a further decrease in the percentage of "buy" recommendations by 3.558 pp. In contrast, the coefficient of 1.952 for *TREATED*POST* in the *SELL* regression suggests that forced CEO turnover during the post-turnover period leads to an increase in the percentage of "sell" recommendations of 1.952 pp. Therefore, **H1** and **H3** are rejected, while **H2** is not.

The other control variables, such as lagged total assets (*AT*), earnings before interest, tax, depreciation, and amortization (*EBITDA*), interest coverage ratio (*ICR*), market-to-book value ratio (*MTB*), return on assets (*ROA*), and current ratio (*CR*), also demonstrate significant associations with analyst consensus recommendations, as indicated by their respective coefficients and p-values.

The models include firm fixed effects and year fixed effects to control for unobserved heterogeneity and time-specific effects. The adjusted R-squared values indicate that the models explain a substantial portion of the variation in the dependent variables, with values ranging from 0.429 to 0.485.

To sum up, the coefficient of interest *TREATED*POST* in the regression results is significant in two out of the three models and provides valuable insights into the impact of forced CEO turnover on analyst consensus recommendations. The negative coefficient for *BUY* suggests

that analysts are less likely to recommend buying stocks when a forced CEO turnover occurs during the post-turnover period. Conversely, the positive coefficient for *SELL* indicates that analysts are more inclined to recommend selling stocks in this scenario. These findings demonstrate the dynamic nature of analyst recommendations and highlight the cautious approach taken towards stocks affected by forced CEO turnover.

Nevertheless, the economic significance of the post-treatment period on *BUY* can be disputed, since the -3.558 pp represents a 7.4% (=3.558/48.058) relative decrease for the average treated firm; the relative decrease in *SELL* is 32.1% (1.952/6.087).

4.3 Additional Tests

To support that the results are not dependent on the definition of the time window around the CEO turnover year, two additional tests are conducted; for 1-year and 3-year windows. In Panel A of Table 6, the coefficients of *TREATED×POST* are very close to the ones in Table 5, however, not statistically significant at conventional levels. On the other hand, in Panel B of Table 6, the coefficients of interests are significant for *BUY* and *HOLD*, partly supporting the first round of tests. Post-treatment firms experience a 4.398 percentage points decrease in the consensus *BUY* recommendations and a 3.197 pp increase in the *HOLD* recommendations. This implies the following: as time lapses from the 2st to the 3rd year, since the forced CEO turnover, analysts become less and less bullish on the affected firms – moving from -3.558 at the 2nd year to -4.398 at the 3rd year – while they also become less bearish – moving from *SELL* at the 2nd year to *HOLD* at the 3rd year. Notice that the 2-year window sample shows the greatest number of firm-year observations (1,920), with 192 unique treatment firms. The samples formed for the additional tests have 1,524 (254 unique treatment firms) and 1,890 (135 unique treatment firms), for the 1-year and 3-year time windows, respectively.

TABLE 6: ADDITIONAL TEST ON DIFFERENT TIME WINDOWS

Panel A: 1-Year Time Window Around CEO Turnover			
	BUY	*HOLD*	*SELL*
TREATED	15.894	-13.152	-2.741
	(0.391)	(0.456)	(0.733)
POST	-0.648	1.369	-0.722
	(0.713)	(0.414)	(0.345)
TREATED×POST	-3.093	2.141	0.952
	(0.114)	(0.251)	(0.262)
Control variables	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes
R^2	1,524	1,524	1,524
Adj. R^2	0.721	0.684	0.724

TABLE 6 (continued)

Num. obs.	0.568	0.510	0.573
Panel B: 3-Year Time Window Around CEO Turnover			
	BUY	*HOLD*	*SELL*
TREATED	-5.060	6.114	-1.054
	(0.694)	(0.608)	(0.858)
POST	-0.828	-0.493	1.320
	(0.655)	(0.774)	(0.119)
TREATED×POST	**-4.398****	**3.197***	1.201
	(0.015)	(0.057)	(0.146)
Control variables	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes
R^2	0.544	0.485	0.551
Adj. R^2	0.457	0.387	0.465
Num. obs.	1,890	1,890	1,890

*Significance at the 10% level; **significance at the 5% level; *** significance at the 1% level.
This table reports the coefficients and p-values (in parentheses) of three OLS regressions (DiD models). The distinction between the treated and control firms is whether the CEO turnover was forced (*TREATED*=1) or regular (*TREATED*=0). The *POST* dummy was created on the premise of a 1-year window around the turnover year in Panel A (254 unique treated firms) and on the premise of a 3-year window around the turnover year in Panel B (135 unique treated firms); the turnover year is classified as *POST*=1. *AT* is the natural logarithm of the lagged total assets in USD thousands. *EBITDA* is the lagged earnings before interest, tax, depreciation and amortization in USD thousands. *ICR* is the lagged interest coverage ratio. *MTB* is the natural logarithm of the lagged market-to-book value ratio. *ROA* is the lagged return on assets. *CR* is the lagged current ratio. *BUY*, *HOLD*, and *SELL* are the issued analyst recommendation percentages from I/B/E/S. See appendix A, for the detailed variable definitions.

5. Conclusion

The intricate and compelling dynamics surrounding CEO turnover and analyst consensus recommendations have attracted considerable interest among researchers and investors. Remarkably, prior studies have not directly investigated the impact of forced CEO turnovers on analysts' consensus stock recommendations, and the interrelationship between these two constructs remains elusive. This thesis addresses this critical research gap by leveraging four comprehensive databases: COMPUSTAT, I/B/E/S, EXECUCOMP, and the Forced CEO Turnover dataset, which was developed by Peters and Wagner (2014) and Jenter and Kanaan (2015). The sample comprises 192 US firms that experienced a forced CEO turnover between 1994 and 2019, matched with companies from the same population that underwent regular CEO turnovers. Each firm is meticulously observed for a two-year period preceding and following the turnover, with the turnover year itself designated as the post period.

By utilizing three Difference-in-Difference (DiD) models, the analysis demonstrates notable outcomes. Specifically, firms subjected to the treatment of forced CEO turnover exhibit a statistically significant decrease of 3.558 percentage points (significant at 5%) in BUY recommendations following the turnover. Simultaneously, there is a significant increase of 1.952 pp (also significant at 5%) in SELL recommendations. However, the effect on HOLD recommendations, while positive, does not reach statistical significance at conventional levels.

To ensure the robustness of the findings and to examine the sensitivity of the results to the definition of the time window surrounding the CEO turnover year, two supplementary tests were conducted, encompassing 1-year and 3-year windows. Accordingly, post-treatment firms experience a noteworthy decrease of 4.398 percentage points in consensus BUY recommendations and a 3.197 pp increase in HOLD recommendations. This implies that as time progresses from the 2nd to the 3rd year following the forced CEO turnover, analysts exhibit a diminishing bullish sentiment towards the affected firms. The shift is observed in the decrease from -3.558 in the 2nd year to -4.398 in the 3rd year for BUY recommendations, while also displaying a move from SELL to HOLD recommendations over the same period.

Nevertheless, my work does not come without limitations. First, the sample consists of US firms only; financial markets and analysts' consensuses in different region around the globe might react unalike in events such as forced CEO turnovers. Second, the parallel trend is the key assumption behind the DiD models. Since there are no formal tests to support this assumption, researchers usually rely on visual inspections. The visual inspections provided in this study do not strongly prop up this key assumption. Lastly, even by using lagged accounting figures, reverse causality could undermine the results. It might be the case that analysts merely react to the forced turnovers and only pay attention to the firm's expectation shortfall, issue unfavorable recommendations, which in turn could be responsible for the shareholders' dissatisfaction and the premature tenure termination.

Since I have commenced the study of forced CEO turnovers and consensus recommendations, a potential avenue for future research could lie in different geographical regions and/or with more granular time windows around the turnovers (e.g., days or months). Additionally, researchers may find it interesting to focus on the forward expansion of the conceptual setting to stock prices or the backwards expansion to the financial-accounting metrics (*metrics* → forced turnovers → consensus recommendations → *abnormal stock returns*).

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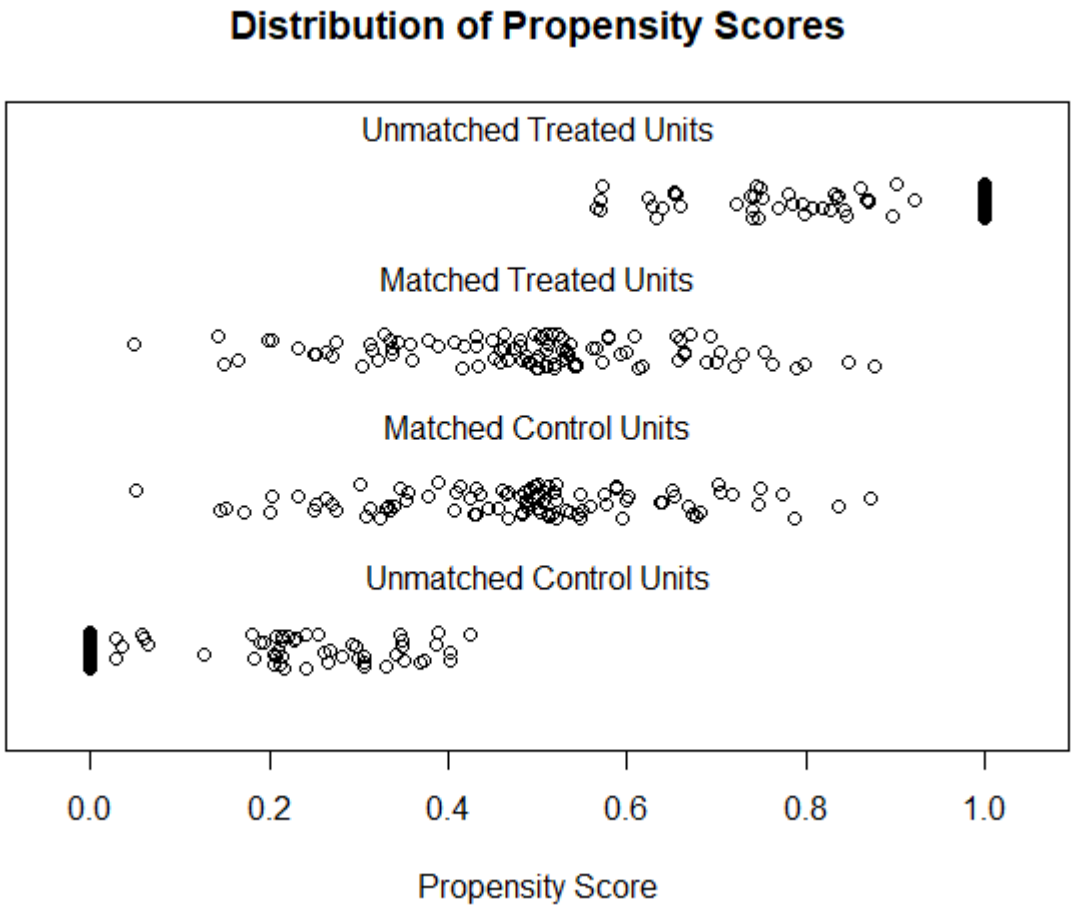
Appendix A

Variable Definition

Variable	Variable Description	Data Source
TREATED	Dummy variable indicating the treatment group; it takes the value 1 if the firm had at least one forced CEO turnover; and 0 if the firm had at least one regular CEO turnover.	Peters and Wagner for the 2001-2019 period, Jenter and Kanaan for the 1993-2000 period
POST	Dummy variable which is created on the premise of a 2-year window around the turnover year; the turnover year is classified as *POST*=1; in case of multiple turnovers, the most recent turnover (year) is kept.	Own computation
AT	Natural logarithm of the lagged assets in USD thousands	COMPUSTAT
*EBITDA**	Lagged earnings before interest, tax, depreciation and amortization in USD thousands (ebitda).	COMPUSTAT
*ICR**	Lagged interest coverage ratio. Computation: lagged earnings before interest and tax (ebit) divided by lagged accrued interest expenses (xint).	COMPUSTAT
MTB	Lagged market-to-book value ratio. Computation: lagged market value (prcc_f*csho) divided by lagged common shareholders equity (ceq).	COMPUSTAT
*ROA**	Lagged return on assets. Computation: lagged net income (ni) divided by lagged total assets (at).	COMPUSTAT
CR	Lagged current ratio. Computation: lagged total current assets (act) divided by lagged total current liabilities (lct).	COMPUSTAT
BUY	Buy percentage (buypct) – the proportion of the buy recommendations to the total number of recommendations.	I/B/E/S - Consensus Recommendations
HOLD	Hold percentage (holdpct) – the proportion of the hold recommendations to the total number of recommendations.	I/B/E/S - Consensus Recommendations
SELL	Sell percentage (sellpct) – the proportion of the sell recommendations to the total number of recommendations.	I/B/E/S - Consensus Recommendations

*Winsorized at 5% and 95%.

Appendix B


Distribution of Propensity Scores
Unmatched Treated Units
Matched Treated Units
Matched Control Units
Unmatched Control Units
0.0
0.2
0.4
0.6
0.8
1.0
Propensity Score