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***CEO performance-turnover sensitivity and board structure: Evidence from Israel***

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# **Abstract**

In this thesis, I examine the relation between firm performance and CEO turnover in Israeli firms and the effect of governance structure on this relation. I find positive relation between firm performance and CEO turnover in the following year. The relation is stronger between turnover and accounting-based performance measures and is weaker between turnover and stock-performance measures. I do not find this effect to be related to firms’ governance structure. Governance measures such as board size, the number of outside directors on the board, whether the firm has a controlling shareholder, and whether the CEO is a member of the board, do not have an effect on the performance-replacement relation. My results are consistent with the argument that CEO replacement in Israeli firms is sensitive to performance and that boards make similar replacement decisions irrespective of governance structure.

***CEO performance-turnover sensitivity and board structure: Evidence from Israel***

# **Introduction**

In this thesis, I examine the relation between firm performance and CEO turnover in Israeli firms. One of the critical roles of the board of directors is to oversee corporate officers and to replace them if necessary. In cases where the CEO underperforms, the board is required to assess the situation and, if necessary, replace the CEO with a more competent CEO.

The academic literature has examined whether indeed directors are more likely to replace their CEOs if they underperform. Studies such as Weisbach (1988), Huson, Parrino, and Starks (2001), Jenter and Kanaan (2015), Denis, Denis, and Sarin (1997) have all found that the frequency of turnover of CEOs is larger if they underperform, confirming the hypothesis that boards indeed evaluate CEOs and replace them based on their past performance.

Drawing on the hypotheses that certain board structures lead to more effective monitoring of the CEO, the academic literature has also examined whether there is a relation between board structure and sensitivity of CEO replacement to performance. For example, Weisbach (1988) finds that when the board is composed of inside directors, then the sensitivity of CEO replacement to performance is weaker, suggesting that directors who are also insiders are less-effective monitors. Goyal and Park (2002) and Brunello, Graziano, and Parigi (2003), find that when the CEO also holds the chairman position, the sensitivity of CEO replacement to performance is weaker, pointing to the weaker monitoring abilities of the board when the CEO has more board power. Denis et al. (1997) find that larger share stake of directors and the existence of a blockholder increase the likelihood of CEO turnover.

In this study, I focus on the relation between CEO turnover and performance in Israeli firms. There are several reasons why Israeli firms are an interesting laboratory to examine this relation. Past studies have focused on US firms, where share ownership structure is relatively dispersed and boards often hold a small stake in the companies they direct. In such an environment, providing incentives for directors to monitor and for shareholders to monitor replacements is of utmost importance. In contrast, most Israeli public companies have a controlling shareholder with the sole power to direct the corporation's affairs. In addition, in many cases one person or one family controls several different companies. The resulting board structure in these companies is one where the controlling shareholder has the majority of board seats, and only few board members are chosen by the minority shareholders. To the extent that concentrated ownership leads to stronger monitoring, we should perhaps observe stronger relation between replacement and performance in Israeli firms. However, to the extent that controlling shareholders might have different agendas than the rest of the shareholders, then perhaps we could see CEO replacement based on factors that are not necessarily related to firm performance. In addition, in the past, the controlling shareholder used to hold both the chairman and the CEO positions. Examining the relation between performance and CEO turnover in this unique environment is therefore important because it sheds additional light on the effectiveness of board monitoring in a concentrated ownership and controlling ownership environment.

In examining the performance-turnover sensitivity I focus on three main questions. The first is whether there is a negative relation between company performance and the replacement of the CEO by the board of directors. Following the approach in the existing literature, I examine the role of company performance relative to industry performance in affecting the decision to replace the CEO. The second question is whether CEO turnover-performance sensitivity relates to board structure. The third is whether CEO turnover-performance sensitivity relates to shareholder ownership structure, with an emphasis on whether the company has a controlling shareholder.

I test each hypothesis using Logit models, which estimate the probability of a CEO change. I use a panel data of 149 public Israel firms, from 2002 to 2018, involved 276 turnover cases.[[1]](#footnote-1) The first performance measure used is the annual return on the company’s stock minus the median stock return of the industry in the same year. The second measure of corporate performance is the return on assets calculated as earnings before interest and taxes (EBIT) divided by total assets minus the median return-on-assets of the industry. I find that for the two measurement methods there is strong inverse relation between CEO turnover and performance. Across both measures the board is more likely to replace CEOs who underperform. These results are consistent with the findings in previous literature (Weisbach 1988; Murphy and Zimmerman 1993).

To illustrate the magnitude of the turnover-performance relation, I use the estimated coefficients to predict the change in CEO turnover probability when firm performance improves from the lowest quintile to the highest quintile of performance. The results indicate that there is an increase in the probability of CEO turnover from 11.15% to 15.26% when the firm moves from the highest to the lowest stock-return performance quintile and an increase in the reduction from 18.07% to 10.69% between the highest and lowest ROA performance quintile.

I then show that CEO-turnover sensitivity to firm performance remains unchanged across different board and ownership structures. Specifically, CEO’s in firms with small boards are not more likely to be replaced due to past negative performance than CEOs of firms with large boards. CEO performance-turnover sensitivity remains unchanged also across firms with different proportions of external directors, across firms that do and do not have the CEO as their board member, and across firms with and without controlling shareholders.

Overall, my findings suggest that boards in Israel are in general active in replacing their CEOs after bad performance. My findings also suggest that boards perform their duty to replace the CEO after bad performance, irrespective of their structure or the ownership structure of the firm. Board incentives in Israeli firms seem strong enough to perform this task even in cases where more agency conflicts could prevail. The results stand in contrast to the findings in US firms where higher agency conflicts between board and shareholders lead to weaker relation between CEO replacement and performance.

This thesis contributes to the existing professional literature in two ways. First, this is the first analysis of CEO replacement decisions in Israeli firms. Israeli firms are unique in that they have concentrated ownership structure and many firms have controlling shareholders. This study therefore sheds new light on CEO replacement decisions in a governance regime that differs from that of the US.

Second, the findings in this study suggest that Israeli boards seem to be aligned in their replacement decisions with shareholder interests. This means that in the Israeli governance regime, directors’ incentives are aligned at least with respect to CEO replacement decision. This result is consistent with the argument that there is no particular board structure that should be applied to Israeli firms in order to motivate them to replace badly-performing CEOs, since all structures were found similar in replacing badly-performing CEOs. This result also implies that regulators should put less emphasis on imposing particular board structures on public Israeli firms in order to motivate boards to replace CEOs.

The rest of this study continues as follows: In section 2, I provide a review of the empirical literature. Section 3 lays out the data and the variables. Section 4 shows the results, and section 5 concludes.

# **Literature Review**

## **2.1 Firm performance and CEO turnover**

The board of directors is shareholders’ representative. It is responsible for determining company policy, managing corporate affairs at macro level, overseeing the CEO and replacing him/her if necessary (Jensen and Meckling 1976). Whether or not boards perform their duties as they should have been the interest of both academics and practitioners. Many have argued that boards are too lax at performing their obligations and not fully adhering to shareholders’ interests (e.g., Jensen, 1995).

For several decades, the academic literature has examined whether indeed boards perform their duties effectively and whether certain board and ownership structures promote a stronger alignment of incentives between board and shareholders (see, e.g., Shleifer and Vishny 1997 for a review of the literature). A central question that was examined in the empirical literature is whether boards replace CEOs who underperform. An examination of this relation provides a good indication of how well the board of directors functions as a supervisor and helps answer more advanced questions regarding the most effective ownership and board structures.

In general, the literature has found an inverse relation between poor performance and high CEO turnover. Studies such as Coughlan and Schmidt (1985), Weisbach (1988), Blackwell, James, and Weisbach (1994), Warner et al. (1999), Denis, Denis and Sarin (1999), Huson, Parrino and Starks (2001), Goyal and Park (2002), Jenter and Kanaan (2015), and Jenter and Lewellen (2017) all find that as the CEO performance worsen, the likelihood of a CEO turnover increases.

The literature examines this relation using both stock-based performance measures and accounting-based performance measures. Studies such as Weisbach (1988) and … Find that accounting-based performance measures have a stronger relation to CEO turnover than stock-based performance measures. Other studies such as Warner et al. (1999) find….

[Explain why they do not find similar results: different samples? Different methodology?]. Studies such as Jenter and Kanaan (2015) show that both CEO performance relative to the industry and industry performance itself have an effect on CEO turnover.

One concern regarding measuring CEO turnover is the fact that many CEOs leave their companies voluntarily, without being dismissed by the board. It is hard to assess whether a CEO left the company because he was forced to or because he decided to retire. Many researchers have tried to overcome this problem by making a judgement call about whether a turnover is forced or voluntary. For example, CEOs that reach the age of 65 are often considered CEOs who leave voluntarily (citations). Also, when a CEO mentions an illness that caused the replacement or if the CEO is moving to a larger company, it is often considered a voluntary replacement. Nevertheless, Jenter and Lewellen point to the fact that many replacements that are labeled voluntary replacements are in fact performance-induced replacements and therefore methodologies based on researcher judgement tend to underestimate true performance-induced replacements.

## **2.2 The effect of Board structure on the turnover-performance relation**

2.2.1 Director independence

A concern associated with delegating the authority to monitor the CEO to the board of directors is that board incentives might not be fully aligned with those of the shareholders. One way to examine the extent by which board incentives are aligned, is to examine whether the board has additional relations with the company they serve, which could conflict with their fiduciary duty to the shareholders.

One measure, offered by the academic literature, is the extent to which board members are also employees of the firm. Board members who are not employees of the firm are referred to as external directors, and board members who are employees of the firm are referred to as internal directors. To the extent that employees have agendas that differ from those of the shareholders, (e.g., they might prefer employment stability and higher salary), they might not necessarily maximize shareholder value. Therefore, the extent to which the board has external directors is a measure of alignment of incentives of the board.

I note that not all literature agrees that this measure captures level of conflicts of interest. For example, Fama and Jensen (1983) argue that internal directors are important because they serve as potential successors to the current CEO and it is important to include them on the board of directors so that external directors can evaluate them.

A related measure of the level of conflicts by the board, also offered by the academic literature, is the extent to which board members are independent. The definition of an independent director differs across studies, but it generally follows the definition of regulators, since regulators try to distinguish across directors based on the potential level of conflicts of interest that they might have. For example, the NYSE disqualifies directors from being independent if they were employed in the company they serve in the past three years, or if one of their family members worked in the company in the past three years, or if their own employer has material business ties with the company they serve on.

In Israel, regulators distinguish among three types of directors: the first type is “regular directors” who are voted on by the shareholders, the second type is the “outside directors” definedas directors with no connection to the controlling shareholder and are not officers in the company they serve[[2]](#footnote-2). The third are “independent directors” whose qualifications are identical to those of the outside director, but the terms of their appointment and dismissal are identical to those of regular directors.

Weisbach (1988) examines the sensitivity of CEO replacement to performance in companies that have a majority of external directors and compares them to the sensitivity of replacement to performance among directors who do not have a majority. He finds that boards with a majority of external directors have a larger sensitivity of CEO dismissal to performance than boards without such majority. Borokhovich, Parrino, and Trapani (1996) find results consistent with Weisbach (1988). When they examine the frequency of CEO replacements among boards with a majority of external directors and without it, they find that boards with a majority of external directors tend to replace their CEOs more frequently than those without such majority. They also find that the market reaction to CEO replacement is positive when the board has a majority of external directors, but is not positive when the board does not have a majority. This finding suggests that the market views replacement decisions made by a board with a majority of external directors more favorably than replacement decisions made by a board without such majority.

The question whether the presence of external directors has a positive effect on the turnover-performance sensitivity has been also examined outside the United States. Kato and Long (2016) find that the presence of an independent director on the board of Chinese firms has a positive and statistically significant effect on the likelihood that the CEO is replaced after bad performance. In contrast, Kang and Shivdasani (1995) find that the existence of external directors on the board of Japanese firms does not affect the likelihood of CEO replacement after bad performance.

I note that in recent years, regulators have imposed restrictions on the number of directors that are either employees or otherwise have business ties with the firm, and that can serve on the board. In the US, all public firms that are traded in the NYSE or NASDAQ need to have a majority of independent directors. In Israel, all companies need to have at least two directors that are chosen by the minority shareholders and they also impose restrictions on the number of employees who can serve on the board (AM I RIGHT? – Complete). These regulations are likely to affect the usefulness of the independence measure since all firms are required to adhere to a certain level of director independence.

2.2.2 CEO power over the board of directors

CEOs are often board members in the company they serve on and their position on the board can allow them to influence board decisions. For example, Shivdasani & Yermack (1999) show that CEOs of US companies influence the selection of new directors. Moreover, in the US, many large companies combine the CEO and the chairman position. A CEO who is also the chairman of the board has the authority to set the agenda of board meetings and to have stronger influence on board decisions. Goyal & Park (2002) has focused on how combining the chairmen and CEO positions affects the sensitivity of CEO turnover and firm performance. They find that the sensitivity of turnover to performance is weaker in firms where the CEO serves as the chairmen. Brunello et al. (2003) Their result is consistent with the argument that boards cannot effectively replace badly performing CEO’S when the CEO and chairman positions are held by the same individual (Jensen 1993).

Israel’s corporate law does not allow the CEO to serve also asthe chairman of the board, except in exceptional cases[[3]](#footnote-3). In fact, in many cases the CEO of an Israeli company is not even a member of the board. In light of this, in this work I will focus on the impact on the CEO’s presence as a director on the board on the turnover-performance sensitivity.

2.2.3 Board Size

Another important aspect of board structure that has been argued to affect board decisions is board size. The argument is that boards that are too large tend to be inefficient because of lack of coordination and free rider problems. Consistent with this argument, Yermack finds negative relation between firm value and board. Consistent with these arguments, practitioners recommended limiting boards’ size to seven or eight members and to encourage equity ownership by directors (Lipton & Lorsch 1992). I intend to examine the relation between board size and the sensitivity of turnover to CEO performance in this study.

## **2.3 The Effect of Ownership Structure on the Turnover-Performance Sensitivity**

The concentration of shareholders ownership in the corporation encourages shareholders to monitor managers. The reason is that when a shareholder has a large stake, the gains from monitoring the CEO are larger, providing incentives for the shareholder to exert effort in monitoring. Consistent with this argument, Denis et al. (1997) find that an existence of a blockholder among shareholders increases the likelihood of a CEO turnover.

The flip side of having a large shareholder on the board is that the shareholder can effectively control the company and can influence corporate strategy in a way that might benefit the shareholder at the expense of minority shareholders (La Porta, Lopez-de-Silanes, and Shleifer, 2000). Consistent with this argument, La Porta et al. (2000) find that the sensitivity of CEO turnover to performance decreases when there is the presence of a controlling shareholder. However, Kato and Long (2006) find that in Chinese companies, the presence of a controlling shareholder has led to more efficient supervision of company executives and to a higher probability of replacing them after bad performance. These contradictory results could suggest that a controlling shareholder has both incentives to maximize value and potentially also incentives to maximize externalities from the company.

In Israel, the ownership structure of public firms is characterized by concentrated ownership and controlling shareholders. Therefore, in this work, I will try to answer the question of whether the presence of a controlling shareholder in the company increases or decreases the sensitivity to the CEO's turnover as a result of poor performance.

# **Data and Variables**

## **3.1 Data**

To construct the sample, I start by identifying all companies listed on the Tel Aviv TA-125 index between the years 2002-2018. The list of companies that belong to the index over the years appears on the Tel Aviv Stock Exchange (TASE) website, starting in 2002.[[4]](#footnote-4) Therefore, the year 2002 is my starting year.

For each company that is part of the index for at least one year, I collect data across all the years where the company operates. For example, if a company appears in the index only in 2004, all the years between 2002-2018 where the company is traded, are added. For each year, I identify the name of the CEO and whether the CEO was replaced in that year. Dates of CEO replacements are found in the company’s announcements which are published on TASE website. Financial data is taken from the companies’ financial reports on TASE website. The data is collected on an annual basis. I classify CEO turnover as occurring in year t if the CEO is replaced between the last two quarters of year t-1 and the first two quarters of year t.

My final sample includes a total of 2423 CEO years for 174 companies with 335 cases of CEO changes between 2002 and 2018.

Table 1 represents the annual frequency CEO turnover in my sample. I show that, on average, firms experience likelihood of turnover of 14% per annum.

I record the companies' announcements regarding the replacement of the CEO as well as the reasons for the change as described in the Company's report. I do not include cases where turnover has been reported as death, poor health or acceptance of another position in the company (e.g., director, chairmen of the board).

## **3.2 Variables**

## **3.2.1 CEO performance**

To measure CEO performance, I use two different variables. The first variable is Return on Assets (ROA), defined as the EBIT / total assets. The second variable is Stock Return, defined as the cumulative one-year return on the company's shares – dividend reinvested (Gao, Harford, Li, 2017). Stock prices are from the Predicta database and accounting data is taken from the financial statements of each company, as published on the TASE website.

Performance measures are adjusted to industry by subtracting the median of the relevant industry returns for each company from the measured relevant return. For this propose the companies in the TA-125 index are classified into six sectors: Banks and Financial Services Companies, Holding Companies, Manufacturing Firms, Real Estate Companies, and Technology and Services Companies. I then divide the returns into year groups and rank each return relative to the returns of all companies in the industry group. The cumulative performance ranking of a firm in a given year is calculated as follows:

*Performance*= .

## **3.2.2 Board structure and ownership variables**

Following Yermack (1996) who found a significant relationship between board size and internal monitoring, my first measure for board structure is the board size. For each company, I collect information about the number of the board members to examine whether the size affects the sensitivity of CEO-turnover relation. Prior work has also shown that when the board is composed of internal directors, then the sensitivity of CEO replacement to performance is weaker (Weisbach 1988). Accordingly, I record the number of external directors and the number of independent directors serving for each of the sample years. The company law in Israel states that every public company must appoint two external directors. These directors cannot be dependent on controlling interests in the company and do not suffer from the dual competing interests[[5]](#footnote-5),. The External directors must be individuals (not corporations), Israel’s residents, who are qualified to be appointed as directors. Information regarding the number of internal and external directors allows me to calculate the proportion of inside directors and to examine the effect of insider-dominated boards similarly to Weisbach (1988).

In addition, Goyal and Park (2002) and Brunello et al. (2003) find that CEOs who also hold the chairmen positions have lower sensitivity of dismissal to performance. By law in Israelthe chairmen of a public company cannot serve as the CEO in the same company except in exceptional cases[[6]](#footnote-6). In light of this, in this work I examine whether a CEO who serves also as a director influences the likelihood of being dismissed. Consequently, for each of the CEOs in the sample, I record whether the CEO served as a director of the company in any given year.

Following Kato and long (2006), I use an indicator variable equal to one if the company has a controlling shareholder, where a controlling shareholder is defined as a shareholder who holds more than half of the Company shares. I collect data regarding the existence of a controlling shareholder for each of the companies in my sample and for each year.

## **3.2.3 Control variables**

Following the literature, I control for firm size, CEO age and CEO tenure. I measure size as the total book value of assets of the company. CEO age and CEO tenure are found in the financial reports.

## **3.3 Descriptive statistics**

Table 2 presents descriptive statistics for firms in the sample. All performance variables are winsorized at the 1st and 99th percentiles. Variable definitions are provided in the Appendix.

The mean (median) total assets is 41.9 Billion NIS (9.6 Billion NIS). The mean (median) CEO age is 52 (53) the mean (median) CEO tenure is 5.5 (4). In 1100 out of the 2,085 firm-year observations, the company had a controlling shareholder who hold more than 50% of the company equity. The mean (median) number of board members is 8 (8).

[Table I]

# **Results**

## **4.1 The relation between performance and CEO’s replacement**

To test whether performance affects CEO’s turnover, I start with a nonparametric test. I collect all firms-years with valid information on turnover performance. For the ROA and stock returns performance variables I have a total of 1,866 and 2,014 firm-year observations, respectively. I separate the sample into performance quintiles and calculate the turnover proportion in every performance quintile. I then test whether there is a significant difference between turnover proportion in the best-performance quintile and the worst-performance quintile. I present the results in Table 3 panel A.

The data in panel A indicate that firms with poor performance have higher turnover proportion than firms with high performance. Firms that belong to the lowest ROA performance quintile have a turnover rate of 19.3% compared to 8.58% among firms with the highest ROA performance. Similarly, firms that belong to the lowest stock-return performance quintile have a turnover rate of 15.63%, compared to 10.42% among firms with the highest stock-return performance. These results are highly significant across both performance variables. These results are consistent replicate the results of Weisbach (1988), when in my results I found larger effect.

The above analysis does not control for potential unobservable variables that could affect CEO turnover. For example, CEO age and CEO tenure could differ across performance quintile and they could also affect the likelihood of CEO turnover. To control for potential unobserved variables that could relate to CEO dismissal and could affect the results, we perform a logistic regression analysis. The dependent variable in the regression is CEO turnover which take the value 1 if the CEO was replaced during the previous year and 1 otherwise. The independent variables are the firm’s performance in year t, the firm’s log total assets, CEO age, CEO tenure and dummy variables for different years to account for year effects. I report results for both performance measures Table 3 panel B.

The first column shows results for the stock return as a performance measure. The coefficient of the return variable is negative and significantly different from zero at the 5% significance level. This means that there is higher probability of CEO to be replaced when performance is poor. When all other variables are constant in their average value, firm in the bottom second decile of stock return rank performance which were 32% lower than the average rank, the CEO has 15.26% chances to be replaced, while the CEO of firm in the second top performance decile that has rank performance 28% higher than the average rank performance, has only 11.15% chances to be replaced. These results are consistent with the nonparametric tests where CEOs with poor stock return performance have a probability of 15.63% to be replaced, compare to CEOs in high performing firms who have a probability of 10.42% to be replaced. The second column shows results for ROA as a performance measure. As expected, the coefficient of the performance variable is negative and significant in 1% level, which means that the probability of CEO to be replaced is influenced negatively by ROA performance. These results are similar to the stock returns performance variable. The coefficient means that the probability that a CEO of firm with poor performance (second decile ROA ranked performance) is replaced is 18.07% while CEO in a high performing firm is replaced with probability of 10.69%. In the nonparametric test for ROA the gap was even larger, with 19.3% probability for firms with poor performance compared to 8.58% for firms with high performance.

Other characteristics that consistently effect CEO turnover probability are CEO tenure, CEO age and firm size (total assets). An increase in log total assets from the lowest percentile to the highest percentile is associated with 13.56% decrease in CEO turnover probability for firms with high stock return performance and 11.33% decrease for companies with poor stock returns performance. For the ROA performance variable in the transition between the top and bottom log total assets percentile we observed 11.6% increase in the probability of CEO to be replaced in firms with poor performance and increase of 14.1% in firms with high performance. The coefficient on the age variable is positive and significantly different from zero at the 5% level for both performance variables. This result suggests that older CEOs tend to be replaced more often than younger CEOs. This result is consistent with the fact that older CEOs might be replaced more often because they might choose to retire. An opposite trend is found for tenure. The coefficient of the tenure variable is negative and significant at the 5% level, which means that there is higher probability of CEO to be replaced when he has short tenure. The explanation for this trend can be that more tenured CEOs have longer history of performance and therefore a year with bad performance might not constitute a strong enough signal for replacement. Another possibility is that CEOs with longer tenure have more power within the firm and therefore it is harder for the board to replace them if they underperformed.

## **4.2 CEO turnover-performance Sensitivity and Board structure**

## **4.2.1. Board size**

I continue the analysis by examining the effect of performance on CEO turnover across different board and ownership structures. Table 4 examines the sensitivity of replacement to performance across firms with different board size. Past literature (e.g., Yermack, 1996) has shown that firms with large boards tend to underperform firms with small boards and attributed this phenomenon to the incompetency of large boards to oversee the organization due to communication and free-rider problems. small In the nonparametric test, I collect all firms-years with valid information on turnover cases, performance and board size. For the ROA and stock returns performance variables I have a total of 1848 and 1868 firm-year observations respectively. I separate the sample into three board-size groups and into five performance quintiles and calculate the turnover proportion in every sub-group. I then test whether there is a significant difference in turnover proportion between large boards and small boards. I present the results in Table 4 panel A.

The data in panel A indicate that firms with large boards have higher turnover proportion than firms with small boards. Turnover proportion for large board is 13.61% while the total turnover proportion in small boards is 11.33%. The sensitivity of replacement to performance does not differ across board sizes when using accounting performance measure. The difference-in-difference in the proportions of replacements between the lowest and the highest performance quintiles is -0.0058 and it is not statistically different than zero. The difference-in-difference in the proportions when using market performance measures is 0.0752. This means that there is larger sensitivity of turnover to performance in large boards than in small boards when using market-based performance measures. The difference is significant at the 10% level.

The results do not indicate that agency conflicts, as measured by board size, affect the sensitivity of CEO replacement to performance. When using accounting measures, there is practically no difference in the sensitivity between large boards and small boards, and when using market-based measures, the sensitivity is higher in large boards, which goes against the agency prediction that large boards are less effective monitors. The findings that firms with large boards tend to rely more on market-based performance measures than firms with small boards can be attributed to the fact that large boards are mostly associated with large firms. To the extent that stock price movements better reflect performance in the more liquid and larger firms, we should observe stronger reliance on stock-based performance measures in firms with larger boards.

To account for unobservable attributes such as size, which could affect the variation in replacement-performance sensitivities, we run a logistic regression. The dependent variable in the regression is CEO turnover which take the value 1 if the CEO is replaced during the year and 0 otherwise. The independent variables are the firm’s performance in the previous year, the firm’s log board size which take the log number of members in the board for each year, board size multiply by performance measurement, the firm’s log total assets, CEO age, CEO tenure and dummy variables for different years to account for year effect. We report results for regressions in which performance is measured by ROA and stock returns. Results are presented in panel B table 4.

The coefficients on the performance variables for both measures are now positive and not significantly different from zero (probably as a result of adding the variable performance\*board size.) The coefficients of the interaction terms of performance and board size variables are positive but not significant at any conventional significant level. The coefficients of the firm’s log board size are not significant. These results suggest that all the sensitivity of replacement to performance is similar across firms with different board sizes. We therefore cannot attribute stronger replacement performance sensitivity to smaller boards.

## **4.2.2. CEO who serves as a director**

A second measure for board structure is a CEO who serves either as a chairman of the board or as a director in the board. Past studies have shown that CEOs who serves as the chairmen of their boards tend to have more power in affecting corporate decisions. This power can reduce the ability of the board to dismiss the CEO if the CEO underperforms. Consistent with this argument Goyal and Park (2002) and Brunello et al. (2003) find that CEOs who also hold the chairmen positions have lower sensitivity of dismissal to performance.

I start with a nonparametric test. I collect all firms-years with valid information on turnover cases, performance and the roles the CEOs have in their firms beyond their position as CEOs. I first separate the sample into two groups, firms with CEOs who are board members (either as directors or as chairmen) and firms with CEO’s who are not part of the board of directors. I then separate the sample into performance quintiles and calculate the turnover proportion in every subgroup. I test whether there is a significant difference between performance-turnover sensitivity between the two groups. Table 5 panel A presents the results. Across both performance measures, there is a higher CEO turnover proportion in firms when the CEO is not a board member. When I test the turnover-performance sensitivity to the presence of the CEO as a board member I do not find any significant results. Regardless of the performance measure used, the increase in the likelihood of turnover when moving from the highest performance tercile to the lowest tercile is not statistically different across the two groups.

In panel B, I perform a logistic regression analysis, controlling for size, tenure and CEO age. The dependent variable in the regression is CEO turnover which take the value 1 if the CEO was replaced during the previous year and 1 otherwise. The independent variables are the firm’s performance in year t, the CEO\_DIRECTOR variable which take the value of 1 if the CEO was part of the board of directors and 0 otherwise, CEO\_DIRECTOR multiplied by performance measure, the firm’s log total assets, CEO age, CEO tenure and dummy variables for different years to account for year effect. Results are presented in panel B table 5. Across both specifications, the coefficients of the CEO\_DIRECTOR and the CEO\_DIRECTOR\* performance variables are not significantly different from zero in the conventional level. These results suggest that, the way boards decide to replace the CEO of a company is not significant different whether the CEO is a director or whether he is not. We therefore cannot conclude that the presence of the CEO on the board affect the sensitivity of replacement to performance.

## **4.2.3. Board independence**

The third measure of board structure is the level of board independence within the board, measured by the proportion of outside directors on the board. I first separate the sample into groups by the proportion of outside directors. I then separate the sample into performance quintiles and calculate the turnover proportion in every subgroup. I test whether there is a significant difference between CEO turnover proportion in firms with high proportion of outside directors and firms with lower proportion. Table 6 panel A presents the results. Across both performance measures, there is higher CEO turnover rate in firms with low proportion of outside directors. When testing the relation between the level of independency and turnover-performance sensitivity, I do not find any significant results.

Panel B shows the results of a logistic regression analysis. The dependent variable in the regression is CEO turnover, which take the value 1 if the CEO is replaced during the year and 0 otherwise. The independent variables are firms’ performance in year t, the proportion of outside directors on the board, the interaction between the proportion of outside directors and the performance measure, and control variables.

Across both specifications, there is no statistically significant relation between the proportion of outside directors and CEO replacement. The rest of the explanatory variables have a sign consistent with the previous findings: performance is negatively related to CEO turnover; higher CEO tenure leads to lower likelihood of replacement and higher CEO age leads to higher likelihood of replacement.

The findings stand in contrast to the findings in previous studies (e.g., Weisbach, 1988) which find that the proportion of outside directors is positively related to the turnover-performance sensitivity.

## **4.3 CEO Turnover-Performance Sensitivity and Ownership Structure**

I continue the examination by studying the effect of the presence of controlling shareholder on the relationship between performance and CEO’s turnover. Table 7 examines the sensitivity of replacement to performance across firms with and without controlling shareholders. Past literature (e.g., Denis, 1997) has shown that ownership structure influence internal monitoring and therefor, influence the probability of officers to be replaced regarding bad performance. In the nonparametric test, I collect all firms-years with valid information on turnover cases, performance and ownership i. For the ROA and stock returns performance variables I have a total of 1863 and 2014 firm-year observations respectively. I separate the sample into two groups and into three performance quintiles and calculate the turnover proportion in every sub-group. I then test whether there is a significant difference in turnover proportion between firs with controlling shareholder and firms without. I present the results in Table 7 panel A.

The data in panel A indicate that the presence of controlling shareholder has no effect on turnover probability. Turnover proportion for companies with shareholder is 12.52% while the total turnover proportion in companies without shareholder is 13.05% using market performance measures and 12.61%, 12.7% when using accounting performance measure and these numbers were not found different from each other in any significant kevel. In addition, the sensitivity of CEO turnover to performance does not differ across those two types of companies when using accounting and market performance measure. The difference-in-difference in the proportions of replacements between the lowest and the highest performance quintiles is 0.028 when using accounting performance and it is not statistically different than zero. The difference-in-difference in the proportions when using market performance measures is -0.017. This means that there is no evidence to sensitivity of turnover to performance in companies with controlling shareholder.

The results do not indicate that agency conflicts, which derive from the existence or non-existence of controlling shareholder, affect the sensitivity of CEO replacement to performance. When using both measures, there is practically no difference in the sensitivity between firms with controlling shareholder and firms without controlling shareholder. The findings can be attributed to the fact that both types of ownership associates with the same level of monitoring when replacing the CEO.

To account for unobservable attributes such as size, which could affect the variation in replacement-performance sensitivities, we run a logistic regression. The dependent variable in the regression is CEO turnover which take the value 1 if the CEO is replaced during the year and 0 otherwise. The independent variables are the firm’s performance in the previous year, controlling shareholder which take the value 1 if the company has a controlling shareholder and 0 otherwise, controlling shareholder multiply by performance measurement, the firm’s log total assets, CEO age, CEO tenure and dummy variables for different years to account for year effect. We report results for regressions in which performance is measured by ROA and stock returns. Results are presented in panel B table 7.

The coefficients on the performance variables for both measures are negative and significantly different from zero at 10% level. When using accounting measures the coefficients of the interaction terms of performance and controlling shareholder variables is positive and significant at 10% level and when using market performance measures the coefficients is positive but not significant at any conventional level. These results suggest that when using market-based measures there is practically no difference in the sensitivity between firms with concentrate control. The finding that boards in companies with controlling shareholders tend to be batter monitors can attribute to the fact that the sensitivity of replacement to performance is higher when using accounting measures.

## **4.4 CEO turnover-performance Sensitivity and Changes in Governance Regimes**

I next explore how the relationship between performance and CEO turnover changed over the time relative to changes in governance mechanism which took place in Israel in 2011. In this year several amendments have been adopted with the aim to increase the board’s independence. I examine whether these changes affect the sensitivity of replacement to performance by testing whether there is a significant difference in turnover proportion between the years 2002-2011 and the years 2012-2018.

To account for unobservable attributes, which could affect the variation in replacement-performance sensitivities, I run a logistic regression. The dependent variable in the regression is CEO turnover which takes the value 1 if the CEO is replaced during the year and 0 otherwise. The independent variables are the firm’s performance in the previous year, year 2011 which take the value 1 if the year observation is before 2012 and 0 otherwise, year 2011 multiply by performance measurement, the firm’s log total assets, CEO age, CEO tenure and dummy variables for different years to account for year effect. I report results for regressions in which performance is measured by ROA and stock returns. Results are presented in table 8.

The coefficients on the performance variables for accounting measures are negative and significantly different from zero at 1% level while the coefficients on the performance variables for market measures are positive but not significantly different from zero. When using both measures the coefficients of the interaction terms of performance and year 2011 variables is not significant at any conventional level. These results suggest that changes that have been made did not influence the relationship between performance and turnover. We therefore cannot attribute stronger replacement performance sensitivity to post regulation period.

# **Conclusion**

Using comprehensive data on Israel’s public firms from 2002 to 2018, I examine the relation between CEO performance and CEO turnover. I find, for both stock market performance and accounting measure, that there is a strong correlation between CEO turnover and firm performance. The worse the performance, the higher the likelihood that the CEO is going to be replaced.

Additionally, I find that board characteristics and ownership structure do not influence the sensitivity of turnover to CEO performance. Regardless of whether the firm is governed by a small or a large board of directors, or whether there are many or few external directors on the board, or whether the firm has a controlling shareholder, the relationship between the CEO turnover and the firm performance remains unchanged.

My findings shed light on the effectiveness of corporate boards in Israel with respect to CEO replacement decisions. My findings indicate that boards are active and react to changes in CEO performance. Moreover, the results indicate that different governance structures across Israeli firms seem to be as effective in the replacement decisions and that regulations in recent years have not changed this relation.

# **Appendix -Variable Definitions**

STOCK RETURN ADJUSTED TO INDUSTRY: The cumulative return on the stock firm excluding dividends. To adjust the returns for industry, we divided the sample into year groups, each year group was divided into six sector groups, the median value of each subgroup was subtracted from each observation in the subgroup.

ROA ADJUSTED TO INDUSTRY: Return on assets was calculated as EBIT divided by the average total assets of the present and last year (EBITt/AVERAGE (TAt ,TAt-1)). To adjust the returns for industry, we divided the sample into year groups, each year group was divided into six sector groups, the median value of each subgroup was subtracted from each observation in the subgroup.

STOCK RETURN RANKED: We ranked each adjusted observation as follow: we numerate each observation from high to low such just the highest return of each group takes the value of 1 and then we used the following question: .

ROA RANKED: To rank the ROA we used the same method as mentioned above.

PROPORTION OF OUTSIDE DIRECTORES: The fraction of outside directors on a board. Board information is obtained from the financial reports for each firm for each year which were published in the TASE website.

BOARD SIZE: The number of members who served in a board.

CEO TURNOVER: An indicator variable that takes a value of 1 if a CEO is replaced in the last six months of the year or in the first six months of the next year, and 0 otherwise.

CEO\_CHAIRMAN OF THE BOARD:

CEO\_NOT DIRECTOR: An indicator variable that takes a value of 1 if the CEO is not part of the Board, and 0 otherwise.

WEDGE: The difference between Vote % and Equity %

VOTE %: The percentage vote rights held by the firm’s largest shareholder.

EQUITY %: The percentage ownership held by the firm’s largest shareholder.

CONTROLING SHAREHOLDER: An indicator variable that takes a value of 1 if the firm’s largest shareholder owns more than 50 percent of the firm

CEO\_ CONTROLING SHAREHOLDER:

CEO\_AGE: Age of the CEO.

CEO\_ TENURE: The number of years where the CEO served in that roll

FIRM SIZE: Total Assets

YEAR: An indicator variable that takes a value of 1 if there is a CEO turnover in the specific year, and 0 otherwise.

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|  |  | Table 1 |  |
|  |  | CEO Turnover over Time |  |

Table 1 presents the annual frequency of CEO turnover of firms in the sample. The sample consists of all firms that appeared in the Tel-Aviv 100 index at least once between the years 2002-2018. Firm-year observations associated with IPOs or going-private transactions are removed from the sample. Firms with less than six years of data are removed. In addition, firm-year observations where CEO tenure is less than two years are removed.



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|  |  | |  |  |  |  | | --- | --- | --- | --- | |  |  | Table 2 |  | |  |  | Summary statistics |  | |  |

Table 2 presents summary statistics of firms in the sample. The sample consists of all firms that appeared in the Tel-Aviv 100 index at least once between the years 2002-2018. Firm-year observations associated with IPOs or going-private transactions are removed from the sample. Firms with less than six years of data are removed. In addition, firm-year observations where CEO tenure is less than two years are removed. The final sample consists of 2,197 firm-year observations. Financial information is obtained from the Tel-Aviv Stock Exchange website. Definitions of all variables are provided in Appendix A. Performance variables are winsorized at the 1st and 99th percentiles.



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| Table 3  CEO Turnover-Performance |
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In panel A, firm-years are sorted into five quintiles according to their performance relative to the industry. The statistics are for differences in turnover proportions between high and low performance quintiles. Panel B presents logit regression results of CEO turnover against firm performance. Column 2 measures firm performance using the return on assets of the firm in the year prior to the resignation. Definition of variables appears in the Appendix. The sample consists of all firms that appeared in the Tel-Aviv 100 index at least once between the years 2002-2018. Firm-year observations associated with IPOs or going-private transactions are removed from the sample. Firms with less than six years of data and firm-year observations where CEO tenure is less than two years are removed. \*\*\*, \*\*, \* represents significance at the 1%, 5%, 10% level, respectively.

*Panel A: CEO Turnover and firm performance*

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*Panel B: CEO Turnover and firm performance*

*Dependent variable: CEO Turnover*

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| Table 4  CEO Turnover-Performance Sensitivity and Board Size |
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In table 4 panel A firms in each group are divided into those that have large boards and those that have small boards. Each group is then divided into five performance quintiles. The statistics are for differences in turnover proportions between large board and small board for each performance level. Panel B presents Logit regressions of CEO turnover against performance and board size. Definition of variables appear in the Appendix. The sample consists of all firms that appeared in the Tel-Aviv 100 index at least once between the years 2002-2018. Firm-year observations associated with IPOs or going-private transactions are removed from the sample. Firms with less than six years of data and firm-year observations where CEO tenure is less than two years are removed. \*\*\*, \*\*, \* represents significance at the 1%, 5%, 10% level, respectively.

*Panel A: CEO Turnover-Performance Sensitivity and Board Size*

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*Panel B: CEO Turnover-Performance Sensitivity and Board Size*

*Dependent variable: CEO Turnover*

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|  |  | | **Table 5** |  | |
|  |  | CEO Turnover-Performance Sensitivity and CEO who serves as a director | | |  |

In table 5 firms in each group are divided into those where the CEO served also as a director and those where the CEO was not part of the board. We then divided each firm- year according to their performance quintile. The statistics are for differences in turnover proportions between firms with CEO who served as a director and CEO’s who did not serve as director. The sample consists of all firms that appeared in the Tel-Aviv 100 index at least once between the years 2002-2018. Firm-year observations associated with IPOs or going-private transactions are removed from the sample. Firms with less than six years of data and firm-year observations where CEO tenure is less than two years are removed. \*\*\*, \*\*, \* represents significance at the 1%, 5%, 10% level, respectively.

*Panel A. Turnover-Performance Sensitivity and CEO- Director*



*Panel B. Turnover-Performance Sensitivity and CEO- Director*

*Dependent variable: CEO Turnover*

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| **Table 6**  CEO Turnover-Performance Sensitivity and Board independence |
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In table 5 firms in each group are divided into those where the board contain high proportion of outside directors and those where the board contain low proportion of outside directors. We then divided each firm- year according to their performance quintile. The statistics are for differences in turnover proportions between firms with high proportion of outside directors and firms with less dependency in their board structure. The sample consists of all firms that appeared in the Tel-Aviv 100 index at least once between the years 2002-2018. Firm-year observations associated with IPOs or going-private transactions are removed from the sample. Firms with less than six years of data and firm-year observations where CEO tenure is less than two years are removed. \*\*\*, \*\*, \* represents significance at the 1%, 5%, 10% level, respectively.

*Panel A. Turnover-Performance Sensitivity and Board Independence*

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*Panel B. Turnover-Performance Sensitivity and Board Independence*

*Dependent variable: CEO Turnover*

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| **Table 7**  CEO Turnover-Performance Sensitivity and Controlling Shareholder |
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In table 7 firms in each group are divided into those that have Controlling Shareholder and those that do not have Controlling Shareholder. We then divided each firm- year according to their performance quintile. The statistics are for differences in turnover proportions between firms with controlling shareholder and firms without controlling shareholder for each performance level. The sample consists of all firms that appeared in the Tel-Aviv 100 index at least once between the years 2002-2018. Firm-year observations associated with IPOs or going-private transactions are removed from the sample. Firms with less than six years of data and firm-year observations where CEO tenure is less than two years are removed. \*\*\*, \*\*, \* represents significance at the 1%, 5%, 10% level, respectively.

*Panel A. Turnover-Performance Sensitivity and ownership structure*

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*Panel B. Turnover-Performance Sensitivity and ownership structure*

*Dependent variable: CEO Turnover*

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| **Table 8**  CEO Turnover-Performance year perspective |
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Table 8 Presents Logit regressions of CEO turnover against performance and the changes that have been made in the year 2011. The sample consists of all firms that appeared in the Tel-Aviv 100 index at least once between the years 2002-2018. Firm-year observations associated with IPOs or going-private transactions are removed from the sample. Firms with less than six years of data and firm-year observations where CEO tenure is less than two years are removed. Performance is measured in both Stock returns (column 1) and Return on Assets (column 2). Definition of variables appear in the Appendix. P-value in parentheses. \*, \*\*, \*\*\* represents significance at the 10%, 5%, and 1% levels respectively.

*Dependent variable: CEO Turnover*



**תקציר**

בעבודת זו חקרתי את רגישות הקשר בין ביצועי חברות לתחלופת מנכ״לים בקרב חברות ציבוריות בשוק ההון בישראל. חיזוי הסתברות החלפת המנכ״ל נעשה בעזרת תשואת מניות החברה ותשואה חשבונאית על נכסי החברה כאמצעי למדידת ביצועי המנכ"ל. על פני תקופת המדגם הנבדקת נמצא קשר מובהק בין ביצועים קודמים נמוכים ותחלופת המנהל הכללי עבור שני אומדני מדידת הביצועים שנבחרו. בנוסף, כאשר נבחנה רגישותו של קשר זה למבנה דירקטוריון ומבני בעלויות שונים נמצא כי לפרופורציית הדירקטורים החיצונים בדירקטוריון החברה, גודל הדירקטוריון, חברותו של המנכ״ל בדירקטוריון החברה ולנוכחותו של בעל שליטה לא קיימת השפעה מהותית על רגישות הקשר בין ביצועי החברה לתחלופת המנכ"ל.

עבודה זו נכתבה בהדרכתו של פרופסור יניב גרינשטיין מהתוכנית לתואר שני בכלכלה פיננסית, בית ספר אריסון למנהל עסקים, המרכז הבינתחומי הרצליה.

המרכז הבינתחומי הרצליה בית ספר אריסון למנהל עסקים תוכנית תואר מוסמך בכלכלה פיננסית

רגישות הקשר בין ביצועי חברות לתחלופת מנכ״לים– עדות משוק ההון בישראל

שחר וידברג

עבודה זו מוגשת כחלק מהדרישות לשם קבלת תואר מוסמך בכלכלה פיננסית בבית הספר אריסון למנהל עסקים של המרכז הבינתחומי הרצליה

אפריל 2019

1. The sample consists of firms that are part or were part of the Tel Aviv 100 index between the years 2002-2016. [↑](#footnote-ref-1)
2. See section 240 (b) of the Israeli Corporate Law (2016). [↑](#footnote-ref-2)
3. See Section 95 (A) of the Israeli Corporate Law (2016) [↑](#footnote-ref-3)
4. Available at <https://info.tase.co.il/heb/statistics/indices/pages/indices.aspx?table=1> [↑](#footnote-ref-4)
5. See section 239 A of the Israeli Corporate Law (2016) [↑](#footnote-ref-5)
6. See section 95 (A) of the Israeli Corporate Law (2016) [↑](#footnote-ref-6)