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Executive Compensation in Publicly Traded Companies in Israel[1]

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תגמול בכירים בחברות ציבוריות בישראל

מיטל גראם רוזן

תקציר

בנייר זה אני סוקרת את תגמול המנהלים הבכירים (מנכ"לים ויושבי ראש דירקטוריון) בשנים
1995-2018 בישראל, ובודקת מהם הגורמים אשר השפיעו על התפתחות גובה התגמול והשינויים
בו לאורך השנים. לשם כך, נעשה שימוש בבסיס הנתונים הגדול והעכשווי ביותר שנאסף בישראל
עד כה על נתוניהם האישיים ושכרם של מנהלים בחברות ציבורית. לפי הממצאים המוצגים
במחקר זה, היה גידול בתגמול המנהלים בתקופה המוקדמת יותר של בסיס הנתונים, אשר הגיע
לשיא   ב-2007, וירידה משמעותית בו בתקופה שאחרי – 2008-2018. שתי המגמות שצוינו בלטו
יותר בקרב מנהלים בחברות הפיננסיות בהשוואה למנהלים בחברות הלא פיננסיות. כתוצאה מכך,
תגמול המנהלים הממוצע בחברות הפיננסיות כמעט והגיע ברמתו לתגמול המנהלים בחברות הלא
פיננסיות. בנוסף, ממוצע תגמול המנהלים הבכירים בחברות ציבוריות גדל בשיעור נמוך יותר
בהשוואה לממוצע השכר למשרת שכיר בתקופה הנסקרת, ועל כן אינו היווה גורם עיקרי לגידול
באי השוויון, כפי שנטען לעיתים. את הירידה בתגמול המנהלים בשנים 2008-2018 ניתן לייחס,
לפי ממצאי מחקר זה, בעיקר לרגולציות העיקריות שחוקקו בישראל בעשור האחרון כדי לרסן
את שכר הבכירים – תיקון 16, תיקון 20 והחוק להגבלת שכר הבכירים בחברות הפיננסיות שתוקן
בשנת 2016. בהתאם למחקרים קודמים שנכתבו בנושא, גודל החברה נמצא כגורם המשפיע ביותר
על גובה שכר הבכירים. עוד מצאתי כי רגישות שכר הבכירים לביצועי הפירמות הוא חלש
בהשוואה למדינות אחרות. יתר על כן, בחברות הפיננסיות לאחר החלת שלוש הרגולציות
העיקריות, הקשר בין תגמול המנהלים לביצועים המנייתיים נחלש, בעוד הקשר בין תגמול
המנהלים לביצועים החשבונאיים התחזק.

Executive Compensation in Publicly Traded Companies in Israel

Meital Graham Rozen

Abstract

In this paper, I examine determinants and trends in top executive compensation in Israeli publicly traded firms between the years 1995–2018. I find a large increase in executive compensation in the earlier period of the sample culminating in 2007, especially in financial firms. Between 2008 and 2018, compensation decreased significantly, again especially in financial firms. As a result, the average executive compensation in financial firms has neared the level of the average executive compensation in nonfinancial firms. The average ratio between top executive compensation in public companies and the average compensation per employee position in 2018 has decreased below its 1995 levels, because of a higher increase in average compensation per employee position during this period. My results show that this decrease in executive compensation can be attributed mainly to regulations that were implemented in Israel in the last decade. Consistent with prior studies, I find that company size is the most important determinant of executive compensation. Pay-performance sensitivity is weak compared to other countries. After the main regulations were implemented, pay-stock performance sensitivity has weakened in financial firms while pay-accounting performance sensitivity has strengthened. In non-financial firms, however, there was no change in pay-accounting performance sensitivity in this period, while pay-stock performance sensitivity increased.

1. Introduction

The issue of executive compensation in Israel and worldwide has featured prominently in the public discourse for the past few decades. One perspective on this is that senior executives shoulder a heavy responsibility; they are called to account for business and/or professional failures, and the level of effort required from them is high. High levels of executive compensation may provide incentives to workers who aspire to reach such positions, and thereby improve the firm's performance (Lazear and Rosen, 1981). This conjecture is consistent with the "shareholder value" view, according to which executives' contracts are the outcome of shareholder value-maximizing firms that compete with each other in an efficient market for managerial talent.[1] The "rent extraction" view[2] is that current compensation practices contradict the predictions of traditional agency models.[3] Thus, contracts are not chosen by boards to maximize shareholder value, but instead by the executives themselves to maximize their own rents. This perspective has been taken very seriously by both scholars and policymakers, especially after the Great Financial Crisis of 2007–08, and has led to major regulatory changes.

I survey the development of top executive (CEO and chairperson of the board) compensation in the past twenty-four years in Israel, and explore the determinants of the level and changes to compensation. I use a hand-collected panel of all Israeli publicly traded (listed on the Tel-Aviv Stock Exchange (TASE)) firms with published information on top executives' compensation over the period 1995 to 2018 (778 firms in total). This is the largest and most up-to-date data assembled on the personal characteristics and compensation of executives in publicly traded companies in Israel, and a contribution to the assessment of executive compensation in Israel.

The literature on executive compensation in publicly traded companies in Israel is relatively poor. There are two recent studies by Lauterbach and Yosef. Their 2022

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[1] This view broadens what is commonly referred to as the "optimal contracting" view.
[2] This perspective is espoused most prominently by Bebchuk and Fried (2004).
[3] Edmans and Gabaix (2016) summarize that these are the two main approaches today to explain executive compensation.

paper studies whether progress in corporate governance trims the pay premium of owner CEOs (CEOs that are members of the control group) over professional non-owner CEOs, and their 2021 paper addresses the main questions regarding executive compensation in Israel. Studies that refer to the consequences of the regulations include Fried et al. (2020), on the effect of minority veto rights on controller pay tunneling, Abudy et al. (2020) who examine how investors reacted to the restriction of executive compensation in financial firms (Hereafter "The 2016 Law") in a short-term event window around the passage of the law and Zviran et al. (2020) who examine the effects of Amendments No. 16 and No. 20 to the Israeli Companies Law of 1999 on executive compensation in Israel. Studies that describe the development of executive compensation in Israel relate to the years 2012–14 (Gershgoren, Sabbach and Teper [2015]) and to the period between 1994 and 2001 (R. Barak, S. Cohen, S. and B. Lauterbach [2007]), who include in their sample only companies in which the CEO was not replaced during the sample period. All other studies prior to Barak et al. (2007) analyzed a sample that includes CEO compensation for a period of up to 4 years before 1998.[4]

In this paper, I find that average top-executive compensation increased by 17 percent (real) during the sample period, while average wage per employee post increased in this period by 35 percent (real). The trends of executive compensation in financial and nonfinancial firms are essentially similar, but the rates of change are different. Compensation among executives in financial firms increased until 2007 and decreased between 2008 and 2018 at much higher rates compared to executives in nonfinancial firms. By 2018 the average executive compensation in financial firms had neared the level of the average executive compensation in nonfinancial firms (NIS 1.9 million vs. NIS 1.8 million). It should be noted that the decrease in compensation after 2010 can be attributed at least partially to three main

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[4] Hauser and Gizbar (1992) used 57 companies in the manufacturing industry during the period 1988-1990; Zussman and Mehrez (1992) used 385 companies between 1987 and 1991; Hauser, Solomon, Shohat and Tanchuma (1995) used all publicly traded companies in the years 1993-1994; Ang, Hauser and Lauterbach (1997) used 434 firms in the years 1992-1994; Bar-Yosef and Talmor (1997) used 234 firms in specific industries over the years 1991-1994; Hauser, and Ofir (1998) used 205 publicly traded firms over the years 1993-1996 and Amzaleg and Mehrez (2002) used 186 public traded companies in 1997.

regulations that were introduced to curb executive pay — Amendment No. 16, Amendment No. 20 and the "Remuneration for Office-Holders in Financial Corporations (Special Approval and Inadmissibility of Expenses for Tax Purposes due to Irregular Remuneration) Law, 5776-2016" (the 2016 Law[5]). This finding is consistent with Zviran et al. (2020) who find that Amendment No. 16 and Amendment No. 20 halted the increase in executive compensation in the period before (2003-2010). Another notable point is that the rate of decrease was higher in financial firms in comparison to nonfinancial firms not only as a result of the 2016 Law, which restricts executive compensation in financial firms, but also as a result of Amendments No. 16 and 20. Because Amendment No. 16 and Amendment No. 20 were introduced within a relatively short time period, I cannot isolate the individual effect of each amendment on executive compensation.

As expected, I find that company size is the main explanatory variable for the level of executive compensation. The results suggest that the pay-performance sensitivity is weak, increases with the size of the firm (accounting performance only), and changes over the years. Pay-stock performance sensitivity has weakened over the years in financial firms, so that between 2011 and 2018, the years in which the three main regulations were implemented, no correlation is found between the two. In contrast, in non-financial firms it has increased. Pay-accounting performance sensitivity, however, has strengthened after applying the regulations in financial firms, while in non-financial firms it has not changed. This result is partially consistent with the literature, which suggests that the sensitivity of CEO pay to firm performance improves following executive compensation regulation. Ferri and Maber (2013) examine the effect on CEO pay of the legislation introduced in the United Kingdom (UK) at the end of 2002 requiring publicly traded firms to submit an executive remuneration report to a non-binding shareholder vote ("say on pay") at the annual general meeting. They document an increase in the sensitivity of CEO cash and total compensation to negative operating performance, particularly in firms with excessive compensation in the "pre" period (2000–02) and

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[5] See Section 4 for details.

in firms with high voting dissent. Using a large sample of firms from 38 countries over the 2001–12 period, Correa and Lel (2016) find that following the adoption of say on pay (SoP) laws, chief executive officer (CEO) pay growth rates decline and the sensitivity of CEO pay to firm performance improves. Correa and Lel find that these changes are concentrated in firms with high excess pay and shareholder dissent, long CEO tenure, and less independent boards.

My results also suggest that an executive's tenure has a positive effect on his or her pay (the effect in financial firms is greater), but its contribution to pay decreases over time. However, surprisingly, the executive's education and firm's business group affiliation were not found to be explanatory variables for executive compensation.

So far, I have tried to answer the question of how the company and the executive characteristics together affect executive compensation. By including FE/dummies for each firm alongside its observable variables I control for the variation in compensation stemming from firms' characteristics. However, in a sample that spans 24 years, there may be some time-varying unobservable firm characteristics that affect executive compensation, such as remuneration policies, risk aversion, etc. These might be correlated with executives' characteristics, leading to biased estimates of their effect. To overcome this, I take co-CEOs and co-board chairpersons in the sample (almost 20 percent of the companies in the sample have two or more CEOs or board chairpersons), who serve at the same company in the same position at the same time, to examine the principal factors affecting the compensation disparity between co-CEOs/chairpersons (hereafter: co-executives), such as executive tenure, share of holdings in the company, education, and membership of the board. To the best of my knowledge this has not been studied before.

The existing literature on shared executive leadership deals mostly with the factors that might account for the presence of a co-CEO structure within a firm (see O'Toole et al. (2002), Pearce and Conger (2003), and Wasserman et al. (2001)) or with the effect of the co-CEO phenomenon on corporate performance and governance (see

for example, Arena et al. (2011) and Krause et al. (2015)). A recent study on the co-CEOs phenomenon, for example, examines the relationship between past firm performance and the likelihood of co-CEO adoption using Korean data for the period 2003 to 2018 (Yoo et al., 2020).

I find that the difference in the executives' tenure and their appointment percentage are correlated with the difference in co-executives' compensation. I also find that a new co-executive is compensated less in comparison to a co-executive who is not in his/her first year in the position. Differences in age, share of holdings in the company, education and membership of the board are not correlated with pay disparities between co-executives' compensation.

In the next section I review the theoretical background and the relevant literature. In section 3 I describe the factors affecting executive compensation. In Section 4, I describe the executive compensation regulations that were implemented in Israel in the last century. Section 5 is a description of the data used for the statistical tests; Section 6 is a description of the empirical methods and an empirical analysis of the results of the estimations and Section 7 is the conclusion.

2. Theoretical background

The conflict between shareholders' and executives' interests is a classic principal-agent problem,[6] which is the main model used in the literature to explain executive compensation. The principal-agent conflict is based on the assumption that shareholders and executives have different interests and asymmetric information (the manager having more information), such that shareholders cannot directly ensure that the executive always acts in their best interests.

Baumol (1959), for example, argued that while managers usually act to promote shareholders' well-being, they are likely to seek a minimal level of profits that will appease shareholders, and pursue their own wellbeing (tangible earnings such as

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[6] Berle and Means (1932) were first to argue that principal-agent problems between shareholders and executives have been a concern since the separation of corporate ownership from control at the turn of the twentieth century.

salary and benefits, and intangible earnings such as reputation),[7] at the expense of shareholder value. If the shareholders had complete information about the manager's activities and the firm's investment opportunities, it would be possible to compile a contract that lists and prices each action that the manager takes or can take in any possible situation. However, reality differs from this utopian model. CEO activities and the investment opportunities open to the firm are not fully observable to shareholders. Under this approach, shareholders are usually unaware of the action that the CEO can take, or which form of action could increase their wellbeing.

La Porta et al. (1999) find that in economies with a good enforcement system for protecting shareholders' rights,[8] only a very small proportion of firms are held by a large number of shareholders, while many firms are held by families or by the state. However, in countries where separation between corporate ownership and management is common, such as in the US and the UK, the agency problem arises. When ownership is dispersed among numerous shareholders (which is not the case in Israel) and the cost of supervision by the individual investor is relatively high,[9] the shareholders' ability to monitor the manager decreases.

To achieve a maximum overlap between shareholders' interests and those of executives, executives' compensation contracts should incentivize actions that will increase shareholders' value (Jensen and Meckling, [1976]; Jensen and Murphy [1990]). Shareholders have few opportunities to accurately measure the manager's personal contribution to the company's performance, so the manager's compensation is connected to the company's performance. This kind of contract can create an incentive for the manager to take risks that conflict with the interests of shareholders. Holmstrom (1979) attempts to describe the terms for the optimal compensation contract for the executive. In his model a single shareholder wishes

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[7] See also Morck et al. (2005).
[8] Based on the 27 wealthiest countries.
[9] This cost includes, *inter alia,* the cost of establishing and maintaining a network for the auditing and supervision of senior managers' activities, the direct costs of a system for reporting to the owners, costs to the investor of gathering information, and costs deriving from the need to interpret the signals which the manager provides regarding his performance.

to formulate a contract whereby the manager's compensation includes incentives for acting to the benefit of a single shareholder (a model of this kind is not applicable at publicly traded companies with numerous shareholders).

Another (at least partial) solution for the potential conflicts of interest between managers and shareholders is to make the manager a shareowner in the company. According to Jensen and Meckling (1976), the costs of deviation from value-maximization decline as management ownership rises. As their stakes rise, managers pay for a greater share of the costs of their on-the-job consumption and are less likely to squander corporate wealth. According to this "convergence of interests" hypothesis, corporate performance improves with increases in management ownership. Consistent with these predictions, Mehran (1994) finds that firm performance is positively correlated with both the percentage of equity held by the managers and the percentage of equity-based compensation in the total compensation. Ofek and Yermack (2000) add that an executive's share-based compensation succeeds in increasing incentives for managers with a low level of ownership, but not for managers with a high level of ownership. This is because the latter group negates most of the effect of this incentive by selling shares (apparently in order to avoid holding too much of their own wealth as equity in the company).

The literature mentions one more way to solve the principal-agent problem - board of director activity that supervises the managers to the benefit of shareholders. According to Core, Holthausen and Larcker (1999), companies with a less effective supervisory structure have more agency problems, their managers are more highly paid and their performance is inferior. However, there are those (Hermalin and Weisbach [1998], for example) who claim that in most cases, CEOs are involved in selecting the directors and they can be expected to cooperate in determining CEO compensation, without the representation of a shareholders' trustee. In later research, Hermalin and Weisbach (2001) added that a board with a small number of members and a high percentage of outside directors reduces the principal-agent problem to the benefit of the interests of all shareholders.

In Israel, members of the board tend to be relatives or business partners of the CEO, who are also stakeholders, and outside directors are also usually appointed on the recommendation of the controlling shareholders.[10] This conforms to the approach whereby the CEOs set their own wage: they exert pressure on the directors to award them high compensation and they themselves determine the compensation structure, exploiting their power and status. Bebchuk and Fried (2004) argue that the board looks after the interests of the executive more than those of shareholders. The executives receive substantial loans from their corporations which they do not usually have to repay; they also benefit from deferred compensation arrangements, post-retirement perks, complete independence in decision-making, re-pricing of options when the price of the underlying share falls, and profits when the share price increases. The authors claim that the main actor behind the excessive salaries paid to CEOs is the board of directors,[11] which is under the control of the CEO, or the fact that the members of the board have a social or business relationship with the CEO.[12] In their view, executives earn more not because they are more adept at creating value for the shareholders, but because they are very adept at protecting their position at the top. They call this approach the managerial power approach.[13]

Under this approach, an optimal contract alone cannot adequately explain payment arrangements for the CEO; CEOs also have considerable influence on the level of their compensation. Executives who have more power would receive higher pay—or pay that is less sensitive to performance—than their less powerful counterparts. Moreover, the manager's power increases when the board is relatively weak or ineffectual,[14] if the company does not have large outside shareholders, if it has few institutional shareholders, or if the executives are protected by anti-takeover

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[10] Barak, Cohen and Lauterbach (2007).

[11] Shleifer and Vishny (1997) previously claimed that the CEO controls the board of directors.

[12] In another example, Main et al. (1995) examined how CEOs control the board in a manner that results in a higher payment to the CEO, and concluded that the outside directors act more as partners to the effort that will lead to the firm's success, rather than as independent auditors of the CEO's performance.

[13] They first presented this approach with David Walker in 2001.

[14] This can occur when the board is large, which makes it more difficult for directors to organize in opposition to the CEO; when more of the outside directors have been appointed by the CEO, which could cause them to feel gratitude or obligation towards the CEO; and when outside directors serve on three or more boards, and thus are more likely to be distracted.

provisions. In these situations, the directors have an incentive to favor the manager as the result of exigencies deriving from market forces and/or connections with outside players.

There are, of course, limits to the arrangements that directors will approve and executives will seek. Bebchuk and Fried claim that executive compensation is determined as the maximum amount that can be "carved off" from the company without evoking ridicule or scorn in the media or in the directors' social and business circles. The authors' position this approach against the "arm's-length bargaining" view, whereby corporate boards setting pay arrangements are guided solely by shareholder interests and operate at arm's length from the executives whose pay they set. Under this model, CEO compensation will increase if the value of managers' services to the firm increases, if the cost of keeping managers in the company increases, and if the requirements of the CEO become more "expensive".

The ownership structure in Israel is different from that described so far. Kosenko (2007) found that between 1995–2009, 20 business groups in Israel, nearly all of them family-owned, controlled 160 public companies (out of the 650 companies that were traded on the Tel Aviv Stock Exchange in those years) and approximately half of the market. In 2007, for example, at 48.4 percent of the companies, a controlling group held over 50 percent of the voting rights. It should be noted that over the years these numbers have declined[15] due to, among other things, the Business Concentration Law[16] that was enacted in December 2013. Such a concentrated ownership structure is common in non-Anglophone advanced economies.[17] Under the winner-take-all society theory,[18] this structure can also be attributed to the spirit of the period. In an increasing number of economies and

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[15] As of the end of 2019, 13 business groups controlled 60 public companies (out of the 560 companies that were traded on the Tel Aviv Stock Exchange in those years).

[16] The law bans groups from owning both financial and nonfinancial enterprises. Any group that has both must divest one or the other. Moreover, it dismantles multi-tiered corporate holding structures – or "business pyramids"– and sets a worldwide precedent. Under the law, no group may have more than two tiers of publicly listed companies (whether they've issued stocks or bonds). Existing pyramids had four years (until the end of 2017) to consolidate into three tiers plus another two years (until the end of 2019) to reach the maximum allowed two-level formation.

[17] Mainly continental western European countries and Japan.

[18] Frank and Cook (2010).

institutions worldwide, a very small number of "winners" who receive a great deal are at the top, while all the others are left with little.

In these countries, where shareholders have a major incentive to supervise the managers' activity, the agency problem is mainly between large shareholders and small ones, and less between shareholders and managers. If in countries with diversified ownership the executive is likely to benefit at the shareholders' expense, in Israel, where ownership is more concentrated, the controlling shareholders and the executive can exploit the minority shareholders. The potential for a manifestation of the conflict of interests between large and small shareholders increases as the large shareholders' control of the firm increases, and with it their power to promote their own interests, particularly when small investors are afforded little legal protection.

In a market such as Israel's, with controlling groups, control by individuals is limited not only by a single company, but by numerous companies under that single company's control as well. This results from the creation of holding pyramids comprised of holding companies, financial institutions and nonfinancial companies, the use of cross-holdings, or a maximum separation between voting rights and equity rights. The large number of firms controlled by interested parties as part of holding pyramids can often lead to the exploitation of tunneling[19] — the transfer of resources between companies under the control of a single owner and the increased probability of exploitation of the minority shareholders by the same core of control. Since it is difficult for the minority shareholders to protect their interests, under this model the use of executive compensation devices has the appearance of tunneling. This is because the cost to the controlling shareholders of each shekel of salary or other expense charged to the company is much lower. However, Mehran (1994) argued that firms in which a higher percentage of shares is held by outside block holders use less equity-based compensation, suggesting that monitoring by outside block holders may be a substitute for incentive pay for

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[19] See for example, Shleifer and Vishny (1997).

executives. This argument conforms to the preceding claim that firms with a higher ownership concentration are less likely to encounter the agency problem.

The phenomenon whereby controlling shareholders place their own appointees in key positions in the company, especially in the position of CEO, is common in Israel.[20] A case like this, in which the representative's personal alignment with, and loyalty to, the person responsible for the appointment plays an important role, is likely to reduce conflicts of interest. It will lessen the need for more effective supervision and control mechanisms, and the need to formulate a performance-sensitive contract to counter the principal-agent problem. In this way, increasing the executive's compensation is generally a substitute for drawing profits from the company without involving minority shareholders in the process—a process by which the controlling shareholders can ensure that the serving executive will manage the company in accordance with their interests. Accordingly, in Israel, where ownership is more concentrated, I would expect the executive compensation to be less equity-based.

3. Factors determining and affecting executive compensation

3.1 Firm Performance

The public criticism of executive compensation focuses not only on the high level of executive compensation, but also on the lack of correlation between the level of compensation and firm performance. A correlation, but not a particularly strong one, between compensation and firm performance has been found in many studies. Jensen and Murphy (1990), for example, found that CEO compensation changes by only \$3.25 for a \$1,000 change in the value of the share. They claim that this low sensitivity of compensation to performance derives from private and public political forces. In a later study, from 1999, which was based on US S&P 500 companies, Murphy found that CEO compensation sensitivity to share

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[20] Amzaleg and Mehrez (2002).

performance in the period 1990–96 averaged 0.38. This means that for each 1 percent increase in the share's price, the salary of the US CEO rose by 0.38 percent.[21]

Core et al. (1999) examine the sensitivity of executive compensation to a firm's accounting performance, and find it to be limited and not significant. Barak et al. (2007) showed that CEO compensation is linked mainly, and at a high level of significance, to the performance of the company's shares. However, they find that CEO compensation sensitivity to the company's net profit or return on equity is limited and not significant. Bolton et al. (2006) claim that the optimal CEO compensation contract places an emphasis on the short-term stock performance at the expense of long-term value, because it motivates the manager to persist in activities that increase the speculative component in the stock price. For this reason, the high-tech bubble led to a rapid increase in CEO compensation at the end of the 1990s. During that period, shareholders were only interested in their stock prices, stock prices went up, and executive contracts were focused on share-based incentives. These incentives took the form of large parcels of short-term options for the CEOs, which encouraged them to take actions that would increase the speculative component in the share price.

Bebchuk and Fried (2004) argue that the correlation between CEO compensation and firm performance is very weak. According to Bebchuk and Fried, since CEOs are not compensated on the basis of the performance of the companies which they manage, they have no adequate incentives to increase value for shareholders. This argument refers to companies with dispersed ownership, and not those with a concentration of controlling shareholders who have the ability to supervise the CEO. As noted before, in countries where companies have a concentrated ownership structure, like Israel, controlling shareholders have significant incentives to monitor management. Therefore, if the stake they hold in the firm is sufficiently large for it to be worthwhile for them to monitor the manager's activity,

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[21] Kaplan (1994) also found a positive correlation between executive compensation and a firm's performance at publicly traded companies in the US and in Japan. Rosen (1990) complements these findings by discovering a 0.2–0.25 sensitivity of executive compensation to sales, 0.1 to accounting return and 0.15 to share return.

they would not have an incentive to tie executive compensation to firm performance.

3.2 Firm Size

Numerous studies, such as those by Gabaix and Landier (2008), Talmor and Wallace (2001), and Bliss and Rosen (2001) found a significant positive correlation between company size and the level of executive compensation.[22] Gabaix and Landier (2008) for example, show that the large increase of over 500 percent in average real CEO compensation in the US between 1980–2003 can be attributed almost entirely to the rate of growth of the companies managed by the US CEOs. The authors propose a theoretical model in which more proficient CEOs tend to manage larger companies and are paid more. The authors claim that this is the result of a competitive process. Since managerial proficiency is rare, proficient managers receive high pay. Gabaix and Landier also show that given that CEOs are ranked by talent, if the top CEO is replaced by a CEO of rank 250, the value of the firm will decrease by only 0.016%. However, these very small talent differences in CEOs' proficiency are translated into considerable compensation differentials, as they are magnified by firm size.

Firm size also affects the performance sensitivity of CEO compensation. Murphy (1999) and Schaefer (1998) find that pay-performance sensitivity is lower in larger firms. Murphy does not find this surprising, since risk-averse and wealth-constrained CEOs of large firms can feasibly "own" only a tiny fraction of the company cash flows through their stock, options, and incentive compensation.

3.3 Ownership

Many empirical studies show that the executive compensation of controller CEOs is lower than that of professional CEOs. These studies suggest that controller CEOs need less incentive-based compensation just because they hold a large block of shares; that family ties can increase controllers' commitment to the firm and make

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[22] See also Zhou (2000) and Baker et al. (1988), who found that a 10 percent larger firm will pay its executives an average of 3 percent more.

them more prone to accept lower pay; that controllers enjoy higher job security; or that they may elect to maximize value diversion through other means, such as related-party transactions.[23]

However, there are also studies supporting the opposite view, showing that controller CEOs tend to extract rent by paying themselves excessive compensation. Holderness and Sheehan (1988) find that in the US, CEOs owning more than 50% of a firm's shares receive significantly higher pay than other CEOs, and using annual data on a sample of 124 closely held Israeli firms in the period 1994–2001, Cohen and Lauterbach (2008) find that owner CEO pay exceeds that of non-owner CEOs by about 50%.

The literature also discusses the difference in pay-performance sensitivity between owner and non-owner CEOs. Cavalluzzo and Sankaraguruswamy (2000) and Cohen and Lauterbach (2008), for example, find that owner CEO pay is less sensitive to performance.

3.4 Relative Performance Evaluation

The Relative Performance Evaluation (RPE) theory developed by Holmstrom (1982)[24] assumes that a firm's performance is a function of the executive's efforts. The manager for his/her part decides how much effort to invest according to the proceeds he/she receives for his/her efforts. As a result, the benefit deriving from the compensation for an additional unit of effort is equal to the decrease in the executive benefit deriving from this unit of effort. The greater the executive's efforts, the higher the compensation the manager will demand. One way to reduce the variability when estimating the executive's efforts as a function of firm's performance is to select a performance variable from which random effects were deducted.

Compensation for relative performance should reduce the risk affecting the manager's compensation (which is not under his/her control), and thereby

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[23] See, e.g., Gomez-Mejia et al. (2003) and McConaughy (2000).
[24] See also Holmstrom (1979) and Holmstrom and Milgrom (1987).

motivate him/her to invest the maximum effort. In such a contract, when the performance of the firm improves but the performance of other firms in the industry decreases, the executive's compensation is higher, compared to a situation where the rate of growth in the firm's performance is the same as the growth rate of performance in the industry. It is worth mentioning that RPE is common in firms with dispersed ownership, like in the US, and less in firms with concentrated ownership, like in Israel.

Aggarwal and Samwick (1999) find empirical evidence of a positive sensitivity of compensation to rival firm performance that increases with the degree of competition in the industry. The need to soften product market competition generates an optimal compensation contract that places a positive weight on both own and rival performance. Aggarwal and Samwick (1999) also find that firms in more competitive industries place greater weight on rival firm performance relative to own firm performance. Smith and Watts (1992) find a significant correlation between executive compensation and the company's industrial sector: both the compensation level and its performance sensitivity are higher in more complex and sophisticated industries.

According to Gibbons and Murphy (1990), rewarding CEOs based on performance measured relative to the industry or market creates incentives to take actions that increase shareholder wealth while insuring executives against vagaries of the stock and product markets that are beyond their control. The authors' empirical evidence strongly supports the RPE hypothesis—CEO pay revisions and retention probabilities are positively and significantly related to firm performance, but are negatively and significantly related to industry and market performance, *ceteris paribus*. Himmelberg and Hubbard (2000) and Hubbard (2005) made a similar finding and argue that firms compensate managers for industry-wide performance because the outside opportunities of the managers are correlated with the condition of the industry. Bebchuk and Fried (2004) also referred to this subject. They point out that compensation committees and consultants tend to increase CEO compensation repeatedly on the basis of the competitive component ("because others are giving a raise, we also have to give a raise"). Boards do not want to reveal

that a manager is below average quality, so the executive's compensation has to be above average—which always pushes up the average.[25] In the past, public US firms were not required to fully disclose the contractual terms that govern CEO compensation. However, in December 2006, the SEC issued new disclosure requirements concerning CEO compensation. Using disclosed contractual terms, De Angelis and Grinstein (2011) and Bettis et al. (2014) document the use of RPE in US firms.

De Angelis and Grinstein (2020) present a different purpose for RPE than in standard agency models. They claim that RPE takes a more complex form and depends on the ranking of the CEO talent relative to peers. They show that firms use RPE, and RPE is based on the ranking of the firm performance compared to the peer group. Moreover, their evidence also indicates that firms tend to rely more on rank-based RPE in firms and industries where CEO talent is more easily transferable.

3.5 Executive Personal Characteristics

The personal characteristics of an executive also play a role in explaining his/her compensation. Lewellen and Huntsman (1971) find a positive correlation between the executive's compensation and the executive's age while Finkelstein and Boyd (1998) do not find any correlation between these two. Palia (2000) finds that the executive labor market helps to sort managers with higher education quality into jobs where they can obtain greater returns from their human capital skills. Gong (2011) finds that both CEO compensation and shareholder value added aggregate naturally over CEO tenure.

Murphy and Zabojnik (2004) add that an increase in executive compensation is related to a change in the composition of managerial skills needed to manage a modern corporation. In particular, the authors conjecture that between 1970 and 2000, general managerial skills (i.e., the skills transferable across companies, or even industries) became relatively more important for the CEO job, perhaps as a

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[25] I elaborate on this issue in Section 3.

result of the steady progress in economics, management science, accounting, finance, and other disciplines which, if mastered by a CEO, can substantially improve their ability to manage any company. At the same time, certain types of knowledge specific to a particular firm, such as information about its product markets, suppliers and clients, which in the 1970s was not so accessible to outsiders and required an investment in learning from the manager, is in the 2000s available in digital and easily accessible formats.

Custodio et al. (2010) also investigate whether the increase in the importance of the general managerial skills of top executives explains the rise in CEO compensation. The authors construct a measure of the generality of human capital based on a CEO's external mobility across industries, experience as top executive, and education. They find a positive and significant relationship between the index and CEO compensation using as their sample S&P 1500 firms between 1993–2007.

3.6 Shared Executive Leadership

Arena et al. (2011) claim that if the existence of co-CEOs increases managerial entrenchment and agency conflicts, then co-CEO compensation is likely to be proportionately higher than that of sole CEOs. Alternatively, if mutual monitoring carried out by co-CEOs is an effective governance mechanism, then co-CEO compensation might be proportionately less than sole CEO compensation. The authors also argue that mutual monitoring by co-CEOs might reduce agency conflict and require less incentive-based compensation for each individual. Alternatively, if the presence of co-CEOs shifts power from the board to executive management, then more incentive-based compensation might be needed to reduce agency conflicts. Comparing co-CEO compensation with sole CEO compensation for the same firm in the year prior to and the year following the existence of a co-CEO arrangement, Arena et al. (2011) find that co-CEOs as a team are more expensive than the traditional sole CEO, but not twice as expensive as a sole CEO. Moreover, they find that co-CEOs receive proportionately significantly less incentive compensation than sole CEOs.

3.7 Policy

The perception that executive pay includes substantial rent extraction, or simply the perception that high levels of pay are "unfair", has led many commentators to propose either pay regulations or changes to best practices. In the next Section I describe the executive compensation regulations implemented in Israel in the last decade.

4. Regulation of compensation in Israel

Following intensive media scrutiny of executive compensation and numerous legislative proposals, since 2011 quite a few regulations have been implemented in Israel to curb executive pay.[26] Table 1 presents detailed information for each regulation.

In March 2011, Amendment No. 16 to the Israeli Companies Law of 1999 was passed. The law increased the level of minority shareholder support required for approving related party transactions, including executive compensation paid to controlling shareholders or to their relatives, from a third to a majority of the minority votes cast.[27] Only twenty months later (November 2012) a new law was enacted—Amendment No. 20 to the Israeli Companies Law of 1999, which addresses the compensation approval process for senior executives in public companies and private companies with publicly traded debt ("Public Company"). First, this Amendment mandates that a Public Company's Board of Directors establish a Compensation Committee consisting of at least three directors. Second, the board of directors must make a compensation policy for the remuneration of company executives, based on the recommendations of the Compensation Committee. The compensation policy must be approved in advance by shareholders, in contrast to US and UK models, in which compensation policies are voted upon ex-post by company shareholders. Third, under the Amendment,

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[26] There were some proposals to monitor executive compensation in 2007, which were not implemented.

[27] For more information about this law, see Fried et al. (2020).

variable compensation components must be capped, and based on measurable criteria and long-term performance.

Additionally, Amendment No. 20 implements a modified version of the "Say on Pay" approach that has been adopted in the US and UK. Under the Amendment, a public company's overall compensation policy, as well as the compensation of its CEO, must be approved by the majority of the non-controlling shareholders at a shareholders' meeting.

In companies with a pyramid structure, a controlling shareholder's ability to control may well exceed his/her equity stake in the company. This raises the risk that lucrative employment conditions will be approved, and that these conditions will incentivize company executives to advance interests that are not necessarily in line with the best interests of the company. As a result, the Amendment strictly mandates that in the case of a Public Subsidiary Company, a compensation policy or the employment terms of an executive that deviate from the compensation policy must be approved by the majority of the non-controlling shareholders in the shareholders' meeting, and such approval shall be binding. These requirements constitute the first practical application to pyramid companies of the recommendations made by the Concentration Committee of the Ministry of Finance.

In November 2013, the Banking Supervision Department revised its directives to require all local banking corporations and credit card companies that are controlled by the banking corporation to meet certain criteria regarding executive compensation. Under these directives, inter alia, the maximum variable compensation shall not exceed 100 percent of the fixed compensation for each employee. However, under exceptional conditions and reasoned decision, the variable remuneration can reach up to 200 percent of the fixed remuneration. A month later (December 2013) a similar directive was published by the Commissioner of the Capital Market, Insurance and Savings Authority regarding institutional entities.

In June 2015, the Banking Supervision Department and the Capital Market, Insurance and Savings Authority issued a directive that the compensation to the chairperson of a board of directors of a banking corporation or institutional body will be fixed, and will not be conditional on performance. This is to improve the supervisory ability of the chairperson of the board and strengthen the independence of the board of directors.

Finally, in April 2016 the Israeli Parliament (the Knesset) voted in favor of capping the compensation of financial firms' executives to 35 times the compensation of the lowest paid employee at the firm. This legislation is unique because it is the only law worldwide that sets a binding upper limit on total executives' compensation in non-state owned firms.[28]

5. Characterization of the data

I use a panel of all Israeli publicly traded (listed on the Tel-Aviv Stock Exchange (TASE)) companies with available information on executive compensation over the period 1995 to 2018 (24 consecutive years, annual data) that belong to ten industries: Banks, Biomed, Insurance, Investments and Holdings, Financial Services, Manufacturing, Oil and Gas Exploration, Real Estate, Technology, and Trade and Services (in accordance with the Tel Aviv Stock Exchange industry classification). The sample is an unbalanced panel. This is due to the delisting of some firms from the Tel Aviv Stock Exchange during the sample period[29] or because of the non-publication of periodic/financial reports in one of the years.

I provide hand-collected data on top executives, i.e., CEOs and chairpersons of the board, who were included in the list of the five highest paid people in the company.

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[28] In 2009, the central government of China introduced a regulation to limit executive salaries for the country's centrally administered state-owned enterprises (CSOEs).

[29] The phenomenon of de-listing during this time period is substantial. According to Cohen, O. 2020 ("Firm-Level and Country-Level Corporate Governance: Does One Substitute or Complement the Other?", unpublished doctoral dissertation. Hebrew University of Jerusalem, Israel), between 2007 and 2017 the number of public companies in Israel declined by 29%. This matches a similar trend in Europe (Martinez and Serve (2011) report that between 1995 and 2005, the number of public companies in Europe declined by 25%) and the US ((see Doidge, Karoly, and Stulz (2017) and Grullon, Larkin, and Michaely (2019), who that report that between 1997 and 2014, the number of public companies in the US declined by 50%).

The database contains information on each executive's compensation (total compensation and its components[30]), personal characteristics (age, tenure, education, holdings, etc.), firm characteristics (industry, number of trading years, etc.), accounting data (total assets, net profit, etc.), and the firm's stock market data. Appendix A provides details of the variables in the database and their data sources. The data include 778 companies. Figure 1 describes the distribution of the firms in my data by industry. Eighty percent of the companies belong to four industries: Manufacturing, Real Estate, Trade and Services and Investments and Holdings. The data set represents the distribution of the total population of Israeli public firms across industries in the period between 1995 and 2018, of which 25% were in manufacturing, 20.9% in real-estate, 19.2% in commerce, 17.2% in investment and holding companies, 6.5% in technology, 4.5% in Biomed, 2.7% in Oil and Gas Exploration, 1.9% in Financial Services, 1.3% in Banks and 1% in Insurance.

5.1 The change in Executive Compensation

Public companies in Israel are required to report the compensation and its components of the five highest paid people in the company. There is fixed compensation, which includes salary, social provisions and other benefits, and variable compensation, which includes performance-sensitive bonuses and share-based compensation.

Average top executive compensation increased 17 percent between 1995 and 2018, an average annual increase of 1.2 percent. The median compensation rose by 16 percent. In 1995, average real executive compensation at publicly traded companies was NIS 1.5 million (with a median of NIS 1.2 million), while in 2018 it was NIS 1.8 million (with a median of NIS 1.3 million) a year (in 2016 fixed prices). For comparison, average wage per employee position had increased in this period by 35 percent (real). According to a report written by Mishel and Wolfe (2019) of the

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[30] Until 2007, most of the firms had not specified compensation components (base salary, social provisions, bonuses and share-based payments - the value of options granted to the CEO) of their executives. This is because the firms were only required by the Israel Securities Authority to present those components from June 2008.

Economic Policy Institute, CEO compensation[31] at the 350 largest publicly owned U.S. firms grew by 187 percent in this period (1995-2018) – from $6 million in 1995 to $17 million in 2018. The authors contrast this with wage growth for the typical worker of just 17.3% in this period.[32]

According to a study by Equilar,[33] which analyzes CEO compensation data from mid-sized companies (defined as companies with revenues between $1-5 billion) in the US, Canada and Europe, over the years 2014-2018, the median total compensation of U.S. CEOs has generally increased from year-to-year, with the exception of 2017, which saw a 2% decline in median pay. The study includes 853 U.S. companies, 98 Canadian companies and 54 European companies of similar size. In 2018, the median compensation of CEOs in U.S. mid-sized companies was approximately $5.3 million, while in Canada and Europe it was $3.2 million and $4.5 million, respectively. European CEO pay trends were more volatile across the sample period, with a net decrease of 22% in median pay from 2014 to 2018 from $5.5 million in 2014 to $4.5 million in 2018. Compensation levels in Canadian companies, however, were fairly constant.

Figures 2(a)-2(c) present executives' median compensation, executives' average compensation and executives' average compensation divided into financial and nonfinancial firms, respectively, over the years 1995 to 2018 in Israel. The main regulations implemented by the firms (Amendment no. 16, Amendment no. 20, the 2016 Law), which were described in detail in Section 4, are depicted in vertical lines in Fig. 2(c). Several conclusions can be drawn from the figures. The median compensation is lower than the average. Contrary to popular belief, pay has not

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[31] Inflation-adjusted compensation (based on realized stock options).

[32] Edmans et al. (2017) who describe the trends in executive compensation in the US during the period 1936-2014 report that for CEOs of S&P 500 firms, the median level of pay climbed rapidly from $3.1 million in 1992 to a peak of $10.0 million in 2001. After 2001, median CEO pay stabilized between $8 and $10 million for more than ten years, and it passed its 2001 peak only in 2014, reaching $10.1 million. In mid-cap firms, median CEO pay rose more slowly during the 1990s, from $1.9 million in 1994 to $3.5 million in 2001, for a 90% increase. In small-cap firms, median pay increased by only 45%, from $1.3 million in 1994 to $1.9 million in 2001. Even though mid-cap and small-cap CEOs saw smaller raises during the 1990s, their pay continued to climb after 2001, when the pay of large-cap CEOs stagnated. Median pay for mid-cap (small-cap) CEOs rose from $3.5 ($1.9) million in 2001 to $5.4 ($2.8) million in 2014.

[33] 12th annual 200 Highest-Paid CEOs study.

constantly risen over time, and there are periods in which pay has been constant or declining. The trends of executive compensation in financial and nonfinancial firms are more or less alike but the rates of change are different.[34] Between 1995 and 1999, there was an increase in executive compensation—by 26 percent in nonfinancial firms and by 69 percent in financial firms.

In the years 2000–02, the compensation gradually decreased (in conjunction with recession years in the Israeli economy) in financial and nonfinancial firms, by 26 and 21 percent, respectively. Within 5 years, in the period from 2002 to 2007, the average executive compensation soared by 56 percent in nonfinancial firms and by 162 percent in financial firms, and peaked at NIS 2.3 million and NIS 5.8 million, respectively. This significant difference between the growth in executive compensation in financial companies and non-financial ones before 2007 was also seen in the US. Philippon and Reshef (2012), who study the allocation and compensation of human capital in the US finance industry over the past century (1909–2006), find that workers in finance earned the same education-adjusted wages as other workers until 1990, but by 2006 the premium relative to education-adjusted wages in other industries was 50% on average. The pattern was the same for top earners but the differences were larger: during the period 1990–2006 CEOs in the financial industry earned a 250% premium relative to CEOs elsewhere.

Compensation decreased during the great recession in 2008—by 40 percent in financial firms and by 16 percent in nonfinancial firms. In 2009–10, compensation in financial firms had recovered and rose by 30 percent, while compensation in nonfinancial firms increased by only 2 percent. After 2010, around the time of Amendment no. 16 and Amendment no. 20, there was a gradual decline in executives' compensation in both groups—reaching 44 percent in financial firms and 10 percent in nonfinancial firms by 2016. Following the 2016 Law, executive compensation in financial firms continued to decrease while in nonfinancial firms it started to increase. As a result, the average executive compensation in financial

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[34] The rate of change in the median compensation in financial firms is quite similar to the rate of change in the average compensation. In financial firms, however, the rate of change in the median compensation is more moderate in comparison to the rate of change in the average compensation.

firms (NIS 1.9 million) and nonfinancial firms has converged (NIS 1.8 million). Unfortunately, there is no overlap between the sample I use and the samples used in earlier studies of executive compensation in Israel, so I cannot report whether the trends I find over time in executive compensation are different or similar to existing literature.

Sixty percent of the executives in the sample serve as CEOs, 30 percent as the board chairperson and 10 percent as both CEO and chair of the board of directors (dual role). Dividing the executive compensation between CEOs and board chairpersons reveals that in nonfinancial firms, until 2010 their compensation was more or less alike, and from 2011 the board chairpersons' compensation has decreased by 39 percent (after the 2016 Law their compensation started to rise) while CEO compensation increased by 4 percent.

Fried et al. (2020) find that the 2011 reform (Amendment No. 16) had a negative effect on the compensation of controller executives. According to the data set I analyze, the percentage of board chairpersons holding more than 25 percent of firm's shares[35] is not particularly different from the percentage of CEOs holding this percentage - 20 percent and 14 percent, respectively. Therefore, I cannot deduce that the difference in trends between these executives is attributed mainly to Amendment No. 16. In financial firms, however, there was no difference in the trends between these executives, but the compensation of the CEOs is higher than the compensation of the chairpersons by 27 percent, on average.

Figure 3 presents average executive compensation over the years 1995–2018 by industry. Executive compensation is highest in banks and insurance companies and lowest in the biomed industry. This order is more or less in line with the order of size of the industries, indicating that company size is the main explanation for the level of executive compensation. However, while the difference between the average compensation of bank executives and the average compensation of insurance companies' executives is relatively small, the average size of banks is

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[35] According to Fried et al. (2020), a 25 percent shareholder is a controller unless another shareholder holds 50 percent of the shares.

three times the average size of insurance companies in the sample, what means that there may be many other factors that explain these differences. At 200 percent the largest increase in executive compensation between the years 1995 and 2018 was in the oil and gas exploration industry, and the investments and holdings industry was the only industry in which executive compensation decreased in this period. Table 2 reports summary statistics for executive compensation by sub-industry.

As mentioned in the literature review, one of the main factors in executive compensation is company size (See for example, Gabaix and Landier, 2008 and Talmor and Wallace, 2001). Figure 4 describes the distribution of executive compensation in big companies—the upper quartile in size (measured by the firm's total assets)—and in small companies, the lower quartile in size.[36] The average executive compensation in the big companies is four times higher than that in the small companies (NIS 0.9 million compared to NIS 3.6 million). This proportion is similar to the proportion presented by Edmans et al. (2017) regarding US firms - the median level of CEO pay of S&P 500 firms was 3.6 times higher than that in small-cap firms ((S&P SmallCap 600) in 2014. Moreover, as seen in the graph, most of the executives in the small firms were compensated below NIS 2 million, while executive compensation in large companies spans the entire range—up to ten million and more.

A common view is that CEO pay is a major contributor to rising inequality. To test this claim with data from Israel, I compare the trend in CEO compensation in publicly traded companies with the compensation trend in the economy. Table 3 is a comparison of CEO compensation in publicly traded companies and in the public service,[37] and the average wage per employee position in the economy from 1996

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[36] I cut the figure at NIS 10 million, so that the compensation would be comparable between the two groups.

[37] Definition: Senior officials and directors-general of government ministries and parallel bodies. Source: Ministry of Finance and Bank of Israel calculations.

to 2018.[38,39] The table compares the second year in the sample—1996,[40] the year when CEO compensation was at its peak—2007, and the last year in the sample—2018. The average pay disparity between CEOs in publicly traded companies and public service CEOs expanded between 1996 and 2007—from 3 times to 5 times – because of the dramatic increase in CEO compensation in publicly traded companies. The average pay disparity decreased to 4 times in 2018, again due to the change (decrease) in compensation in publicly traded companies. CEO compensation in publicly traded companies and in government-owned companies has a pay disparity of 2.9 times in 2018. The pay disparity between public company CEOs and the average compensation per employee position increased from 1996 to 2007—from 13 times to 19 times, but returned to 13 times by 2018 after all three regulations were introduced. In other words, the inequality in Israel, measured by the pay disparity between CEO compensation in publicly traded companies and the average wage per employee position, which had expanded by 2007, has returned to the level recorded 24 years earlier. For comparison, the pay disparity between public company CEOs and the average compensation per typical worker in the US leaped from 154 times in 1996 to 278 times in 2018.[41] Another notable point is that CEO compensation increased on average by an annual rate of 1.7 percent over the period 1996 and 2018; the compensation of public service CEOs went up by only 0.9 percent a year, and the compensation per employee position increased by 1.3 percent.

Figure 5 presents the structure of executive compensation by exhibiting the fixed compensation to total compensation ratio in financial and nonfinancial firms between 2008 and 2018. The graph only starts in 2008 because the firms were only required by the Israel Securities Authority to present components of executive

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[38] Central Bureau of Statistics of Israel data.

[39] Average wage per employee post in the economy refers to salary, while CEO compensation reflects the wage cost. To compare the two figures, I added thirty percent to the average wage per employee position to essentially turn it into the cost of the wage, so that it could be compared to CEO compensation.

[40] The reason I do not start in 1995 is that there is no data on the compensation of CEOs in the public service for 1995.

[41] According to Mishel and Wolfe (2019) report in Economic Policy Institute.

compensation from 2008.[42] According to the figure, the fixed component in executive compensation was higher in 2008 among nonfinancial firms—85 percent in comparison to 81 percent—and by 2018 it decreased to 79 in nonfinancial firms while it increased to 87 percent in financial firms. Although the fixed component in executive compensation in US companies is much lower, there was a similar downward movement in it, as seen in the fixed component in executive compensation in non-financial firms. According to Edmans et al. (2017), the fixed component in CEO compensation had decreased from 17% in 2008 to 13% in 2014 in the S&P 500 companies, from 27% to 19% in the S&P MidCap 400 companies and from 37% to 29% in the S&P SmallCap 600 companies (executives in smaller firms receive less of their pay as stock and options and more as salary). Another notable point from Figure 5 is that the trends of this ratio were more or less alike between financial and nonfinancial firms in most of the years, and after the executive compensation in most of the financial firms was restricted (the 2016 Law), the trends changed. There was an upward trend in the proportion of the fixed component in the total compensation in financial firms and a downward trend in it in nonfinancial firms. These trends are opposite to the trends of the total compensation level, which were presented in Figure 2. The opposite trends between total compensation level and the percentage of fixed component in the total compensation are also seen in executive compensation in US companies (see Edmans et al. (2017)), indicating that a way to increase executive compensation is to increase the variable component. The financial firms that were restricted by the 2016 Law reduced the variable component in executive compensation, so they could keep the level of executive compensation that was limited at a certain compensation level. This upward trend in the proportion of the fixed component in the total compensation in financial firms may also be in line with the restrictions on the variable component of compensation that were set by the Banking

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[42] Therefore, by 2007, most of the firms had not specified compensation components of their executive remuneration.

Supervision Department and the Capital Market, Insurance and Savings Authority in 2013 and 2015.[43]

5.2 Executive Characteristics

Table 4 is a summary of executives' characteristics over the years 1995-2018, where Panel A presents data for financial firms and Panel B presents data for nonfinancial firms. The average age of a top executive is 54–55 years. The oldest executive in the sample is 95 years old (who is also a controller shareholder in the company) and the youngest is 23 years old. For comparison, in US companies the average age of a CEO in the years 1993-2007 is 55 years, the oldest executive is 90 years old (who is also a controller shareholder in the company) and the youngest is 29 years old (Custodio et al., 2010). An executive serves in his/her position for an average of 8 years in a nonfinancial firm (according to Custodio et al., 2010, this is also the average among CEOs in US companies in the period between 1993 and 2007) and 6 years in a financial firm. The maximum number of years served by a top executive is 43 in a financial firm and 53 in a nonfinancial firm, which is again fairly close to recorded data for CEOs in US companies (49). In financial firms almost 50 percent of the executives hold a masters degree or higher while in nonfinancial firms only 32 percent hold these degrees. In US companies over the period 1993-2007 48 percent of the CEOs had a business degree[44] (while in Israel during this period 76 percent of the CEOs had at least a bachelor degree). An executive's average rate of holdings was higher in a nonfinancial firm (12.5 percent) than in a financial one (7.4 percent). However, the median rate of holdings was less than one percent in both groups,[45] as it was among Russell 3000 CEOs.[46]

In addition, an average of 13 percent of all CEOs were replaced every year. The year in which the largest percentage of CEOs were replaced was 2008 (19.1 percent), the year of the great recession. Thirty percent of all CEOs in the sample remained

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[43] As described in detail in Section 4.
[44] Custodio et al. (2010).
[45] The maximum executive holdings in a company is 96.85 percent. This high percent is due to the delisting of this company from the Tel Aviv Stock Exchange in that year.
[46] According to an Equilar memorandum by Jessica Phan.

in the position for 10 or more years. The median age at which a CEO left his position (leaving the company or moving to another position in the company) is 51. Figure 6 shows the percentage of CEOs out of all the CEOs in the sample who were replaced in the years 1995-2018 (the sample contains an average of 370 CEOs in each year).[47] There was an uptrend in this percentage between 1996 and 2008—from a turnover rate of 6 percent in 1995 to 19 percent in 2008. After a significant decrease in the rate in 2009, by 2018 there was no clear trend in the percentage—it just fluctuated around the mean.[48] In this respect, Kaplan (1994) found that the average turnover rate in Germany during the 1980s was 10 percent; Haddlock and Lumer (1997) found that in the years 1933–1941, the rate of CEO turnover was half the rate they calculated for modern times, and Farrel and Whidbee (2003) found that between 1986 and 1997 the average rate of CEO turnover in unregulated industries[49] was 9 percent.

A CEO manages all aspects of the organization, under board supervision. CEOs typically oversee the firm's money, time and resources and liaise between the board and staff. In some businesses the CEO, in additional to the managerial role, has a governance role on the board. This can enhance the CEO's stature and influence with other board members, but it also carries great responsibility. It may also bring the two roles into conflict—balancing day-to-day operations and big-picture decision making. Some board members believe the CEO should be on the board to help inform their decisions; others think it gives the CEO too much power when setting his/her salary, when selecting directors to the board, when supervising the CEO performance and more.

Figure 7 divides the CEOs into CEOs who sit on the board, CEOs who do not sit on the board and CEOs who are chair of the board, and shows this distribution for the period 1995 to 2018. In 1995, only 15 percent of CEOs were not members of the

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[47] The percentage of CEOs replaced is the percentage of new CEOs out of total CEOs in the sample in each year.

[48] According to "CEO Success Survey" of PWC, turnover among CEOs at the world's 2,500 largest companies soared to a record high of 17.5 percent in 2018 — 3 percentage points higher than the 14.5 percent rate in 2017 and above what has been the norm for the last decade.

[49] The firm is included in the *Execucomp* database during the 1993–1997 period or appears in the *Forbes Annual Survey of Compensation* in the 1985–1992 period.

board; by 2015 this had soared to 74 percent. At the same time, both the percentage of CEOs serving as directors and the percentage of those who also serve as board chairperson declined from 53 percent to 22 percent and from over 30 percent to only 4 percent, respectively. The downward trend in the percentage of CEOs who also serve as the board chairperson started in 1999, when such joint appointments were prohibited in banks, and in all firms in 2011 after Amendment No. 16 was legislated.[50] In 2016–18 this trend began to reverse, so that the percentage of CEOs who do not sit in the board started to decrease and reached 60 percent in 2018.

Figure 8 presents the distribution of the executives by education. Over time the percentage of executives holding a bachelor and below has decreased while the percentage of those with a masters degree and above has increased. In 1995, 28 percent of top executives held a matriculation certificate alone. By 2018, this proportion had fallen to only 17 percent. However, the proportion of those with at least a masters degree more than doubled, from 17 percent to 43 percent. This upsurge derived from both the decrease in those with a high-school education only and the decrease in the number of those with a bachelor degree only (from 55 percent to 40 percent). This increase in years of education among executives in public companies in Israel matches trends among all workers in Israel.

5.3 Firm Characteristics

Table 5 shows the main firm-level variables for 1995 - 2018—total assets, market value, ROE, ROA, stock return, leverage, business group affiliation, firm's time since listing on the TASE and the firm's inclusion in the TA-125 Index. The table is divided into financial firms (Panel A) and nonfinancial firms (Panel B). Financial firms are larger, more leveraged and have been traded longer on the TASE than nonfinancial firms. Moreover, the percentage of firms that belong to a business group over the years is higher in financial firms in comparison to nonfinancial firms – 31 percent compared to 20 percent. Figure 9 presents the percentage of firms in

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[50] The CEO cannot also serve as Board Chairperson without the approval of the General Meeting of the Company's shareholders has been obtained by a majority of two-thirds of the votes of the non - controlling shareholders in the Company. This law applies also to the CEO's relatives and the CEO's subordinate.

the sample that belong to a business group, and shows that in 1995 25 percent of listed companies belonged to a business group. Since 2008 this percentage has decreased gradually, halving to 13 percent by 2018. The decline was greater among financial firms—from 52 percent in 1995 to 13 percent in 2018—compared to financial firms—from 20 percent in 1995 to 11 percent in 2018. As mentioned before, the reduction after 2014 occurred, among other things, because of the Business Concentration Law enacted in December 2013. This law combats economic concentration and strengthens competition.

Aminadav and Papaioannou (2018) gathered data on 27,000 companies traded in 85 countries in 2012 and find that 16.4 percent of the companies are controlled by a family or a single controlling shareholder. This is not the case in Israel. According to the Israel Securities Authority (ISA), 88 percent of the publicly traded companies on the Tel Aviv Stock Exchange in 2018 are owned by a single controlling shareholder or by a controlling group. These companies belong to a variety of industries while the companies with dispersed ownership belong mostly to the banking and high tech industries.

Controlling shareholders, the theory suggests, have both the ability and the incentive to monitor executive pay. Bebchuk and Hamdani (2008) explain that diversion of value through executive compensation is of less concern in controlling shareholder companies than in widely held companies. However, Kastiel (2015) finds empirical indications that the compensation packages of professional managers in controlled companies are unlikely to be accurately calibrated to maximize shareholder value. Kastiel suggests that controlling shareholders may overpay managers to maximize their consumption of private benefits of control. However, in Israel there is a significant difference in the level of executive compensation between companies with concentrated ownership or dispersed ownership because of the difference in firm size, which is the main determinant of executive compensation. In other words, the ownership structure of a firm in Israel does not explain executive compensation.

6. Empirical approach and results

I now combine all the partial evidence from the descriptive statistics and use regression analysis to discover the determinants of the level and change in top executive compensation in Israel.

6.1 Determinants of executive compensation

To examine the determinants of executive compensation at firms traded on the Tel Aviv Stock Exchange between 1995 and 2018, I estimate a set of multivariate regressions using ordinary least squares where the unit of observation is executive i at firm j in year t as follows:

(1)

$$y_{ijt} = \beta_0 + \beta_1 Year\ 2011\_2012_t + \beta_2 Year\ 2013\_2016_t + \beta_3 Post\ 2016_t + \gamma E_{ijt} + \delta F_{jt} + Firm_j + Year_t + Ind + \varepsilon_{ijt}$$

y_{ijt} is the dependent variable of interest (log of total compensation, etc.), Year 2011_2012 is a dummy variable that equals 1 if the year is 2011 or 2012 (the years following the enactment of Amendment no.16), Year 2013_2016 is a dummy variable that equals 1 if the year is between 2013 and 2016 (the years following the enactment of Amendment no.20), and Post 2016 is a dummy variable that equals 1 if the year is 2017 or 2018 (the years following the enactment of the 2016 Law). E_{ijt} is a vector of executive control variables such as age, tenure, education (a dummy variable that equals 1 if the executive holds a masters degree and zero otherwise), the executive's holdings in the company, turnover (a dummy variable that equals 1 if it is the executive's first year in the role and zero otherwise) and the appointment percentage variable (full time or part time employment). F_{jt} is a firm-level control such as size (natural logarithm of total assets[51]), performance (lagged stock return

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[51] According to Gabaix and Landier (2008), the best proxy for company size is total assets (debt + shareholders' equity).

or lagged ROA[52,53]), and firm's business group affiliation. The regressions were run with dummy variables for firms ($Firm_j$), for years ($Year_t$) and for industries (Ind) to control for unobserved effects caused by specific characteristics of the year, industry and the firm over time.[54] I tested the addition of fixed effects for executive to see whether the results are due to unobserved heterogeneity among the executives. When I broke down the variance into the variance within one unit (executive) and the variance between the units, I found that the former accounted for only 10 percent of the variance. This means that when we look at the executive, the total compensation represents a low variance over time; most of the variance is due to variance between the executives. If fixed effects are included in such a case, most of the variance in the dependent variable is lost and the model becomes almost useless. In years when two or more people serve in the same position in the same company (for example, if there was a turnover of the executives in the middle of the year, in cases of co-CEO or co-chairperson, etc.), I omitted the newer executive from the data.[55] Across all of the specifications, errors are clustered within firm. All specifications use 2016 prices.

I first estimate equation (1) in which the dependent variable is the natural logarithm of total compensation. Table 6 reports the results. Firms may report, for accounting reasons, equity-based pay after the grant year, which may distort compensation measurement. To address this, the dependent variable in the specifications presented in columns (2) and (4) is the natural logarithm of (total compensation minus equity-based pay). To control for the performance of the firm I use lagged stock return (stock performance, columns 1 and 2) or lagged ROE (accounting performance, columns 3 and 4). Columns 5-6 present the results for the post-2006

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[52] I used stock return/ROA in $t-1$ and not in t to avoid endogeneity - the company is likely to pay more to a better CEO, which will probably lead to better performance. Otherwise, there would be no reason to pay him/her more. Moreover, higher compensation is an incentive for the executive to achieve better firm performance.

[53] Lagged stock return and lagged ROA are winsorized at the 5 and 95 percentiles.

[54] I put dummy variables both for firms and industries because there are firms that change industries over time.

[55] In the cases of turnover, I also made compensation adjustments to the remaining executive, so that the salary part in his/her compensation is adjusted to annual terms. For example, if an executive retires in the end of October, his/her reported salary is multiplied by 12/10 in that year.

period when compensation reports became more accurate, and Columns 7-8 present the results for firms belonging to the TA-125 Index due to a higher reporting quality.

Consistent with the notion that the three regulations had led to a decrease in total compensation, I find that the coefficients of Year 2011_2012, Year 2013_2016 and Post 2016 variables are negative and statistically significant.[56] My results show that Amendment No. 16 and Amendment No. 20 led to a decrease (between 7 and 17 percent on average compared to the period 2007-2010) in executive compensation, when among TA-125 firms (Columns 7-8) the rate of decrease was much higher.[57] This finding is consistent with Zviran et al. (2020) who find that Amendment No. 16 and Amendment No. 20 stopped the increase in executive compensation in the preceding period. Among TA-125 firms, the 2016 Law led to another decrease in executive compensation. In both specifications, when the dependent variable is the natural logarithm of non-equity compensation, the coefficient of the Year 2011_2012 variable is not statistically significant. This result implies that Amendment No. 16 did not lead to a decrease in the non-equity compensation.

As expected, both total compensation and non-equity compensation increases with size (total assets). Zhou (2000) argues that the compensation's elasticity to firm size is more or less constant around the level of 0.25 (between 0.2 and 0.35) in various countries, such as the US, Japan, the UK, and Canada. According to the current estimate, this elasticity ranges between 0.13 to 0.19 (the coefficient of total assets log),[58] which means that for every 10 percent increase in the size of the firm, executive compensation increases by 1.3-1.9 percent. This result means that the main explanatory variable for executive compensation is the size of the firm. Using lagged stock return or lagged ROA for performance did not change most of the

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[56] Fried et al. (2020) find that the 2011 reform had a negative effect on the compensation of controller executives.

[57] I find that the decrease in compensation following the regulations was much more significant for board chairpersons than for CEOs.

[58] The average total assets is 20 times the median, which is indicative of a broad distribution of companies: Large firms bias the average upward even though they are small in number.

significance of the results.[59] The coefficient of lagged stock return was small and significant — an increase of 10 percentage points in lagged stock return leads to an increase of 0.007 percent in executive compensation. The coefficient of lagged ROA, however, was only significant in two specifications (Columns 4 and 8). However, when using stock return in t instead of *t*-1, the coefficient remains significant but becomes smaller (0.0004). While the positive effect of ROA in t-1 on non-equity executive compensation is significant, the effect of ROA in t is not significant. Furthermore, the coefficient is higher when using ROA in t instead of ROA in the sample of TA-125 firms (0.03 compared to 0.02).

The rate of the executive's holdings coefficient is positive and significant – the higher the executive's holdings, the higher his/her compensation[60] (among firms belonging to the TA-125 Index the effect is smaller). The executive's tenure coefficient is positive and significant whereas the executive's tenure-squared coefficient is negative and significant. That means that the executive's tenure positively affects his/her compensation, but its contribution to compensation decreases over time. The executive's masters degree dummy coefficient is positive but not significant in 3 of the 4 specifications. This is consistent with the opposite trends in executive compensation and the executives' degree of education in the last decade, as seen in the descriptive statistics section – executive compensation had decreased although there was an increase in their level of education. This can be explained by the fact that there is a competitive market for professional executives. In addition, the coefficient of the executive's turnover (a dummy variable which equals 1 if it is the executive's first year in the role) is negative but not significant.[61] That is, according to the results, a new executive does not

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[59] It is actually preferable to connect executive compensation to the interests of the shareholders as these are reflected in the value of the company's equity, which signals the firm's future profits. Nevertheless, connecting executive compensation to accounting profit also appears to be advantageous. Accounting profit is less subject to fluctuations that are not connected to the company's management or performance (Lambert, 1993).

[60] Replacing the executive's holdings variable with a dummy variable that takes the value of 1 if the executive is one of the control group members (holding above 25 percent of firm's shares) and 0 otherwise does not change the results.

[61] Omitting first year and last year in office instead of including the variable "Turnover" (2,002 omitted observations) does not change the results.

necessarily begin with a lower compensation compared to an executive with at least one year's seniority.[62] The coefficient of the appointment percentage variable, as expected, is positive and significant—an increase of 10 percentage points in the executive's appointment percentage leads to an increase of 0.13-0.14 percent in executive compensation. The coefficient of business group affiliation was not found to be significant using all firms in the data set, meaning that there is no significant difference in executive compensation between business group affiliated firms and nonaffiliated ones. However, for firms belonging to the TA-125 Index, the coefficient is negative and significant, meaning that executive compensation in business group affiliated firms is lower compared to nonaffiliated ones, ceteris paribus. The level of initial annual compensation, controlling for firm and executive characteristics, is NIS 60,000 (exp [11]) a year.

Table 7 presents the specifications from Columns 1 and 3 in Table 6, separately for financial firms (Column 1 and 2) and nonfinancial firms (Columns 3 and 4). I find that executive compensation decreased in financial companies following Amendment no. 16, and it continued to decrease after Amendment no. 20 and after the 2016 Law. Following these compensation reductions, executive compensation in financial firms in the years 2017–18 was 45 percent lower than the level of compensation between 2007-2010. The rate of decrease was higher in financial firms compared to nonfinancial firms not only as a result of the 2016 Law, which restricts executive compensation in financial firms, but also as a result of Amendments Nos. 16 and 20.

The coefficient of lagged stock return was found to be positive and significant in both financial and non-financial companies. Nevertheless, the significant coefficient is small—an increase of 10 percentage points in the firm's stock price in *t-1* leads to a 0.01 percent increase in executive compensation in *t*.[63] When adding

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[62] In this respect I find negative correlation between the probability of CEO turnover and the firm's accounting performance (beyond industry accounting performance), which means that firms in Israel tend to replace the management when their accounting performance is deficient. I do not find any correlation between CEO turnover and firm's stock performance.

[63] When replacing firm's stock price in t-1 with firm's stock price in t, the coefficients remain significant in both estimations, but become much smaller (0.0005-0.0006).

firm's stock price in *t* along with firm's stock price in *t-1* to the estimations, both coefficients remain significant in both groups.[64] The lagged ROA coefficient, which stands for accounting performance, however, was significant in financial firms only. When using ROA in *t* instead of *t-1*, the effect is not significant. Also of note, when I divide the sample period into two sub-periods (before the three regulations were implemented, 1995–2010, and after, 2011–18) and re-estimate Equation (1), I find different results. For non-financial firms, the effect of stock performance on executive compensation was positive and significant in both periods (the size of the lagged stock return coefficient was higher in the second period - 0.001 compared to 0.0004). The effect of accounting performance on executive compensation in nonfinancial firms was not significant in either period. For financial firms, however, the effect of stock performance was significant in the first period but not in the second period. Analyzing the effect of accounting performance on executive compensation in financial firms, I find an opposite result - the effect in the first period was not significant while in the second period it was. Although Barak et al. (2007)[65] find a stronger pay-performance sensitivity — an increase of 1 percentage points in the firm's stock price leads to an increase of 0.19 percent in executive compensation including only firms in which the CEO was not replaced during 1994–2001, they do not find a significant pay sensitivity to accounting performance.[66] Amzaleg and Mehrez (2002), who sampled 186 firms in 1997, find that executive compensation is significantly affected by both stock and accounting performance. Our result is inconsistent with Gershgoren et al. (2015) who find that there is no significant correlation between executive compensation and firm performance over the years 2012–14.[67]

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[64] According to Hall and Liebman (1998), it is preferable to use both performance in *t* and *t-1* to explain executive compensation.

[65] Barak et al. (2007) include in their sample only companies in which the CEO was not replaced between 1994 and 2001.

[66] I find a significant pay-performance sensitivity when I re-estimate equation (1) for the period 1995-2001, both stock and accounting performance. I do not manage to replicate Barak et al. (2007) results.

[67] Gershgoren et al. (2015) include in their sample not only the CEO and the board chairperson, but all five highest paid executives in the firm.

Additional conclusions that can be drawn from the results are that the effect of firm's size and of executive's tenure in his/her position on executive compensation is greater in financial firms than in nonfinancial firms. The executive's holdings in the firm, however, are an explanatory variable for executive compensation in nonfinancial firms but not in financial firms.

The next question I examine is whether firm's size affects the sensitivity of executive compensation to firm performance. I added a dummy variable — *Large* — giving the value 1 to companies with total assets above the median of the total assets of the companies in the sample and 0 for companies with total assets below the median, as well as interaction variables between *Large* variable and each of the performance explanatory variables.[68] Column 1 in Table 8 presents the results for stock performance and Column 2 for accounting performance. Another way to divide the sample by firm size is to separate firms that belong to the *TA-125 Index* (16 percent of the firms) and firms that do not. In Columns 3 and 4 I add the variable *TA-125 Index* (which equals 1 if the firm belongs to the *TA-125 Index* and 0 otherwise), and the interaction variable between *TA-125 Index* and stock performance (*Stock return in t-1*, Column 3) and accounting performance (*ROA in t-1*, Column 4). The coefficient of the interaction between *Large* and accounting performance was positive and significant (Column 2), meaning that the sensitivity of executive compensation to a firm's accounting performance is higher at larger companies. However, no empirical evidence exists for the hypothesis that the sensitivity of executive compensation to the firm's stock performance differs between small and large companies.

I further examine whether the sensitivity of executive compensation to firm performance changes with firm size by adding the interaction variable between the log of total assets and firm performance — stock performance in Column 5 and accounting performance in Column 6. In these specifications I find again that the sensitivity of executive compensation to the firm's accounting performance increases with the size of the firm. Note that at the same specification (Column 6)

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[68] See Zhou (2000).

the coefficient of ROA in t-1 was negative and significant for a technical reason—for all values of total assets (observed in the data), the overall effect of ROA is positive. In conclusion, the sensitivity of executive compensation to the firm's accounting performance increases with the size of the firm.

6.2 Co-CEOs and Co-Board Chairpersons

So far, I have tried to answer the question of how the company and the executive characteristics together affect executive compensation. By including FE/dummies for each firm alongside its observable variables, I control for the variation in compensation stemming from a firm's characteristics. However, in a sample that spans 24 years, there might be some time-varying unobservable firm characteristics that affect compensation, such as remuneration policies, risk aversion, etc. These might be correlated with the executives' characteristics, leading to biased estimates. To overcome this possibility, I look to the effect of co-CEOs and co-board chairpersons.

Almost 20 percent of the companies in the sample have two or more CEOs or board chairpersons (in either all or some of the sample years). For comparison, 426 (37.3%) of the 1,141 listed Korean firms have adopted a co-CEO structure (see Yoo et al., 2020), while in the United States, only 83 firms reported having a co-CEO structure between 2000 and 2011 (Krause et al., 2015). Since these executives serve in the same company in the same position at the same time, the effect of executive characteristics on executive compensation can be isolated by estimating the factors affecting the pay disparities between the CEOs/chairpersons in the sample.

I use a sub-sample of co-CEOs and co-chairpersons. It has 134 companies: 109 companies with two co-CEOs, 11 companies with two co-chairpersons, 13 companies with three co-CEOs, 2 companies with four co-CEOs and 1 company with 5 co-CEOs. Among these companies, there is mutual management over 5 years on average and over a maximum of 19 years.

Nineteen out of the 134 companies (14 percent) are listed on the Tel Aviv 125 Index (most of the time).[69] Most of the companies belong to the Trade and Services Industry (26 percent), Manufacturing (26 percent), Real Estate (23 percent) and the Investments and Holdings Industry (13 percent). There are only few cases in which there was shared leadership in financial companies. The median total assets of these companies equal 60 percent of the median total assets of the firms that are not managed by co-executives. The average pay disparity between two co-executives is NIS 353,000, the median is NIS 38,000, and the maximum is NIS 13 million. Moreover, in 25 percent of the cases the executives are compensated the same.

To analyze the factors affecting the pay disparity between the CEOs/chairpersons I estimate the following model in which the unit of observation is firm j in year t as follows:[70]

$$(Y_{jtA} - Y_{jtB}) = \alpha_0 + \alpha_1(X_{jtA} - X_{jtB}) + Firm_j + Year_t + \varepsilon_{jt}$$

The dependent variable is $(Y_{jtA} - Y_{jtB})$ which is the difference between the log of total compensation of executive A and executive B. The variable $(X_{jtA} - X_{jtB})$ is the difference between vectors of executive control variables such as age, tenure in position, education, holdings in the company, having a relative who is a stakeholder in the company, executive turnover, membership and position on the board, and the appointment percentage variable (full time or part time), again of executive A and executive B. The estimations include dummy variables for firms ($Firm_j$), and for years ($Year_t$) to control for unobserved effects caused by specific characteristics of the firm and years. The data in all specifications use 2016 prices.

Table 9 presents the results. In all specifications, the coefficient of the difference in the executives' tenure was found to be positive and significant, meaning that the number of years the executive has held the position plays a role in determining the compensation disparity between co-executives. A difference of one year in the tenure of co-executives contributes to an increase of 0.005 percent in the pay

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[69] There are firms in this sub-sample that were listed on the Tel Aviv 125 Index only part of the time.
[70] For the estimation, I dropped the companies with more than two co-executives.

disparity. Beyond the gap in seniority in position, I also find, as expected, that a new co-executive is compensated less than a co-executive for whom it is not his/her first year in the role—ceteris paribus, by 11 percentage points. The coefficient of the variable appointment percentage of a co-executive was positive and significant—an increase of ten percentage points in the difference between the appointment percentage of co-executives leads to an increase of 10 percent in the difference between the co-executives' compensation gap.

The coefficient of the difference in age of the executives was not significant (even when I omitted the variable *difference (tenure)*, it was not significant). Board membership or alternatively serving also as the chairperson of the board (Column 2) was not an explanatory variable for the co-executives' pay gaps. Also education, using a dummy variable that equals 1 if the executive holds a masters degree or higher and zero otherwise (*MA* variable, Columns 1-2 and 4-5) or a dummy variable that equals 1 if the executive holds a bachelor degree or higher and zero otherwise (*BA* variable, Columns 1-2 and 4-5) was not significant in explaining the difference in compensation between co-executives. To estimate the effect of executive holdings on co-executives' compensation gap, I used the rate of executive's holdings in compensation (Columns 1-3), a dummy variable that equals 1 if the executive holds 5 percent or more in the firm's shares (the variable *stakeholder*, Column 4) and a dummy variable that equals 1 if the executive has a relative who is a stakeholder in the company (*Family stakeholder*, Column 5). The coefficients of all these variables were not significant, meaning that the rate of holdings in the company does not explain any of the difference in compensation between co-executives.

In conclusion, I find that the differences in the executives' tenure and their appointment percentage are correlated with the differences in co-executives' compensation, while differences in age, share of holdings in the company, education, and membership on the board are not.

7.   Summary and Conclusions

Executive compensation has been a frequently-debated topic in Israel and worldwide for the past few decades. The debate focuses on why executive compensation in publicly traded companies is so high, whether it is justified and how it is being addressed for the benefit of the shareholders and others involved with the firm. Moreover, 'inflated' executive pay has fueled the conversation on economic inequality that has recently moved to the center of the national conversation. In Israel this overall negative sentiment regarding CEO pay, encouraged by intensive media scrutiny over the issue, has since 2011 led to regulatory scrutiny and measures by the government to curb executive pay.

The literature on the development of executive compensation in publicly traded companies in Israel is relatively limited, which may adversely affect the public discourse. With this paper, I contribute to the debate on executive compensation by examining the development and determinants of top executive compensation in Israel, and assessing the consequences of the main regulations (Amendment no. 16, Amendment no. 20 and the 2016 Law). I use a hand collected panel of all Israeli publicly traded (listed on the Tel-Aviv Stock Exchange (TASE)) firms (778 firms in total) with available information on top executives' compensation over the period 1995 to 2018. The paper presents the largest and most up-to-date data assembled on the personal characteristics and compensation of executives in publicly traded companies in Israel.

My conclusions are partially at odds with the prevailing wisdom on CEO compensation in Israel. I find that average top executives' compensation increased by 17 percent (real) during the period reviewed, while average wage per employee position increased by twice as much in this period – by 35 percent (real). The pay disparity between public company CEOs and the average compensation per employee position increased from 1996 to 2007—from 13 times to 19 times, but returned to 13 times by 2018 after all three regulations were implemented. In other words, the inequality in Israel, measured by the pay disparity between CEO compensation in publicly traded companies and the average wage per employee

position, which had expanded by 2007, has returned to the level recorded 24 years earlier. This contrasts with the pay disparity between public company CEOs[71] and the average compensation per typical worker in the US, which increased dramatically during this period - from 154 times in 1995 to 278 times in 2018 - due to a much higher increase in CEO compensation during this period – 187 percent, compared to just 17 percent.[72]

Separating the firms into financial and non-financial firms, I find that the trends of executive compensation between 1995 and 2018 are essentially similar but the rates of change are different—by 2007 it soared by 227 percent in financial firms while it increased by 54 percent in nonfinancial firms. After 2010 and by 2016, around the time Amendment no. 16 and Amendment no. 20 were imposed, there was a gradual decline in executives' compensation in both groups—44 percent in financial firms and 10 percent in nonfinancial firms. Following the 2016 Law, executive compensation in financial firms continued to decrease while in nonfinancial firms it started to increase. As a result, the average executive compensation in financial firms has neared the level of the average executive compensation in nonfinancial firms (NIS 1.9 million vs. NIS 1.8 million). I conclude that Amendment no. 16 and Amendment no. 20, which mainly accord the directors and shareholders more authority to vote and determine the level of executive compensation, as is common in other countries, have had a significant effect in decreasing executive compensation in both financial and non-financial firms. Even without the 2016 Law, which was an extreme and dramatic intervention that was not supported by economic consideration but by public and political pressures, the goal of curbing executive compensation had already been achieved.

The companies with the highest pay for top executives were banks and insurance companies, while top executives in companies in the biomed industry were paid the least. Consistent with the literature, company size is the main explanation for the level of executive compensation. I find a significant difference in executive compensation between business group affiliates and non-affiliates only in TA-125

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[71] Among 350 largest publicly owned U.S. firms.
[72] According to a report written by Mishel and Wolfe (2019) in Economic Policy Institute.

firms. The results also suggest that the pay-performance sensitivity is weak compared to other countries. As noted before, in countries with a concentrated ownership structure, like Israel, controlling shareholders have significant incentives to monitor management and not tie executive compensation to firm performance. However, it is worth noting that more aggressive pay-for-performance systems (and a higher probability of dismissal for poor performance) would produce sharply lower compensation for less talented managers. Over time, these managers would be replaced by more able and more highly motivated executives who would, on average, perform better and earn higher pay. Existing managers would have greater incentives to enhance corporate performance, and their pay would rise as well. Note that compensating executives for the short term only could encourage them to take excessive risks and/or to leave the firm when the market turns.

Pay-accounting performance sensitivity has strengthened after applying the regulations to financial firms, while in non-financial firms it has not changed. However, I find that the pay-stock performance sensitivity has weakened over the years in financial firms, so that between 2011 and 2018, the years in which the three main regulations were implemented, no correlation is found between the two. This raises the question whether lower executive compensation in the years in which the three regulations were implemented, was not due to performance-based considerations, but rather to public forces. In contrast, in non-financial firms it has increased.

I also find that the sensitivity of executive compensation to the firm's accounting performance increases with the size of the firm. With respect to executive characteristics, the average age and average tenure of top executives in Israel are similar to the averages recorded among CEOs in US companies. However, the share of executives who hold an academic degree is higher among CEOs in Israel than in the US. I find that executive tenure has a positive effect on pay (the effect in financial firms is greater), but its contribution to pay decreases over time. I do not find any effect of the executive's highest academic qualification on compensation.

In addition, as expected, the executive's rate of holdings in the company affects positively the level of compensation.

Almost 20 percent of the companies in the sample have two or more CEOs or Board Chairpersons (in either all or part of the sample years). Based on a sub-sample which includes co-CEOs and co-chairpersons, I analyze the personal characteristics of the executives that affect the pay disparities between them. To the best of my knowledge this has not been done before. I find that the difference in the executives' tenure and their appointment percentage explains part of the difference in co-executives' compensation. I also find that a new co-executive is compensated less than a co-executive who is not in his/her first year in the position. Differences in age, share of holdings in the company, education, and membership of the board do not affect pay disparities between co-executives.

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Appendix A. Variable Definitions

Variable	Definition	Source
Firm's Issuer Number	Company number (according to Stock Exchange symbol)	TASE data
Executive's position	Indicator Variable which takes the value of zero if the executive is the Chairperson of the Board; one - if he is the CEO; two - if he both the chairperson and the CEO; three – otherwise.	Manually collected from the periodic and immediate annual reports
CO_CEO	Dummy variable, which takes the value of one if the office holder is a co-CEO or co-Chairperson and zero otherwise.	Manually collected from the periodic and immediate annual reports
Deputy CEO	Dummy variable equals to one if the office holder is a Deputy CEO and zero otherwise.	Manually collected from the periodic and immediate annual reports
Name	Executive's name	Manually collected from the periodic and immediate annual reports
ID	Executive's ID number	Manually collected from the periodic and immediate annual reports
Age	Executive's age	Manually collected from the periodic and immediate annual reports
Education	Indicator Variable equal to zero if the executive has 12 years of education, one if he has a bachelors degree, and two if he has a masters degree or higher.	Manually collected from the periodic and immediate annual reports
Membership in the Board of Directors	Indicator Variable equal to zero if the executive is not a member of the Board of Directors, one if he is a member of the Board of Directors, and two if he is the Chairperson of the Board of Directors.	Manually collected from the periodic and immediate annual reports

Family Relation	Dummy variable equals to one if the executive is a relative of a party at interest, and zero if not.	Manually collected from the periodic and immediate annual reports
Tenure in the Company	Executive's tenure measured as the number of years spent with a given firm	Manually collected from the periodic and immediate annual reports
Tenure in position	Executive's tenure measured as the number of years spent with a given position	Manually collected from the periodic and immediate annual reports
Turnover	Dummy variable equals to one if there is a change of the executive in a given year.	Manually collected from the periodic and immediate annual reports
Appointment percentage	The percentage of appointment in executive position (part or full time employment)	Manually collected from the periodic and immediate annual reports
Holdings	The executive's holdings in the company	Manually collected from the periodic and immediate annual reports
Family Stakeholder	Dummy variable equals one if the executive has a relative who is a stakeholder in the company, and zero otherwise.	Manually collected from the periodic and immediate annual reports
Total Compensation	Total compensation paid to the executive in a given year in current prices (in shekels)	Manually collected from the periodic and immediate annual reports
Of which: Salary	Base salary paid to the executive in a given year in current prices (in shekels)	Manually collected from the periodic and immediate annual reports
Of which: Social Provisions	Social Provisions paid to the executive in a given year in current prices (in shekels)	Manually collected from the periodic and immediate annual reports
Of which: Bonuses	Bonuses paid to the executive in a given year in current prices (in shekels)	Manually collected from the periodic and immediate annual reports

Of which: Share based compensation	Share based compensation paid to the executive in a given year in current prices (in shekels)	Manually collected from the periodic and immediate annual reports
Of which: Other benefits	Other benefits paid to the executive in a given year in current prices (in shekels)	Manually collected from the periodic and immediate annual reports
ROE	Return on Equity computed as the ratio of equity and total assets	Annual financial statements data
ROA	Return on Assets computed as the ratio of net income and total assets	Annual financial statements data
Size	Natural logarithm of total assets	Computed by author using annual financial statements data
Market Value	Natural logarithm of market value (at the end of the year)	Computed by author using TASE data
Industry	Industry of the firm	Annual financial statements data
Business Group Affiliation	Dummy variable equals to one if the firm is a business group-affiliated and 0 otherwise.	Computed by author using Bank of Israel data
Industry ROE	Average Return on Equity in the Industry (weighted average by total assets)	Computed by author using annual financial statements data
TA 125 index	Dummy variable equals to one if the company belongs to the TA 125 Index and zero otherwise.	Computed by author using TASE data
Trading Years	Number of company's years of trading on the Tel Aviv Stock Exchange	Computed by author using annual financial statements data
Leverage	Ratio of book value of liabilities to book value of assets	Computed by author using annual financial statements data
Stock Return	Company stock return	Computed by author using TASE data

Industry stock return	Industry stock return (weighted average by market value)	Computed by author using TASE data
Tobin's Q ratio	Method of calculation: (book value of debt + market value)/ (book value of assets)	Computed by author using TASE data
Public	Dummy variable equals to one if the company's stock is traded in TASE and zero otherwise (only bond or other instrument is traded)	Computed by author using TASE data
Year 2011_2012	Dummy variable equals to one if the year is 2011 or 2012 (after Amendment No. 16) and zero otherwise	Computed by author
Year 2013_2016	Dummy variable equals to one if the year is 2013 or 2014 or 2015 or 2016 (after Amendment No. 20) and zero otherwise	Computed by author
Post 2016	Dummy variable equals to one if the year is after 2016 (after Act) and zero otherwise	Computed by author
Ta 125 Index Return	TA 125 Index annual return	Computed by author using TASE data
All Stocks Index return	All Stocks Index annual return	Computed by author using TASE data

Figure 1: Distribution of the companies by industry

This figure describes the distribution of the companies (number of companies) in my data by industry (percent in parentheses). If a company moves to another industry during the sample period, the company will be classified according to the industry to which it belonged for most of the period.
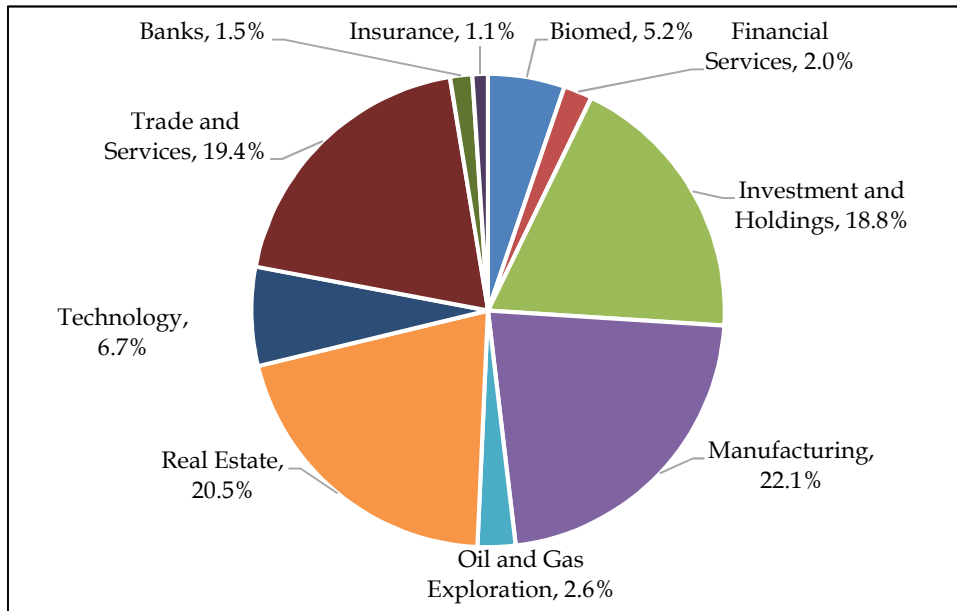
Figure 2: Executive Compensation

Figures 2(a)-2(c) present executives' median compensation, executives' average compensation and executives' average compensation divided into financial (blue line) and nonfinancial (red line) firms, respectively, over the years 1995 to 2018 in Israel. The compensation is in millions of shekels in 2016 fixed prices. The dashed vertical lines in figure 2(c) denote the point in time at which Amendment no. 16 (2010), Amendment no. 20 (2012) and the 2016 Law (2016) were introduced.
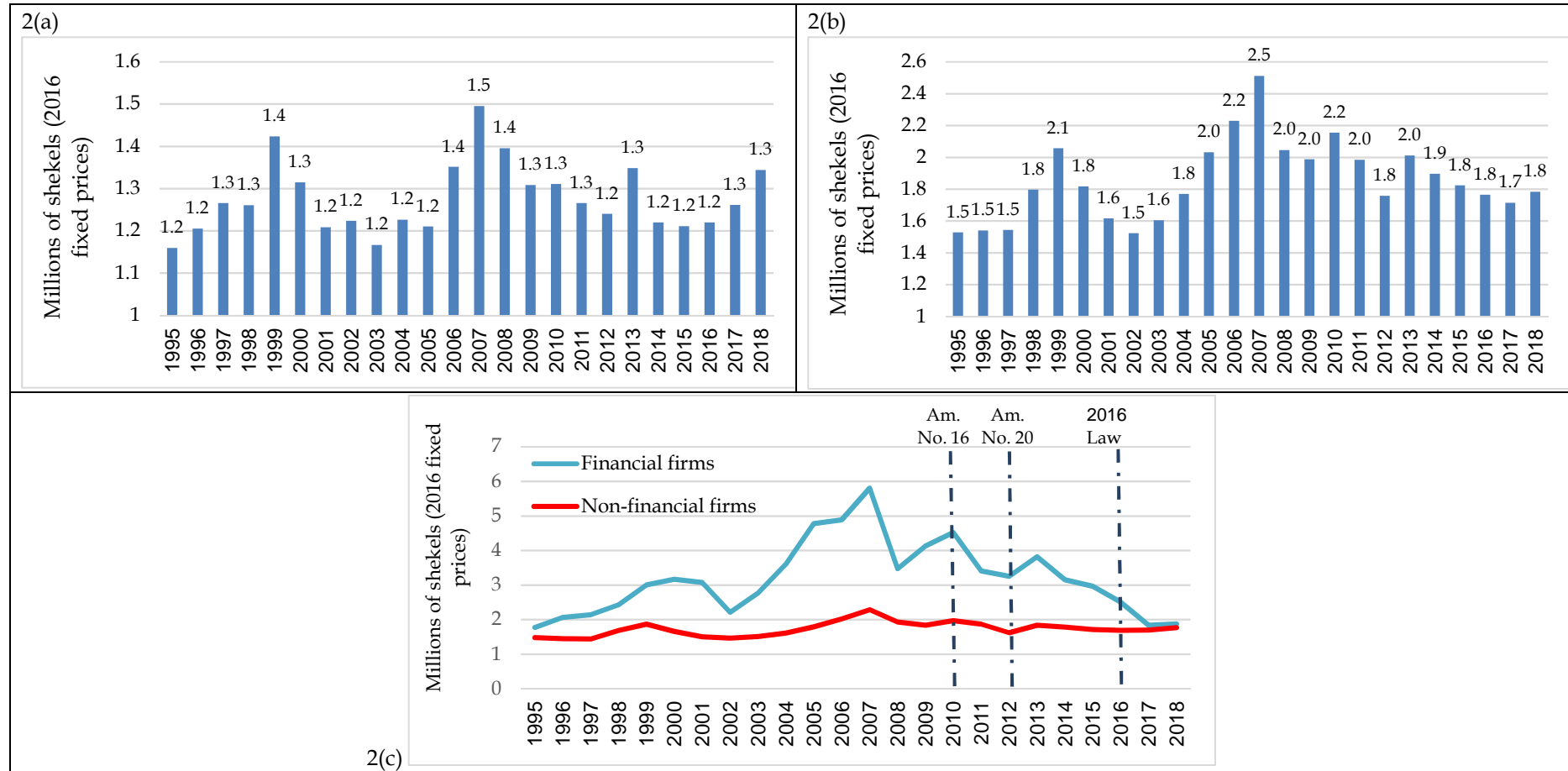
Figure 3: Executive Compensation, by industry

This figure exhibits the average executive compensation, by industry, in the years between 1995 and 2018. The compensation is in millions of shekels in 2016 fixed prices.
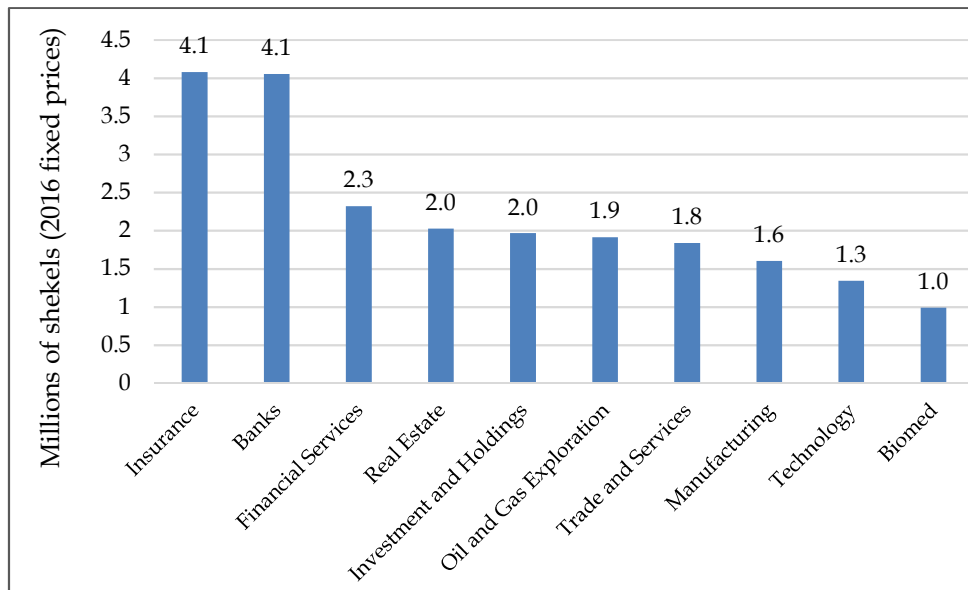
Figure 4: Executive compensation, by size

The figure presents the distribution of executive compensation in big companies—the upper quartile in size (calculated according to the company's total assets)—and in small companies, the lower quartile in size. The compensation is in millions of shekels in 2016 fixed prices.
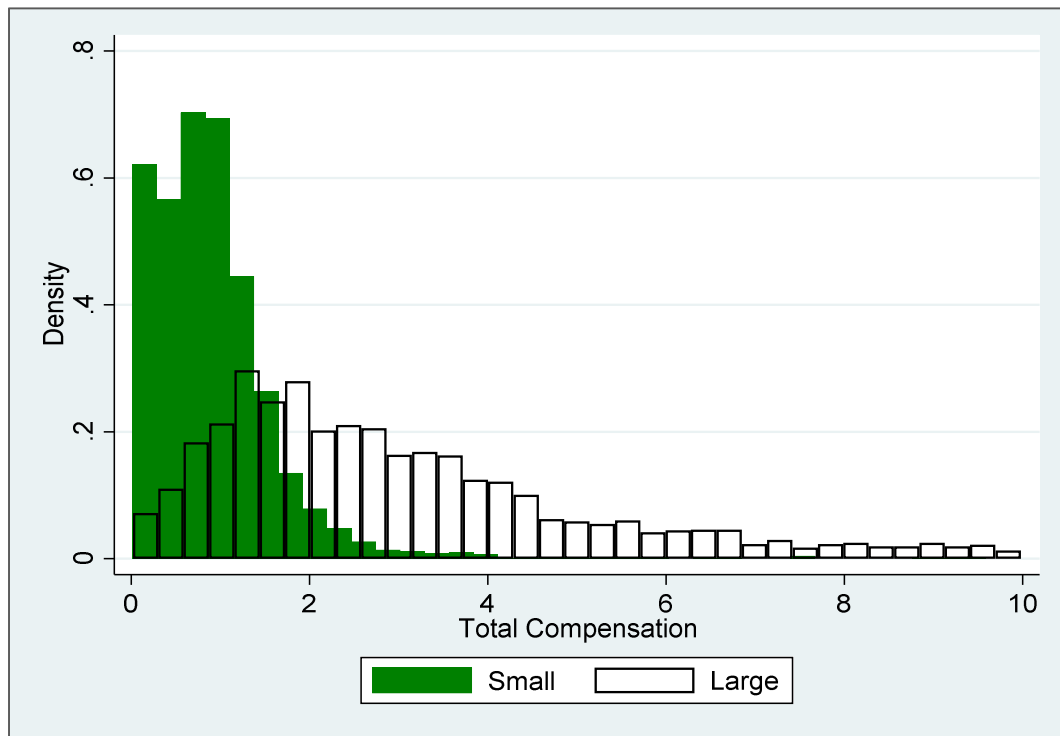
Figure 5: Executive compensation structure

The figure presents the structure of CEO compensation by exhibiting the fixed compensation to total compensation ratio in financial (blue line) and nonfinancial (red line) firms.
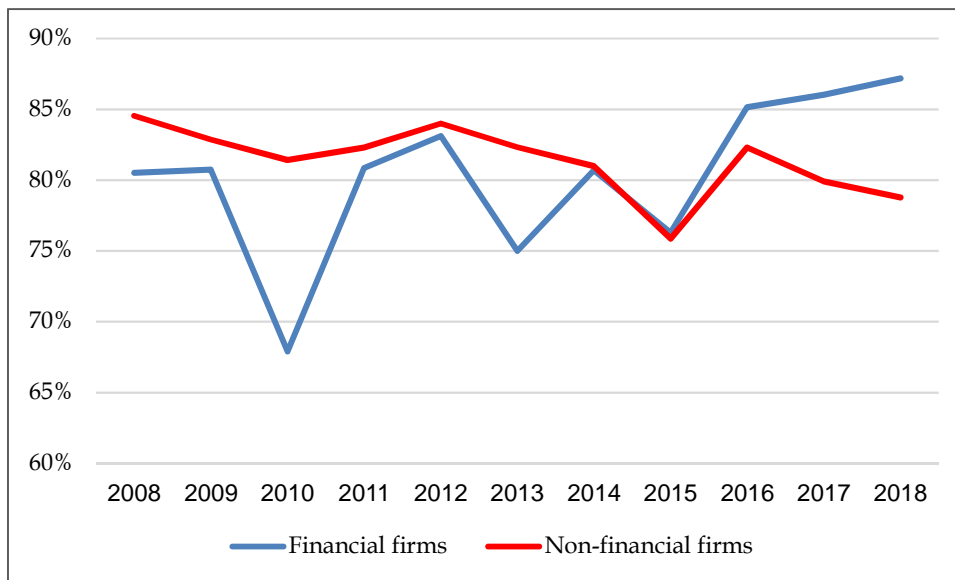
Figure 6: CEO turnover

The graph exhibits the percentage of CEOs who were replaced out of all the CEOs in the sample in the years 1995–2018.
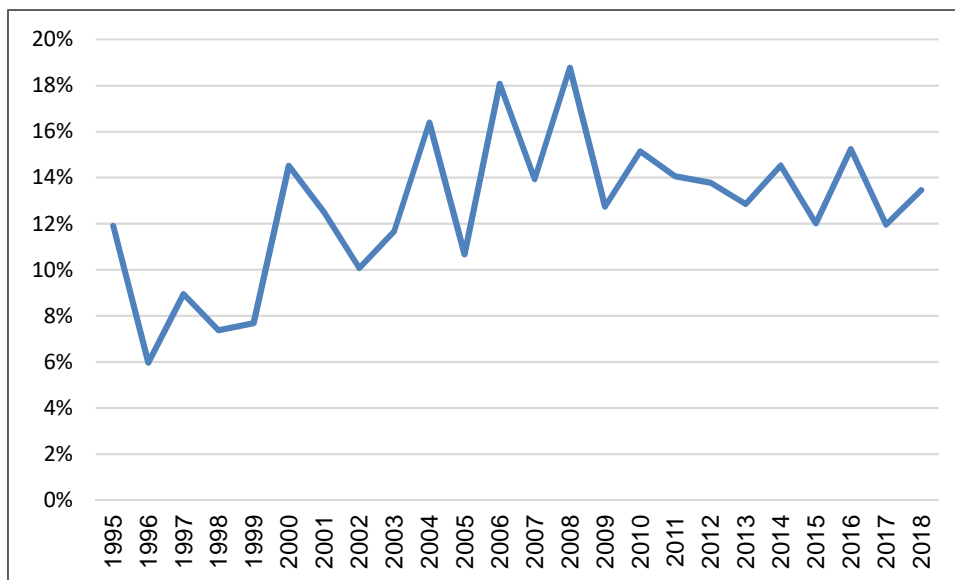
Figure 7: CEOs on the board

The figure divides the CEOs between CEOs who sit on the board (in red), CEOs who do not sit in the board (in blue) and CEOs who serve also as the Chairperson of the Board (in green) and describes this distribution, in percent, over time – between 1995 and 2018.
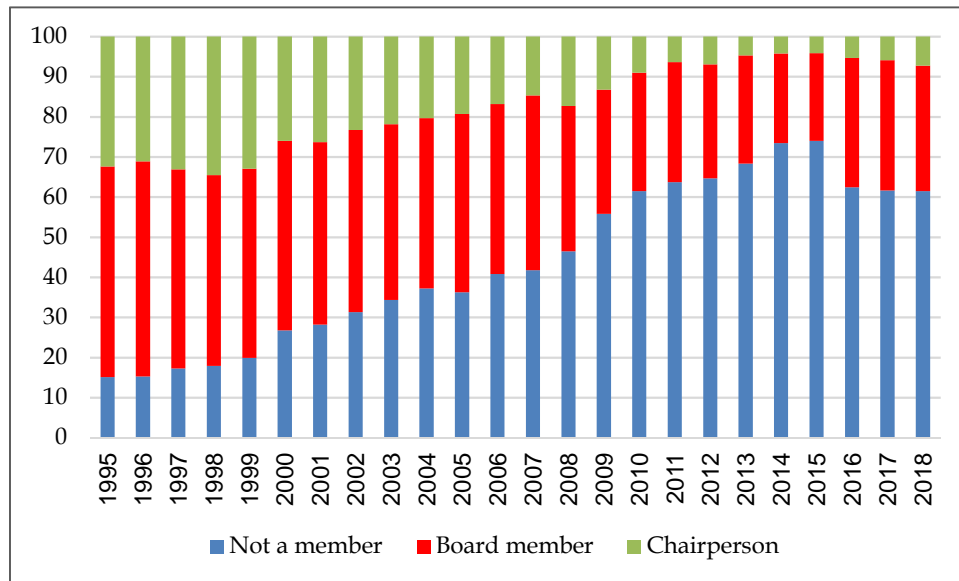
Figure 8: Executive Education

The figure divides the executives between those who hold matriculation certificate alone (in blue), those with a Bachelor's degree only (in red), and those with at least a Master's degree (in green) and describes this distribution, in percent, over time – between 1995 and 2018.
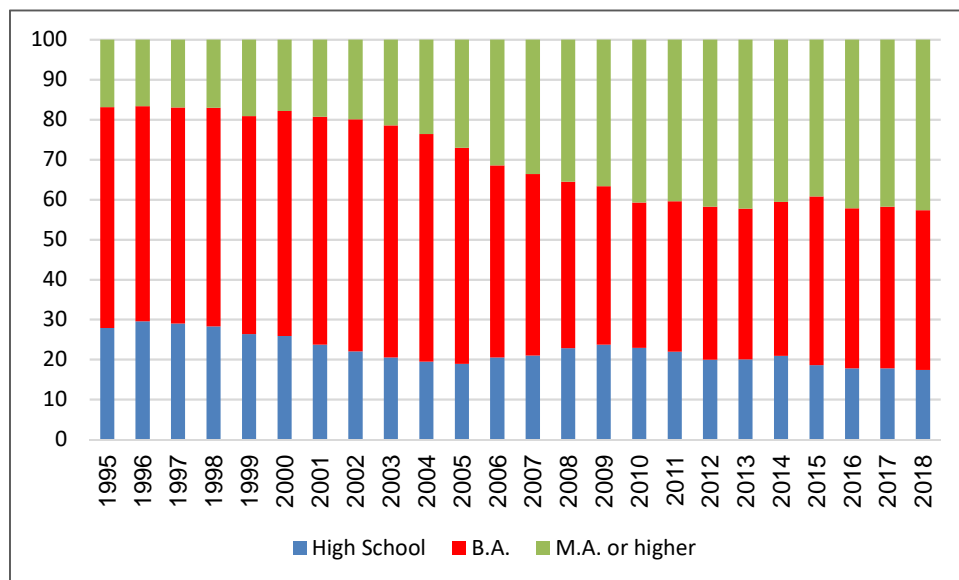
Figure 9: Business Group Affiliation

The graph exhibits the percentage of firms that belong to a Business Group out of all listed firms in the sample over the years 1995–2018.
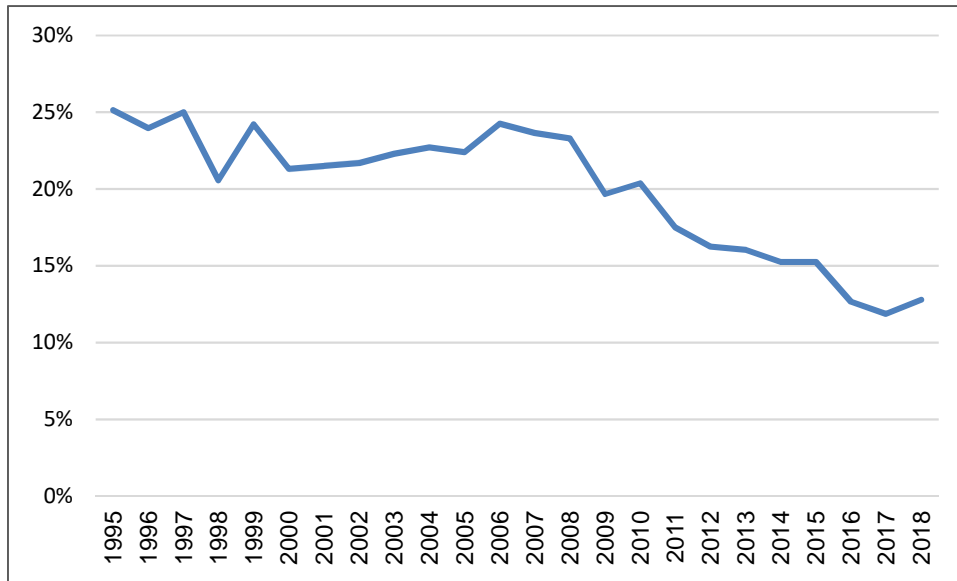
Table 1: The implemented regulations in Israel regarding Executive Compensation

This table describes the regulation that have implemented in Israel in the last decade regarding executive compensation. For each regulation the table reports its name, the time it was applied, to whom it is directed and a detailed information about the legislation requirements.

Name	Time the regulation was approved	Target	Details
Amendment No. 16 to the Israeli Companies Law of 1999	March 2011	Compensation paid to executives who are controlling shareholders or their relatives	The level of minority shareholder support required for approving related party transactions, including executive compensation paid to controlling shareholders or to their relatives, increased from a third to a majority of the minority votes cast.[73]
Amendment No. 20 to the Israeli Companies Law of 1999	November 2012. The Amendment went into effect on December 12, 2012, and it stipulates that Public Companies have to adopt a compensation	Executive compensation in public companies and private companies with publicly traded debt	• The Board of Directors might establish a Compensation Committee consisting of at least three directors. All of the firm's external directors must serve on the committee and constitute a majority. The remaining committee members must be directors whose compensation is consistent with the regulations governing the compensation of external directors in a public company. An individual who is not eligible to serve on the company's Audit Committee is not eligible to serve on the Compensation Committee. Among its functions, the Compensation Committee is responsible for providing the Board of Directors with recommendations regarding the company's compensation policy as it pertains to all of the company's executives, in accordance with the principles outlined in the Amendment; examining the application of the compensation policy and whether it should be updated; approving the employment terms of company

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[73] For more information about this law, see Fried et al. (2020).

| | policy within nine months (by September 12, 2013). | | executives; and deciding whether the employment terms of a candidate for the position of CEO should be brought to a shareholders' meeting for approval.

• The board of directors in the company is required to formulate a compensation policy addressing the remuneration of company executives, based on the recommendations made by the Compensation Committee. The compensation policy must be approved in advance by company shareholders. The compensation policy should take into account the advancement of the company's long-term goals, the creation of proper incentives for company executives in view of the company's risk management policy, and the company's size and activities. The Amendment requires that compensation policies address various criteria regarding the terms of office and employment of company executives (such as an executive's education, professional experience and qualifications), and in particular, the proportionality between the compensation of company's executives and the compensation of other company employees (including contract workers).

• Variable compensation components must be capped, and based on measurable criteria and long-term performance. Only the insubstantial parts of the variable salary components may be awarded on the basis of non-measurable criteria, by taking into account the executive's contribution to the company.

• A Public Company's overall compensation policy, as well as the compensation of its CEO, must be approved by the majority of the non-controlling shareholders at a shareholders' meeting. If the shareholders' meeting does not approve the compensation contract, the contract can still be approved, provided that the Compensation Committee and the Board of Directors re-consider the compensation and approve it with reasons |

			supporting their decision. With respect to director compensation, the approval of a simple majority of shareholders in the shareholders' meeting is required. The compensation of all executives must comply with the company's compensation policy. Under special circumstances, however, the Amendment permits the approval of specific compensation agreements that deviate from the compensation policy, provided that appropriate approvals have been obtained. • In the case of a Public Subsidiary Company, a compensation policy or the employment terms of an executive, that deviate from the compensation policy must be approved by the majority of the non-controlling shareholders in the shareholders' meeting, and such approval shall be binding.
Banking Business Directives number 301 ("Board of Directors") and 301A ("Compensation Policy in a Banking Corporation")	November 2013	Executive compensation in all banking corporations, except foreign banks, as well as to credit card companies that are controlled by the banking corporation.	The maximum variable compensation shall not exceed 100 percent of the fixed compensation for each employee. However, under exceptional conditions and reasoned decision, the variable remuneration can reach up to 200 percent of the fixed remuneration. At least 50 percent of the variable remuneration granted for a calendar year to an officer (as defined in the Companies Law) shall be awarded in the form of shares and stock-based instruments that are eligible to vest over a number of years, in accordance with performance during this period. Furthermore, a banking corporation may not grant variable non-performance-based rewards.[74]
Compensation Policy in institutional entities	December 2013	Executive compensation in institutional entities	Ditto

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[74] Except for a signing grant to a new key employee in the banking group, limited to the first year of work (contingent remuneration during a service period only will not be approved).

Compensation policy for the chairman of the board of directors at a supervised entity and additional remuneration arrangements	June 2015	The compensation of the chairperson of the board of directors of a banking corporation or institutional body	The compensation shall be fixed and not conditional on performance.
Remuneration for Office-Holders in Financial Corporations (Special Approval and Inadmissibility of Expenses for Tax Purposes due to Irregular Remuneration) Law, 5776-2016	April 2016. The restricted firms were required to apply it as of 2017.	Executive compensation in certain types of financial firms - banks, insurance companies, investment firms, portfolio firms and mutual funds[75,76].	Capping the compensation to 35 times the compensation of the lowest paid employee at the firm. Firm employees include both direct employees and personnel employed indirectly through outsourcing firms. The compensation under the law includes all components besides deposits and allowances into severance pay and pension funds (including disability insurance) and allowances in respect of past rights that accrued prior to the Act[77]. Executive compensation that is below the cap, but more than NIS 2.5 million would not be tax deductible. To pay an executive more than NIS 2.5 million also requires the approval of the compensation committee, board of directors, a majority of independent directors, and the shareholders.

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[75] Including parent companies of those firms that hold at least 30 percent of the firm.

[76] Other financial industries such as credit card issuers, private equity funds and hedge funds, for example, are not subject to the law. In addition, the law does not apply to subsidiaries of affected firms engaging in other financial activities, such as investment banking, underwriting companies and insurance agencies. Similarly, the foreign subsidiaries of affected firms are exempt. The Minister of Finance of Israel can apply the law to other financial corporations with the approval of the Knesset Finance Committee.

[77] Salary, bonuses, share-based compensation, management fees, consulting fees, etc.

Table 2: Executive Compensation, by sub-industry

This table reports summary statistics for executive compensation, by sub-industry, in the years between 1995 and 2018. The compensation is in millions of shekels in 2016 fixed prices.

	N	Mean	Median	S.D.	Max	Min
Agriculture	15	0.7	0.6	0.3	1.5	0.30
Investments in life sciences	128	0.9	0.6	1.0	5.2	0.06
Biotechnology	151	1.0	0.8	0.9	7.4	0.03
Medical equipment	165	1.0	0.8	0.9	5.6	0.04
Building Supplies	85	1.2	1.1	0.6	3.3	0.01
Metals	578	1.3	1.1	0.8	5.0	0.01
Electronics	33	1.4	1.3	0.9	3.7	0.24
Computers	474	1.4	1.1	1.1	9.2	0.03
Hotels and Tourism	281	1.5	1.2	1.2	8.9	0.06
Electricity	833	1.5	1.3	1.0	9.9	0.08
Investments in manufacturing and various industries	126	1.5	0.8	2.8	29.4	0.19
Wood, paper and printing	320	1.6	1.2	1.8	27.2	0.07
Fashion and Clothing	350	1.8	1.4	1.3	9.5	0.19
Services	894	1.9	1.4	2.3	41.8	0.02
Chemicals, rubber and plastics	666	1.9	1.4	2.3	18.0	0.05
Oil and gas exploration	157	1.9	1.3	2.7	26.6	0.09
Food	552	2.0	1.3	2.1	20.3	0.11
Commerce	1,029	2.0	1.4	1.8	15.1	0.05
Investments and Holdings	1,924	2.0	1.2	2.6	42.9	0.00
Construction and Real Estate	3,035	2.0	1.3	2.7	39.6	0.01
Financial Services	289	2.3	1.4	2.4	13.5	0.05
Communications and Media	173	2.7	1.8	3.1	19.3	0.02
Banks	464	3.8	2.8	3.8	40.0	0.22
Insurance	261	4.1	3.2	3.1	28.6	0.28

Table 3: CEOs' compensation and average wage per employee position

This table compares CEO compensation in publicly traded companies with the compensation of CEOs in the public service, and with the average wage per employee position in the economy from 1996 to 2018. The compensation is in thousands of shekels in 2016 fixed prices.

	1996	2007	2018	Average annual change (1996-2018)
(1) CEOs of publicly traded companies (thousands of shekels)	1,568	2,577	2,036	1.7%
(2) CEOs in the public service (thousands of shekels)	462	505	557	0.9%
(3) Employee position (thousands of shekels)	119	138	157	1.3%
(1) / (2) ratio	3	5	4	
(1) / (3) ratio	13	19	13	

Table 4: Summary statistics of executive characteristics

This table reports summary statistics for the main executive variables over the years 1995 and 2018 —age, tenure in position, executive's holdings in the company, proportion of executives who have a Master degree or higher and CEO turnover rate. Panel A presents it for financial firms and Panel B for nonfinancial firms.

Panel A: Financial Firms

	N	Mean	Median	S.D.	Max	Min
Age	1,172	54.7	55.0	9.8	88.0	30.0
Tenure in position (in years)	1,150	6.2	4.0	7.3	43.0	0.0
Executive's holdings (%)	1,180	7.4	0.0	17.0	94.7	0.0
Executives with a Master degree or higher (%)	1,168	49.1	0.0			
CEO turnover (%)	661	12.9	0.0			

Panel B: Nonfinancial Firms

	N	Mean	Median	S.D.	Max	Min
Age	12,605	54.2	54.0	10.5	95.0	23.0
Tenure in position (in years)	12,442	7.9	5.0	8.5	53.0	0.0
Executive's holdings (%)	12,759	12.5	0.4	20.5	96.9	0.0
Executives with a Master degree or higher (%)	12,334	31.6	0.0			
CEO turnover (%)	8,195	12.6	0.0			

Table 5: Summary statistics of firm characteristics

This table reports summary statistics for the main firm-level variables over the years 1995 and 2018 — total assets, market value, ROE, ROA, stock return, leverage, Business group affiliation, firm's tenure in TASE and the firm's inclusion in TA-125 Index. Panel A presents it for financial firms and Panel B for nonfinancial firms.

Panel A: Financial Firms

	N	Mean	Median	S.D.
Total assets (NIS, million)	677	55,120	10,062	94,780
Market value (NIS, million)	649	3,121	603	5,871
ROE (%)	690	9.6	10.1	20.3
ROA (%)	690	1.6	0.6	6.4
Stock return (%)	690	23.7	14.2	52.7
Leverage (%)	690	82.7	93.5	23.3
Business group affiliation (%)	690	31.3	0.0	46.4
Firm's Tenure in TASE (in years)	678	18.0	18.0	10.9
Inclusion in TA-125 Index (%)	690	45.4	0.0	49.8

Panel B: Nonfinancial Firms

	N	Mean	Median	S.D.
Total assets (NIS, million)	8,262	2,438	286	9,717
Market value (NIS, million)	7,863	644	96	2,683
ROE (%)	8,470	1.2	8.2	33
ROA (%)	8,470	-1.9	1.8	15
Stock return (%)	8,470	20.1	7.1	59.0
Leverage (%)	8,470	61.8	64.6	25.4
Business group affiliation (%)	8,470	19.7	0.0	39.8
Firm's Tenure in TASE (in years)	8,410	14.8	13.0	11.0
Inclusion in TA-125 Index (%)	8,470	13.7	0.0	34.3

Table 6: Determinants of Executive Compensation

This table presents the result of OLS regression estimation of the determinants of CEO and chairperson of the board's compensation at listed companies in Israel during the last 24 years (1995-2018). The dependent variables are the natural logarithm of total compensation (columns 1, 3, 5-8) and the natural logarithm of non-equity compensation in 2016 prices of an individual executive i at firm j in year t. For controlling the performance of the firm I use lagged stock return (columns 1, 2, 5 and 7) or lagged ROE (columns 3, 4, 6 and 8). Due to higher reporting quality, Columns 5-6 present the results for the period after 2006 and Columns 7-8 present the results just for firms belonging to Tel-Aviv 125. Year 2011_2012 takes the value of 1 if the year is 2011 or 2012 (the years after the year of the commencement of Amendment no.16). Year 2013_2016 takes the value of 1 if the year is between 2013 and 2016 (the years after the year of the commencement of Amendment no.20), and Post 2016 is a dummy variable that equals 1 if the year is 2017 or 2018 (the years after the 2016 Law). All other variables are defined in Appendix A. All specifications include firm, industry and year fixed effects. Errors are clustered within firm.

Dependent Variable:	Log (Total Compensation)	Log (Non-equity Compensation)	Log (Total Compensation)	Log (Non-equity Compensation)	Log (Total Compensation)	Log (Total Compensation)	Log (Total Compensation)	Log (Total Compensation)
	All firms, 1995-2018				All firms, 2007-2018		Only TA-125, 1995-2018	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Post 2010	-0.0700*	-0.0531	-0.0950***	-0.0780	-0.0667*	-0.0951**	-0.1092	-0.1506**
	(0.037)	(0.052)	(0.036)	(0.050)	(0.039)	(0.038)	(0.076)	(0.073)
Post 2012	-0.1700***	-0.0942*	-0.1714***	-0.0945*	-0.1712***	-0.1732***	-0.4031***	-0.4270***
	(0.049)	(0.052)	(0.049)	(0.052)	(0.049)	(0.049)	(0.127)	(0.132)
Post 2016	-0.1386***	-0.0994*	-0.1474***	-0.1077*	-0.1407***	-0.1507***	-0.4540***	-0.4673***
	(0.051)	(0.060)	(0.051)	(0.059)	(0.051)	(0.051)	(0.111)	(0.114)
Stock Return in t-1	0.0007***	0.0007***			0.0007***		0.0008**	
	(0.000)	(0.000)			(0.000)		(0.000)	
ROA in t-1			0.0013	0.0021*		0.0014		0.0179**
			(0.001)	(0.001)		(0.001)		(0.008)
Log (Total Assets)	0.1922***	0.1764***	0.1900***	0.1717***	0.1549***	0.1521***	0.1153	0.1342*
	(0.025)	(0.024)	(0.025)	(0.024)	(0.026)	(0.026)	(0.086)	(0.081)
Executive's holdings	0.0033***	0.0037***	0.0033***	0.0037***	0.0040**	0.0039**	0.0116**	0.0116**
	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)	(0.005)	(0.005)

Tenure	0.0291***	0.0278***	0.0289***	0.0275***	0.0329***	0.0331***	0.0249**	0.0252**
	(0.005)	(0.005)	(0.005)	(0.005)	(0.006)	(0.006)	(0.011)	(0.011)
Tenure - squared	-0.0006***	-0.0005***	-0.0006***	-0.0005***	-0.0006***	-0.0006***	-0.0006	-0.0006*
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
MA	0.0657*	-0.0040	0.0670*	-0.0022	0.0640	0.0643	0.0169	0.0194
	(0.038)	(0.045)	(0.038)	(0.045)	(0.046)	(0.046)	(0.074)	(0.074)
Turnover	-0.0208	-0.0612*	-0.0198	-0.0597	0.0166	0.0170	-0.0694	-0.0614
	(0.027)	(0.037)	(0.027)	(0.037)	(0.035)	(0.035)	(0.059)	(0.060)
Appointment percentage	0.0127***	0.0144***	0.0127***	0.0144***	0.0128***	0.0127***	0.0154***	0.0154***
	(0.001)	(0.002)	(0.001)	(0.002)	(0.001)	(0.001)	(0.002)	(0.002)
Business group affiliation	-0.0466	0.0062	-0.0507	0.0021	0.0207	0.0185	-0.1559**	-0.1614**
	(0.043)	(0.051)	(0.043)	(0.051)	(0.062)	(0.062)	(0.070)	(0.070)
Constant	10.4478***	10.4460***	10.4975***	10.5279***	10.6894***	10.7425***	11.9903***	11.5959***
	(0.473)	(0.474)	(0.471)	(0.476)	(0.711)	(0.696)	(1.400)	(1.306)
Observations	12,139	12,087	12,139	12,087	7,525	7,525	2,127	2,127
R-squared	0.597	0.501	0.596	0.500	0.617	0.616	0.546	0.547
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 7: Determinants of Executive compensation, dividing into financial and nonfinancial firms

This table presents the result of OLS regression estimation of the determinants of CEO and chairperson of the board's compensation at financial companies (Columns 1 and 2) and nonfinancial companies (Columns 3 and 4) between 1995 and 2018. The dependent variable is the natural logarithm of total compensation in 2016 prices of an individual executive i at firm j in year t. For controlling the performance of the firm I use lagged stock return (columns 1 and 3) or lagged ROA (columns 2 and 4). All other variables are defined in Appendix A. All specifications include firm, industry and year fixed. Errors are clustered within firm.

Dependent Variable:	Log (Total Compensation)			
	Financial firms		Nonfinancial firms	
	(1)	(2)	(3)	(4)
Year 2011_2012	-0.1593	-0.2301**	-0.0597	-0.0833**
	(0.118)	(0.109)	(0.038)	(0.037)
Year 2013_2016	-0.3594***	-0.3941***	-0.1504***	-0.1496***
	(0.109)	(0.104)	(0.051)	(0.051)
Post 2016	-0.4520***	-0.4796***	-0.0939*	-0.1020*
	(0.125)	(0.122)	(0.052)	(0.052)
Stock Return in t-1	0.0011**		0.0007***	
	(0.000)		(0.000)	
ROA in t-1		0.0077*		0.0014
		(0.004)		(0.001)
Log (Total Assets)	0.2610***	0.2565***	0.1821***	0.1797***
	(0.038)	(0.038)	(0.027)	(0.026)
Executive's holdings	0.0031	0.0034	0.0030**	0.0030**
	(0.004)	(0.004)	(0.001)	(0.001)
Tenure	0.0272***	0.0270***	0.0281***	0.0279***
	(0.009)	(0.009)	(0.005)	(0.005)
Tenure - squared	-0.0006*	-0.0005	-0.0005***	-0.0005***
	(0.000)	(0.000)	(0.000)	(0.000)
Turnover	0.0119	0.0214	-0.0233	-0.0228
	(0.054)	(0.055)	(0.029)	(0.029)

Appointment percentage	0.0110***	0.0107***	0.0128***	0.0128***
	(0.003)	(0.003)	(0.001)	(0.001)
Business group affiliation	-0.1279	-0.1240	-0.0258	-0.0311
	(0.094)	(0.092)	(0.048)	(0.048)
Constant	9.4519***	9.5845***	10.5135***	10.5641***
	(0.626)	(0.607)	(0.341)	(0.339)
Observations	1,049	1,049	11,389	11,389
R-squared	0.703	0.701	0.575	0.574
Year Fixed Effects	Yes	Yes	Yes	Yes
Industry Fixed Effects	Yes	Yes	Yes	Yes
Firm Fixed Effects	Yes	Yes	Yes	Yes

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 8: Does firm's size affect the sensitivity of executive compensation to firm's performance

This table presents the result of OLS regression estimation of the determinants of CEO and chairperson of the board's compensation at listed companies between 1995 and 2018. The dependent variable is the natural logarithm of total compensation in 2016 prices of an individual executive i at firm j in year t. For controlling the performance of the firm I use lagged stock return (columns 1, 3 and 5) or lagged ROA (columns 2, 4 and 6).. Large is a dummy variable which gets the value of 1 for companies with total assets that exceed the median of the total assets of the companies in the sample and 0 for companies with total assets that are less than the median. TA-125 Index is a dummy variable which equals 1 if the firm belong to Tel-Aviv 125 Index and 0 otherwise. All specifications include the variable Year 2011_2012, Year 2013_2016 and Post 2016, which are defined in Table 4, as well as firm and executive control variables (firm's business group affiliation, executive tenure in position, squared executive tenure in position, executive's holdings in the company, executive MA indicator, executive turnover and executive appointment percentage) as well as firm, industry and year fixed effects. Errors are clustered within firm.

Dependent Variable:	Log (Total Compensation)					
	(1)	(2)	(3)	(4)	(5)	(6)
Stock Return in t-1	0.0007***		0.0006***		0.0002	
	(0.000)		(0.000)		(0.001)	
ROA in t-1		0.0007		0.0011		-0.0198***
		(0.001)		(0.001)		(0.007)
Large	0.0618	0.0409				
	(0.050)	(0.048)				
Large*Stock Return in t-1	-0.0002					
	(0.000)					
Large*ROA in t-1		0.0056**				
		(0.003)				
TA-125 Index			0.1242***	0.0915*		
			(0.048)	(0.048)		
TA-125 Index*Stock Return in t-1			0.0003			
			(0.000)			
TA-125 Index*ROA in t-1				0.0092		
				(0.006)		
Log (Total Assets)	0.1847***	0.1859***	0.1857***	0.1850***	0.1920***	0.2139***
	(0.025)	(0.024)	(0.025)	(0.025)	(0.025)	(0.026)

Log (Total Assets)*Stock Return in t-1					0.0000	
					(0.000)	
Log (Total Assets)*ROA in t-1						0.0020***
						(0.001)
Constant	10.5159***	10.5187***	10.5027***	10.5395***	10.4457***	10.1417***
	(0.466)	(0.462)	(0.474)	(0.469)	(0.474)	(0.465)
Observations	12,139	12,139	12,139	12,139	12,139	12,139
R-squared	0.597	0.597	0.598	0.597	0.597	0.598
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Industry Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Firm Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 9: Compensation disparity between Co-CEOs and Co-Chairpersons

This table presents the result of OLS regression estimation of the determinants of Compensation disparity between Co-CEOs and Co-Chairpersons at listed companies between 1995 and 2018. The dependent variable is the difference in the natural logarithm of total compensation in 2016 prices between two Co-Executives who serves at the same position in the same company at the same year. The control variables are the difference between co-executives characteristics – executive's age, executive tenure in position, executive's membership in the board, executive's holdings in the company, executive MA indicator, executive BA indicator, executive appointment percentage and executive turnover. All specifications include firm and year fixed effects.

Dependent Variable:	Difference (Log (Total Compensation))				
	(1)	(2)	(3)	(4)	(5)
Difference (Age)	-0.0022	-0.0025	-0.0024	-0.0018	-0.0002
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Difference (Tenure in position)	0.0050**	0.0046**	0.0053***	0.0053***	0.0011
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Difference (Board member)	-0.0562		-0.0638*	-0.0552	0.0235
	(0.038)		(0.038)	(0.038)	(0.044)
Difference (Board chairperson)		0.0057			
		(0.023)			
Difference (MA)	-0.0052	-0.0091		-0.0077	-0.0038
	(0.025)	(0.025)		(0.025)	(0.027)
Difference (BA)			0.0195		
			(0.033)		
Difference (Executive's holdings)	0.0009	0.0010	0.0011		
	(0.001)	(0.001)	(0.001)		
Difference (Stakeholder)				-0.0286	
				(0.035)	
Difference (Family stakeholder)					0.0352
					(0.029)
Difference (Appointment percentage)	0.0120***	0.0123***	0.0121***	0.0120***	0.0163***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)

Difference (Turnover)	-0.1101**	-0.1114**	-0.1219**	-0.1103**	-0.0793*
	(0.048)	(0.048)	(0.048)	(0.048)	(0.043)
Constant	-0.0067	-0.0114	-0.0051	-0.0077	-0.0024
	(0.078)	(0.078)	(0.078)	(0.078)	(0.059)
Observations	580	580	585	580	404
R-squared	0.176	0.172	0.179	0.176	0.305
Number of Firms	121	121	121	121	97
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes
Firm Fixed Effects	Yes	Yes	Yes	Yes	Yes

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1