

# **Do Executive Compensation Contracts Maximize Firm Value? Indications from a Quasi-Natural Experiment**

**Menachem (Meni) Abudy**

*Bar-Ilan University, School of Business Administration, Ramat-Gan, Israel, 5290002*

**Dan Amiram\***

*Tel Aviv University, Coller School of Management, Ramat Aviv, Israel, 6997801  
Columbia University Graduate School of Business, 3022 Broadway, New York, NY 10027*

**Oded Rozenbaum**

*The George Washington University, 2201 G St. NW, Washington, DC 20052*

**Efrat Shust**

*The Open University of Israel, Department of Management and Economics, Raanana, Israel, 4353701*

Current Draft: July 2018

## **Abstract**

We find significant positive abnormal returns surrounding a surprising and quick enactment of a law that restricts executive pay to a binding upper limit in a few industries. We find that the effect is concentrated only for firms in which the restriction is binding. We also find that the increase in value is greater for firms with weaker corporate governance and smaller for firms that grant a greater portion of equity-based compensation to their executives. These results provide indications that, on average, compensation contracts can be set in a way that does not maximize firm value.

**Keywords:** Executive compensation; governance; optimal contracts

**JEL Classification:** G30, G38, M12, M48, M52

---

We thank Rui Albuquerque, Yakov Amihud, Eli Amir, Ayala Arad, Bernie Black, Ties de Kok, Peter Easton, Eli Elal, Tomer Blumkin, Brian Cadman, Shai Danziger, Olubunmi Faleye, Fabrizio Ferri, Koresh Galil, Stuart Gillan (discussant), Jon Glover, Zohar Goshen, Yaniv Grinstein, Trevor Harris, Brad Hendricks, Martin Jacob, Itai Kama, Saggi Katz, Elli Kraizberg, Alina Lerman, Shai Levi, Ariel Levy, Kai Li, Nan Li, Suresh Nallaready, Ernst Maug, Alon Raviv, Ethan Rouen, Amir Rubin, Christoph Sextroh (discussant), Jack Stecher, Dan Weiss, Avi Wohl, Yishay Yafeh and Moshe Zviran, as well as seminar participants at Bar Ilan University, Ben Gurion University, Columbia University, the Hebrew University of Jerusalem, The Hong Kong Polytechnic University, Humboldt University of Berlin, Tilburg University, WHU, the 28<sup>th</sup> Conference on Financial Economics and Accounting, the 11<sup>th</sup> Tel Aviv Conference in Accounting, FIRS 2018, and the 2018 AAA FARS midyear meeting for helpful comments and suggestions. We thank the Raymond Ackerman Family Chair in Israeli Corporate Governance for financial support.

\* corresponding author. Phone: 212-851-9420; Fax: 212-316-9219

*E-mail addresses:* Menachem.abudy@biu.ac.il (M. Abudy); da2477@gsb.columbia.edu (D. Amiram);  
orozenbaum@email.gwu.edu (O. Rozenbaum); efratshu@openu.ac.il (E. Shust)

## **1. Introduction**

There is considerable debate among academics and practitioners regarding executive compensation, which led to the emergence of two views (Frydman and Jenter 2010). On the one hand, rent extraction theories note that executive compensation practices sharply contrast the predictions of traditional optimal contracting theories. They suggest that, on average, contracts are set suboptimally to enable executives to extract rents at the expense of shareholders, as the contract setting process by the board is “captured” by the executives (e.g., Bebchuk and Fried 2003; Kastiel 2015). On the other hand, modern value maximization theories claim that traditional compensation contracts theories fail to explain observed contracts only because they do not take into account the specific features of the executive labor market. Modern value maximization theories suggest that once these features are accounted for, on average, executive compensation contracts are optimally designed to compete for talent in the market for executives (e.g., Gabaix and Landier 2008; Edmans and Gabaix 2016). This debate has important implications for different literature streams in economics, including those examining contract theory, corporate finance, corporate governance, labor economics, and income inequality. The debate also has significant policy implications, given that numerous proposals to limit executive pay have been promoted by both media commentators and politicians.

Despite the importance of this debate, Edmans and Gabaix (2016) point out that even the basic question of whether executive pay is, on average, optimally designed to maximize firm value has not been satisfactorily answered, as there are significant challenges to assigning causality. Specifically, compensation contracts are inevitably correlated with unobservable firm, industry and executive characteristics, which in turn affect firm behavior, performance and value (Edmans, Gabaix and Jenter 2017). Therefore, Edmans and Gabaix (2016) note that the first

order task in this literature should be “to find good instruments for or quasi-exogenous shocks to CEO pay, to allow the identification of the effects...”. We do exactly that in this study and use an exogenous shock to provide some causal indications on this open question. To be clear, the value maximization theories and the rent extraction theories are not mutually exclusive in the economy. There are obviously some contracts that are set sub-optimally and allow rent extraction and there are some contracts that maximize firm value. The challenge in this literature is to identify a setting that allows to make clear causal statements on the average outcome and then, like most natural experiments, extrapolate from this setting.

Our setting utilizes the first time, to the best of our knowledge, a legislature in a developed economy passes a law that puts a binding restriction on total executive pay in certain firms.<sup>1</sup> On March 16, 2016, the Israeli Treasury Committee of the Knesset (the Israeli Parliament) surprisingly and unanimously approved a law proposal to restrict the compensation of executives.<sup>2</sup> As discussed in detail in Section 2, if a proposal passes at the Treasury Committee with both coalition and opposition parties supporting it, the actual vote by the full Knesset body (i.e., the Israeli parliament) is just a formality (and as expected, the final vote occurred on March 29, 2016, without change). Therefore, the passage of the law in the Treasury Committee is the main event we examine. Nevertheless, for completeness, we also examine all the dates that are associated with passage of the law.

---

<sup>1</sup> The law imposes an actual restriction on total pay and does not only cap the tax deductibility of executive compensation as exists in other countries (importantly, the tax deductibility cap under the law is not binding because the limit on total pay is smaller than the effective tax deduction cap).

<sup>2</sup> For a full description of the dramatic and surprising meeting of the Treasury Committee, see (in Hebrew) <http://www.calcalist.co.il/articles/0,7340,L-3683702,00.html>. For journalist reporting on the Bill see, for example, <https://www.haaretz.com/israel-news/business/1.744507> and <https://www.haaretz.com/israel-news/business/premium-1.710605>. We note that some international news agencies and newspapers erroneously only mention the tax sanctions on compensation exceeding the cap but fail to note the binding compensation cap. We relate to it as another indication of the surprising nature of the pay cap, which was introduced only in the final stage of the Treasury Committee’s hearings (see Section 2.2 for additional details).

The final version of the law, as approved by the Treasury Committee, applies only to insurance, banking, and asset management firms (including parent companies of those firms), which we refer to as financial institutions. The law restricts total employer compensation costs (including but not limited to salaries, bonuses, share-based compensation, deferred compensation, benefits, and retirement compensation) to be not higher than 35 times that of the lowest-paid employee, including indirect employees such as employees of subcontractors (this translates to a ratio of up to 44 in net compensation terms). According to the Bank of Israel data, at least 10 percent of bank employees are paid the Israeli minimum wage (approximately 72,000 ILS a year). Therefore, this restriction translates to an effective upper limit on total pay of 2.53 million ILS a year. Given that the average compensation of the highest paid executives in the financial institutions subject to this law is 4.8 million ILS (4.7 million median), this represents a significant pay cut for those executives.

The passage of the law is a unique quasi-natural experiment that allows us to examine the key differential prediction between the value maximization and rent extraction theories. Under value maximization theories, compensation contracts are optimally set to maximize firm value.<sup>3</sup> Therefore an outside restriction on these contracts, such as a limit on executive pay, is suboptimal and should lower firm value, as affected executives in our setting have alternative employment options.<sup>4,5</sup> In contrast, under rent extraction theories, a pay limit can reduce executive rent extraction, which should boost firm value. As the passage of the law in its restrictive form was a surprise and exogenous to the financial institutions, we use an event study

---

<sup>3</sup> In this study, we refer to an “optimal” contract as a “value maximizing” contract.

<sup>4</sup> As we discuss in detail in Section 5.3, if the executives had no other employment options (i.e., if all the economy, loosely defined, was affected by the change), then the reduction in pay could increase shareholder wealth at the expense of optimally paid executives. We conduct tests that show that this wealth transfer is not the driver of our results. This is not surprising as, in our setting, executives have other employment options (see Section 5.3).

<sup>5</sup> Indeed, when the Bill passed, the Chancellor of the bank of Israel warned that it may cause many executives in banks to resign (see <https://www.gfmag.com/magazine/julyaugust-2016/israeli-bankers-quit-over-salary-cap>).

methodology to examine how firm value changed in the short window around its passage. This research design limits the possibility that unobservable factors contribute to the changes in the firm value.<sup>6</sup> Moreover, the fact that law limits executive pay in some financial institutions but not in others and the fact that firms other than financial institutions were unaffected allow us to perform additional tests that reinforce our causal interpretation. Given the magnitude of the question and limitation with our setting, we view our investigation as indicative rather than providing definitive answers on the subject.

We find that financial institutions experienced statistically significant 1.58% abnormal returns in the three days ( $t-1$  to  $t+1$ ) surrounding the approval of the law by the Knesset Treasury Committee.<sup>7</sup> As the Tel-Aviv 100 index (the main index for the Israeli stock market) did not change significantly during these days, the abnormal returns are driven primarily by the increase in the value of financial institutions. We conduct additional tests to buttress the causal interpretation of our results. First, we show that the positive effect of the approval of the law on firm value is concentrated among the financial institutions bound by the pay limit, namely, firms that paid their executives more than the pay limit before the law enactment. These financial institutions experienced significant abnormal returns of 1.77%, compared to a statistically insignificant increase of 0.528% in the value of financial institutions for which the pay limit was not binding. Second, we examine the effect of the passage of the law on financial institutions that are not within the scope of the bill and find statistically insignificant abnormal returns for this

---

<sup>6</sup> As in most capital markets event studies, we assume a reasonably efficient capital market, in which prices impound all available public information within a few days. Research on the Israeli stock exchange suggests that this is a reasonable assumption in our setting (e.g., Amihud et al. 1997; Kalay et al. 2002).

<sup>7</sup> We obtain similar inferences when we shorten the event window to two days or lengthen it to five days. Although examining a long-term event window is useful in certain settings, we refrain from a long-term event window here to reduce the possibility of confounding events. As a regulated industry, financial institutions exhibit frequent changes in their regulatory environment. For example, shortly after the law was passed, in June 2016, the Bank of Israel allowed institutional investors to increase their holdings in banks from 5% to 7.5% without being considered as an interested party. This regulation led to a sharp increase in the value of banks during the second half of 2016 (see <http://www.themarket.com/markets/1.2978112>, in Hebrew).

subset of firms.<sup>8</sup> Third, we employ a regression discontinuity design and examine the effect of the law on financial institutions that were just below or above the pay limit. We find that only the firms just above the pay limit experienced significant abnormal returns surrounding the event window. These results suggest that, on average, rent extraction theories dominate in our setting. Our findings also limit the possibility that differential uncontrolled risk factors in our estimations explain the observed abnormal returns as the observed abnormal returns are significantly higher than any reasonable expected returns for a comparable event window.<sup>9</sup>

There may be other alternative explanations for our findings.<sup>10</sup> For example, as discussed in Section 5.3, if executives do not have viable employment alternatives, the law may simply transfer welfare from optimally paid executives to shareholders (by enabling a non-market mechanism—coordination—that reduces the reservation wage of the executives). Although, as we discuss in detail below, lack of outside options is not likely to be the case in this setting, we perform several cross-sectional tests to rule out this and other unspecified alternative explanations. First, we find that the observed increase in firm value is greater for financial institutions with weak corporate governance. Specifically, we find that financial institutions with a proportion of independent directors below the sample median experienced higher abnormal returns around the event window than those with a proportion of independent directors above the median. Relatedly, we find that firms with a proportion of busy directors above the sample

---

<sup>8</sup> The scope of the bill is limited to banks, insurance companies, asset management firms, mutual fund managers, and ETF issuers and their parent firms. Hence the bill does not affect firms operating in other financial segments, such as factoring and underwriting.

<sup>9</sup> Nevertheless, in robustness tests, we use the Fama and French three risk factors in our estimation of abnormal returns. As expected, this has no effect on our inferences. This is also consistent with numerous studies that claim that, as the expected returns in a short event window are very small, they can be ignored in these estimations.

<sup>10</sup> One alternative explanation is that because regulated banks in Israel may have implicit deposit insurance, it is optimal from a shareholders' perspective to compensate executives with high powered incentives to encourage risk taking at the expense of the government and the new law may restrict these incentives. This predicts a negative market reaction to the law (not positive, as we find) as shareholders are likely to lose value because of their inability to encourage executives to take risk. In addition, we find similar results for insurance companies in Israel, which are not likely to have implicit insurance.

median experienced higher abnormal returns than those with a proportion of busy directors below the median.<sup>11</sup> We also find that positive abnormal returns are lower when the executive pay structure better aligns the interests of executives with those of shareholders. Specifically, we find that financial institutions with a ratio of equity-based compensation to total compensation that is above the sample median experienced lower abnormal returns around the event day compared to those with a ratio of equity-based compensation to total compensation below the sample median. These results further support the rent extraction theories and help rule out alternative explanations, as other explanations do not predict variation in abnormal returns based on corporate-governance and pay-structure characteristics.<sup>12</sup>

For completeness, we perform six more robustness analyses. First, we calculate a rough estimate of the expected annual compensation savings per firm as a result of the law and find that these savings have a significant correlation of 82% with the increase in firm value at the event window. Second, we find that approximately 85% of the financial institutions in our sample experienced positive abnormal returns during the event window. Third, in placebo tests, we change the event window to periods where we do not expect an abnormal return. We find no significant abnormal returns in the treated and untreated groups in a three-day window just before the event date. These results suggest that momentum in returns or a reversal of returns due to prior unspecified events are not likely explanations for our results. Also, we find no significant abnormal returns for the financial institutions in the treated and untreated groups in a three-day window just after the event date. These results suggest that there was no reversal of the observed positive abnormal returns during the event window due to overreaction to the law or other

---

<sup>11</sup> Following the literature, we define busy directors as those serving on three or more boards.

<sup>12</sup> For example, it is possible that compensation contracts are suboptimal but not because of rent extraction but because high-powered incentives induce executives to take excessive risks or to work independently and not as part of a team. The finding that the returns during the event window are lower for firms with high-powered incentives is inconsistent with this alternative explanation.

reasons. Taken together, the results from the placebo tests suggest that the abnormal returns are concentrated in the event window. Fourth, we show that all the other events that are associated with the passage of the law (e.g., preliminary vote and formal enactment) are associated with insignificant abnormal returns. Fifth, we search and provide a description of all other news that were released on the financial institutions in our sample during our primary event window. We find that no other event likely caused the positive abnormal returns we observe. Lastly, as the law went into effect only on January 2017, we are able to provide only preliminary evidence on its effect on actual contracts and executive turnover. Our preliminary investigation reveals executive turnover, citing the law as a cause, in the period after the enactment. Moreover, all executive contracts were changed to conform with the law and are now mostly limited to a fixed salary.

Our results provide indicative causal evidence that compensation contracts, on average, can be set in a way that does not maximize firm value. However, as in many natural experiments, our findings have limitations. Our experiment occurred in a relatively small developed market and derived from a relatively small number of firms. In addition, the fact that the regulatory intervention in pay occurred in Israel perhaps suggests that rent extraction was more severe in Israel than other countries. Therefore, it is unclear whether our results can be generalized to other countries and industries. Although those concerns are certainly valid, there are several institutional factors that lead us to believe similar results could arise in other settings. First, Israel is an OECD member, a developed economy that practices common law. These countries have been shown to have the strongest governance as well as public and private institutions that protect minority shareholders and enforce contracts (e.g., La Porta et al. 1998; Djankov et al. 2008). Moreover, corporate governance in Israel resembles that of the United States and other



advanced economies (for example, Israel, too, has say-on-pay rules). In addition, many Israeli firms, and in particular financial institutions, use international consulting firms to help design executive compensation contracts.

Second, Israeli financial institutions have an additional layer of monitoring, compared to industrial firms. Israeli banks are supervised by the Bank of Israel, and Israeli insurance firms are supervised by the Capital Market, Insurance, and Savings Supervisor in the Israeli Finance Ministry. These regulators are recognized as some of the best in the world.<sup>13</sup> Third, Israeli financial institutions were among those that suffered the least in the 2008 financial crisis, suggesting that they are well managed and well governed. Moreover, Amir and Sharony (2017) find that the profitability (as well as its components) of Israeli banks is statistically indistinguishable from those of banks in other advanced economies. Lastly, the fact that our sample, which represents all financial institutions in Israel, is relatively small makes it more difficult for us to reject the null hypothesis of no effect of the law. Despite the generalizability limitations, there are numerous published studies that use the advantages of the Israeli setting and analyzed a small number of firms to draw conclusions on important questions that otherwise would have remained unexplored (see for example Schwartz-Ziv and Weisbach 2011, whose sample includes 11 Israeli government business companies).

Taken together, these factors suggest that, if anything, our findings supporting rent extraction theories may underestimate the effect in other countries or industries. Nevertheless, we admit that the study suffers from external validity concerns. Therefore, although we believe this study contributes to the literature, we encourage readers and policymakers to consider the differences among countries and industries when extrapolating from our conclusions. At

---

<sup>13</sup> See, for example, [https://www.centralbanking.com/central-banking/news/2481620/bank-of-israel-and-sama-triumph-in-this-year-s-central-banking-awards#cxrecs\\_s](https://www.centralbanking.com/central-banking/news/2481620/bank-of-israel-and-sama-triumph-in-this-year-s-central-banking-awards#cxrecs_s)

minimum, this experiment provides evidence that executive compensation contracts in a developed, common-law country with a modern banking system can be, on average, designed in a way that fails to maximize firm value.

## **2. Motivation and institutional details**

### **2.1 Motivation**

Executive compensation is a heavily debated topic. Since at least as early as the 1950s, the media, public, politicians, and academic researchers have remarked on the high levels of CEO pay and questioned whether these levels are fair and appropriate (e.g., Murphy 2002). Yet, at the same time, many commentators argue that executive compensation is determined in a free and competitive market and therefore represents optimal compensation.

The popular view that executive pay is excessive has led regulators worldwide to try to curb out executive pay. In the United States, federal legislators capped the tax deduction on executive pay in 1993. The U.S. Securities and Exchange Commission mandated increased disclosure requirements on compensation in 2006. Say-on-pay legislation was passed as part of the Dodd-Frank Act in 2010, and the SEC has passed a rule requiring firms to disclose the ratio of CEO pay to median employee pay as a measure of within firm pay disparity (Rouen 2017). On the other side of the Atlantic, in 2013, the European Union capped bankers' bonuses at the level of their salary—or twice their salary if shareholders approve. In November 2013, Switzerland held an ultimately unsuccessful referendum to limit CEO pay to 12 times the pay of the lowest earning employee.<sup>14, 15</sup>

---

<sup>14</sup> An additional example in Europe includes the proposal of the former French president, Francois Hollande, to cap executive pay of state-owned firms at 20 times that of the lowest paid employee. There are other cases where regulations limited executive pay but these regulations are not suitable to examine a causal relation between pay and firm value. During the financial crisis of 2007–2009, limitations on executive pay were imposed. However, these

Core and Guay (2010) argue that the popular resentment of executive compensation and the following legal actions appear to at least partly stem from a perception of growing income inequality. Frydman and Saks (2007) use the ratio of CEO pay to worker pay as a measure of income inequality. They note: “A comparison of executive pay to the earnings of a typical worker provides insight into the evolution of earnings inequality at the top of the income distribution.” Reproducing data from Frydman and Saks (2007), Core and Guay (2010) show that CEO pay, relative to the average worker’s pay, has increased sharply since 1970. Specifically, it has risen from a level of about 30:1 to approximately 120:1 by 2000.<sup>16</sup> Reproducing the Piketty and Saez’s (2003) findings, Core and Guay (2010) also show an increase of about 33% in the share of income earned by the top 10% of taxpayers during roughly the same period, suggesting a link between those trends. The academic debate on the two non-mutually exclusive views of executive compensation is thoroughly discussed in Edmans and Gabaix (2016) and Edmans et al. (2017). One side of the debate advances the rent extraction view, which claims that compensation practices sharply contrast with the predictions of optimal contracting models (e.g., Bertrand and Mullainathan 1999, 2000, 2001). Thus, contracts are not chosen by boards to maximize shareholder value but instead by the executives themselves to

---

limitations were partial and applicable only to financial institutions that received government support or were restricted to only one component of executive pay. This makes them problematic from a research design perspective. In the United States, the American Recovery and Reinvestment Act limited executive compensation at firms that received financial assistance from the Troubled Asset Relief Program. (For a review of TARP limitations on executive pay, see, for example, Cadman et al. 2012) In Germany, the German Financial Markets Stabilization Act (from October 2008) restricted total annual executive compensation for all firms that received government aid from the stabilization fund to 500,000 euro (Dittmann et al. 2011). In 2009 the Financial Services Authority published the UK Remuneration Code, which required executives in large banks (and later on in financial institutions) to defer a larger portion of their bonus compensation and introduced performance vesting conditions for these bonuses to increase pay-performance sensitivity (Kleymenova and Tuna 2017). Another example is pay restriction by the Chinese government in 2009 on State Owned enterprises (Bae, Gong and Tong, 2017)

<sup>15</sup> Albuquerque et al. (2017) show analytically that without a regulatory constraint on relative performance evaluation, a cap on total pay may backfire and will eventually cause an increase in banks’ systematic risk and leverage. In Dittmann et al.’s (2011) model, a cap on total CEO pay has a small impact on firm value.

<sup>16</sup> When published, these figures are met with populist anger, motivated by a perception of inequity in corporate compensation practices (Faleye, Reis and Venkateswaran, 2013).

maximize their rents. This perspective is espoused most prominently by Bebchuk and Fried (2004). Similar views on executive rent extraction in closely controlled firms are discussed by Kastiel (2015), among others.

On the other hand, modern value maximization theories reach a different conclusion. While the proponents of those theories acknowledge that standard agency models are inconsistent with practice, they argue that such models do not capture the specifics of the CEO setting, since they were created as general frameworks for the principal-agent problem. For example, CEOs can have a very large effect on firm value. Thus, in a competitive labor market, it may be optimal to pay high wages to attract talented CEOs even though doing so requires paying a premium. These models aim to capture the specifics of CEO employment and can indeed generate predictions consistent with the data. Under this perspective, regulation will do more harm than good. This perspective is most prominently modeled by Gabaix and Landier (2008).

Israel does not differ from the trends observed around the world and exemplifies the issues discussed above. A rise in inequality in Israel spurred a populist move to curb out executive pay. Politicians strongly argued that executives earn too much at the expense of employees and consumers. This upsurge in populist sentiment led the Israeli parliament to enact a law aimed at curbing executive pay in financial institutions. The first draft of the bill, which was approved in two preliminary votes by the Knesset, introduced a tax deduction cap, which resembles the ineffective deduction cap used in other countries. However, in a surprise move, the Treasury Committee of the Knesset introduced and passed a revised version of the bill limiting executive pay. We discuss the details of the passing of the law in the following section. The Israeli banking industry and even some commentators in the media and the chancellor of the

Bank of Israel have argued that the law went too far and will cause talented managers to flee from the banking industry.<sup>17</sup>

More importantly for us, the surprising nature of the law's passage creates a unique research opportunity. The major limitation of examining the different views on executive compensation is that executive compensation is endogenously determined. This limits the usefulness of any cross-sectional or time-series examination of the relation between executive pay and firm value. Hence the first order question in this literature—whether executive pay is, in fact, set to maximize firm value—remains unanswered (Edmans and Gabaix 2016). Israel's pay limit is an exogenous shock to financial institutions' executive compensation contracts and therefore allows us to overcome many of the challenges in prior research.

## **2.2. Institutional details**

Laws in Israel get approved following a preliminary vote in the Knesset, discussions and a vote in the relevant Knesset's parliamentary committee and two additional votes in the Knesset. The preliminary vote serves as initial screening. A bill that receives a majority in that vote is then directed to one of the Knesset committees, where it is discussed and prepared for the second and third votes in the Knesset.

The preliminary vote on the “Executive Compensation in Financial Institutions” bill in the Israeli Knesset occurred on July 28, 2014. We term this vote “Event 1.” The initial draft of the bill stated that executive compensation exceeding 3.5 million ILS (0.9 million USD) would not be tax deductible for financial institutions. The bill was approved in the preliminary vote with a majority of 24 in favor to 0 against. A tax deduction cap on executive pay exists in several countries, including the United States, and has been shown to be generally ineffective, both from

---

<sup>17</sup> As a matter of fact, several senior financial institutions' executives in Israel resigned after the enactment of the law, citing the law as the primary cause.

a regulatory and research-design perspective, as firms usually bear the tax consequences of the regulation or can avoid it altogether (e.g., Murphy 2012).<sup>18</sup>

Following the adjournment of the 19<sup>th</sup> Knesset on December 3, 2014 and the subsequent elections, the bill was reintroduced with no significant changes on May 4, 2015, by two other *opposition* members of Knesset. (Hence the reintroduction was not supported by the coalition nor the government.) Subsequently, the bill was approved in another preliminary vote on November 9, 2015, with 25 votes in favor and 0 against. We term the bill re-initiation “Event 2” and the second preliminary vote “Event 3.” On January 4, 2016, the Knesset’s Treasury Committee had the first discussion on the bill. We term this discussion “Event 4.” The material issues discussed in the meeting include some committee members advocating to (1) broaden the scope of the bill to all public firms, not just financial institutions, and (2) lower the threshold of the tax deductibility of executive compensation. On February 15, 2016, the Knesset’s Treasury Committee reconvened to discuss the bill again. We term this discussion “Event 5.” The material issues discussed in the meeting include some committee members advocating to (1) broaden the scope of the bill to all public firms, not just financial institutions, (2) impose the tax burden on excess executive compensation on the receiving executive rather than the awarding firm, and (3) lower the threshold of the tax deductibility of executive compensation to 2.5 million ILS (0.7 million USD) or even to 0.8 million ILS (0.2 million USD). The meeting adjourned without any agreements among the committee members.

On March 16, 2016, the Knesset’s Treasury Committee reconvened for a final discussion and a vote on the bill. We term this discussion and vote “Event 6.” In this meeting, the committee surprisingly introduced and approved a pay limit for the first time. During the

---

<sup>18</sup> For a recent example of the ineffectiveness of the tax cap, see <https://www.propublica.org/article/remember-that-ceo-pay-cap-even-less-effective-than-we-knew>.

discussions, all members of the committee agreed on a more restrictive bill.<sup>19</sup> Most importantly, instead of a 3.5 million ILS (0.9 million USD) tax deduction cap, the committee agreed on a binding pay limit of 35 times the gross salary of the lowest paid employee at the firm (or a 44 multiple in net terms). Firm employees include both direct employees and personnel employed indirectly through outsourcing firms. In addition, if the firm is part of a business group, such as a holding company, or belongs to a group of firms with a joint major shareholder, the compensation cap applies to the compensation from all the firms that belong to the group. The minimum annual wage in Israel is set to 72,000 ILS (18,947 USD), which implies an effective executive compensation threshold of 2.5 million ILS (0.66 million USD). The compensation under the bill consists of both monetary and nonmonetary components, including salaries, bonuses, share-based compensation, deferred compensation, benefits and retirement compensation.<sup>20</sup> The committee also decided to limit the scope of the bill to financial institutions, as previously proposed. Note that, if a bill is approved unanimously in the Treasury Committee by all coalition and opposition members, the official vote on the law by all members of the Knesset is a formality. Because of the surprising nature of this event and the complete support of the law, which sealed its passing, the committee vote serves as our primary event.

Given the unanimous support of the bill in the Treasury Committee by all coalition and opposition members, the bill approval by the Knesset in a second and third and final vote on March 29, 2016, was only a formality. We term this vote “Event 7.” The bill received unanimous

---

<sup>19</sup> Some opposition members of the Treasury committee proposed in Event 5 to restrict the tax deductibility of executive compensation to 0.8 million ILS. If market participants expected that proposition to have an adverse effect on firm value and viewed the version that eventually passed on March 16 as an improvement, the positive returns that we observe may be driven by a partial reversal of the market’s expectations following Event 5. That seems unlikely for two reasons. First, we do not observe a significantly negative market reaction around the events that preceded Event 6. Second, the tax savings resulting from increasing the tax deductibility cap from 0.8 million ILS to 2.5 million ILS do not explain the magnitude of the positive abnormal returns we observe around Event 6.

<sup>20</sup> In addition, executive compensation that is below the cap but more than 2.5 million NIS (0.66 million USD) is not tax deductible and requires the approval of (1) the compensation committee, (2) board of directors, (3) a majority of independent directors and (4) the shareholders at the annual shareholders’ meeting.

support with no amendments on both votes, with 56 in favor and 0 against. The effective date of the bill was January 1, 2017.<sup>21</sup>

### 3. Research design

We conduct an event study to test the market reaction to the main event (the unanimous vote of the Treasury Committee, i.e., Event 6). Since the events are clustered in their effect on institutions, we expect the error terms to be correlated across firms. Therefore, following the literature, we aggregate all financial institutions into one portfolio. Using this portfolio, we estimate the following model:

$$R_{p,t} = \alpha + \beta R_{m,t} + \gamma D_t + \varepsilon_t, \quad (1)$$

where  $R_{p,t}$  is the equal-weighted portfolio returns on day  $t$ .<sup>22</sup> We use a total of 432 trading days, beginning 10 trading days before event 1 (i.e., the preliminary vote on July 28, 2014) and ending 10 trading days after the last event (i.e., the passage of the bill on the second and third votes on March, 29, 2016, or Event 7).  $R_{m,t}$  is the Tel-Aviv 100 index return on day  $t$ .<sup>23</sup> The Tel-Aviv 100 index is the weighted index of the largest 100 firms on the Tel-Aviv Stock Exchange (TASE) based on market capitalization.<sup>24</sup> The total market capitalization of firms in the index is approximately 189.61 billion USD, compared to (1) a total capitalization of 23.28 billion USD

---

<sup>21</sup> The law was scheduled to enter into effect in October 2016. However, on June 1, 2016, the Association of Banks in Israel filed a petition to the High Court of Justice against the law (see <http://www.globes.co.il/en/article-israeli-banks-petition-high-court-against-pay-curbs-1001129235>). The petition was dismissed, subject to a ruling that past compensation rights of banks' executives will not be violated. In addition, the High Court of Justice postponed the law's effective date to January 1, 2017, to allow executives to prepare for the law's consequences (see <https://www.themarket.com/markets/1.3083793>, in Hebrew). We also examine the market reaction around the major events related to this petition (untabulated). The results are consistent with the rent extraction view.

<sup>22</sup> Inferences are unchanged if we use value-weighted portfolios. We do not use value weighted portfolios in our main analyses as they may bias inferences because both pay and the expected effect on firm value are correlated with size.

<sup>23</sup> We employ a conservative approach and do not remove financial institutions from the Tel-Aviv 100 index. As financial institutions in the index had positive raw returns in the event window, eliminating them would increase the magnitude of the abnormal returns we document.

<sup>24</sup> In February 2017, the Israeli stock exchange revised its indexes, and the Tel-Aviv 100 index became the Tel-Aviv 125 index.



for all financial institutions in our sample and (2) a total capitalization of 201.682 billion USD for all firms publicly traded on the Tel Aviv Stock Exchange (TASE).

$D_t$  is an indicator variable equal to one on any one of the three days surrounding Event 6, from  $(t-1)$  to  $(t+1)$ , and zero otherwise. The coefficient on  $D_t$  is our coefficient of interest. A negative coefficient on  $D_t$  supports optimal contracting theories, while a positive coefficient on  $D_t$  supports rent extraction theories. Lastly,  $\varepsilon_t$  is the error term. Following the literature, we employ two different specifications for the standard errors: (1) Huber-White and (2) unadjusted.

#### **4. Sample selection and data**

Our tests are limited to financial institutions that fall under the scope of the executive compensation law. We identified a total of 20 such financial institutions on the Tel-Aviv Stock Exchange (TASE). Eight are classified as banks and seven as insurance firms. Four additional institutions are classified as investment firms, and one of the institutions is a holding company of an insurance firm. Industry classification and returns data are obtained from the TASE website. We obtain executive compensation data from the annual reports of the companies. These reports provide information on the five highest paid executives in each of the financial institutions in our sample as well as information on the directors in those firms, which we use in our corporate governance analyses.

Since the events related to the passage of the bill are expected to affect all financial institutions, we create daily portfolios of all publicly traded financial institutions. Our sample period spans from July 15, 2014, to April 12, 2016. Consequently, our sample size in all the analyses is 432 days (representing each trading day in our sample).

Table 1 provides the descriptive statistics for the institutions represented in our sample. The median maximum total compensation is 4.8 million ILS (1.2 million USD). The 25<sup>th</sup> percentile of maximum total compensation is 3.3 million ILS (0.875 million USD), which implies that more than 75% of the institutions in our sample were required by law to lower their maximum executive compensation in 2017. The mean market capitalization of financial institutions in our sample is 4.5 billion ILS (1.1 billion USD), compared to a mean of 3.4 million ILS (0.9 million USD) for all firms traded on the TASE. The average market-to-book ratio is 1.128, consistent with the low market-to-book ratios of financial institutions observed in the United States. The average proportion of independent directors is 0.308, lower than the average observed in the United States. The mean proportion of busy directors is 0.518, consistent with the results of Fish and Shivdasani (2006) for US firms. Lastly, the mean equity-pay to total-pay ratio in our sample is fairly small, merely 0.084, with a median of 0. This implies that compensation consists mostly of cash and other short-term components.

## **5. Results**

### **5.1 Main results**

The main results for the market reaction to the unanimous vote in the Treasury Committee (Event 6) are presented in Table 2. For brevity, we discuss only the results with the Huber-White standard errors (column 1). The mean equal-weighted return in the three days surrounding the event and after controlling for the market return is 0.528 ( $t$ -statistic = 2.09). This implies that the share value of financial institutions increased by a total of 1.584% ( $0.528 \times 3 =$

1.584)) in the three days surrounding the unanimous vote in the Treasury Committee.<sup>25</sup> Although 1.584% is an economically significant abnormal return, it is not too large to be infeasible.

Overall, the results in Table 2 suggest that investors view the compensation cap as, on average, value increasing. This suggests that investors in financial institutions in Israel associate the companies' executive compensation more with rent extraction than with value maximization.

## 5.2 Additional primary tests

We perform further tests to enhance the causal interpretation of our results. In Table 3, we partition the sample of financial institutions based on the expected impact of the legislation on them and examine the market reaction to the main event (Event 6). To the extent that the executive compensation limits are, on average, value increasing for shareholders, we expect financial institutions that award executive compensation above the new legislative limit to experience a stronger market reaction compared to those awarding compensation below the new limit and compared to those unaffected by the restriction.

We present the results from estimating Eq. (1) for financial institutions with maximum executive compensation above 2.5 million ILS (0.66 million USD) in Panel A. Since the results are similar across both specifications, for brevity, we only discuss the results in column 1. The average abnormal return in the three days surrounding the main event is 0.590 ( $t$ -statistic = 2.18). This implies that the value of institutions awarding executive compensation above 2.5 million ILS (0.66 million USD) increased, on average, by 1.77% ( $0.590\% \times 3$ ) in the three days surrounding the main event, after controlling for the market return.

---

<sup>25</sup> We obtain similar inferences when we use a sample limited to banks and when the sample is constrained to insurance firms.

In Table 3 Panel B, we present the results from estimating Eq. (1) for institutions with maximum executive compensation below 2.5 million ILS (0.66 million USD). As before, since the results are similar across both specifications, we discuss the results in column 1. As expected, the market reaction for firms that award executive compensation below the legislative limit is significantly smaller and statistically insignificant. The average increase in firm value in the three days surrounding the main event is 0.176 ( $t$ -statistic = 0.39). This implies that the value of institutions awarding executive compensation below 2.5 million ILS (0.66 million USD) increased by 0.528% ( $0.176\% \times 3$ ) in the three days surrounding the main event, significantly lower than the increase in the value of firms awarding executive compensation above 2.5 million ILS (0.66 million USD).

We present the results for nine financial institutions that are not in the scope of the law in Table 3 Panel C. Since those financial institutions are not within the scope of the law, we do not expect to find a significant market reaction around the main event. We indeed find a statistically insignificant increase of 0.316 ( $t$ -statistic = 0.97) in the value of the portfolio consisting of those firms.

In Table 4, we present the results from estimating Eq. (1) for a subset of financial institutions awarding executive compensation immediately above and below the 2.5 million ILS (0.66 million USD) threshold. We implement this approach to facilitate a better-identified research design. In Panel A, we present the results for a subset of four institutions awarding executive compensation above 2.5 million ILS (0.66 million USD) and below 4 million ILS (1.05 million USD). The results show a positive and significant market reaction to the unanimous vote for the approval of the bill in its restrictive form in the Treasury Committee. The average daily abnormal returns in the three days surrounding the main event are 0.434 ( $t$ -statistic = 4.17),

which implies an average increase in the abnormal value of 1.302% ( $0.434\% \times 3$ ) in the three days surrounding the event. The positive reaction is smaller than the reaction for all institutions awarding executive compensation above 2.5 million ILS (0.66 million USD), which is presented in Table 3 Panel A, where the average daily abnormal returns in the three days surrounding the main event are 0.590 ( $t$ -statistic = 2.18). These results provide further support for the conclusion that the greater the impact of the executive compensation cap, the more favorably the market reacts to the main event.

We present the results for a portfolio consisting of a subset of three financial institutions awarding executive compensation below 2.5 million ILS (0.66 million USD) and above 1 million ILS (0.26 million USD) in Table 4 Panel B.<sup>26</sup> The results show no significant market reaction to the main event. Average daily abnormal returns in the three days surrounding the unanimous vote for the approval of the bill in its restrictive form in the Treasury Committee are 0.176 ( $t$ -statistic = 0.39). Since the current highest executive compensation in the three firms in this subsample is below the cap set by the law, the results are consistent with investors not expecting to see a further decrease in executive compensation in those firms. Overall, the results in Table 4 are consistent with investors' belief that the prevailing executive compensation in financial institutions in Israel reflects rent extraction.

### **5.3 Cross-sectional tests**

Our findings may prompt alternative explanations. For example, if the market for executives is not well developed and the executives do not have viable employment alternatives, the law may simply extract welfare from optimally paid executives and transfer it to

---

<sup>26</sup> This subset of firms is identical to the one in Table 3 Panel B, but we repeat the analysis here for the ease of the reader.

shareholders. Due to lack of available data, we are unable to provide a formal test that would indicate that the turnover in this industry increased. However, several institutional factors make this explanation unlikely. First, the law is imposed on insurance, banking, and investment firms and not on the entire financial industry, nor on firms in other industries. Credit card issuers, private equity funds and hedge funds, for example, are not subject to the law, and neither are the vast majority of Israeli firms. In addition, the law does not apply to subsidiaries of financial institutions engaging in other financial activities, such as investment banking and underwriting. Moreover, subsidiaries operating outside of Israel are considered foreign firms and are not subject to the law.<sup>27,28</sup> While the law is relatively new, there are already examples of executives who resigned from the banks but remained with their unaffected foreign subsidiaries.<sup>29</sup> Affected executives can also move to nonfinancial firms that provide their executives with generous pay. Hence outside options exist both within and outside the financial industry. Lastly, as many Israeli financial institutions executives have experience in U.S. and other foreign financial institutions, foreign companies could also serve as an outside option.

Nevertheless, to rule out this alternative explanation and other unspecified alternative explanations, we preform two sets of cross-sectional tests. In our first set of tests, we build on prior studies that document that weak corporate governance is associated with management rent extraction (Core et al. 1999). Therefore, if the reduction of rent extraction is the reason of the

---

<sup>27</sup> Examples of foreign banks owned by Israeli banks include Bank Leumi USA, IDB Bank (located in the United States), and Leumi ABL, located in London.

<sup>28</sup> Despite the fact that subsidiaries of banks are exempt from the law, we learned from conversations with lawyers that it is illegal for executives to hold a position in the Israeli firm but be registered as a foreign employee to receive an unrestricted compensation. The legal experts we talked with did not see a way in which this law could be circumvented.

<sup>29</sup> One example is Dani Zidon, who resigned from his position as the deputy CEO of Bank Leumi in April 2016, but remained the board chairman of Leumi partners (the investment banking subsidiary of Bank Leumi, which is not subject to the law) and as a board member in Leumi USA. It was also announced he is considering joining a private equity fund (and private equity funds are not subject to the law). Another example is Erez Goldsmith who left his position as the CEO IBI to start his own underwriting business because of the pay limit.

observed positive abnormal returns around the main event date, then the positive market reaction following this legislation is likely to be stronger for financial institutions with weaker corporate governance. We examine two corporate governance characteristics: board independence and director busyness.

We present the results from estimating Eq. (1) for financial institutions with a proportion of independent directors below (above) the sample median in Table 5 Panel A. Our definition of independent directors follows the definition in the Israeli Companies Act. We find that the market reaction for financial institutions with low board independence is economically and statistically significant. The coefficient estimate is 0.546 (representing 1.65% abnormal return in the three days surrounding the main event) and the  $t$ -statistic is 2.66 (in column 1). Conversely, we find statistically insignificant results for financial institutions with strong board independence. The coefficient estimate is 0.511, and the  $t$ -statistic is 1.46 (column 3).

We examine the market reaction of the legislation for financial institutions with low (high) director busyness in Table 5 Panel B. Director busyness is defined as the fraction of directors serving on three or more boards. We find that there is a stronger market reaction for firms with busy board members. The three-day abnormal returns surrounding the main event are 2.181% ( $0.727\% \times 3$ ,  $t$ -statistic = 3.10) for firms with busy boards. Conversely, the three-day abnormal returns for financial institutions with a proportion of busy board members below the median is statistically insignificant (coefficient estimate = 0.330;  $t$ -statistic = 0.94). Overall, the results from the cross-sectional tests that exploit corporate governance characteristics are consistent with the predictions of rent extraction theories on executive pay.

In our second set of cross-sectional tests, we examine the effect of executive pay structure on the observed positive abnormal returns around the main event date. Prior studies

find that equity-based pay better aligns the interests of managers and shareholders. Therefore, rent extraction is less likely when executives are paid with equity. We present the results in Table 6 and find that the positive market reaction to the new legislation is stronger among financial institutions with an equity to total-pay ratio below the sample median. The three-day abnormal returns are 2.013% ( $0.671\% \times 3$ ;  $t$ -statistic = 2.93). In contrast, the three-day abnormal returns for financial institutions with a high equity to total-pay ratio is 0.792% ( $0.264\% \times 3$ ) and is statistically insignificant ( $t$ -statistic = 0.88). Again, these results are consistent with the predictions of rent extraction theories. Taken together, these results also suggest that alternative explanations are unlikely, as other explanations do not predict variation in abnormal returns around the event based on corporate-governance and pay-structure characteristics.

#### **5.4 Further robustness analyses**

In this section, we present further analyses to enhance confidence in our results. First, we present the cumulative three day abnormal returns for each of the financial institutions in our sample around Event 6 in Table 7. The table reveals that out of the 20 financial institutions, 16 had a positive CAR during the event period and four had a negative CAR. Out of the four financial institutions with the negative CAR, one institution was not bound by the law. The findings in Table 7 provide comfort that our results are not likely driven by a small subset of financial institutions or by the error structure of the data.

Second, we test the correlation between an estimate of the expected annual compensation savings and the increase in market value of the financial institutions. We estimate the annual expected compensation cost saving for each financial institution, assuming that the compensation of executives earning more than the cap will be set equal to the cap. Hence the estimated annual savings of each financial institution is the difference between the actual compensation of the five



highest paid executives in 2015, as disclosed in the firms' annual reports, and the compensation of those executives adjusted to the cap. The mean and median estimated annual saving for our sample firms is 5.6 million ILS. Three firms in our sample are not expected to record any savings since none of their executives reached the compensation cap in 2015. Conversely, in nine firms, all of the five highest paid executives exceeded the cap in 2015. Since firms are obligated to disclose compensation of only the five highest-paid executives, there may be additional executives in those firms earning more than the cap in 2015. If so, our estimation of the savings is biased downward. Another caveat is that our estimate does not account for the effect of the law on lower ranking executives, whose compensation may also be adjusted to maintain a sensible pay hierarchy within the firm. Nevertheless, we believe our calculation provides a rough estimate of firm-specific cost savings following the law.

Next, we compute for each financial institution the change in market value by multiplying its abnormal return in the three days surrounding the approval of the bill at the Treasury Committee by its market value just before the event. In our sample, the mean (median) increase in market value is 83 (33) million ILS. We compare the annual expected compensation cost savings and the change in market value and find that they are significantly positively correlated, with a Pearson correlation of 0.819. This correlation suggests that the positive market response to the law is strongly associated with the cost reduction it is expected to generate and provides additional evidence of investors' favorable view of the pay cap.

Third, in a series of placebo tests we change the event window to periods when we do not expect to observe abnormal returns. In our first series of placebo tests, the new placebo event

window ends two days before the first day of our main event window.<sup>30</sup> We find no significant abnormal returns for financial institutions in the treated and untreated groups in the three-day window just before the event date.<sup>31</sup> These results suggest that momentum in returns or a reversal of returns of a prior unspecified event do not likely explain our results. In our second series of placebo tests, we change the event window so that the first day of the new placebo event window starts two days after the last day of the real event window. We find no significant abnormal returns for financial institutions in the treated and untreated groups in the three-day window just after the event date. These results suggest that there was no reversal of the positive abnormal returns observed around the main event. Taken together, the results from the placebo tests suggest that the abnormal returns are concentrated in the main event window.

Fourth, we estimate Eq. (1) for all other events related to the executive compensation law and described in Section 2. Untabulated results show that, although the abnormal returns during all the events that relate to the passing of the law are positive, the only consistently statistically significant and economically meaningful abnormal returns are around Event 6, which is our main event window. This result is consistent with investors incorporating the news into firms' stock prices following the main event, the unanimous vote for the approval of the bill in the Treasury Committee.

Fifth, to ensure that our results are not driven by a confounding event, we search for other news related to the affected financial institutions that occurred in the three days surrounding the main event. The outcome of this analysis is presented in Table 8. We searched for filings made

---

<sup>30</sup> In the placebo tests, we keep one extra day between the real event date and the placebo dates to avoid confounding the real event window with the placebo window.

<sup>31</sup> We find statistically significant but economically negligible (-0.5%) abnormal returns for the treated institutions. These returns are 3.5 times lower (in absolute value) than the positive abnormal returns of 1.8% we observe for the treated institutions during the event window (documented in Table 3 Panel A).

by our sample firms in the three days surrounding our main event. Two firms issued their annual reports in that window—Bituach Yashir and Meitav. The average market reaction of both of those firms in the three-day event window is below the overall average for all firms in our sample. Therefore, we do not believe that the release of these annual reports is driving our results.

We also searched on Google for the word “banks”, in Hebrew, with a date restriction of March 14 through March 18, 2016. Our assumption is that any significant news related to the banking industry would appear in our search. We identified a few relevant articles that are unrelated to the main events. The first article is about banks in Israel being stable but inefficient.<sup>32</sup> It is not clear whether this article should induce positive returns. In addition, our sample includes insurance firms, not just banks. A second article states that Deutsche Bank closed its trading division in Israel.<sup>33</sup> Again, this article is limited to banks, and it is not clear whether such news should result in a positive or a negative market reaction.

In addition, we searched for all articles (not limited to any specific term) in the Israeli financial website *The Marker* with a date restriction of March 14 through March 18, 2016. We identified an article on the increased competition in the pension management industry, which would suggest negative returns.<sup>34</sup> We also identified an article that details the executive compensation in 2015 based on firms’ annual disclosure.<sup>35</sup> This article is a summary of firm specific disclosures that were already released to the market. Lastly, we identified an article claiming that the two leading banks in Israel (Poalim and Leumi) may be able to issue credit cards but not to their clients. This is part of the discussions by regulators to require banks to sell

---

<sup>32</sup> <http://www.ynet.co.il/articles/0,7340,L-4780179,00.html>

<sup>33</sup> <http://www.calcalist.co.il/markets/articles/0,7340,L-3683645,00.html>

<sup>34</sup> <http://www.themarket.com/news/1.2885575>.

<sup>35</sup> <http://www.themarket.com/markets/reports/1.2883434>.

off their credit card businesses. Since our sample is not restricted to those two banks, we do not believe that this event is driving our results.<sup>36</sup>

### **5.5. Preliminary consequences of the law**

Since the law came into effect on January 1, 2017, we can provide additional insights regarding its consequences. First, numerous executives resigned from financial institutions following the law's approval. Prominent examples include the deputy CEO of the second largest bank in Israel, the CEO of one of largest investment firms, the deputy CEO of the largest bank in Israel, and the deputy CEO and head of the Investment Division of one of the largest insurance companies, who resigned after 16 years on the job.

In addition, all the financial institutions that previously paid their executives compensation above the pay cap modified their compensation structure. Since financial reports for the 2017 fiscal year are not available yet, we only have partial information on the updated compensation schemes. According to public disclosures, the new compensation structure is comprised mostly of cash compensation; second, cash compensation will be linked to the lowest salary paid by the financial institution; third, bonuses on performance are still available, but their scope will be limited.<sup>37</sup> Lastly, the compensation structure of the entire organization has been revised as well, and even lower level managers – whose salary was below the pay cap – suffered from a decrease in their salaries (the pay cut is mostly in the performance-based compensation, but cash compensation also declined).

---

<sup>36</sup> <http://www.themarket.com/markets/1.2881721>.

<sup>37</sup> See for example a newspaper article on the new compensation structure of one of the banks: <http://www.globes.co.il/en/article-leumi-cuts-exec-pay-as-new-law-bites-1001154435>.

## 6. Conclusions

We examine the optimality of executive compensation contracts. There is considerable debate on executive compensation in both the public arena and academia. On the one hand, value maximization contracting theories imply that executive compensation contracts are optimally designed to attract talented executives and incentivize those executives to maximize shareholder value. On the other hand, rent extraction theories suggest that compensation contracts enable executives to extract rents at the expense of shareholders.

We use a quasi-natural experiment that allows us to test the key differential prediction between the two theories. In 2016, the Israeli Parliament surprisingly passed a law limiting executive pay in financial institutions. Under value maximization theories, this intervention should reduce firm value, while under rent extraction theories, the opposite should occur. We find significantly positive abnormal returns for financial institutions around the passage of the law. We also find that the positive abnormal returns are significantly larger for financial institutions bound by the pay limit. We further find that the financial institutions that had executive pay just above the pay threshold experienced much larger abnormal returns than those that were just below the threshold. These results support the rent extraction view of executive compensation, on average, in our setting. Lastly, we find that the positive market reaction is greater for financial institutions with weaker governance and for those that award a lower proportion of equity-based pay.

Our results have implications to several literature streams in economics, including contract theory, corporate finance, corporate governance, labor economics, and income inequality. Moreover, the results may be relevant to policy discussions, given that numerous

proposals to limit executive pay have been advanced both by the media and politicians. Nevertheless, we caution the reader to take care in extrapolating our results to other settings.

## References:

Albuquerque, R., Cabral, L., & Guedes, J. (2018). Relative performance, banker compensation, and systemic risk, ECGI working paper 460/2016.

Amir, E., & Sharony, I. (2017). The profitability of the Israeli banking system around the 2008 financial crisis. Working paper (in Hebrew).

Bae, K.H. and Z. Gong and W. Tong. 2017. Restricting CEO Pay Backfires: Evidence from China.

Bertrand, M., & Mullainathan, S. (1999). Is there discretion in wage setting? A test using takeover legislation. *The Rand Journal of Economics*, 535–554.

Bertrand, M., & Mullainathan, S. (2000). Agents with and without principals. *The American Economic Review* 90(2), 203–208.

Bertrand, M., & Mullainathan, S. (2001). Are CEOs rewarded for luck? The ones without principals are. *The Quarterly Journal of Economics* 116(3), 901–932.

Bebchuk, A.L., & Fried, J.M. (2003). Executive compensation as an agency problem. *The Journal of Economic Perspectives* 17(3), 71–92.

Brenner, M., Eldor, R., & Hauser, S. (2001). The price of options illiquidity. *Journal of Finance* 56 (2), 791–807.

Cadman, B., Carter, M.E., & Lynch, L. (2012). Executive compensation restrictions: Do they restrict firms' willingness to participate in TARP? *Journal of Business, Finance and Accounting* 39, 997–1027.

Core, J. E., & Guay, W.R. (2010). Is there a case for regulating executive pay in the financial services industry? Working paper.

Core, J. E., Holthausen R.W., & Larker, D.F. (1999). Corporate governance, chief executive officer compensation, and firm performance. *Journal of Financial Economics* 51, 371–406.

Dittmann, I., Maug, E., & Zhang, D. (2011). Restricting CEO pay. *Journal of Corporate Finance* 17, 1200–1220.

Djankov, S., La Porta, R., Lopez-de-Silanes, F., & Shleifer, A. (2008). The law and economics of self-dealing. *Journal of Financial Economics* 88(3), 430–465.

Edmans, A., & Gabaix, X. (2016). Executive compensation: A modern primer. *Journal of Economic Literature* 54(4), 1232–1287.

Edmans, A., Gabaix, X., & Jenter, D. (2017). Executive compensation: A survey of theory and evidence. National Bureau of Economic Research.

- Faleye, O., Reis, E., & Venkateswaran, A. (2013). The determinants and effects of CEO–employee pay ratios. *Journal of Banking & Finance*, 37(8), 3258-3272.
- Fish, E. M., & Shivdasani, R. (2006). Are busy boards effective monitors. *Journal of Finance* 61(2), 689–724.
- Frydman, C., & Jenter, D. (2010). CEO compensation. *Annual Review of Financial Economics* 2, 75–102.
- Gabaix, X., & Landier, A. (2008). Why has CEO pay increased so much? *The Quarterly Journal of Economics* 123(1), 49–100.
- Kastiel, K. (2015). Executive compensation in controlled companies. *Indiana Law Journal* 90, 1131–1175.
- Kleymenova, A. & Tuna, A.I. (2017). Regulation of Compensation, Chicago Booth Research Paper No. 16-07.
- La Porta, R., Lopez-de-Silanes, F., Shleifer, A., & Vishny, R.W. (1998). Law and finance. *Journal of Political Economy* 106(6), 1113–1155.
- Murphy, K.J. (2012). Executive compensation: Where we are, and how we got there. Working paper.
- Rouen, E. (2017). Rethinking Measurement of Pay Disparity and its Relation to Firm Performance. Working paper 18-007, Harvard Business School.
- Schwartz-Ziv, M., and Weisbach, M., (2011). What do boards really do? Evidence from minutes of board meetings, *Journal of Financial Economics* 108, 349-366.



### Table 1: Descriptive Statistics

The table reports descriptive statistics for our sample of the 20 financial institutions that were traded on the Tel-Aviv Stock Exchange during the legislation process leading to the executive compensation cap law. *Max total compensation* is the compensation of the firm's highest-paid executive in 2015. *Market Cap* is the firm's market value of equity on December 31, 2015. *Total Assets* is the firm's total assets at the end of 2015. *Gross Revenues* are the firm's annual revenues in 2015. *ROA* is return on assets, calculated as net income in 2015 over average total assets in the same year. *ROE* is return on equity, calculated as net income, scaled by average total shareholders' equity in 2015. *Market to Book* is the market value of equity divided by the book value of equity at the end of 2015. *P/E ratio* is the ratio between share price and earnings per share in 2015. *Proportion of independent directors* is the fraction of directors considered independent under the Israeli Companies Act. *Proportion of busy directors* is the fraction of directors serving on three or more boards. *Equity-pay to total-pay ratio* is the ratio of share-based compensation and total compensation for the firm's highest-paid executive in 2015.

	N	Mean	Std Dev	P25	P50	P75
Max total compensation (ILS, 000s)	20	4,766	2,165	3,250	4,738	6,621
Market Cap (ILS, millions)	20	4,534	7,024	620	2,140	3,901
Total Assets (ILS, millions)	20	98,199	129,134	8,825	43,052	125,909
Gross Revenues (ILS, millions)	20	5,981	5,968	643	3,088	11,900
ROA (%)	20	2.150	4.909	0.348	0.510	1.669
ROE (%)	20	10.991	9.091	6.236	6.872	10.441
Market to Book	20	1.128	1.216	0.601	0.714	0.903
P/E ratio	20	10.832	6.362	7.365	9.125	11.403
Proportion of independent directors	20	0.308	0.110	0.250	0.300	0.333
Proportion of busy directors	20	0.518	0.226	0.300	0.570	0.643
Equity-pay to total-pay ratio	20	0.084	0.132	0.000	0.000	0.1993

**Table 2: Abnormal returns at the approval of the bill by the Treasury Committee for all financial institutions that are under the scope of the bill (March 16, 2016)**

The table presents the coefficient estimates from Equation (1), which measures the average abnormal returns in the three days surrounding the date of the approval of the executive compensation cap bill by the Treasury Committee. Our sample firms are described in Table 1. The sample period is from July 15, 2014, to April 12, 2016 (432 trading days). The dependent variable is the return of an equally weighted portfolio consisting of the sample firms. *TA-100 index* is the return of the Tel-Aviv 100 index, the main index for the Israeli stock market. *Unanimous vote in the Treasury Committee* is an indicator variable that equals 1 on the three days surrounding the approval of the bill at the Treasury Committee (Event 6) and 0 otherwise.

Dependent Variable:	(1) Portfolio Returns	(2) Portfolio Returns
Intercept	0.003 (0.12)	0.003 (0.12)
Unanimous vote in the Treasury Committee for the approval of the bill	0.528** (2.09)	0.528* (1.89)
TA-100 Index	0.737*** (18.18)	0.737*** (25.20)
Standard Errors	Huber-White	None
# of Firms	20	20
Observations	432	432
Adjusted R-squared	0.596	0.596

**Table 3 Panel A: Abnormal returns at the approval of the bill by the Treasury Committee (March 16, 2016) for financial institutions with top executive compensation that exceeds the bill's compensation threshold (2.5 million ILS)**

The table presents the coefficient estimates from Equation (1), which measures the average abnormal returns in the three days surrounding the date of the approval of the executive compensation cap bill by the Treasury Committee. Our sample firms are described in Table 1. The sample period is defined in Table 2. The dependent variable is the return of an equally weighted portfolio consisting of our sample firms. *TA-100 index* and the *Unanimous vote in the Treasury Committee* are defined in Table 2. Panel A (Panel B) examines the market reaction for the portfolio of financial firms with top executive compensation that exceeds (is below) the bill's compensation threshold (2.5 million ILS). Panel C examines the market reaction for the portfolio of financial firms that are not subject to the executive compensation cap bill.

Dependent Variable:	(1) Portfolio Returns	(2) Portfolio Returns
Intercept	-0.005 (-0.18)	-0.005 (-0.18)
Unanimous vote in the Treasury Committee for the approval of the bill	0.590** (2.18)	0.590* (1.97)
TA-100 Index	0.786*** (19.58)	0.786*** (25.00)
Standard Errors	Huber-White	None
# of Firms	17	17
Observations	432	432
Adjusted R-squared	0.592	0.592

**Table 3 Panel B: Abnormal returns at the approval of the bill by the Treasury Committee (March 16, 2016) for financial institutions with top executive compensation below the bill's compensation threshold (2.5 million ILS)**

Dependent Variable:	(1) Portfolio Returns	(2) Portfolio Returns
Intercept	0.045 (1.06)	0.045 (1.06)
Unanimous vote in the Treasury Committee for the approval of the bill	0.176 (0.39)	0.176 (0.35)
TA-100 Index	0.463*** (5.97)	0.463*** (8.71)
Standard Errors	Huber-White	None
# of Firms	3	3
Observations	432	432
Adjusted R-squared	0.146	0.146

**Table 3 Panel C: Abnormal returns at the approval of the bill by the Treasury Committee (March 16, 2016) for financial institutions excluded from the bill (not under the scope of the bill)**

Dependent Variable:	(1) Portfolio Returns	(2) Portfolio Returns
Intercept	0.003 (0.12)	0.003 (0.12)
Unanimous vote in the Treasury Committee for the approval of the bill	0.316 (0.97)	0.316 (0.32)
TA-100 Index	0.505*** (4.80)	0.505*** (4.88)
Standard Errors	Huber-White	None
# of Firms	9	9
Observations	432	432
Adjusted R-squared	0.048	0.048

**Table 4 Panel A: Abnormal returns at the approval of the bill by the Treasury Committee (March 16, 2016) for financial institutions with top executive compensation that exceeds the bill's compensation threshold (2.5 million ILS) but below 4 million ILS.**

The table presents the coefficient estimates from Equation (1), which measures the average abnormal returns in the three days surrounding the date of the approval of the executive compensation cap bill by the Treasury Committee. Our sample firms are described in Table 1. The sample period is defined in Table 2. The dependent variable is the return of an equally weighted portfolio consisting of our sample firms. *TA-100 index* and the *Unanimous vote in the Treasury Committee* are defined in Table 2. Panel A examines the market reaction for the portfolio of financial institutions with top executive compensation that exceeds the bill's compensation threshold (2.5 million ILS) but below 4 million ILS. Panel B examines the reaction of the portfolio of financial institutions with top executive compensation below the bill's compensation threshold (2.5 million ILS) but above 1 million ILS.

Dependent Variable:	(1) Portfolio Returns	(2) Portfolio Returns
Intercept	-0.052* (-1.65)	-0.052* (-1.65)
Unanimous vote in the Treasury Committee for the approval of the bill	0.434*** (4.17)	0.434 (1.15)
TA-100 Index	0.699*** (13.63)	0.699*** (17.70)
Standard Errors	Huber-White	None
# of Firms	4	4
Observations	432	432
Adjusted R-squared	0.420	0.420

**Table 4 Panel B: Abnormal returns at the approval of the bill by the Treasury Committee (March 16, 2016) for financial institutions with top executive compensation below the bill's compensation threshold (2.5 million ILS) but above 1 million ILS. (Identical to table 3 panel B, and is added here for the convenience of the reader)**

Dependent Variable:	(1) Portfolio Returns	(2) Portfolio Returns
Intercept	0.045 (1.06)	0.045 (1.06)
Unanimous vote in the Treasury Committee for the approval of the bill	0.176 (0.39)	0.176 (0.35)
TA-100 Index	0.463*** (5.97)	0.463*** (8.71)
Standard Errors	Huber-White	None
# of Firms	3	3
Observations	432	432
Adjusted R-squared	0.146	0.146

**Table 5 Panel A: Abnormal returns at the approval of the bill by the Treasury Committee (March 16, 2016) for financial firms with a proportion of independent directors below (above) the sample median.**

The table presents the coefficient estimates from Equation (1), which measures the average abnormal returns in the three days surrounding the date of the approval of the executive compensation cap bill by the Treasury Committee. Our sample-firms are described in Table 1. The sample period is defined in Table 2. The dependent variable is the return of an equally weighted portfolio consisting of our sample firms. *TA-100 index* and the *Unanimous vote in the Treasury Committee* are defined in Table 2. In Panel A, the sample is divided into two groups of firms with a proportion of independent directors that is above (below) the sample median value. In Panel B, the sample is divided into two groups of firms if the proportion of busy directors is above (below) the sample median value.

	(1)	(2)	(3)	(4)
Sample: % of independent directors	< Median	< Median	> Median	> Median
Dependent Variable:	Portfolio Returns	Portfolio Returns	Portfolio Returns	Portfolio Returns
Intercept	0.024 (1.00)	0.024 (1.00)	-0.019 (-0.64)	-0.019 (-0.64)
Unanimous vote in the Treasury Committee for the approval of the bill	0.546*** (2.66)	0.546* (1.87)	0.511 (1.46)	0.511 (1.46)
TA-100 Index	0.732*** (17.38)	0.732*** (23.97)	0.742*** (16.17)	0.742*** (20.26)
Standard Errors	Huber-White	None	Huber-White	None
# of Firms	10	10	10	10
Observations	432	432	432	432
Adjusted R-squared	0.571	0.571	0.487	0.487

**Table 5 Panel B: Abnormal returns at the approval of the bill by the Treasury Committee (March 16, 2016) for financial institutions with a proportion of busy directors below (above) the sample median.**

	(1)	(2)	(3)	(4)
Sample: Proportion of busy directors	< Median	< Median	> Median	> Median
Dependent Variable:	Portfolio Returns	Portfolio Returns	Portfolio Returns	Portfolio Returns
Intercept	0.009 (0.32)	0.009 (0.32)	-0.003 (-0.11)	-0.003 (-0.11)
Unanimous vote in the Treasury Committee for the approval of the bill	0.330 (0.94)	0.330 (1.02)	0.727*** (3.10)	0.727** (2.29)
TA-100 Index	0.627*** (13.40)	0.627*** (18.41)	0.847*** (20.12)	0.847*** (25.49)
Standard Errors	Huber-White	None	Huber-White	None
# of Firms	10	10	10	10
Observations	432	432	432	432
Adjusted R-squared	0.439	0.439	0.602	0.602

**Table 6: Abnormal returns at the approval of the bill by the Treasury Committee (March 16, 2016) for financial institutions with a proportion of equity based pay above (below) the sample median.**

The table presents the coefficient estimates from Equation (1), which measures the average abnormal returns in the three days surrounding the date of the approval of the executive compensation cap bill by the Treasury Committee. Our sample firms are described in Table 1. The sample period is defined in Table 2. The dependent variable is the return of an equally weighted portfolio consisting of our sample firms. *TA-100 index* and the *Unanimous vote in the Treasury Committee* are defined in Table 2. The sample is divided into two groups based on whether the proportion of equity based-compensation (out of total pay) is above (below) its sample median value.

	(1)	(2)	(3)	(4)
Sample: Equity-pay to total-pay ratio	< Median	< Median	> Median	> Median
Dependent Variable:	Portfolio	Portfolio	Portfolio	Portfolio
	Returns	Returns	Returns	Returns
Intercept	-0.014 (-0.52)	-0.014 (-0.52)	0.034 (1.23)	0.034 (1.24)
Unanimous vote in the Treasury Committee for the approval of the bill	0.671*** (2.93)	0.671** (2.08)	0.264 (0.88)	0.264 (0.80)
TA-100 Index	0.737*** (16.60)	0.737*** (21.83)	0.737*** (16.54)	0.737*** (21.28)
Standard Errors	Huber-White	None	Huber-White	None
# of Firms	13	13	7	7
Observations	432	432	432	432
Adjusted R-squared	0.525	0.525	0.511	0.511



**Table 7: Abnormal returns at the approval of the bill by the Treasury Committee (March 16, 2016), by financial institution**

The table presents the cumulative abnormal returns for each of the 20 firms in our sample in the three days surrounding the date of the approval of the executive compensation cap bill by the Treasury Committee. We obtain the cumulative abnormal returns by estimating Equation (1) at the firm level and multiplying by 3.

**Panel A: Firms with executive compensation in excess of the bill's limit (2.5M ILS):**

Firm	3-Day CAR
1 Ayalon	-0.006
2 Beinleumi	1.689
3 Bituach Yashir	1.329
4 Clal	1.326
5 Discount	1.728
6 Harel	5.712
7 IBI Investments	0.216
8 IDI	-0.504
9 Igud	3.993
10 Leader	1.191
11 Leumi	3.474
12 Meitav	-0.507
13 Menorah	2.403
14 Migdal	1.509
15 Mizrahi	0.546
16 Phoenix	4.656
17 Poalim	1.347

Average 3-Day CAR: 1.771% (t-statistic = 4.11)

# positive: 14

# Negative: 3

Tel-Aviv 100 Index 3-day returns: -0.168

**Panel B: Firms with executive compensation below the bill's limit (2.5M ILS):**

Firm	3-Day CAR
1 Analyst	-0.150
2 Dexia	0.762
3 Jerusalem	0.978

Average 3-Day CAR: 0.530% (t-statistic = 1.53)

**Table 8: Firm-specific disclosures around the main event**

The table presents firm-specific events that appear in the economic media, firm-filings, and as outcomes of a Google search from March 14 through March 18, 2016, which encapsulate the five days that surround the date of the unanimous vote for the approval of the bill by the Treasury Committee (March 16, 2016). The table also specifies the closest annual report filing date.

<b>Firm</b>	<b>Type</b>	<b>Filings +/- 3days around main event (March 16, 2016)</b>	<b>Closest 10K filing</b>
Analyst	Other	None	March 23, 2016
Ayalon	Insurance	None	March 31, 2016
Beinleumi	Bank	None	February 28, 2016
Bituach Yashir	Insurance	2015 10K filing and declaration of a dividend	March 17, 2016
Clal	Insurance	None	March 23, 2016
Dexia	Bank	None	February 23, 2016
Discount	Bank	None	February 29, 2016
Harel	Insurance	List of common stock and options	March 23, 2016
IBI Investments	Other	None	March 29, 2016
IDI	Insurance	None	February 28, 2016
Igud	Bank	None	February 29, 2016
Jerusalem	Bank	None	February 23, 2016
Leader	Other	None	March 30, 2016
Leumi	Bank	9.5 million USD acquisition of enVerid Systems Inc. by subsidiary Leumi Partners (1.158 <i>CAR</i> ). Only one Israeli financial newspaper discussed this (Globes)	February 29, 2016
Meitav	Other	2015 10K filing - 3 day <i>CAR</i> is -0.507 so doesn't explain the positive <i>CAR</i>	March 16, 2016
Menorah	Insurance	On March 15, 2016, the firm announced a class action lawsuit against one of its subsidiaries	March 31, 2016
Migdal	Insurance	None	March 30, 2016
Mizrahi	Bank	Changes in holdings by related parties on March 16, 2016	February 25, 2016
Phoenix	Insurance	None	March 28, 2016
Poalim	Bank	Extension of appointment of two directors. Affirmation of A- credit rating by Fitch. (0.449 <i>CAR</i> )	February 29, 2016