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Do Former Civil Servants Affect a Firm's Value and Credit Spreads?

Noam Michelson¹

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Bank of Israel - <http://www.boi.org.il>

¹ Research Department, Bank of Israel - Email: noam.michelson@boi.org.il

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חטיבת המחקר, בנק ישראל ת"ז 780 ירושלים 91007
Research Department, Bank of Israel. POB 780, 91007 Jerusalem, Israel

האם עובדי המינהל הציבורי לשעבר משפיעים על שווי חברה ומרווחי האשראי שלה?

נועם מיכלסון

תקציר

עבודות קודמות שאמדו את השווי של קישוריות פוליטית אותה חברה משיגה דרך העסקת איש ציבור לשעבר התמקדו בעיקר בדמויות פוליטיות ובמנהלים בכירים מהמינהל הציבורי. בנייר זה אני מרחיב את ההגדרה של "איש ציבור לשעבר" כך שתכלול דמויות פוליטיות לצד כל עובדי המינהל הציבורי לשעבר, בדרגי עבודה ובכל דרגות הניהול. בעזרת בסיס נתונים עשיר אני אומד את ההשפעה של שכירת עובדי המינהל הציבורי לשעבר, ובכללם פוליטיקאים, על שווי השוק ומרווחי האשראי של החברות הציבוריות בישראל השוכרות את שירותיהם, בשנים 2007-2015. אני מוצא כי שווי השוק עולה בעקבות מינוי של עובד מינהל ציבורי לשעבר להנהלת החברה או לדירקטוריון שלה, ללא השפעה נוספת במידה ואותו עובד היה בעל דרגה בכירה במינהל הציבורי. לעומת זאת, מרווח האשראי של החברה השוכרת מצטמצמים רק בעקבות מינוי של עובד לשעבר במינהל הציבורי שהיה בעל תפקיד בכיר, בעוד למינוי של עובד לשעבר שהיה בדרג לא בכיר לא נמצאה השפעה. עוד נמצא כי ההשפעה הן על שווי השוק והן על מרווחי האשראי חזקה יותר במידה ובעת המינוי החברה אינה מעסיקה בהנהלתה עובד לשעבר במינהל הציבורי, וחלשה יותר ככל שעבר זמן רב יותר מאז עזב העובד לשעבר במינהל הציבורי את המינהל הציבורי ועד המינוי. התוצאות ממחישות את החשיבות שבהכללת כל הדרגים של עובדי המינהל הציבורי לשעבר והמאפיינים שלהם במידה ורוצים לבחון את הערך של קישוריות פוליטית.

Do Former Civil Servants Affect a Firm's Value and Credit Spreads?

Noam Michelson

ABSTRACT

Earlier studies estimating the value of political connections firms gain by hiring former government officials have focused mostly on politicians and high-ranked former government officials. In this paper, I extend the common definition of former government officials to include all politicians and civil servants, at working levels and senior levels. Using a rich and coherent dataset, I estimate the effect of these former government officials on publicly listed firms' value and credit spreads in Israel in the years 2007–2015. I find that firm's value increases following the appointment of former government officials to a firm's management, with no additional increase associated with high-ranked former government officials. Credit spreads, however, decrease only with the appointment of high-ranked former government officials. I find further that both effects are greater if the appointee is the first former government official to be employed by the firm, and that these results are sensitive to the number of years that pass between the departure of the appointee from his or her last position in the political system or civil service and the time of his or her appointment to firm's management. These results stress the importance of including all ranks of former government officials and their background when testing for the value of political connections.

1. INTRODUCTION

The benefits of political connections to a firm have been widely documented in recent years. There is evidence from a wide range of countries – developed and developing, corrupt and not so corrupt, democratic and dictatorial – of the effect of political connections on a wide range of financial and business outcomes. The evidence shows that political connections affect a firm’s value (Roberts, 1990; Fisman, 2001; Faccio, 2006; Goldman et al., 2009; Luechinger and Moser, 2014), performance and profitability (Khwaja and Mian, 2005; Amore and Bennedsen, 2013), credit spreads and covenants (Li et al., 2008; Houston et al., 2014; Ho et al., 2015), access to capital (Khwaja and Mian, 2005; Claessens et al., 2008; Boubakri et al., 2012), access to government contracts (Goldman et al., 2013; Brogaard et al., 2017; Schoenherr, 2019), bail-outs (Faccio et al., 2006), executive compensation and pay dispersion (Chizema et al., 2015), and accounting quality (Guedhami et al., 2014).¹

The literature is divided into two camps over the way political connections ought to be identified. One camp identifies political connections with donations to political candidates (e.g., Claessens et al., 2008; Goldman et al., 2009; Brogaard et al., 2017). The other camp identifies political connections with the presence of one or more former political figures among the firm’s shareholders, board members, or top executives (e.g., Faccio, 2006; Faccio et al., 2010; Lester et al., 2008; Chaney et al., 2011; Vidal et al., 2012; Houston, 2014; Luechinger and Moser, 2014; Faccio and Hsu, 2017; Shin et al., 2018; Hu et al., 2020; Zhang and Truong, 2019).²

¹ The literature also finds that the following costs are associated with the hiring of ex-government officials: if they are hired for their government experience, they may not provide effective monitoring and advisory services, because they often lack industry experience and serve in multiple directorships, reducing the amount of time they can spend serving each firm (Kang and Zhang, 2018). In addition, if they still hold their political affiliation, they might extract political benefits at the expense of other stakeholders, which raises their incentives for rent seeking and expropriation of the firm’s resources (Boubakri et al., 2012). Empirically, Bertrand et al. (2018) show that politically connected CEOs alter corporate employment decisions in order to help politicians in their re-election efforts, by increasing job and plant creation rates or lowering job and plant destruction rates in election years, especially in politically contested areas.

² Schoenherr (2019) goes a bit further in his case study and defines politically connected firms as those with board members who share the same social networks as the South Korean president’s social network.

The focus of this second, more popular, camp is usually on politicians (heads of state, parliament members, ministers) or high-ranked officials from the civil service (senior officials of government institutions). Mostly due to unavailable data, these studies ignore the vast majority of middle- and low-ranked civil servants (hereafter: working-level civil servants) and do not consider firms that employ them to be politically connected. This is in spite of the unquestionable importance of the civil service to a firm's activity and the gains to be had from employing not only high-ranked former civil servant but also working-level former civil servant.³ Indeed, relative to high-ranked former civil servants, working-level former civil servants may have a more detailed knowledge of the different aspects of their government institution, knowledge that they can use outside the civil service.⁴ Moreover, high-ranked former civil servants remain under public scrutiny even after they leave the civil service, and therefore firms might find it harder to utilize their capital without incurring public criticism, whether justified or not (Luechinger and Moser, 2014).

Studies that do include lower-ranked former civil servants restrict attention to those who left a specific government institution, like regulatory authorities (Shive and Forster, 2016), Department of Defense (Luechinger and Moser, 2014), or U.S. Armed Forces (Benmelech and Frydman, 2015). Kang and Zhang (2018) is the only study that includes all ranks of civil servants and all government institutions when defining firms as politically connected. They show that the inclusion of working-level former civil servants is indeed important when estimating the effect of political connections on a firm's value.⁵ However, their study does not avoid another shortcomings. One of them is the identification process of political or civil service experience (i.e., the institution he served in and the highest rank he achieved there). As most studies that use former politicians and civil servants

³ The fact that, in most countries, cooling-off periods are relevant also for working-level former civil servants emphasizes the importance the legal system attaches to former government officials at all levels.

⁴ By contrast, Lester (2008) claims that only high-ranked former civil servants and politicians add value, as only they have good national and international access and influence.

⁵ Shive and Forster (2016) show that these results hold for ex-finance regulators in the U.S.

presence as an indicator for political ties do, their study also exclusively use public sources from which the FCS's political experience is taken (e.g., text searches, voluntary reports, BoardEx databases, etc.). Although popular, this methodology does have its limitations that might lead to mismeasurements of political and civil service background and hence to a biased estimate of political connections' effect.

In this study, I use official administrative sources to broaden the definition of former government officials to include all ranks. Then, I identify the type of civil service or political experience top executives and board directors of publicly traded firms in Israel during the years 2007-2015 have, and test their effect on firm's value and credit spreads. Using their full history in the civil service and political system, I define how high-ranked they were in their last position in the civil service and what type of experience they bring to the firm from their civil service term, based on a specific classification of the firm's business activity and the former government official's experience (e.g., former regulators, accounting experience, legal experience etc.). These definitions allow me to examine whether the effect of a former civil servant or politician on a firm's outcomes is conditional on the extent to which his civil service job is related to the firm's business activity. For the sake of simplicity, and unless explicitly mentioned otherwise, I hereafter use the abbreviations FCS (former civil service) to indicate a person with any past political or civil service experience.

There are other research gaps in the literature on political connections that this paper aims to fill. Lester et al. (2008) show that the probability of a former government official being hired as a director on a firm's board decreases with the time that has passed since he left his last position in the civil service. However, studies that test for FCSs' effect on firm's outcomes do not take into account the decaying nature of civil service experience. Here, I will examine whether the decaying nature of the FCS's unique capital is reflected in a diminishing effect on the firm's outcomes. In addition, no study has yet isolated the effect of hiring a new former civil servant on a firm's outcomes conditional on the number of political ties the hiring firm already holds when it hired the new former civil servant. Here,

I will examine whether the benefits of political connectedness have a decreasing marginal value such that the effect of the first political hire is greater than the effect of the second political hire, which is greater than the third, etc.

Using the classic event-study methodology, I estimate the value of political connections by testing for abnormal changes in stocks' prices and daily-traded corporate bonds' spreads around the appointment of an FCS as a director or high-ranked executive. I exploit the detailed data in hand to fill the aforementioned research gaps by testing the effect of different FCS ranks and other characteristics of the new appointee's civil service experience on a firm's value and credit spread. By including the number of political ties hiring firm has when it hires new FCS I test for decreasing marginal value of FCS, and by including the number of years that have passed between the time sample observation and the departure of the FCS from his last position in the civil service I test for the decaying nature of FCS unique capital.

Event studies have several advantages over alternative approaches for estimating the value of political connections. The main advantage is that effects on stock prices and corporate bonds' spread are immediate, making the causal interpretation more plausible. In addition, stock prices reactions are a comprehensive measure for the value of political connections. The complementary analysis of corporate bonds' spread reaction may shed some light on the question whether the effect of political connections is simply a redistribution of value between debt holders and shareholders, or rather a change in market perception regarding the fundamentals of the firm (Handjinicolaou and Kalay, 1984).

At the background of every event study setting lies the assumption that the appointment was surprising and not anticipated by the markets. Although I cannot know for sure that this was indeed the case in each appointment,⁶ this threat for the identification strategy implies that I might underestimate the real effect of former civil servant appointment. Furthermore, even if rumors are spread

⁶ Other studies (e.g. Faccio, 2006) tried to control of this concern by isolating the appointments that the media described them as a surprise. In Israel there is not enough coverage of the capital market, and surely not in high-frequency.

regarding the identity of the new manager they are still rumors that merely give probability for the occurrence of this appointment. When official announcement is made, all uncertainties are solved and this should be reflected in market prices (Goldman et al., 2009).

The literature has already shown that sorting FCS to firms is not random, but rather is conditional on the former civil servant's social and human capital and the firm's characteristics, needs, and business profile. This has led some scholars to look for a procedure to control for selection bias when estimating the effect of political connectedness on different firm's outcomes, such as matching (Boubakri et al., 2012; Houston et al., 2014; Kang and Zhang, 2018), instrument variables (Houston et al., 2014; Kang and Zhang, 2018), and exogenous shocks (Goldman et al., 2009; Amore and Bennedsen, 2013; Houston et al., 2014; Lehrer, 2017; Kang and Zhang, 2018). Studies that implement the matching procedure tend to rely on the common findings in the literature, starting with Faccio (2006), who gives emphasis to financial and accounting variables (like size, growth opportunities, etc.), while ignoring important non-financial variables such as the firm's type of business activity and how it is related to the government. However, two studies stand out as exceptions. The first is that of Agrawal and Knoeber (2001) who find that firms in a more politically dependent industry tend to have more FCS on the board, and that the number of politically experienced directors increases as politics becomes more important. The second is that of Kang and Zhang (2018) who take into account the role of the firm's regulatory burden in the matching process between former civil servants and firms. However, they do so in a very crude manner by considering only certain industries to be regulated, as is reflected in their use of a dichotomous dummy variable. As a result of the aforementioned limitations, the effect of political ties on a firm's outcomes is still an understudied area.

To control for selection bias I adopt the matching procedure in order to to construct a suitable control group by matching on observables. To the common financial and accounting characteristics which were found as important determinates of firm's political connections, I add a novel continuous measure for the regulatory burden

imposed on firm. This measure reflects in a better manner Agrawal and Knoeber (2001) and Kang and Zhang (2018) findings about the importance of regulatory burden as a determinate of firm's political connections.

The main findings of this paper are as follows. I find that the appointment of FCS, including working-level FCS, to a firm's management has a positive and significant effect on the firm's value, with no additional increase associated with high-ranked FCS. The effect is greater when the number of FCS in the firm's management at the time of the new appointment is smaller, and also when the number of years that have passed since the FCS left his last position in the civil service is smaller. I do not find additional value added to the firm by the hiring of the firm's former regulator or former civil servants who gained from the civil service specific knowledge of the firm's business activity. In addition, I find that the appointment of a high-ranked FCS to a firm's management has a negative and significant effect on the firm's credit spreads. The effect is greater when the number of high-ranked FCS in the firm's management at the time of the new appointment is smaller, and also when the number of years that have passed since the FCS left his last position in the civil service is smaller. Finally, I do not find any additional value added to the firm when the former civil servant's experience in public office is relevant to the firm's business activity.

My paper contributes to the to the fruitful academic debate on politically connected firms, by using the broadest definition of political connections, both in the scope of government institutions included in the analysis and in the inclusion of all ranks of former civil servants. The variety of public-private sectors interactions leads also to a variety in the means by which firms try to gain access and connections to the public sector. My paper sheds light on the well-known hiring former government officials channel by comprehensively showing that it is not limited to high-ranked politicians and civil servants but also to working-level civil servants. Faccio (2006) finds that the politically connected firms are more present in countries which are more democratic, have higher levels of (perceived) corruption, more restrictions on foreign financial investments, less freedom of press, and with higher secondary

school enrollments. In most of these aspects, Israel's profile is close to other Western developed countries, supporting to some extent the external validity of my results.

The paper is organized as follows. Section 2 describes the empirical strategy, Section 3 presents the data used for estimation, Section 4 discusses the results, and Section 5 discusses the results and concludes.

2. EMPIRICAL STRATEGY

I use an event study methodology in order to estimate the effect of FCS on two outcome – firm value and the credit spread. Specifically, I observe differences in these outcomes right after the announcement of a new board member or top-executive (hereafter: managers), conditional on his background – is he an FCS or not.

2.1. Abnormal Equity Returns

For each new manager's firm I estimate the cumulative abnormal returns of the stock price of each firm in a time window close to the date of appointment, τ , using these two stages: in the first stage I purge market effects on stock prices by regressing each stock excess return in the window $[\tau-120, \tau-30]$ on local market index excess return and an international one, since the Israeli market, as a small and open economy, is greatly dependent on international markets. Technically, I estimate

$$(1) \quad \bar{R}_{i,t} = \alpha_i + \beta_{i,m}\bar{R}_{m,t} + \beta_{i,g}\bar{R}_{g,t} + \varepsilon_{i,t},$$

where $\bar{R}_{i,t} = R_{i,t} - R_{f,t}$ is the excess return of an individual stock i on date t over a risk-free asset f , in this case the daily return of the 12-month Bank of Israel's MAKAM, the Israeli T-Bill equivalent; $\bar{R}_{m,t}$ is the excess return of the TA125 index over the risk-free asset on date t ; and $\bar{R}_{g,t}$ is the excess return of MSCI World over the risk-free asset f on date t ; $\varepsilon_{i,t}$ is a random error of stock i on date t . Using the coefficients from each regression, I calculate the cumulative abnormal returns

(CAR) of each stock in a time window of $[\tau - l, \tau + n]$ where l is the number of days before the date of appointment τ and n is the number of days after it:

$$(2) \quad CAR_{i,\tau-l,\tau+n} = \sum_n (\bar{R}_{i,\tau-l,\tau+n} - \hat{\alpha}_i - \hat{\beta}_{i,m} \bar{R}_{m,\tau-l,\tau+n} - \hat{\beta}_{i,g} \bar{R}_{g,\tau-l,\tau+n}).$$

For each window I filter out the 1st and 99th percentiles of CAR. Because some of the stocks are not daily traded, which might affect calculating CAR due to liquidity considerations, I filter out stocks for which the number of days on which they were traded in the 90-day window prior to the appointment is in the lowest 5th percentile. In order to account for event-induced variance changes, I standardize CAR by subtracting the cross-section mean CAR and dividing it by the standard deviation (Luechinger and Moser, 2014).

In the second stage, I use CAR as the outcome variable for which I check the effect of an FCS on a firm's outcomes in the following way:

$$(3) \quad CAR_{i,\tau-l,\tau+n} = \gamma_0 + \gamma_1 FCS + \gamma_2 \omega_i + \varepsilon_i.$$

FCS takes a value of 1 if the manager has any experience in the civil service and 0 otherwise. ω_i includes control variables, both at the manager level and at the firm level, which I will discuss later. The above setting is the same as can be found in previous literature. I depart from this literature by adding two more variables: first, I add a dummy variable, *Senior FCS*, to control for the rank of the FCS. This variable takes a value of 1 if the FCS was a senior official or stood in the head of a civil service institution and 0 otherwise:⁷

$$(3') \quad CAR_{i,\tau-l,\tau+n} = \gamma_0 + \gamma_1 FCS + \gamma_2 \text{senior FCS} + \gamma_3 \omega_i + \varepsilon_i$$

If political value is gained only by hiring a senior FCS, we should expect γ_1 to be non-significant and γ_2 to be positive and significant. However, if a firm gains political value through hiring working level FCS as well, γ_1 will be positive and significant, while γ_2 can indicate that senior FCS brings additional value, or not.

⁷ For a complete mapping of ranks in different civil service institution please refer to Section 3 and Appendix A.

2.2. Abnormal Corporate Bond Returns

Event studies estimating the effect of various corporate events on bond returns are outnumbered by those focusing on equity returns (Bessembinder et al., 2009). This is partly due to the fact that data on bond returns is scarcer than data on equity, and sometimes it is available only on low frequency (monthly). In Israel, however, corporate bonds are traded in the TASE. Therefore, I have daily quotes of bond prices and other relevant data needed for extracting the yield to maturity. By subtracting the risk-free yield, given by the yield to maturity of an Israeli government bond with similar duration and indexation, I obtain the credit spread of each bond. When there is more than one bond for a firm, I calculate the weighted average of the credit spread of all the firm's bonds, weighted by the bond's market value (Bessembinder et al., 2009). Using managers' appointment dates, from each firm's credit spread (S_i) I calculate the difference between the average spread in the n days after date τ , the time of the manager's appointment, and the average spread 30 days before τ :

$$(4) \quad \Delta S_{i,\tau,n} = \bar{S}_{i,\tau+n} - \bar{S}_{i,\tau-30}.$$

Due to the wide heterogeneity in bonds' characteristics, Bessembinder et al. (2009) suggest cleaning common market effects by creating bond portfolios based on common characteristics, such as credit ratings. Therefore, I calculate the difference between the average spread of a bond portfolio with the same credit rating before and after date τ . For each bond (or firm's bond portfolio), I match a bond portfolio with similar credit rating.⁸ Then, I calculate the difference in differences of the firm's bond portfolio and the matched portfolio:

$$(5) \quad \Delta S_{i,\tau,n,rating}^* = \Delta S_{i,\tau,n} - \Delta S_{rating,\tau,n}.$$

Finally, I regress $\Delta S_{i,\tau,n,rating}^*$ on firm and manager attributes, including of course civil service experience, as in equation (3) to (3'). For the estimation of the effect of an FCS on credit spread I filter out from the sample the highest and lowest 0.5

⁸ I matched financial and non-financial firms separately.

percent of $\Delta S_{i,\tau,n,rating}^*$ and for liquidity concerns I keep only bonds that were traded in at least 85 percent of trading days prior and after appointment.

2.3. Matching Process

Since firm's political connections are not random, estimating the effect of political connections on firm's outcomes encounter an identification problem. If, as well documented in previous studies (e.g., Faccio, 2006), FCSs tend to be hired by bigger firms with bigger market shares, a positive effect on firm's value following an appointment announcement might be a result of firm's characteristics and not the civil service experience of the appointee. In contrast, if FCSs are more present in firms with higher regulation burden, we might observe lower returns for appointment, as firms have more obstacles to create value if they are heavily regulated. Therefore, not controlling for the selection of FCS into firms might lead to biased results.

For the matching stage, I estimate the probability of a firm to hire an FCS. Technically, I estimate a logit in which the dependent variable takes a value of 1 if the newly appointed manager is an FCS and 0 otherwise, conditional on a set of independent firm level variables. Based on the obtained estimates and predicted probability, I match each treatment group observation (i.e., of an appointment of an FCS to a firm) to a control group observation (i.e., of an appointment of a non-FCS to a firm) of a firm with the closest characteristics in terms of the probability of being a politically connected firm. In this way I create a matched sample with an equal number of FCS appointees and non-FCS appointees, with balanced observable variables, and can control for the probability of a firm being politically connected. Under the assumption that unobservable variables are correlated with observable variables, the matching procedure ensures that I compare two similar groups.

3. DATA

3.1. Full Dataset

The dataset of politically connected firms covers the sphere of publicly-traded firms in Israel, and in particular their boards of directors and high-ranked executives in the period of 2007–2015.⁹ It consists of 3,552 observations at the firm-year level and 47,390 observations at the manager-firm-year level. A firm is defined as politically connected if at least one of its managers is a former civil servant. A person is defined as a former civil servant if he was employed by one of the following civil service institutions: the parliament (e.g., ministers and Knesset members), all government offices (Ministry of Finance, Ministry of Communications, Ministry of Foreign Affairs, etc.), related and independent regulatory authorities (Israel Tax Authority, Israel Securities Authority, Bank of Israel, Antitrust Authority), the defense sector (IDF, GSS, Mossad), interior security (police, prison service, firefighting), and local authorities. Diplomats and special advisors are also included, while interns or military officers having an army rank lower than the five highest ranks are not.¹⁰

I gathered managers' civil service experience from two main reliable sources. The first is Regulations 26 and 26a of the annual reports, in which firms report their board members (Reg. 26) and high-ranked executives (Reg. 26a) and their personal details. There is a minimum set of executives that must be reported, but beyond this minimum set each firm chooses which executives to include in the report. Therefore, the number of executives reported varies between firms and years. The report includes various data about the directors and executives, including name, position, birth date, gender, education, and more.¹¹

⁹ For a complete list of variables and definitions, please refer to Appendix A.

¹⁰ This is because army service in Israel is mandatory and therefore almost all citizens have military experience. I define ex-military officers as having civil experience only if they reached the five highest ranks (*Sgan Aluf* and above). This is because until the sixth rank (including), promotion is mostly dependent on tenure. Promotion to the fifth rank requires the approval of the Chief of General Staff.

¹¹ As for dual-listed companies reported in US Standards, I collected managers' work histories from Item 6.

One of the items reported is the manager's experience in the last 5 years. This is an important source for identifying whether the manager has any experience in the civil service. Another source of information is a unique dataset of all workers in the parliament and other government institutions since 1990. This detailed dataset enabled me to look for managers' experience in the civil service in cases where the relevant report doesn't provide enough or any information. The last data source is publicly available data on the internet, especially where high-ranked officers in the defense sector are concerned.

Other studies have used a manager's name to search for his connections to the civil service using other data sources, mostly open ones. This methodology has some clear drawbacks that might lead to underestimation of the level of political connectedness of firms, and this is true especially for working-level FCS, as these FCS are much more anonymous and tend to be less visible in open sources. An important attribute of my dataset is that it includes the ID numbers of managers and therefore the identification of their work histories is almost complete. However, based on the above sources, there are still some managers who are FCS that I might have missed, especially those from dual-listed firms. For these managers I conducted a more comprehensive search of open sources to be sure that there was no under-identification.

In my full dataset, 4,261 out of 47,390 (9 percent) managers in the years 2007–2015 had civil service experience. For each manager I have personal data (name, ID number, birth date, age, gender, nationality, and education), his role in the firm (e.g., chairman, director, executive, outside director, etc.), and whether he has civil service experience. In addition to a dichotomous definition of civil service experience (i.e., a dummy variable that takes a value of 1 if he has civil service experience and 0 otherwise), I use a set of dummy variables to code in details of his civil service experience: the institution he served in (e.g., army, government office, ISA, Knesset, etc.) and the highest rank he achieved (e.g., working-level civil servant, senior official, head of institution). If an FCS served in more than one institution, each of his experiences was coded separately, while the coding of his

rank reflects the rank in his last position. I define high-ranked officials and heads of institutions as *Senior FCS*, and find that out of 4,261 FCSs, 3,554 are *Senior FCS*. In addition, for each manager with civil service experience I look for the year he left his last position and calculate the number of years that have passed since then. Using the full description of the manager's civil service experience and given the firm's business activity, I define which type of experience the firm can extract from the FCS: if the role of the FCS directly relates to the firm's business activity I define it as "specific experience"; if the FCS was in a managerial role he also brings "managerial experience" and if he has legal or financial experience he brings "legal/financial experience."

Using the official Regulations Handbook I define each FCS as former regulator of a firm or not. The Handbook lists all regulating units in government departments and agencies and their purpose. I map each regulating unit to the industry under its authority, and assign the value of 1 if the FCS served in one (or more) of the hiring firm's industry, and 0 otherwise.

As for firm-level data, since my data consists of only publicly-traded firms, all accounting and market data are publicly available using TASE resources. These include financial statement data and derived financial ratios (e.g., total assets, leverage, ROE, etc.) and market data (e.g., market value). Since corporate bonds are traded in the TASE, I have full information on prices, yield to maturity, bond spreads, and bond credit ratings. To this I add an industry regulation index (IRI) to proxy for the regulatory burden imposed on a firm. In short, the IRI is the total government budget allocated to all regulating unit of each firm's industry, divided by the number of businesses in each industry. A full description of the index is in Appendix B.

3.2. New Appointments Sample

In order to estimate the effect of FCS on stocks' cumulative abnormal returns, I extract from the full database all directors and executives that were appointed between January 1st 2007 and December 31st 2015 and whose appointment date is

well identified. After filtering out some outliers as described above, I am left with 4,925 observations, of which 463 are of FCS and 4,462 are of non-FCS. For each appointment in my data, I calculate CAR within several windows but here I concentrate on the CAR[-1,1] window and address the other CAR windows in Section 4.1.5.

The variables of interest in equation (3) are *FCS* and *Senior FCS*. Along with these variables I include the following control variables, all based on prior literature: at the manager level I take the manager's age, highest academic degree, and gender; at the firm level I take the firm's size (measured by the natural log of the firm's market value), leverage, ROE, board size (measured by the number of directors on board), IRI and whether the firm has a controlling shareholder.

Descriptive statistics for these variables can be found in Table 1. As can be seen, 9.4 percent of the observations are of appointments of an FCS manager. The CAR[-1,1] in these cases, compared to cases in which the new manager is not an FCS, is almost 3 times bigger. However, the characteristics of the other controlling variables clearly show the selection bias that might affect the estimation of the effect, as politically connected firms tend to be bigger in terms of market value and board size, have higher ROE and have higher regulatory burden.¹² These findings also stress the importance of controlling the matching process, since it is clearly not random. At the manager level, I find that appointed FCS tend to be older and more educated.

3.3. Matched Sample

By adopting the matching process I described earlier, each FCS appointment is matched with a non-FCS appointment to a firm with the closest characteristics in terms of the probability a firm will hire an FCS. The probability is calculated based on the estimates of a logit model in which the dependent variable takes 1 if the firm hired an FCS and 0 otherwise, and the independent variables are the size of the

¹² In my Ph.D dissertation I find similar results when using the stocks of firms and managers, and not just the new appointments, to characterize politically connected firms.

firm (log of market value), its profitability (ROE), its financial leverage ((liabilities - equity) / assets)), a dummy for a dual-listed firm, a dummy for the existence of tradeable corporate bonds, a measure for firm's regulatory burden (as will be explained), and dummy variables for each year and firm's Tel Aviv Stock exchange industry classifications.

At the end of the process, I am left with a dataset with an equal number of FCS appointees and non-FCS appointees. Assuming that a common support exists, we should have a balanced dataset with matching observable variables. I present the descriptive statistics of the matched sample in Table 2. The $CAR[-1,1]$ is still much higher when an FCS is appointed; however, the differences are not significant. All firm characteristics on which the matching was based are balanced, while some of the manager characteristics that were not part of the matching process are still significantly different.

4. ESTIMATION RESULTS

4.1. The Effect of an FCS on a Firm's Value

Figure 1 presents a box plot of the $CAR[-1,1]$ for three groups in the matched and unmatched sample: non-FCS, non-senior-level FCS (i.e., working-level FCS), and senior FCS. It appears that CAR is somewhat higher for non-senior FCS, especially in the matched sample. The lower panel of the figure shows the same information but only in cases where the appointed FCS is the first FCS in the firm's management. This figure provides the first evidence of the effect of FCS on CAR and reflects the importance of including the level of seniority in analyzing the effect of FCS on CAR.

In the next step, I estimate different specifications of equation (3) using both unmatched and matched samples, and present in Table 3 the results obtained from each estimation. When using only the FCS dummy variable with the manager- and firm-level controls, a positive though not significant effect is found (Column 1), regardless of the inclusion or exclusion of firm fixed effects (Column 2). Including the dummy variable that controls for the manager being a *Senior FCS* (Columns 3

and 4) shows the importance of differentiating between the different levels of seniority of FCS: the effect of *FCS* becomes positive and significant, while the effect of *Senior FCS* is found to be negative and eliminates all the positive effect of *FCS*. In Columns 5 and 6 I add the level of regulation and its interactions with the two dummy variables. The results show the effects of *FCS* and *Senior FCS* on CAR remain significantly positive and negative, respectively, while their magnitude increased. The level of regulation does not have a significant effect on CAR; however, the interaction between it and the *FCS* variable shows a negative effect. This implies that the added value that an FCS brings to the firm decreases as the regulatory burden on the firm increases. On the other hand, the interaction between the level of regulation and the dummy for *Senior FCS* is found to be positive, meaning that the added value of a senior FCS increases with the regulatory burden on the firm.

Before discussing these results, I turn to Columns 7–12, in which I estimate the same models, using the matched sample for estimation. The full specification (Columns 11 and 12) show similar results in the effect of *FCS*, though a bit smaller and with lower levels of significance, probably because of the correction of the selection bias. The effect of *Senior FCS* is negative, but it is significant only at the 10% level (Column 11) or not at all (Column 12). The interactions between the level of regulation and the *FCS* and *Senior FCS* dummies have the same effects as found using the unmatched sample.

I draw several conclusions from these results. First, in line with previous papers (e.g., Faccio, 2006; Goldman et al., 2009; Luechinger and Moser, 2014), this paper finds that also in Israel investors perceive former civil servants as adding value to a firm, as reflected in a significant CAR of between 0.75 and 1 percent. Given that the median market value of the firm in the unmatched (matched) sample is about 293 (486) million NIS, a 0.75–1 percent abnormal return implies a 2.2–2.9 (3.6–4.9) million NIS increase in the firm's value.

Second, the results show the importance of including a regulation measure, as this measure determines how much value an FCS adds to a firm when he joins its

management. In Figure 1a, I show the estimated increase in CAR conditional on different levels of regulation. The higher the regulatory burden is, the lower the effect of FCS on CAR is, and this effect vanishes entirely as the regulatory burden reaches the highest 33rd percentile of the IRI distribution. In other words, firms with a high regulatory burden do not gain value from the appointment of an FCS. Since the IRI has an important and positive role in determining whether a firm will hire an FCS, this result might be affected by the fact that the FCS who is hired is not the first FCS in the firm's management and hence his marginal value is lower. I will refer later to the decreasing marginal effect of FCS conditional on the number of FCS already on the firm's management.

Third, the difference in the size and significance level of the coefficients obtained from the unmatched and matched sample imply that not controlling for the selection of FCS into firms lead to upward biased results. In other words, firms who hire FCSs have higher CAR following an appointment announcement, regardless of the appointee civil service experience. However, although smaller, there is a positive CAR following an FCS appointment even after eliminating the observed differences between politically connected and non-connected firms.

Last, in some specifications I find that the effect of senior FCS on a firm's value is smaller than that of working level FCS, but that their effect increases with the regulatory burden, whereas the effect of non-senior FCS decreases. However, these results are not conclusive, as the significance level of the effects is marginal and should be verified with robustness tests. Nevertheless, the sensitivity of the results to the inclusion of the seniority level of FCS indicates the importance of this characteristic, which is absent from most studies. The only study that includes the seniority level of the FCS is Kang and Zhang (2018) who find positive abnormal returns for senior FCS relative to non-senior FCS. This finding contradicts mine, but it is hard to compare the two studies because the definitions of senior and non-senior FCS are not the same. Nevertheless, the evidence in both studies indicates the importance of including the level of seniority of the FCS, as it does affect the results.

4.1.1. FCSs' Marginal Value

I now address the question of the marginal value of an FCS, given the level of political connectedness of the hiring firm. If political connections are valuable, we should assume that the first connection is the most valuable and then there is a diminishing marginal value, at least up to some point. I test this assumption in various ways. First, I limit the sample to only politically unconnected firms, i.e., firms with no FCS in its management at the time of the appointment. If a political connection is valuable, I expect to find a higher effect of the appointment of the FCS. This is confirmed in Table 4, Columns 1 and 2. The effect of FCS is almost 50 percent higher than that estimated in Table 3, Columns 5 and 11, although an F-test cannot reject the the assumption that the effects are equal. Another important results is the effect of the interaction between the FCS dummy variable and the IRI. As I suggested before, the negative effect of this interaction which I have found when I used the full sample for estimation is partly affected by the fact that the FCS who is hired is not the first FCS in the firm's management. The non-significant effect of this interaction when using the sub-sample of firms' first FCS support this suggestion.

Next, I test for diminishing marginal value by using the full sample (unmatched and matched), and replacing the FCS dummy variable with a set of dummy variables that take a value of 1 according to the number of FCS in the firm's management, including the new appointee. For example, if the appointed manager is an FCS and with him the firm now has 4 FCSs, the dummy variable *Appointed FCS is no. 4* takes a value of 1 and the other three dummies take a value of 0. If the appointed manager is a non-FCS, all of these dummies take a value of 0, regardless of the number of FCSs already in the firm. The results are presented in Table 4, Columns 3 and 4, and are illustrated in Figure 2. Although not monotonic, the marginal value is diminishing and is not evident in the fifth FCS. However, the effect is again positive and significant in the eighth to the eleventh FCS. Since there are very few observations on firms with this number of FCS, the results might be driven by these outliers. Alternatively, the presence of a large number of FCS in a

firm's management might be correlated with some other, unobserved characteristics of the firm that might also be driving its value.

I complete this analysis by replacing the set of dummy variables by a continuous variable that takes the value of the number of FCSs (except for the new appointee, if he is an FCS), and interacting it – and its square term – with the *FCS* dummy. A diminishing marginal value should be reflected in a negative sign of the interaction. If there is a certain value at which the marginal value becomes increasing, then we should expect a positive sign for the square term. The results (Table 4, Columns 5 and 6) confirm these expectations: the effect of the appointment of an FCS conditional on the number of FCS already in the firm's management is U-shaped, as illustrated in Figure 3.

4.1.2. FCSs' Capital Decay Rate

I now turn to test for the differential effect of FCS conditional on the length of their service and the time that has passed since they left the civil service. The intuition is that the longer an FCS was in the civil service, the more informed and connected he is, and therefore the more value he brings to the firm. As for the number of years that have passed since departure from the civil service, the intuition is that there exists a decay rate of civil service experience: whatever specific human capital an FCS brings to a firm – in the form of connections, knowledge, information, etc. – it is reasonable to assume that it has a decay rate, since former colleagues do not stay forever in their positions, work procedures change, regulations change, etc.

While data on the number of years since leaving the civil service is available, data on the length of service is not. I proxy for the latter by interacting the age with the number of years since leaving the civil service: if the FCS is 40 years old and he left the civil service 10 years ago, his experience is probably much less than that of a 60-year-old who left the civil service 10 years ago.¹³ Based on the above reasoning,

¹³ An exception is FCS who started their career in the private sector, moved to the civil service, and then went back to the private sector. This is most common among FCS in political roles, such as Knesset members, ministers, and diplomats. However, the results are not sensitive to the exclusion of these FCS.

I expect a negative effect of the numbers of years since leaving and a positive effect of the interaction, which proxies for the length of civil service. For the estimation I limit the sample to FCS, given that the two new variables are not relevant for non-FCS.¹⁴

A histogram of the number of years that have passed since leaving the civil service is presented in Figure 4. Since it includes all appointments of FCS, there might be repeat observations, given that an FCS can be appointed in one year by more than one firm.¹⁵ As can be seen in the histogram, the distribution is decreasing, with a long right tail. The greatest mass is around the value of 0, which reflects the high presence of FCS who were appointed less than a year after they left the civil service.^{16,17} The results are presented in Table 5.

The effects of the two variables of interest have their expected signs, although the effects are not significant. I test for the possibility that the results are driven by outliers, by estimating the model again using only the sample under the 99th, 95th, and 90th percentiles, which translates to a limit of not more than 27, 19, and 16 years that have passed, respectively. As can be seen, the more homogeneous the sample is, the greater is the negative effect of the years that have passed and of the interaction. The effects are also found to be significant. The implication of the results is that there is a decreasing return for FCSs' human capital and an increasing return for their length of service. The balance between these two related variables is illustrated in Figure 5, where each line represents the effect of the number of years that have passed, conditional on the age of the FCS at the time of the appointment. Moving along a line represents a longer time since leaving the civil service for an FCS with a given age; moving between lines represents a higher age of the FCS for a given number of years since he left the civil service, which translates to a longer civil service term. This illustration shows that when the

¹⁴ Houston et al. (2014) use similar measures but estimate their effect on bank's credit terms using a sample that includes also non-FCS.

¹⁵ The shape of the histogram for unique observations is the same.

¹⁶ Due to legal constraints, there are very few cases of a firm appointing a serving civil servant and they almost always involve employees of local authorities.

¹⁷ This result may also reflect the ineffectiveness of cooling-off periods, as Shapira (2019) finds that in 258 out of 268 cases the Court decided to shorten the cooling-off period.

number of years since leaving the civil service is very small (2 years), the length of the civil service term is less relevant, as all lines are very close. However, if a longer time has passed, the length of service is much more relevant, as the capital of short-term FCS decreases faster than the capital of longer-term FCS.

These results indicate that there is a positive association between the quality (i.e., non-expiration) and quantity of FCSs' unique capital: the greater the amount of capital an FCS holds, the longer it persists and is valued. This positive association can be illustrated by indifference curves, based on the different coefficients and return values obtained (Figure 6). At each point on the curve, the contribution to a firm's value is the same for the age of the FCS at the time of appointment and the number of years since he left the civil service. The closer the curves are to the south-east corner, the higher the FCS' effect on firm's value. The higher the age is at time of appointment, the greater the amount of experience and capital an FCS holds and therefore, in order to generate the same contribution to firm's value, the greater the number of years before this capital decays away. Hence, the older an FCS who moves to the private sector a very short time after leaving the civil service is, the greater is his contribution to firm's value.

4.1.3. FCSs' Civil Service Experience and the Firm's Value

I now turn to test for a differential effect of an FCS on a firm's value, conditional on his experience in the civil service. In my first paper I showed that the sorting of FCS to firms is not random. Rather, it is conditional on a firm's financial characteristics, regulatory burden, and industry classification, as well as the FCS' experience. I now test whether the effect of the FCS on the firm value reflects his relevance to the firm's business activity or whether the market perceives the contribution of FCS as orthogonal to his specific experience and relevance to the firm. The ultimate relevance of an FCS to a firm is of course that of an FCS who was a former regulator of the firm. Alternatively, an FCS can have *specific experience* in the firm's business activity even without being its regulator. However, some FCS might be hired even if they have no specific experience in the firm's business activity, since they might bring other relevant, more general, types of experience

like *managerial experience* if the FCS was a manager in the civil service, or *economic/legal experience* if the FCS served in a financial, economic, or legal position in the civil service, e.g., a government office accountant or legal advisor.

I test for the effect of a former regulator on a firm's value using the full matched sample and a subsample comprised only by FCS appointees, and by including a dummy variable that takes a value of 1 if the FCS served in a civil service institution that regulates the firm. In addition, I use this subsample to test for the effect of the type of experience an FCS brings to a firm, by including three dummy variables for each type of experience (specific, managerial, and economic/legal). Since I do not have information about the type of experience non-FCS bring to a firm I do not use the full sample of new appointees rat.

In another set of tests, I replace the *FCS* dummy variable with a set of dummy variables for each civil service institution (e.g., Ministry of Finance, Knesset, etc.), where each FCS's history is then mapped into these dummy variables. By this set of dummy variables, I test whether there are one or more civil service institutions that drive the effect of FCS on a firm's value. Alternatively, to avoid overfitting, I cluster civil service institutions into five different groups - security institutions (IDF, GSS, Mossad, Police, and Ministry of Defense), financial institutions (Bank of Israel, ISA, Antitrust, Tax Authority, and Ministry of Finance), government institutions (Ministry of Communications, Ministry of Interior, etc.), politicians (ministers, MKs, diplomats and advisors), and local authorities - and test for the effect of these groups, alongside dummy variables for Ministry of Economy and Ministry of Prime Minister experience, on a firm's value. Again, I estimate these specifications using the full sample, the matched sample, and the subsample that is limited to FCS only.

Finally, the underlying assumption behind the above estimations is that experience and relevance are homogeneous across industries. I eliminate this assumption by estimating all the above specifications industry by industry, in order to reveal possible differences in the value of FCS' experience and relevance across industries.

I begin by presenting the results of tests for the value of relevance (Table 6). The first eight columns include the results of estimating the baseline model on different samples, with the addition of a dummy variable that takes a value of one if the FCS served in a civil service institution that regulated the firm. The results show that being a former regulator does not significantly add value to the firm beyond the fact that the appointee is an FCS (Columns 1 and 2), and in fact it does not add any value at all when the *FCS* dummy variable is dropped (Columns 3 and 4). When using the matched sample¹⁸ (Columns 5 and 6) or the sample limited to FCS only (Columns 7 and 8), I also find no significant effect of being a former regulator.

In the last two Columns 9 and 10, I replace the former regulator dummy with three dummy variables for each type of experience: specific, managerial, and economic/legal. The sample is limited to FCS only. No significant effect is found for any of the three types of experience.

Next, I replace the *FCS* and the experience relevance dummy variables with a set of dummy variables for the civil service institutions in my data.¹⁹ I use different specifications and samples but the results, presented in Table 7, do not change: no specific civil service institution or cluster of them is found to consistently yield additional value beyond the general value added by FCS (Columns 1-4) or instead of it (Columns 5-8).²⁰ This result do not change when using the subsample of FCS (Columns 9 and 10).

These results stress the point that for all firms, on average, civil service experience is valuable as a whole, and is not conditional on either the type of experience or its relevance to the firm's business activity. In particular, now additional value was found when firm hires a former regulator. This might result from the possibility

¹⁸ The matching sample is based on the propensity to hire an FCS in general, and not a former regulator specifically. If the matching process for former regulator is different from the matching process for FCS in general, this may cause some selection bias. However, the results do not change even if the matching is based on the propensity to hire a former regulator.

¹⁹ I cluster together government institutions with a very low number of FCS in the data under the title "other government offices."

²⁰ In these specifications, I dropped the dummy variable of a *Senior FCS* and the interaction between regulation and FCS dummy variables. Including these variables and the interaction does not change the results.

that the transition of a former regulator to a regulated firm is more exposed to public scrutiny, which could offset the value that is added if the transition is highly criticized, or could at least make the transition better anticipated by the market. However, this is not the case for other, less exposed transitions of FCS with specific knowledge of firm's businesses, which constitute the majority of the transitions in my data. Therefore, we can conclude that the value added by an FCS is not conditional on specific experience or relevance to the firm, but rather stems from the basic fact that he used to serve in the civil service.

4.1.4. Industry-Specific Effects

Thus far in my analysis I have taken industry heterogeneity into account only by including industry fixed effects and adding the IRI. In this type of analysis, the effect of FCS is composed of a constant effect and a differential effect given the level of IRI each firm has. However, as TASE industries and IRI industries are not identical, and as the characteristics of an industry are not limited to the regulatory burden, there might be differential effects of FCS given the industry of the firm. From a methodological point of view, in the framework of a two-sided matching model, the value of an FCS is dependent not only on his own characteristics and the firm's characteristics, but also on the interaction between these two. As mentioned, the interaction term of the *IRI* and *FCS* illustrates this point, but it is limited to one industry characteristic.

In order to investigate the differential value FCS bring to a firm, I estimate again the main models above, except that this time I add interactions between the industry dummies and the FCSs' civil service characteristic. I begin by adding the basic interaction of industry dummies with the *FCS* dummy and dropping the *FCS* dummy without the interaction (Table 8, Panel A). The results show that the *FCS* effect is present in all industries, except for the insurance industry. Point estimates are different from each other and range between 0.8 and 1.7; however, the differences are statistically insignificant.

In Panel B, I present the results from an estimation that includes, besides the interaction between industry dummies and the FCS dummy, the interaction between industry dummies and the former regulator dummy. The overall results I have presented hold and no additional effect of former regulator is found. When adding to the former regulator variable the three dummy variables for each type of experience, I found that specific experience has no value in any industry, while managerial experience is valued in the financial sector and economic/legal experience is valued in the banking sector (Panel C).

Estimating the same specification using the matched sample (Panel D) shows that the value of FCS is significant in a smaller number of industries: financial services, manufacturing, commerce and services, and gas and oil. As in the unmatched sample, no effect was found for former regulators (Panel E).

Lastly, I test for differential effects of specific types of civil service institutions in each industry. To do so, I add to the basic specifications the set of dummy variables for civil service institutions or by for civil service institutions cluster, as explained above – and the interaction between this set of dummy variables and industry dummy variables. The total effect of an FCS with a certain type of experience on a firm's value within a given industry is therefore the sum of the effect of the experience dummies and their interaction with the industry dummies. For convenience, I present the sum of coefficients with their standard errors for each estimation (Table 9).

The results show large heterogeneity in the effect of FCS' experience on firms' value, conditional on the type of experience and the firm's industry. FCS who served in financial civil service institutions positively affect the value of firms only in the financial services and oil and gas industries. The latter industry is also positively affected by FCS with political experience and especially by FCS who served in security civil service institutions. An interesting result is the overall effect of former Ministry of the Economy civil servants. Their effect is evident in three industries: financial services, manufacturing, and holdings and investments. This result is in line with the wide variety of interactions the Ministry of the Economy

has with the private sector, especially with the manufacturing industry: the ministry is in charge of providing subsidiaries, grants, and guarantees to stimulate the economy, and it has authority over various regulating authorities, such as the Regulatory Administration, the Standards Institution of Israel, the Israeli Export Institute, the Foreign Trade Administration, and more. In the manufacturing industry, FCS with experience in local authorities and FCS who served in other government institutions were also found as positively and significantly affect firms' value.

The right panel of Table 9 presents the same specification as the left panel except that in this specification I test for the effect of the above-mentioned types of civil service experience on a firm's value by civil service institution instead of by civil service institutions clusters. This specification shows mostly the same results for the types of history that were included in the former specification. In addition, due to the higher level of detail, the results in the specification by civil service institutions shed further light on the results in the specification by civil service institutions clusters. Specifically, former Bank of Israel and ISA employees drive the positive effect of FCS with financial experience on the value of financial services firms. Former ISA employees also drive the positive effect of financial experience on the value of firms from the gas and oil industry. While FCS with political experience positively affect the value of firms from the oil and gas and holding and holding and investments industries, only Knesset members do so significantly.

The results in Table 9 imply that there are some types of civil service experience that have a negative marginal effect on a firm's value. In most cases, where the relevance of the certain type of civil service experience to the industry is obscure, I find a significant negative effect, as in the case of FCS with civil service experience in security institutions on banks and insurance companies. The significant negative effect of former Antitrust Authority civil servants on a firm's value might be driven by investors' beliefs that these managers will support overly prudent strategies.

4.1.5. Sensitivity Analysis

In order to test the robustness of my main results I conduct several robustness tests of the results. Specifically, I change one or more of the following technical specifications used up to now: the standardization of the CAR, the filtering out of firms with low stock liquidity, and the CAR window. I focus on how these robustness tests change the effect of appointed FCS on the value of firms in which FCS are not present in their management at the time of the appointment

Using more lenient (i.e., taking the 99% of most liquid stocks) or more stringent (i.e., taking the 90% of most liquid stocks) measures does not change the results: the sign and the significance level of the effect both remain the same. The results are found to be robust also when I replace the standardized CAR with the raw version.

Changing the CAR window affects the results in a non-monotonic way. When I use small windows such as [-1,2] or [-1,3] the sign and the significance level of the effect do not change. When I use longer windows, such as [-1,5], [-1,10], [-1,15], and [-1,25], the results maintain the sign of the effect, but they are not significant. However, when I use the even wider CAR window ([-1,30]), the results are again positive and significant. Assuming that there is no other positive shock in the 30 days following the appointment – which is of course a non-trivial assumption – and a strong reaction immediately after the appointment, the results suggest that the returns due to an FCS appointment do not significantly differ from those due to a non-FCS appointment, but that in the longer run there are observed differences.

4.2. FCS Effect on Credit Spreads

4.2.1. Main Results

I now turn to estimate the effect that appointing an FCS has on credit spreads, as measured by corporate bond spreads. Since corporate bonds are traded in the TASE, I am able to conduct an event study similar to the one I did to estimate the FCS effect on CAR. As I described above, I first calculate the difference in the

weighted average spread of all the firm's bonds before and after the appointment, and from this I subtract the difference in a rating-based matched portfolio over the same period. I define this difference as excess spread (ES) and calculate it over different windows, where the window defines the number of days before and after the appointment on which I am averaging. I start by using the ES[-30,1] as the dependent variable²¹, which means that I compare the difference between the credit spread one day after an appointment and the average credit spread in the 30 days prior to the appointment, to the difference in rating-matched bond portfolios over the same period. The independent variables are those that were used in the CAR analysis, with the addition of firm's average credit rating of its bonds.

I use the full sample of appointments, which is smaller than the sample I used for the CAR analysis, as fewer firms have corporate bonds. I also construct a matched sample in the same way I described above, but limit the population from which the control group is selected to firms with corporate bonds. Then I conduct all the tests I conducted above.

The results of the basic tests are presented in Table 10. Interestingly, the results suggest that as opposed to the CAR analysis, the dummy variable *FCS* have a positive, but not significant, effect on ES, while *Senior FCS* have a negative impact. These results imply that when a working-level FCS is appointed, the firm's credit spread decreases less (or increases more) than similarly rated bonds, but that when a senior FCS is appointed, bond spreads decrease more (or increase less) than the benchmark. While the effect of *FCS* is constantly insignificant, the effect of *Senior FCS* is significant in the matched sample (Columns 3 and 4). In Columns 5 and 6 I limit the sample to cases in which the senior FCS appointed is the first senior FCS in the firm, in order to measure more accurately the effect of establishing a political

²¹ For convenience, I will hereafter use the term ES instead of ES[-30,1].

connection via a senior FCS. The results show that the effect is negative and significant in the unmatched sample, but not in the matched sample.²²

In Table 11, I present the results of an estimation that controls for the number of senior FCS already in a firm's management at the time of the appointment, either by a dummy variable for each number (Columns 1 and 2) or by a continuous variable (Columns 3 and 4). Both specifications show that there is a decreasing marginal effect of the new senior FCS, and that it depends on the number of senior FCS already in the firm. Using the coefficients from Column 3, I find that the effect vanishes already after only one senior FCS is present in the firm, as shown in Figure 7.

I now turn to test whether, as in the CAR case, the value of the capital of an FCS erodes in the time that has passed since he left his last position in the civil service. I add to the basic model the number of years that have passed and the interaction between age and the number of years that have passed. The results are presented in Table 12. It can be seen that the effects of the variables of interest, namely, the number of years that have passed and the interaction of this variable with age, which proxies for the length of service, reveal the same pattern as in the CAR analysis: the longer the time that has passed since departure from the civil service, the smaller the decreasing effect of the FCS' capital is. However, for a certain number of the years that have passed, the older the FCS is, the longer he served in the civil service, and therefore the greater is the decreasing effect of his capital on ES.

The next group of tests concentrate on the effect of the FCS' civil service experience and its relevance to the firm. I test whether former regulators, FCS with specific experience in the firm's business activity, FCS with managerial experience, and FCS with economic/legal experience add more value to the firm. I use several specifications and different samples but find no significant effect for FCS' type of

²² The latter result is partly due to the very low number of observations. When I estimate this specification again without the control variables, and, more specifically, without the year and industry dummies, the effect is negative and significant, and has a similar magnitude to that in the unmatched sample.

experience or relevance to the firm (Table 13). I then replace the relevance variables with the FCS' specific civil service experience by civil service institutions and civil service institutions clusters. I find that only former Tax Authority employees have a significant and consistent negative effect on ES (Table 14).

Lastly, I test for a differential effect of FCS conditional on the firm's industry (Table 15). First, I find that the appointment of a senior FCS decreases ES in most industries. This effect is mostly not significant in the full sample (Panel A) but is significant in all non-financial industries in the matched sample (Panel D). Adding the former regulator dummy shows no significant effect in the matched sample (Panel E), and the significant effect found in the insurance industry in the full sample (Panel B) is driven by one individual observation and hence has no systemic meaning. A small number of observations are also behind the significant effects of specific and managerial experience in the insurance industry, as presented in Panel C. In summary, as in the CAR analysis, I find no evidence that FCS' type of experience or relevance to a firm is valued.²³

4.2.2. Sensitivity Analysis

I test for the sensitivity of my main results to different ES windows, namely [-30,10] and [-30,30], and find that in the first window the results are not significant while in the second window they are. This finding is similar to the CAR sensitivity results, in which I found that results hold in the shortest (i.e., 1 day after appointment) and longest (30 days after appointment) windows and are not significant in the windows in between. I also find that the results are not sensitive to increasing or decreasing the number of days on which bonds are traded before or after the appointment event.

Another concern about the robustness of the results is the possibility that the sorting process is different for senior and for non-senior FCS. In this case, the

²³ I also tested for the differential effect of senior FCS' specific types of experience on ES in different industries. However, given that the total number of senior FCS is very small, and variation across specific types of experience and industries is very low, it is hard to draw conclusions from the data and therefore I do not report the results.

estimates that are based on the matched sample are biased, as the matching process does not eliminate possible unobserved differences that distinguish between firms with a senior FCS and those without one. I test for this concern by defining as the treatment variable the presence of a senior FCS and not the presence of all types of FCS. I ran the main models again and found that although the overall effect of senior FCS is not significant, there is a negative and significant effect on ES when the appointed senior FCS is the first in the firm.

5. DISCUSSION

The wide range of tests I conducted have raised some interesting results that should be discussed. In this concluding section I discuss the most important ones.

FCS self-sorting. The observed effect I find may be explained by a confounded variable, threatening the alleged causal effect of political ties on a firm's outcomes – the quality of the FCS. If FCSs are (perceived) as better managers, their civil service background is merely a signal for the qualifications.²⁴ In this case, my results are merely correlations and have nothing to do with causation. However, the results in this paper are not in line with this argument. First, if FCSs have more skills, why do we observe a decaying nature of their civil service experience? Second, the decreasing marginal value of an FCS being conditional on the number of FCSs in the firm's management at the time of appointment merits further exploration on the implied mechanism for causation. These findings support the claim the FCSs bring a unique capital to their hiring firm and their civil service experience is not just a signal for their quality.

Senior vs. working-level FCSs. The analysis indicates that senior and working-level FCSs have different effects: while no additional value is associated with a senior FCS, only senior FCSs were found to reduce credit spreads.²⁵ This result might be

²⁴ Mazar (2008) found that workers leaving the civil service in Israel are relatively more qualified than those who do not leave.

²⁵ Although these results are drawn from different samples, they hold even when one sample that consists of all cases that are eligible for the CAR analysis and the ES analysis is used, and when I look at the effect of the first FCS.

explained by the different role each type of FCS is expected to fill in the hiring firm. Shive and Forester (2016) distinguish between FCSs who are hired to increase profitability and FCSs who are hired to decrease risk. All FCSs possess knowledge and connections that help in increasing profitability. However, only senior FCS possess knowledge that is associated with decreasing risk, as they have connections, strategic knowledge of the civil service, and a civil service work ethic, such as prudence, compliance with regulations, ethical behavior (Jabotinsky, 2017; Benmelech and Frydman, 2015), and reliability (Houston et al., 2014).²⁶ Moreover, senior FCSs often have longer civil service experience, and therefore conservative civil service norms and policies are more embedded in their character than is the case for a working-level FCS with shorter civil service experience. Therefore, all ranks are equal in increasing a firm's value, but are different in decreasing firm's risk.

Cooling-off period. The question of seniority naturally leads to the question of the importance and effectiveness of cooling-off periods. In most advanced economies, transitions between the public sector and the private sector are regulated in order to minimize potential social costs, such as overly lenient treatment of corporates' violations by regulators, misuse of civil service knowledge and connections to the benefit of the employing corporation, etc. However, there are some social costs for restricting these transitions. Given that in most (if not all) countries salaries in the public sector are lower than in the private sector, the unique capital a civil servant gains in the civil service and his or her future employment opportunities are a complementary non-monetary compensation that acts as an incentive for good workers to join the civil service (Brezis, 2017). Strict regulations on public-private transitions might lead to difficulties in recruiting good workers to the public sector.²⁷

²⁶ Houston et al. (2014) study the effect of FCS in a bank's credit spreads. They find that the longer the lending relationship between the bank and firm is, the weaker the FCSs' effect is, and the same holds for firms with a strong credit rating. These findings imply that FCSs' connections can be substituted by other signals or knowledge about a firm's reliability.

²⁷ Law and Long (2011) find that public utilities commissioners in states that have restrictions on the employment of former civil servants have less expertise, serve shorter terms, and are less likely

It is hard to measure the overall social welfare arising from public-private transitions, since it is hard to measure the cost and benefits of public-private transitions. However, most countries' revealed preferences indicate that a cooling-off period is a common practice used to balance between these considerations. My results show that indeed FCSs' capital erodes in the time that has passed since they left their last position in the civil service. In fact, rough calculations show that after 5 years no effect on CAR is observed.^{28,29} These results are relevant to the discussion of cooling-off periods. Beyond the social welfare question, the main argument against cooling-off periods is that they violate the FCS's freedom of occupation. However, if a bridging salary is paid, this argument is somewhat weaker.³⁰ Suppose that we suspect that some part of the CAR is illegitimate. From a public-interest point of view, paying a bridging salary would avoid giving the private firm an unfair advantage. Using the estimates I obtained, I can calculate some lower and upper bounds for this bridging salary. Suppose that we consider the entire 1-percent effect of FCS on CAR as too high and suspect that it totally reflects misuse of FCSs' capital. The median market value of a firm in the matched sample is NIS 486 million, and hence a 1-percent effect equals NIS 4.86 million. Based on estimation results, each cooling-off year would reduce the FCS effect by $4.8 \times 20\% \approx \text{NIS } 1 \text{ million}$. If policymakers want to offset this "undesired CAR" by a bridging salary, they should pay not more than NIS 1 million as a bridging salary. This salary is over 5 times higher than the average (annual) salary in Israel's public sector, which in 2015 stood at NIS 185,500, and almost 3 times higher than the average annual salary of high-ranked officials in the public sector.³¹

to be subsequently employed in the private sector, compared with their counterparts from states without such restrictions.

²⁸ The unconditional effect of an FCS appointment is 1 percent and each year erodes it by 0.2 percent (as reported in Table 5).

²⁹ To add more complexity, but greater accuracy, the length of the cooling-off period should be determined by taking into account the FCS's length of service, as I have shown that the eroding rate of human capital is conditional on the length of service.

³⁰ Bridging salaries during cooling-off periods are paid, for example, in Finland and Norway (OECD, 2010).

³¹ Figures are taken from the 2015 Supervisor of Wages and Labor Agreements report.

The difficulty lies in knowing exactly what the “undesired CAR” is and setting the bridging salary accordingly. The average annual salary in the public sector is around $15,458 \times 12 = \text{NIS } 185,496$, which translates into an estimated compensation of the eroding effect of $185,496/1,000,000 = 18.5\%$ for a 1-year cooling-off period. That means that if the share of the “undesired CAR” is lower than 18.5%, it is cheaper for policymakers not to pay a bridging salary and eliminate cooling-off periods.³²

The (non-)yield for relevance. The last result of interest arises from the set of tests on the effect of FCSs’ relevance to a firm on CAR or ES. It appears that the relevance of the FCS’s civil service experience to firm’s activity has no effect on these two measures. Most interestingly, even appointing a former regulator does not yield a higher CAR (or a lower ES). This implies that an FCS’s appointment is valued regardless of whether he or she has specific experience from the civil service that directly relates to the firm’s business activity or whether he or she is a former regulator of the firm. It implies that the valued capital of an FCS is not a particular understanding of a firm’s business activity or experience in a specific government institution, but rather more general capital such as connections and knowledge of civil service ethics and procedures or, alternatively, a “portfolio” of experience in different civil service institutions. At the same time, the industry-level analysis reveals some consistent results in which experience is valued more (mainly in CAR) by particular types of firm. However, these results are in line with the finding about the insignificance of professional relevance, as the combinations between type of experience and firm’s industry that were found to produce additional value do not reflect combinations that are solely in the same civil service institutions cluster. For example, while former FCS who served in financial civil service institutions (specifically, former ISA employees) add value to financial firms, they also add value to oil and gas firms, as do FCSs who served in security civil service institutions and former MKs. Another example is the value added by former Ministry of the Economy employees to firms from a wide range of industries,

³² If we look at high-ranked officials, the cut-off share of the “undesired CAR” is even higher (27%).

without being considered as having specific experience in these firms' business activities. Since "specific experience" was coded manually, there is always concern about measurement error. However, this is not the case for the definition of "former regulator," and yet no effect was found in this case. Therefore, it is more likely that the value added by FCS is not a direct function of their civil service experience in similar business activities as those of the hiring firm, but is rather a direct function of more general types of capital, such as connections and a deep

TABLES AND FIGURES

Table 1. Descriptive statistics of the full sample

This table shows basic descriptive statistics of firms and manager variables in the full sample and in within non-FCS and FCS separately. The last columns present a t-test results for comparing means.

	all appointments		non-FCS	FCS	t-value <i>H0: mean (non-FCS)- mean(FCS)=0</i>
	N=4,925		N=4,462	N=463	
	mean	standard deviation	mean	mean	
CAR[-1,1]	0.105	1.81	0.09	0.26	-1.96
FCS (dummy)	0.094	0.29			
Senior FCS (dummy)	0.075	0.26			
<i>firm characteristics</i>					
IRI	2.606	2.25	2.57	2.93	-3.22
Log(firm market value)	19.711	1.75	19.65	20.30	-7.64
leverage	0.712	1.10	0.72	0.68	0.70
ROE	10.429	12.77	10.40	10.75	-0.56
number of board members	8.283	2.79	8.21	8.96	-5.50
controlling shareholder (dummy)	0.740	0.44	0.74	0.74	-0.17
<i>manager characteristics</i>					
age	48.941	10.85	48.52	52.95	-8.40
Man (dummy)	0.781	0.41	0.78	0.81	-1.34
highest education					
B.A. (dummy)	0.424	0.49	0.43	0.33	4.29
M.A. (dummy)	0.455	0.50	0.44	0.57	-5.46
Ph.D (dummy)	0.051	0.22	0.05	0.08	-2.76

Table 2. Descriptive statistics of the matched sample

This table shows basic descriptive statistics of firms and manager variables in matched sample and in within non-FCS and FCS separately. The last column present a t-test results for comparing means.

	all appointments		non-FCS	FCS	t-value <i>H0: mean (non-FCS)- mean(FCS)=0</i>
	N=926		N=463	N=463	
	mean	standard deviation	mean	mean	
CAR[-1,1]	0.198	1.95	0.13	0.26	0.99
FCS (dummy)	0.500	0.50			
Senior FCS (dummy)	0.396	0.49			
<i>firm characteristics</i>					
IRI	2.885	2.46	2.84	2.93	0.51
Log(firm market value)	20.283	1.77	20.27	20.30	0.29
leverage	0.684	0.33	0.69	0.68	-0.56
ROE	10.666	12.21	10.59	10.75	0.20
number of board members	8.946	3.11	8.93	8.96	0.13
controlling shareholder (dummy)	0.752	0.43	0.76	0.74	-0.61
dual listed firms	0.071	0.26	0.07	0.08	0.51
firms with tradable bonds	0.554	0.50	0.55	0.56	0.46
<i>manager characteristics</i>					
age	51.153	11.16	50.07	52.95	4.95
Man (dummy)	0.806	0.40	0.81	0.81	-0.00
highest education					
B.A. (dummy)	0.377	0.48	0.42	0.33	-2.93
M.A. (dummy)	0.516	0.50	0.47	0.57	3.57
Ph.D (dummy)	0.069	0.25	0.05	0.08	1.04

Table 3. Estimating FCS effect on firm's value

This table presents OLS estimates of the effect of FCS and other variables on CAR[-1,1]. Errors are clustered within firm. Standard deviation are in parenthesis. *** indicates 1% significance, ** indicates 5% significance and * indicates 10% significance.

	Unmatched sample						Matched sample					
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
FCS	0.12522 (0.092)	0.09386 (0.099)	0.37279* (0.199)	0.45046** (0.216)	0.90349*** (0.275)	1.05132*** (0.297)	0.04413 (0.122)	0.06182 (0.158)	0.22051 (0.231)	0.17045 (0.324)	0.75280** (0.313)	0.79721* (0.425)
Senior FCS			-0.3167 (0.218)	-0.45949* (0.241)	-0.62443** (0.31)	-0.90814*** (0.345)			-0.23442 (0.232)	-0.14259 (0.343)	-0.55999* (0.318)	-0.56685 (0.462)
IRI	-0.01036 (0.019)	0.16698 (0.12)	-0.01051 (0.019)	0.16296 (0.119)	0.00025 (0.018)	0.1934 (0.122)	-0.06817* (0.037)	-0.93314** (0.42)	-0.06778* (0.038)	-0.94120** (0.424)	-0.01466 (0.047)	-0.91058** (0.434)
IRI X FCS					-0.19599*** (0.075)	-0.22215*** (0.081)					-0.19076** (0.088)	-0.22196* (0.12)
IRI X Senior FCS					0.11959 (0.078)	0.17103** (0.084)					0.11943 (0.076)	0.15304 (0.107)
age	0.0001 (0.003)	-0.00035 (0.003)	0.00042 (0.003)	0.00028 (0.003)	0.00044 (0.003)	0.00033 (0.003)	-0.00287 (0.007)	-0.00164 (0.012)	-0.00132 (0.007)	-0.00046 (0.013)	-0.00112 (0.007)	-0.00037 (0.013)
man	-0.04504 (0.064)	-0.05246 (0.067)	-0.04343 (0.064)	-0.05143 (0.067)	-0.05037 (0.063)	-0.05951 (0.067)	-0.01874 (0.167)	-0.11617 (0.237)	-0.00701 (0.167)	-0.10945 (0.237)	-0.01509 (0.166)	-0.12549 (0.236)
B.A.	-0.01919 (0.106)	-0.00027 (0.108)	-0.0169 (0.106)	0.00344 (0.108)	-0.02473 (0.106)	-0.00237 (0.108)	0.75424** (0.313)	0.96263** (0.41)	0.75478** (0.315)	0.96168** (0.412)	0.71575** (0.317)	0.89984** (0.423)
M.A.	-0.00197 (0.108)	0.05122 (0.111)	0.00108 (0.108)	0.05533 (0.111)	-0.00276 (0.108)	0.05252 (0.111)	0.68903** (0.32)	0.92287** (0.419)	0.69983** (0.322)	0.93086** (0.421)	0.66546** (0.323)	0.88313** (0.429)
Ph.D	0.00601 (0.141)	0.00617 (0.144)	0.00584 (0.141)	0.00386 (0.144)	0.00837 (0.141)	0.00787 (0.144)	0.20345 (0.391)	0.42772 (0.53)	0.20556 (0.393)	0.42737 (0.534)	0.18478 (0.393)	0.39952 (0.546)
log(firm market value)	0.04094* (0.023)	-0.01398 (0.067)	0.04191* (0.023)	-0.01566 (0.067)	0.04151* (0.023)	-0.01984 (0.067)	0.03422 (0.06)	-0.47669* (0.272)	0.03798 (0.06)	-0.48115* (0.272)	0.03667 (0.06)	-0.50543* (0.276)
leverage	0.03725 (0.03)	0.06272 (0.042)	0.03742 (0.03)	0.06254 (0.042)	0.03822 (0.03)	0.06184 (0.042)	0.09929 (0.206)	1.18325 (1.521)	0.09898 (0.207)	1.11684 (1.515)	0.09079 (0.206)	0.97884 (1.506)
ROE	0.00353 (0.003)	0.00572 (0.004)	0.00353 (0.003)	0.0057 (0.004)	0.00355 (0.003)	0.00583 (0.004)	0.00937 (0.008)	0.03237* (0.019)	0.00943 (0.008)	0.03259* (0.019)	0.00913 (0.008)	0.03236* (0.019)
board size	-0.01161 (0.019)	0.0042 (0.033)	-0.0117 (0.019)	0.00456 (0.033)	-0.01162 (0.019)	0.00472 (0.033)	0.03433 (0.047)	0.02444 (0.1)	0.0344 (0.047)	0.0266 (0.1)	0.03579 (0.047)	0.03126 (0.098)

(Table 3 continued)

controlling shareholder	-0.05014 (0.071)	-0.09877 (0.121)	-0.05134 (0.071)	-0.10152 (0.121)	-0.05442 (0.071)	-0.10441 (0.121)	0.05333 (0.162)	0.21193 (0.448)	0.05272 (0.162)	0.2063 (0.448)	0.04091 (0.162)	0.19512 (0.446)
Constant	-0.43753 (0.473)	-0.78401 (1.428)	-0.47568 (0.477)	-0.78005 (1.431)	-0.49071 (0.476)	-0.76823 (1.431)	0.16709 (1.161)	10.85567* (5.999)	0.02017 (1.155)	10.91545* (5.995)	-0.08337 (1.162)	11.44846* (6.087)
position FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
TASE industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
firm FE	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Adjusted R-squared	0.02911	0.06449	0.02937	0.06526	0.03097	0.06685	0.05187	0.0995	0.0519	0.09846	0.05553	0.10388
Observations	4,925	4,925	4,925	4,925	4,925	4,925	926	926	926	926	926	926

Figure 1. A box-plot of CAR[-1,1], by civil service experience

This figure illustrates the distribution of CAR[-1,1] in time of appointment, conditional on the civil service experience of the appointee. The upper panel present the distribution of the CAR in all appointments, while the lower panel include cases of FCS appointments only in firms that didn't have an FCS in its management in time of appointment. The box in the middle defines the 25-75 percentile interval and the line inside the box is the median. The upper line represents the value of the 75th quartile + 1.5 *(75th quartile - 25th quartile) and the lower line represents the value of the 25th quartile - 1.5 *(75th quartile - 25th quartile).

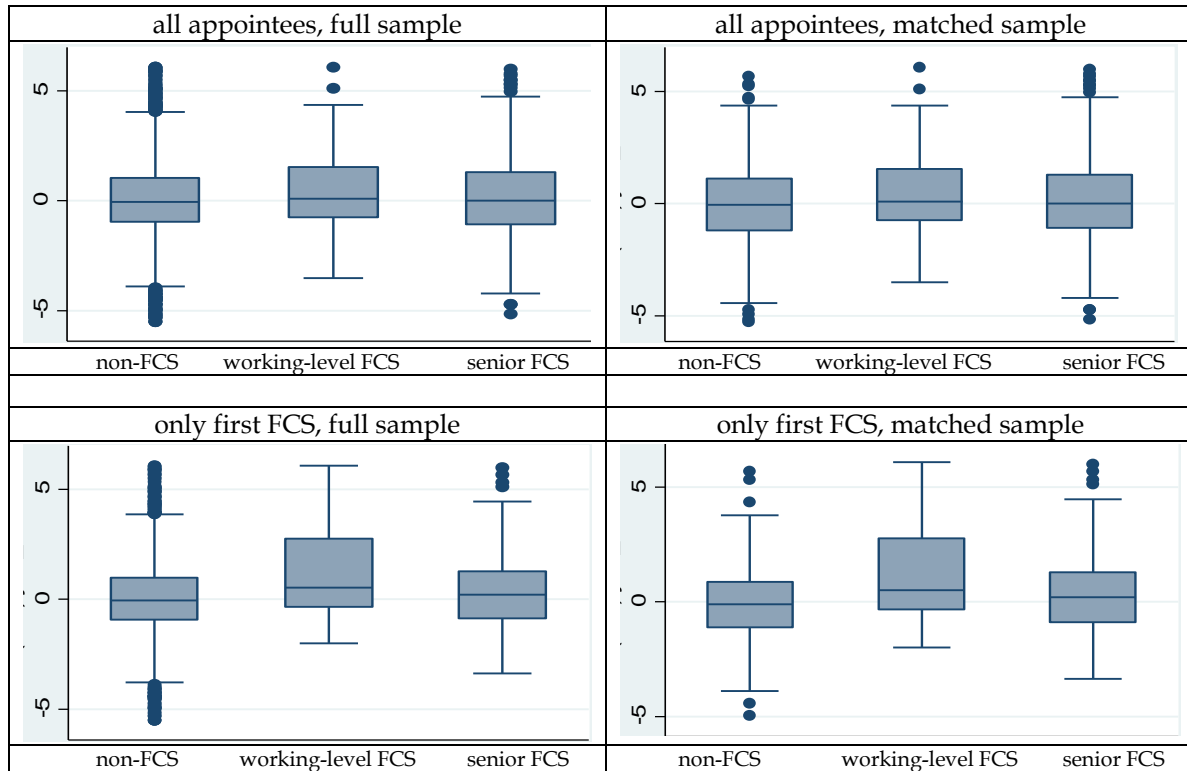


Figure 1a. FCS effect on firm's value for different regulation levels

This figure illustrates the aggregate effect of FCS and IRI on CAR[-1,1], based on the coefficients of FCS, IRI and IRI X FCS in Table 3, Column 11, for changing values of IRI. Shaded area indicates the 95% confidence interval. Horizontal bars lie in the 25th, 50th and 75th percentile of the IRI.

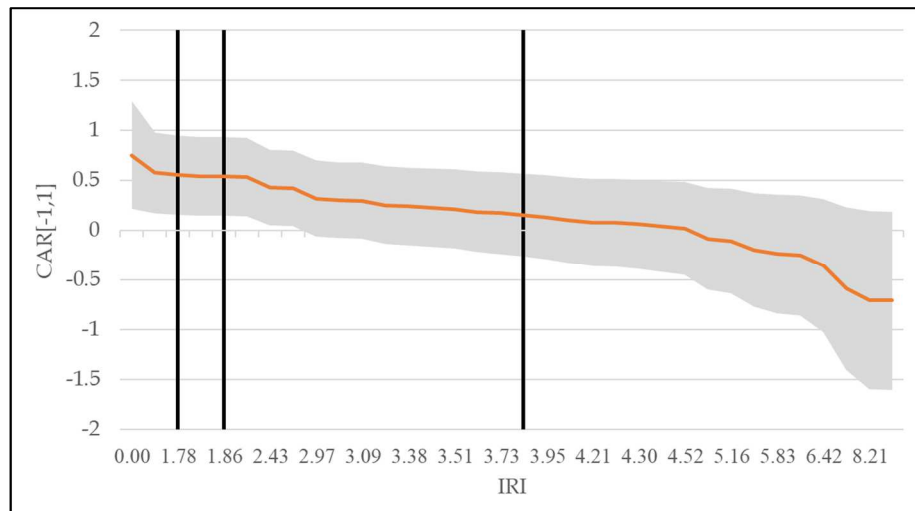


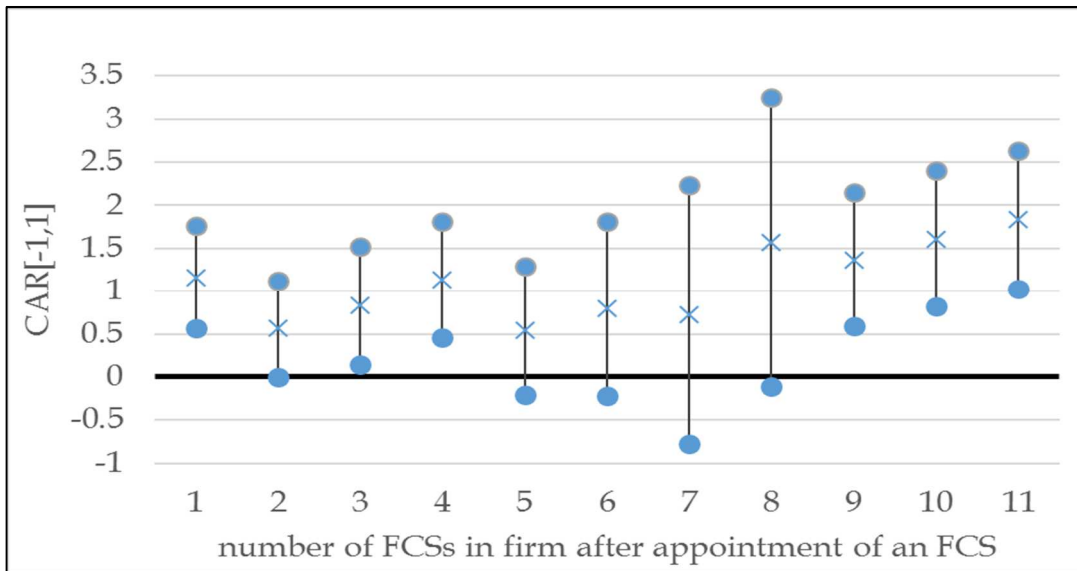
Table 4. Testing for the marginal FCS effect on firm's value

This table presents OLS estimates of the effect of FCS and other variables on CAR[-1,1], while taking into account the number of FCS already in firm (if at all). Estimations in Column 1 and 2 use only firms without FCS at time of the appointment; Column 3 and 4 reflect the number of FCS in the firm by a set of dummy variables; Columns 5-6 reflect the number of FCS in the firm by a continuous variable. Errors are clustered within firm. Standard deviation are in parenthesis. *** indicates 1% significance, ** indicates 5% significance and * indicates 10% significance.

	(1)	(2)	(3)	(4)	(5)	(6)
	Only first FCS		Controlling for the number of FCS - dummies		Controlling for the number of FCS - continuous variable	
	Unmatched	Matched	Unmatched	Matched	Unmatched	Matched
FCS	1.47819*** (0.44)	1.21318** (0.561)			1.23433*** (0.359)	1.08842** (0.426)
Senior FCS	-0.84953 (0.567)	-0.80277 (0.635)	-0.50894* (0.308)	-0.40487 (0.335)	-0.57889* (0.305)	-0.46486 (0.329)
number of FCS in firm's management after appointment					0.00678 (0.025)	0.02101 (0.057)
FCS X number of FCS in firm's management after appointment					-0.23390* (0.13)	-0.30380** (0.142)
FCS X squared-number of FCS in firm's management after appointment					0.02748** (0.011)	0.03656*** (0.012)
IRI	0.00956 (0.022)	-0.04584 (0.074)	0.00152 (0.018)	-0.03951 (0.05)	0.00118 (0.018)	-0.04137 (0.053)
IRI X FCS	-0.17436 (0.136)	-0.16277 (0.163)	-0.19601*** (0.072)	-0.16131* (0.085)	-0.20260*** (0.075)	-0.16193* (0.088)
IRI X Senior FCS	0.01748 (0.183)	0.10754 (0.193)	0.09401 (0.076)	0.10466 (0.076)	0.1124 (0.077)	0.12103 (0.076)
appointed manager is FCS no. 1			1.16070*** (0.305)	0.89965** (0.359)		
appointed manager is FCS no. 2			0.56132** (0.285)	0.38717 (0.334)		
appointed manager is FCS no. 3			0.83085** (0.352)	0.52695 (0.397)		
appointed manager is FCS no. 4			1.13712*** (0.347)	0.85931** (0.348)		
appointed manager is FCS no. 5			0.54266 (0.382)	0.37385 (0.434)		
appointed manager is FCS no. 6			0.79492 (0.518)	0.42876 (0.503)		
appointed manager is FCS no. 7			0.72682 (0.767)	0.65736 (0.765)		
appointed manager is FCS no. 8			1.56599* (0.858)	1.51238** (0.738)		
appointed manager is FCS no. 9			1.36547*** (0.398)	1.17451** (0.488)		
appointed manager is FCS no. 10			1.61151*** (0.404)	1.65865*** (0.514)		
appointed manager is FCS no. 11			1.83511*** (0.41)	2.17047*** (0.534)		
Constant	-1.11214* (0.633)	1.5561 (2.387)	-0.47018 (0.485)	1.09604 (1.177)	-0.44229 (0.518)	1.07898 (1.195)
controls	Yes	Yes	Yes	Yes	Yes	Yes
position FE	Yes	Yes	Yes	Yes	Yes	Yes
TASE industry FE	Yes	Yes	Yes	Yes	Yes	Yes
year FE	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R-squared	0.03363	0.04505	0.03144	0.04875	0.03119	0.05097
Observations	3,102	269	4,925	926	4,925	926

**Figure 2. An illustration of the marginal FCS effect on firm's value:
dummy variables**

This figure presents the coefficients (stars) and their 95% confidence interval (dotts) of the dummy variables reflecting the effect of the appointment of an FCS on CAR given the new FCS's ordinal number in the stock of FCS in firm's management after the appointment. Coefficients are based on the results presented in Table 4, Column 3.



**Figure 3. An illustration of the marginal FCS effect on firm's value:
continuous variable**

This figure presents the coefficients the estimated marginal value of apponted FCS on CAR given the his ordinal number in the stock of FCS in firm's management after the appointment. The marginal value is the sum of:

$\widehat{FCS} + (\widehat{FCS} \times \text{number of FCS in firm's management after appointment}) \times \text{number of FCS in firm's management after appointment} + (\widehat{FCS} \times \text{squared number of FCS in firm's management after appointment}) \times (\text{number of FCS in firm's management after appointment})^2$.
Coefficients are based on the results presented in Table 4, Column 5.

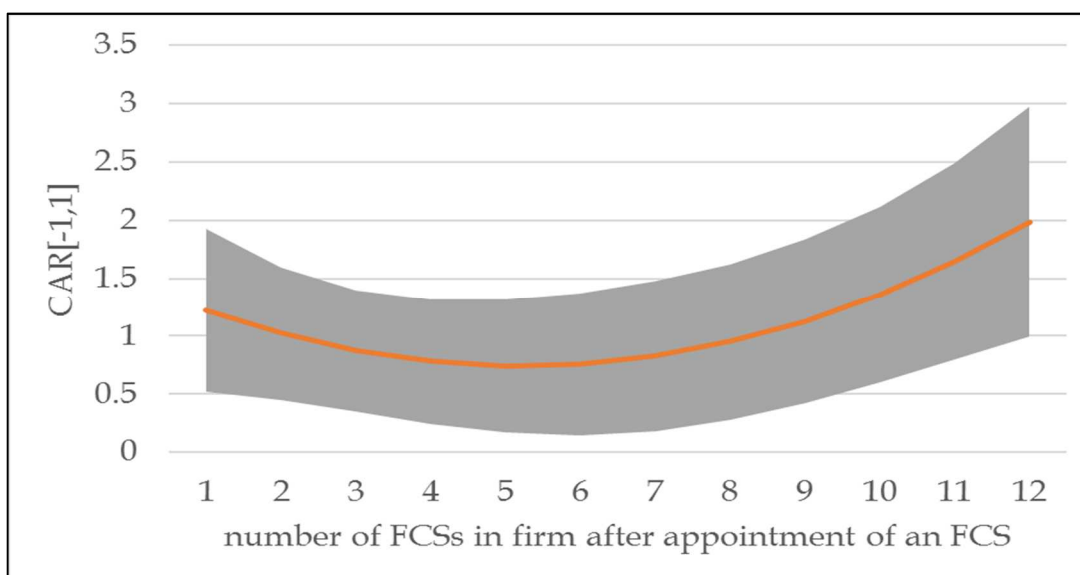


Figure 4. A histogram of the number of years since leaving the civil service

This figure presents a histogram of the number of years that have passed since FCS left the civil service within the sample of appointed FCS.

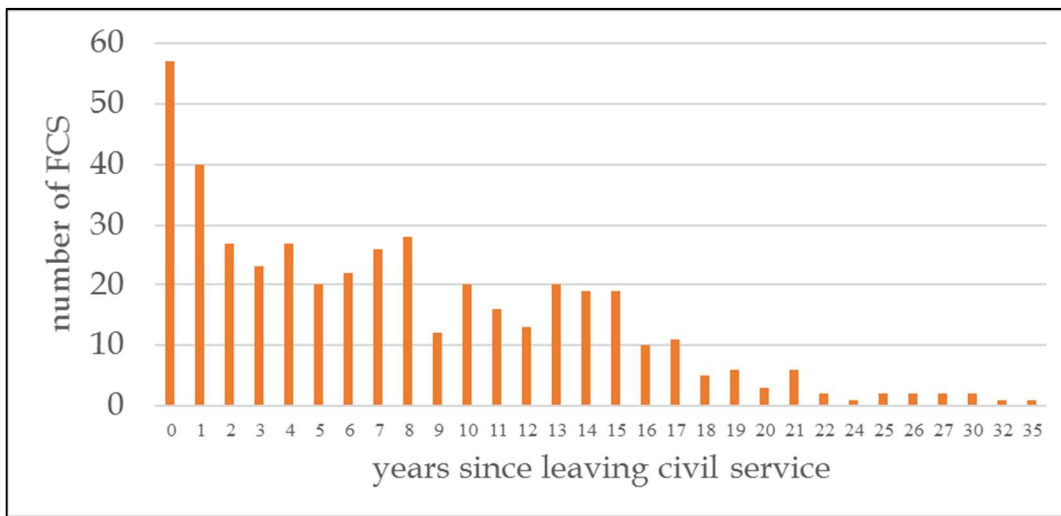


Table 5. The effect of FCS on firm’s value conditional on the number of years that have passed since leaving the civil service

This table presents OLS estimates of the effect of FCS on CAR[-1,1] given the number of years that have passed since they left their last position in the civil service, and an interaction between the number of years and the FCS age, which proxies for the length of service in the civil service. Control variables include FCS’s gender and a dummy for highest degree, firm’s size, leverage, ROE, board’s size and whether it has a controlling shareholder. Errors are clustered within firm. Standard deviation are in parenthesis. *** indicates 1% significance, ** indicates 5% significance and * indicates 10% significance.

	(1)	(2)	(3)	(4)
	All FCS	Years since left <= 27 (99th pct.)	Years since left <= 19 (95th pct.)	Years since left <= 16 (90th pct.)
Senior FCS	-0.23913 (0.3)	-0.32467 (0.303)	-0.2475 (0.329)	-0.21627 (0.344)
IRI	-0.10902* (0.058)	-0.10508* (0.058)	-0.10729* (0.061)	-0.09452 (0.069)
years since left the civil service	-0.1277 (0.09)	-0.21321** (0.092)	-0.20725** (0.102)	-0.27415** (0.115)
age X years since left the civil service	0.00216 (0.002)	0.00375** (0.002)	0.00367** (0.002)	0.00467** (0.002)
age	-0.03093* (0.016)	-0.03880** (0.017)	-0.03888** (0.017)	-0.04077** (0.017)
Constant	2.43978 (1.542)	2.69140* (1.574)	2.69862* (1.627)	3.48355** (1.673)
controls	Yes	Yes	Yes	Yes
position FE	Yes	Yes	Yes	Yes
TASE industry FE	Yes	Yes	Yes	Yes
year FE	Yes	Yes	Yes	Yes
Adjusted R-squared	-0.00693	0.00334	-0.0032	0.00571
Observations	443	439	421	399

Figure 5. The marginal effect of FCS on CAR[-1,1] conditional on the number of years that have passed since the FCS left the civil service, by age at time of the appointment

This figure presents the marginal effect on CAR[-1,1] conditional on the number of years that have passed since the appointed FCS left the civil service and on his age at appointment, obtained by: $(years\ since\ left\ the\ civil\ service) \times years\ since\ left\ the\ civil\ service + (age \times years\ since\ left\ the\ civil\ service) \times age \times years\ since\ left\ the\ civil\ service$. Solid line represent significant effect while dashed line represent non-significant effects. Coefficients are based on the results presented in Table 5, Column 4.

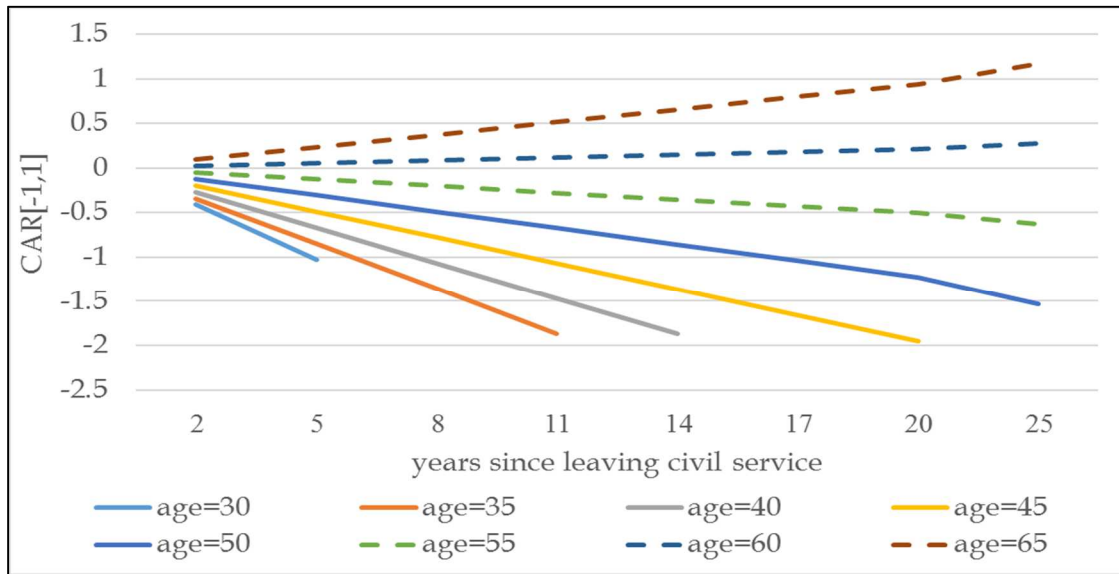


Figure 6. FCSs' human capital quality-quantity indifference curves

This figure presents indifference curves between the quality (i.e., non-expiration) and quantity (i.e., length of civil service term) of FCSs' unique capital. Each curve represent a specific marginal effect on CAR, and shows all the points defined by age at time of appointment to a firm's management and years since leaving the civil service for which the effect on CAR is equal. Calculation are based on the coefficients presented in Table 5, Column 4.

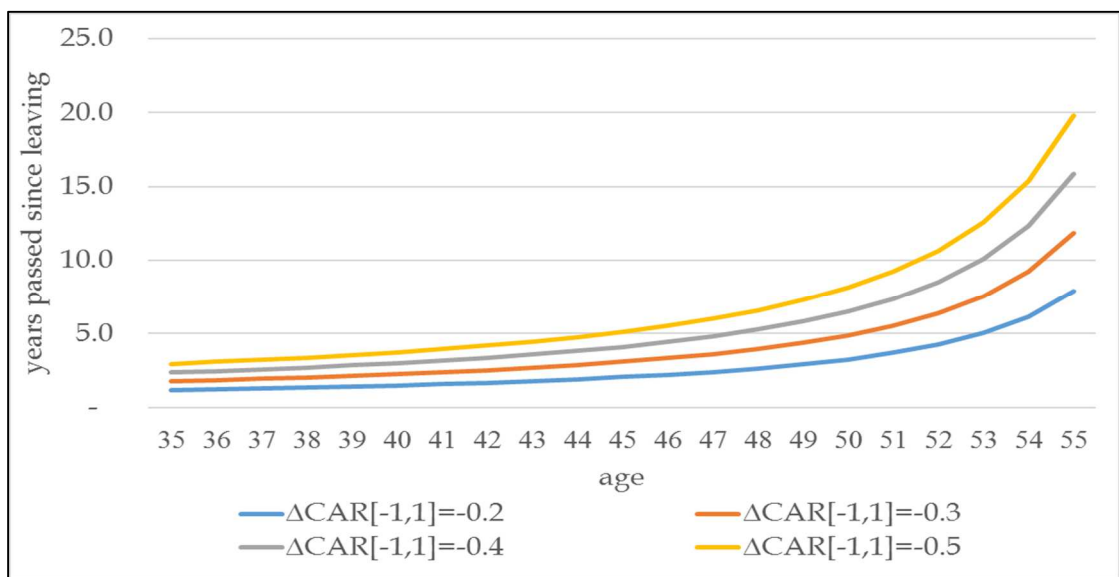


Table 6. Former regulator and type of experience effect on firm's value

This table presents OLS estimates for the effect of appointed FCS civil service experience relevance to a firm on CAR[-1,1]. Relevance is defined either by an FCS who served in one of the firm's regulating office or by the FCS bringing specific experience and/or managerial experience and/or general economic/legal experience from his civil service period. Control variables include FCS's gender and a dummy for highest degree, firm's size, leverage, ROE, board's size and whether it has a controlling shareholder. Errors are clustered within firm. Standard deviation are in parenthesis. *** indicates 1% significance, ** indicates 5% significance and * indicates 10% significance.

	Unmatched				Matched		Only FCS			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
FCS	0.90195*** (0.275)	1.04777*** (0.296)			0.74219** (0.324)	0.95768** (0.435)				
Senior FCS	-0.62703** (0.311)	-0.91656*** (0.345)	0.25414 (0.174)	0.10274 (0.184)	-0.55482* (0.332)	-0.69399 (0.498)	-0.39289 (0.352)	-0.09252 (0.833)	-0.59204 (0.383)	-0.1156 (0.907)
IRI	0.00016 (0.018)	0.1941 (0.122)	-0.00429 (0.018)	0.17691 (0.119)	-0.05028 (0.051)	-0.63355 (0.621)	-0.22657*** (0.084)	-1.51657*** (0.503)	-0.22173*** (0.082)	-1.46901*** (0.462)
IRI X FCS	-0.19724*** (0.075)	-0.22570*** (0.081)	-0.01591 (0.059)	-0.0151 (0.064)	-0.17546* (0.09)	-0.23626** (0.114)				
IRI X Senior FCS	0.11935 (0.078)	0.17061** (0.084)	-0.05794 (0.067)	-0.03492 (0.071)	0.13722* (0.08)	0.19858* (0.11)	0.11271 (0.078)	0.10286 (0.159)	0.11277 (0.078)	0.10502 (0.165)
firm's former regulator (dummy)	0.06321 (0.25)	0.17586 (0.282)	0.08299 (0.253)	0.19537 (0.288)	0.0658 (0.27)	0.16622 (0.376)	0.25551 (0.303)	0.33383 (0.658)		
specific experience in firm's businesses (dummy)									0.23284 (0.251)	0.89058 (0.563)
managerial experience (dummy)									0.18911 (0.282)	0.0016 (0.605)
economic/legal experience (dummy)									-0.19045 (0.206)	0.20032 (0.37)
Constant	-0.48867 (0.476)	-0.76225 (1.433)	-0.46515 (0.475)	-0.80084 (1.43)	-1.99369* (1.187)	8.06657 (6.14)	1.76185 (1.427)	11.79137 (9.909)	1.7123 (1.529)	10.69369 (10.263)
controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
firm FE	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
position FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
TASE industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R-squared	0.03078	0.06672	0.02885	0.06402	0.03518	0.05583	0.00618	-0.01004	0.00614	0.00348
Observations	4,925	4,925	4,925	4,925	926	926	463	463	463	463

Table 7. Civil service experience effect on firm's value

This table presents OLS estimates for the effect of appointed FCS civil service experience on CAR[-1,1]. Civil service experience is represented by a set of dummy variable for main civil service institutions, which take the value of 1 if the FCS served in this institution. In uneven columns I use detailed level of civil service institution, while in even columns I cluster financial civil service institutions together and political institutions together. Control variables include FCS's gender and a dummy for highest degree, firm's size, leverage, ROE, board's size and whether it has a controlling shareholder. Errors are clustered within firm. Standard deviation are in parenthesis. *** indicates 1% significance, ** indicates 5% significance and * indicates 10% significance.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Unmatched		Matched		Unmatched		Matched		Only FCS	
FCS	0.60818** (0.298)	0.31419 (0.259)	0.69567** (0.312)	0.41997 (0.268)						
Security Institutions	-0.69006** (0.3)	-0.43309 (0.279)	-0.80260** (0.323)	-0.55517* (0.297)	-0.18093 (0.189)	-0.16784 (0.19)	-0.25861 (0.221)	-0.23251 (0.221)	-0.71808** (0.356)	-0.53531 (0.334)
Ministry of the Economy	0.26613 (0.519)	0.48722 (0.488)	0.28665 (0.536)	0.5104 (0.496)	0.67697 (0.421)	0.66873 (0.433)	0.72187 (0.449)	0.7304 (0.454)	0.35994 (0.514)	0.53362 (0.482)
Prime Minister Office	-0.15784 (0.461)	0.04012 (0.463)	-0.25065 (0.465)	-0.06323 (0.463)	0.31566 (0.416)	0.27789 (0.422)	0.24648 (0.437)	0.223 (0.44)	-0.25217 (0.481)	-0.10996 (0.477)
Financial Institutions		-0.04983 (0.243)		-0.18927 (0.257)		0.18786 (0.139)		0.10061 (0.175)		-0.3115 (0.275)
Ministry of Finance	-0.42751 (0.325)		-0.52537 (0.35)		0.08295 (0.202)		0.01407 (0.229)		-0.4974 (0.361)	
Bank of Israel	-0.17359 (0.581)		-0.20504 (0.616)		0.20219 (0.605)		0.20645 (0.65)		-0.26186 (0.604)	
ISA	-0.30438 (0.335)		-0.45039 (0.354)		0.18696 (0.244)		0.07145 (0.286)		-0.62407* (0.357)	
Antitrust Authority	-0.44227 (0.59)		-0.55318 (0.587)		-0.3167 (0.577)		-0.40791 (0.573)		-0.8011 (0.674)	
Tax Authority	-0.13261 (0.397)		-0.3555 (0.407)		0.02958 (0.382)		-0.18098 (0.393)		-0.45362 (0.429)	
Political Institutions		-0.14963 (0.214)		-0.16502 (0.222)		-0.04629 (0.197)		-0.04498 (0.207)		-0.09645 (0.232)
MK	-0.16207 (0.498)		-0.26033 (0.504)		0.1809 (0.434)		0.10334 (0.441)		-0.2235 (0.519)	
Minister	0.00583 (0.651)		0.16975 (0.646)		-0.19138 (0.647)		-0.0463 (0.645)		0.34086 (0.665)	

(Table 7 continued)

	Unmatched		Matched		Unmatched		Matched		Only FCS	
Diplomat	-1.19168*		-1.17034*		-0.85684		-0.81733		-0.90449	
	(0.615)		(0.645)		(0.563)		(0.593)		(0.652)	
Other Government Offices	-0.41387	-0.21263	-0.42487	-0.24919	0.00657	-0.06768	0.02653	-0.06816	-0.41182	-0.27825
	(0.311)	(0.196)	(0.331)	(0.204)	(0.262)	(0.181)	(0.283)	(0.195)	(0.341)	(0.221)
Local Authorities	-0.30752	-0.12317	-0.24732	-0.07313	0.09833	0.09195	0.18311	0.18581	-0.17727	-0.04688
	(0.456)	(0.449)	(0.446)	(0.446)	(0.414)	(0.406)	(0.408)	(0.406)	(0.492)	(0.491)
Constant	-0.48714	-0.46027	-1.53068	-1.4048	-0.49947	-0.47546	-1.48991	-1.42807	1.83586	1.74997
	(0.471)	(0.47)	(1.055)	(1.047)	(0.472)	(0.472)	(1.062)	(1.053)	(1.51)	(1.468)
controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
position FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
TASE industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R-squared	0.02881	0.02903	0.02448	0.02594	0.02809	0.02892	0.02045	0.02474	0.0035	0.00694
Observations	4,925	4,925	926	926	4,925	4,925	926	926	463	463

Table 8. FCS effect on firm's value, by industry

This table presents OLS estimates for the effect of appointed FCS on CAR[-1,1], conditional on the appointing firm's industry. In Panel A only FCS dummy is included, in Panel B I add the former regulator dummy. In these estimations I use the unmatched sample. In Panel C I add relevance dummies and use only the sample of FCS. In panel D and E I use the matched sample, once only with FCS dummy (Panel D) and then I add the former regulator dummy (Panel E). The coefficients are those of the interaction between the dummy in the row and a dummy for the firm's industry in the top of the column. Control variables include the IRI, an interaction between the IRI and FCS, an interaction between IRI and senior FCS, FCS's gender and a dummy for highest degree, firm's size, leverage, ROE, board's size and whether it has a controlling shareholder. I also include fixed effects for position and year. Errors are clustered within firm. Standard deviation are in parenthesis. *** indicates 1% significance, ** indicates 5% significance and * indicates 10% significance.

	Financial services	Banks	Insurance	Commerce and services	Real estate	Manufacturing	Investments and holdings	Gas and oil
<i>Unmatched sample</i>								
<i>Panel A: only FCS</i>								
FCS	1.69243*** (0.646)	1.23375** (0.603)	0.71996 (0.621)	0.83059*** (0.285)	0.82412** (0.353)	1.13859*** (0.343)	0.81268** (0.349)	1.38517*** (0.43)
<i>Panel B: adding former regulator</i>								
FCS	1.71726***	1.32143**	0.73612	0.81486***	0.76142**	1.09581***	0.91869**	1.37258***
firm's former regulator (dummy)		-0.28297 (0.442)	-0.05793 (0.944)	0.28992 (0.3)	0.32584 (0.527)	0.50628* (0.297)	-1.73120* (0.965)	
<i>Panel C: adding type of experience (FCS only)</i>								
firm's former regulator (dummy)		-0.41317 (0.663)	-0.13399 (0.996)	0.5451 (0.442)	0.31329 (0.529)	0.40015 (0.518)	-1.66461* (1.002)	
specific experience in firm's businesses (dummy)	-0.02562 (1.275)	-0.56265 (0.566)	0.51236 (0.811)	0.21076 (0.753)	-0.04462 (0.532)	0.26268 (0.513)	-0.41377 (0.436)	
managerial experience (dummy)	1.53406** (0.619)	2.50243** (0.973)	1.15522*** (0.413)	-0.54647 (0.516)	0.66413 (0.495)	-0.41256 (0.455)	-0.01563 (0.539)	-0.40484 (0.401)
economic/legal experience (dummy)		1.56135** (0.792)	0.36136 (0.484)	0.07106 (0.53)	-0.89552* (0.487)	-0.22145 (0.349)	0.05037 (0.539)	-1.4735 (1.017)

(Table 8 continued)

	Financial services	Banks	Insurance	Commerce and services	Real estate	Manufacturing	Investments and holdings	Gas and oil
<i>Matched sample</i>								
<i>Panel D: only FCS</i>								
FCS	1.69243*** (0.646)	1.23375** (0.603)	0.71996 (0.621)	0.83059*** (0.285)	0.82412** (0.353)	1.13859*** (0.343)	0.81268** (0.349)	1.38517*** (0.43)
<i>Panel E: adding former regulator</i>								
FCS	1.71726***	1.32143**	0.73612	0.81486***	0.76142**	1.09581***	0.91869**	1.37258***
firm's former regulator (dummy)		-0.28297 (0.442)	-0.05793 (0.944)	0.28992 (0.3)	0.32584 (0.527)	0.50628* (0.297)	-1.73120* (0.965)	

Table 9. FCS civil service experience effect on firm's value, by industry

This table presents the overall effect of FCS's civil service experience on CAR[-1,1], conditional on firm's industry. Estimates are obtained from OLS estimation. Civil service experience is represented by a set of dummy variable for main civil service institutions, which take the value of 1 if the FCS served in this institution. The conditional effect is the coefficient of the interaction between the civil service experience and the appointing firm's industry. For estimation I use the matched sample. Empty cells are present when there is no variation in the interaction between the civil service experience in the row and the industry in the column. Control variables include the IRI, an interaction between the IRI and FCS dummy, an interaction between IRI and senior FCS dummy, FCS's gender and a dummy for highest degree, firm's size, leverage, ROE, board's size and whether it has a controlling shareholder. I also include fixed effects for position and year. Errors are clustered within firm. Standard deviation are in parenthesis. *** indicates 1% significance, ** indicates 5% significance and * indicates 10% significance.

	Financial services	Banks	Insurance	Commerce and services	Real estate	Manufacturing	Investments and holdings	Gas and oil	Financial services	Banks	Insurance	Commerce and services	Real estate	Manufacturing	Investments and holdings	Gas and oil
	Clustered Histories								Detailed Histories							
Security Institutions		-1.054 (0.808)	-1.59*** (0.52)	-0.387 (0.44)	0.046 (0.644)	0.327 (0.428)	-0.97* (0.577)	4.024*** (0.497)		-1.502* (-1.498)	-1.296* (-1.498)	-0.45 (1.482)	-0.077 (0.9)	0.017 (0.041)	-1.154** (-1.498)	3.936*** (-1.498)
Ministry of the Economy	3.599*** (0.657)	-0.461 (0.991)	0.806 (1.023)	-0.333 (0.394)	-0.387 (0.816)	1.77*** (0.481)	2.558** (1.263)		3.779*** (0.773)	-0.773 (0.732)	0.558 (1.467)	-0.27 (0.953)	-0.386 (0.575)	1.207*** (0.526)	2.532* (0.604)	
Prime Minister Office		0.104 (0.526)		0.419 (1.01)	-1.104 (0.738)	1.274 (0.846)	0.922 (0.606)			-0.265 (1.034)		0.348 (0.823)	-1.24 (1.187)	1.016 (0.794)	0.807 (0.999)	
Financial Institutions	2.152*** (0.805)	0.826 (0.677)	0.145 (0.847)	0.54 (0.376)	-0.295 (0.391)	0.063 (0.31)	-0.353 (0.389)	1.381*** (0.375)								
Ministry of Finance									1.734 (-1.673)	1.098 (-1.922)	-0.213 (-2.429)	0.294 (0.217)	-0.261 (1.612)	-0.823* (-1.823)	-0.647 (-1.673)	
Bank of Israel									2.993*** (3.779)	-0.484 (-0.773)	-0.262 (0.558)	-3.478*** (-0.27)		0.27 (1.207)		
ISA									2.19*** (0.807)	-1.764*** (-0.265)	-0.154 (0.807)	1.482 (0.348)	-0.283 (-1.24)	-0.044 (1.016)	-0.459 (0.807)	1.312*** (0.807)
Tax Authority										-0.722 (-0.304)	1.411 (-1.609)	0.187 (-0.512)	-0.499 (-0.126)	-0.372 (0.746)	-0.305 (0.119)	0.357 (-0.259)
Antitrust Authority									-2.211*** (0.489)	1.071 (-1.687)			-2.408*** (1.344)	-0.229 (1.998)	-0.361 (1.516)	
Political Institutions	0.731 (1.335)	0.728 (1.118)	1.056 (1.372)	0.277 (0.464)	0.402 (0.457)	-1.089*** (0.319)	-0.374 (0.459)	1.154*** (0.311)								
MK										1.209 (0.804)	2.388 (0.78)	-0.283 (0.479)	-0.94 (0.658)	-1.428 (0.459)	1.231* (0.563)	1.134*** (0.523)
Minister											-1.498 (1.175)	1.482 (0.427)	0.9 (0.481)	0.041 (0.424)	-1.498 (0.638)	
Diplomat										-1.922*** (0.835)	-2.429** (0.942)	0.217 (0.509)	1.612* (1.293)	-1.823** (1.293)	-1.673 (1.293)	
Other Govt. Offices	-0.815 (0.69)	-0.19 (0.659)	-1.487	-0.341 (0.32)	-0.137 (0.503)	0.894*** (0.351)	0.287 (0.537)	-1.36*** (0.33)	0.714 (0.687)	-0.304 (0.965)	-1.609 (1.27)	-0.512 (1.27)	-0.126 (0.975)	0.746 (0.724)	0.119 (1.27)	-0.259 (1.27)
Local Authorities		-1.296** (0.6)		-0.779 (0.47)	1.446 (1.145)	1.672*** (0.677)	1.603 (1.061)	0.555 (0.423)		-1.687** (1.088)		-0.819* (0.835)	1.344 (0.982)	1.998*** (1.115)	1.516 (0.697)	0.489 (0.474)

Table 10. FCS effect on credit spread

This table presents OLS estimates of the effect of FCS and other variables on ES[-30,1]. The last two columns estimate this effect only within firms that had no senior FCS in their management prior to the appointment. Errors are clustered within firm. Standard deviation are in parenthesis. *** indicates 1% significance, ** indicates 5% significance and * indicates 10% significance.

	All FCS				First senior FCS	
	(1)	(2)	(3)	(4)	(5)	(6)
	Unmatched		Matched		Unmatched	Matched
FCS	0.45592 (0.384)	0.60944 (0.416)	0.68515* (0.392)	0.77205 (0.509)	0.79233 (0.682)	0.18571 (0.651)
Senior FCS	-0.60763 (0.389)	-0.65142 (0.416)	-0.77773** (0.351)	-0.83084* (0.448)	-1.58159** (0.797)	-0.5738 (0.649)
IRI	0.03823* (0.022)	-0.20923 (0.23)	0.09974* (0.053)	-1.42642* (0.788)	0.06629* (0.034)	0.12003 (0.166)
IRI X FCS	-0.0838 (0.062)	-0.11202* (0.065)	-0.0876 (0.064)	-0.10895 (0.077)	-0.1824 (0.13)	0.01382 (0.147)
IRI X Senior FCS	0.10635* (0.063)	0.11531* (0.064)	0.08941 (0.058)	0.11350* (0.067)	0.43813** (0.212)	-0.13369 (0.187)
age	-0.00288 (0.003)	0.00033 (0.003)	0.01206* (0.007)	0.01318* (0.008)	-0.00359 (0.003)	0.06444*** (0.023)
man	-0.00519 (0.057)	-0.00567 (0.061)	0.04148 (0.149)	0.1918 (0.159)	0.0529 (0.088)	-0.14302 (0.462)
B.A.	-0.15497 (0.094)	-0.06562 (0.11)	-0.04126 (0.217)	0.42725 (0.469)	-0.14616 (0.128)	0.83968 (0.937)
M.A.	-0.17048* (0.096)	-0.03922 (0.111)	0.07715 (0.177)	0.67288 (0.47)	-0.13997 (0.126)	0.95634 (0.986)
Ph.D	-0.11287 (0.151)	0.02728 (0.146)	-0.18168 (0.262)	0.5126 (0.489)	-0.24553 (0.279)	0.1658 (1.048)
log(firm market value)	0.01832 (0.026)	-0.01017 (0.122)	0.07678 (0.078)	-0.11619 (0.239)	0.00063 (0.035)	-0.00462 (0.28)
leverage	0.07394 (0.277)	0.08895 (0.347)	-0.90072 (0.575)	1.32135 (2.233)	0.0173 (0.324)	-2.64645 (1.923)
ROE	-0.00339 (0.003)	-0.00572 (0.006)	-0.01304 (0.009)	-0.03483 (0.021)	-0.00947** (0.004)	-0.07643*** (0.024)
board size	0.00483 (0.016)	0.0021 (0.024)	-0.00893 (0.045)	0.08595 (0.062)	0.0275 (0.025)	0.34565** (0.162)
bond's rating	-0.03307 (0.05)	0.02652 (0.127)	0.13151 (0.101)	0.20636 (0.222)	-0.0448 (0.058)	0.08256 (0.213)
controlling shareholder	-0.04793 (0.084)	-0.02123 (0.165)	0.16678 (0.182)	-0.00846 (0.401)	-0.01474 (0.121)	2.12674*** (0.668)
Constant	-0.31697 (0.645)	0.21374 (2.899)	-2.80285 (1.76)	1.95636 (6.988)	-0.36698 (0.795)	-10.94779** (4.41)
position FE	Yes	Yes	Yes	Yes	Yes	Yes
TASE industry FE	Yes	Yes	Yes	Yes	Yes	Yes
year FE	Yes	Yes	Yes	Yes	Yes	Yes
firm FE	No	Yes	No	Yes	No	No
Adjusted R-squared	0.03159	0.21908	0.12159	0.53915	0.08881	0.42049
Observations	1,551	1,551	375	375	856	102

Table 11. Testing for the marginal FCS effect on credit spread

This table presents OLS estimates of the effect of FCS and other variables on ES[-30,1], while taking into account the number of senior FCS already in firm (if at all). Column 1 and 2 reflect the number of FCS in the firm by a set of dummy variables; Columns 3 and 4 reflect the number of FCS in the firm by a continuous variable. Control variables include FCS's gender and a dummy for highest degree, firm's size, leverage, ROE, board's size, bond's rating and whether the firm has a controlling shareholder. Errors are clustered within firm. Standard deviation are in parenthesis. *** indicates 1% significance, ** indicates 5% significance and * indicates 10% significance.

	(1)	(2)	(3)	(4)
	Controlling for the number of FCS - dummies		Controlling for the number of FCS - continuous variable	
	Unmatched	Matched	Unmatched	Matched
appointed manager is an FCS	0.45535 (0.385)	0.65193* (0.392)	0.46879 (0.384)	0.65057* (0.391)
appointed manager is a senior FCS			-1.07856** (0.486)	-1.29467*** (0.455)
number of senior FCS in firm's management			-0.01601 (0.015)	-0.02297 (0.062)
appointed manager a senior FCS X number of senior FCS in firm's management after appointment			0.28562** (0.129)	0.33393** (0.144)
appointed manager a senior FCS X squared-number of senior FCS in firm's management after appointment			-0.02254** (0.011)	-0.02730** (0.012)
IRI	0.04064* (0.022)	0.11024* (0.056)	0.04203** (0.021)	0.11078* (0.058)
IRI X FCS	-0.08377 (0.062)	-0.08239 (0.065)	-0.08497 (0.062)	-0.08623 (0.064)
IRI X Senior FCS	0.07707 (0.064)	0.05063 (0.064)	0.07611 (0.063)	0.05459 (0.062)
appointed manager is senior FCS no. 1	-0.78816* (0.468)	-0.91992** (0.433)		
appointed manager is senior FCS no. 2	-0.63604 (0.399)	-0.71382* (0.366)		
appointed manager is senior FCS no. 3	-0.47401 (0.415)	-0.71768* (0.378)		
appointed manager is senior FCS no. 4	-0.07335 (0.41)	-0.15782 (0.454)		
appointed manager is senior FCS no. 5	-0.31913 (0.427)	-0.22203 (0.495)		
appointed manager is senior FCS no. 6	-0.29899 (0.415)	-0.331 (0.474)		
appointed manager is senior FCS no. 7	-0.40872 (0.421)	-0.24178 (0.497)		
appointed manager is senior FCS no. 8	-0.29082 (0.418)	-1.88002** (0.771)		
appointed manager is senior FCS no. 9	-0.28974 (0.433)	-0.00398 (0.621)		
appointed manager is senior FCS no. 10	-0.26579 (0.437)	-0.82886 (0.514)		
appointed manager is senior FCS no. 11	-0.95194** (0.423)	-1.00338** (0.428)		
Constant	-0.27242 (0.644)	-2.39811 (1.856)	-0.37046 (0.669)	-2.57481 (2.008)
controls	Yes	Yes	Yes	Yes
position FE	Yes	Yes	Yes	Yes
TASE industry FE	Yes	Yes	Yes	Yes
year FE	Yes	Yes	Yes	Yes
Adjusted R-squared	0.03001	0.1172	0.03371	0.12682
Observations	1551	375	1551	375

Figure 7. The marginal FCS effect on credit spread illustration: continuous variable

This figure presents the point estimate and the 95% confidence interval of the marginal value of appointed senior FCS on ES[-30,1] given his ordinal number in the stock of senior FCS in firm's management after the appointment. The marginal value is the sum of:

$\widehat{\text{senior FCS}} +$
 $(\widehat{\text{senior FCS}} \times \widehat{\text{number of senior FCS in firm's management after appointment}}) \times \text{number of senior FCS in firm's management after appointment} +$
 $(\widehat{\text{senior FCS}} \times \widehat{\text{number of senior FCS in firm's management after appointment}})^2 \times (\text{number of senior FCS in firm's management after appointment})^2$
 Coefficients are based on the results presented in Table 11, Column 3.

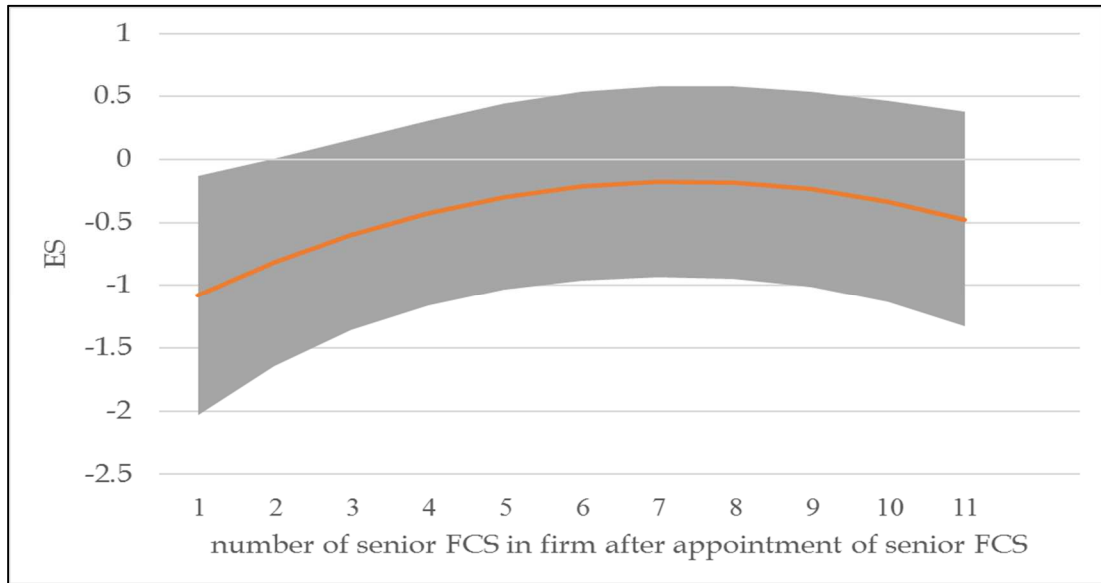


Table 12. FCS effect on credit spread conditional on the number of years that have passed since leaving the civil service

This table presents OLS estimates of the effect of FCS on ES[-30,1] given the number of years that have passed since they left their last position in the civil service, and an interaction between the number of years and the FCS age, which proxies for the length of service in the civil service. Control variables include FCS's gender and a dummy for highest degree, firm's size, leverage, ROE, board's size, bond's rating and whether the firm has a controlling shareholder. Errors are clustered within firm. Standard deviation are in parenthesis. *** indicates 1% significance, ** indicates 5% significance and * indicates 10% significance.

	(1)	(2)	(3)	(4)
	All FCS	Years since left <= 30 (99th pct.)	Years since left <= 22 (95th pct.)	Years since left <= 17 (90th pct.)
Senior FCS	-0.17523 (0.271)	-0.21368 (0.268)	-0.14563 (0.267)	-0.18669 (0.279)
IRI	0.11494 (0.073)	0.11187 (0.076)	0.13122* (0.078)	0.14217* (0.078)
years since left the civil service	0.11767 (0.073)	0.0683 (0.054)	0.18844** (0.076)	0.18448** (0.082)
age X years since left the civil service	-0.00225* (0.001)	-0.00126 (0.001)	-0.00367** (0.001)	-0.00365** (0.002)
age	0.02818* (0.016)	0.02175 (0.014)	0.03344** (0.017)	0.03434* (0.018)
Constant	2.43978 (1.542)	2.69140* (1.574)	2.69862* (1.627)	3.48355** (1.673)
controls	Yes	Yes	Yes	Yes
position FE	Yes	Yes	Yes	Yes
TASE industry FE	Yes	Yes	Yes	Yes
year FE	Yes	Yes	Yes	Yes
Adjusted R-squared	0.07133	0.06027	0.09549	0.10129
Observations	189	188	180	174

Table 13. Former regulator and type of experience effect on credit spread

This table presents OLS estimates for the effect of appointed FCS civil service experience relevance to a firm on ES[-30,1]. Civil service experience relevance is defined either by an FCS who served in one of the firm's regulating civil service institutions or by the FCS bringing specific experience and/or managerial experience and/or general economic/legal experience from his civil service term. Control variables include FCS's gender and a dummy for highest degree, firm's size, leverage, ROE, board's size, bond's rating and whether the firm has a controlling shareholder. Errors are clustered within firm. Standard deviation are in parenthesis. *** indicates 1% significance, ** indicates 5% significance and * indicates 10% significance.

	Unmatched				Matched		Only FCS			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
FCS	0.4566 (0.384)	0.60774 (0.417)			0.65926* (0.355)	0.58815 (0.542)				
Senior FCS	-0.59517 (0.39)	-0.665 (0.417)	-0.14819 (0.171)	-0.08114 (0.144)	-0.81535** (0.318)	-0.69505 (0.501)	-0.36844 (0.36)	-0.7776 (0.538)	-0.68104 (0.424)	-0.92976 (0.712)
IRI	0.03891* (0.022)	-0.23929 (0.225)	0.03731* (0.022)	-0.24324 (0.213)	0.13151** (0.063)	-0.63035 (0.643)	0.07986 (0.082)	-1.09022 (0.927)	0.04159 (0.07)	-1.2435 (0.982)
IRI X FCS	-0.08114 (0.062)	-0.11499* (0.065)	-0.00722 (0.016)	-0.01819 (0.021)	-0.09085 (0.059)	-0.1072 (0.074)				
IRI X Senior FCS	0.10414 (0.063)	0.11809* (0.064)	0.03229 (0.032)	0.02543 (0.029)	0.08735 (0.055)	0.11304* (0.067)	0.05356 (0.053)	0.10898 (0.077)	0.0688 (0.047)	0.1087 (0.082)
firm's former regulator (dummy)	-0.1004 (0.203)	0.11335 (0.203)	-0.09841 (0.203)	0.1194 (0.2)	-0.26013 (0.28)	-0.05804 (0.227)	-0.32739 (0.345)	0.21709 (0.455)		
specific experience in firm's businesses (dummy)									0.01626 (0.269)	0.2401 (0.325)
managerial experience (dummy)									0.16166 (0.254)	0.19283 (0.398)
economic/legal experience (dummy)									-0.2458 (0.184)	0.0311 (0.259)
Constant	-0.31503 (0.645)	0.30589 (2.892)	-0.27107 (0.637)	0.52356 (2.865)	-3.02748 (2.055)	-5.99826 (5.854)	-0.68477 (1.991)	-6.47375 (7.117)	-0.69609 (2.102)	-6.85523 (7.01)
controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
firm FE	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
position FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
TASE industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R-squared	0.03109	0.21867	0.02981	0.21584	0.02865	0.49017	0.05413	0.56448	0.04589	0.56101
Observations	1,551	1,551	1,551	1,551	375	375	195	195	195	195

Table 14. Civil service effect on credit spread

This table presents OLS estimates for the effect of appointed FCS civil service experience on ES[-30,1]. History is represented by a set of dummy variables. In uneven columns I use detailed history, while in even columns I cluster financial civil service institutions together and political institutions together. Control variables include FCS's gender and a dummy for highest degree, firm's size, leverage, ROE, board's size, bond's rating and whether the firm has a controlling shareholder. Errors are clustered within firm. Standard deviation are in parenthesis. *** indicates 1% significance, ** indicates 5% significance and * indicates 10% significance.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Unmatched		Matched		Unmatched		Matched		Only FCS	
FCS	0.2961 (0.292)	0.29899 (0.238)	0.53772* (0.306)	0.63277** (0.293)						
Senior FCS	-0.28192 (0.208)	-0.30831 (0.204)	-0.56922** (0.223)	-0.58408*** (0.214)	-0.16176 (0.155)	-0.097 (0.118)	-0.33775* (0.172)	-0.28858* (0.15)	-0.32278 (0.234)	-0.34989 (0.218)
Security Institutions	-0.04187 (0.24)	-0.01013 (0.169)	-0.19195 (0.288)	-0.23817 (0.238)	0.1187 (0.187)	0.06058 (0.161)	0.05726 (0.243)	0.01446 (0.219)	0.0215 (0.319)	-0.02357 (0.275)
Ministry of the Economy	0.07997 (0.191)	0.08111 (0.125)	0.02399 (0.278)	0.01965 (0.229)	0.19087 (0.157)	0.13406 (0.113)	0.25137 (0.241)	0.19064 (0.215)	0.00696 (0.304)	0.03107 (0.247)
Prime Minister Office	0.60845* (0.332)	0.61756* (0.363)	0.71362* (0.372)	0.67745* (0.385)	0.70279* (0.378)	0.70994* (0.379)	0.91497** (0.434)	0.88821** (0.426)	0.57410* (0.323)	0.58130* (0.337)
Financial Institutions		-0.14829 (0.15)		-0.40087* (0.231)		-0.06117 (0.116)		-0.06474 (0.141)		-0.40553 (0.261)
Ministry of Finance	-0.14857 (0.229)		-0.19726 (0.252)		0.01947 (0.152)		0.09085 (0.185)		-0.20054 (0.27)	
Bank of Israel	0.02328 (0.185)		-0.22091 (0.253)		0.19536* (0.106)		0.0783 (0.18)		-0.12194 (0.274)	
ISA	0.00341 (0.233)		-0.22502 (0.255)		0.20536 (0.205)		0.11331 (0.186)		-0.32256 (0.284)	
Antitrust Authority	0.31572 (0.317)		0.14684 (0.293)		0.38761 (0.266)		0.24526 (0.228)		0.16879 (0.329)	
Tax Authority	-1.19339* (0.665)		-1.25780** (0.6)		-1.07697* (0.62)		-1.10866* (0.577)		-1.10889** (0.549)	
Political Institutions		0.24924 (0.171)		0.11918 (0.145)		0.26354 (0.173)		0.19191 (0.151)		0.14108 (0.164)
MK	0.48266 (0.49)		0.25236 (0.494)		0.56104 (0.533)		0.38492 (0.518)		0.34724 (0.554)	

(Table 14 continued)

	Unmatched		Matched		Unmatched		Matched		Only FCS	
Minister	-0.58419 (0.578)		-0.31728 (0.669)		-0.60722 (0.593)		-0.39154 (0.695)		-0.38348 (0.673)	
Diplomat	0.1474 (0.486)		-0.1686 (0.569)		0.28104 (0.434)		0.04592 (0.506)		-0.09352 (0.557)	
Other Government Offices	-0.1092 (0.215)	-0.37609 (0.233)	-0.04589 (0.241)	-0.30982 (0.233)	-0.00608 (0.175)	-0.30489 (0.205)	0.1486 (0.203)	-0.16904 (0.197)	-0.07786 (0.283)	-0.2681 (0.234)
Local Authorities	-0.33118 (0.344)	-0.2623 (0.237)	-0.39708 (0.349)	-0.42625 (0.272)	-0.2044 (0.326)	-0.19254 (0.226)	-0.17872 (0.346)	-0.18989 (0.254)	-0.40884 (0.423)	-0.40309 (0.311)
Constant	-0.11362 (0.587)	0.03563 (0.628)	-1.68464 (1.749)	-1.36898 (1.701)	-0.10971 (0.593)	-0.04434 (0.622)	-1.62071 (1.729)	-1.41949 (1.695)	0.23993 (1.698)	0.38218 (1.668)
controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
position FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
TASE industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R-squared	0.03715	0.03234	0.04474	0.0417	0.03572	0.03164	0.04132	0.03411	0.1014	0.09686
Observations	1,722	1,722	396	396	1722	1722	396	396	216	216

Table 15. FCS effect on credit spread, by industry

This table presents OLS estimates for the effect of appointed FCS on ES[-30,1], conditional on the appointing firm's industry. In Panel A only FCS and senior FCS dummy is included, in Panel B I add the former regulator dummy. In these estimations I use the unmatched sample. In Panel C I add civil service experience relevance dummies and use only the sample of FCS. In panel D and E I use the matched sample, once only with FCS and senior FCS dummies (Panel D) and then I add the former regulator dummy (Panel E). The coefficients are those of the interaction between the dummy in the row and a dummy for the firm's industry in the top of the column. Control variables include the IRI, an interaction between the IRI and FCS, an interaction between IRI and senior FCS, FCS's gender and a dummy for highest degree, firm's size, leverage, ROE, board's size, bond's rating and whether the firm has a controlling shareholder. I also include fixed effects for position and year. The results for the gas and oil industry are dropped due to a very low number of observations. Errors are clustered within firm. Standard deviation are in parenthesis. *** indicates 1% significance, ** indicates 5% significance and * indicates 10% significance.

	Financial services	Banks	Insurance	Commerce and services	Real estate	Manufacturing	Investments and holdings
<i>Unmatched sample</i>							
<i>Panel A: only FCS</i>							
Senior FCS	-0.44191 (0.484)	-0.85586 (0.737)	-0.38823 (0.441)	-0.93035* (0.508)	-0.59375 (0.434)	-1.11378 (0.674)	-0.60086 (0.412)
<i>Panel B: adding former regulator</i>							
Senior FCS	-0.56054 (0.527)	-1.14774 (0.857)	-0.39954 (0.457)	-1.00191* (0.523)	-0.47837 (0.454)	-1.25794* (0.721)	-0.65755 (0.43)
firm's former regulator (dummy)		0.2201 (0.188)	-0.68854*** (0.241)	0.27575 (0.483)	-0.49159 (0.425)	0.03681 (0.367)	-0.06878 (0.323)
<i>Panel C: adding type of experience (FCS only)</i>							
firm's former regulator (dummy)		0.0817 (0.459)	-0.78086 (0.885)	0.02809 (0.676)	-0.54669 (0.584)	-0.84741* (0.498)	-0.807 (1)
specific experience in firm's businesses (dummy)		-0.32115 (0.365)	-0.98965** (0.485)	0.07735 (0.511)	0.37097 (0.845)		-0.04641 (0.518)
managerial experience (dummy)		0.3785 (0.502)	3.08678** (1.31)	-0.80296 (0.721)	0.57041 (0.43)	-0.9844 (0.602)	-0.35879 (0.44)
economic/legal experience (dummy)		0.09036 (0.376)	-1.57184 (1.01)	-0.58711 (0.5)	0.31442 (0.413)	-1.01228 (0.625)	-0.18908 (0.498)

(Table 15 continued)

	Financial services	Banks	Insurance	Commerce and services	Real estate	Manufacturing	Investments and holdings
<i>Matched sample</i>							
<i>Panel D: only FCS</i>							
Senior FCS	-0.77911* (0.458)	-0.80711 (0.642)	-0.14119 (0.575)	-1.19151** (0.454)	-0.87218** (0.379)	-1.43803** (0.698)	-0.51591 (0.369)
<i>Panel E: adding former regulator</i>							
Senior FCS	-0.89318* (0.494)	-1.0773 (0.753)	-0.23637 (0.591)	-1.25646*** (0.475)	-0.77669* (0.396)	-1.57149** (0.735)	-0.5439 (0.386)
firm's former regulator (dummy)		0.14456 (0.389)	0.12502 (0.704)	-0.1382 (0.739)	-0.47933 (0.477)	0.04781 (0.401)	-0.89479 (0.58)

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APPENDIX A. DETAILED DATA DESCRIPTION

Manager data	Description	Notes
Year		
Firm	Name and company ID	
Manager's name		
Role in firm's management	A set of dummy variables for director, chairman of board, outside director, CEO, and other type of executive	Manager can have more than one role (e.g., CEO and director)
Date of appointment	When manager has more than one role and data is available, each role's date of appointment is taken	
Birth date		
Gender	0=female, 1=male	
Foreign citizen	Dummy variable (1=yes, 0=no)	
Academic degree	0=no academic degree, 1=B.A., 2=M.A., 3=Ph.D.	
Has civil service experience?	Dummy variable (1=yes, 0=no)	
Civil service experience	A dummy variables for each civil service experience in one or more of the following institutions or roles: Israel Defense Force, Police, Secret Services (GSS and Mossad), Knesset member, minister, Diplomatic service, Bank of Israel, Israel Securities Authority, Antitrust, Tax Authority, Local Authorities, advisor to a civil servant and specific government offices (see table below)	Manager can have more than one civil service experience (e.g., Knesset member and IDF Chief of Staff)
Rank in his last civil service role	Three levels: head of institution, senior official and working-level official.	The last rank in civil service. "Senior FCS" includes senior officials and head of institutions.
Type of experience former civil servant brings to the firm	A set of dummy variables for managerial experience (if he was a manager), specific experience (if he served in a related civil service institution) or economic/legal experience (if he served in an economic, financial, or legal civil service institution).	Manager can bring more than one type of experience to the firm Examples of each type: head of the Office of Construction brings managerial and specific experience to a construction firm, while former Tax Authority worker brings only economic/legal experience to this firm
Did he serve in a regulating institution?	Dummy variable (1=yes, 0=no)	A wider definition includes Antitrust and ISA as regulating institutions

Firm data	Description	Notes
Board size		
Market value		
Total balance		
Capital book value		
Total liabilities		
Total revenue		
Leverage	Total liabilities / Total balance	
Return on equity (ROE)		
Equity multiplier		
Dual-listed firm	Dummy variable (1=yes, 0=no)	
Private firm	Dummy variable (1=yes, 0=no)	
Controlling person	Dummy variable (1=yes, 0=no)	
TASE industry classification	Financial Services, Banks, Biomed, Technology, Insurance, Commerce and Services, Construction and Real Estate, Manufacturing, Investments and Holdings, Oil and Gas Exploration	
TASE sub-industry classification		
CBS industry classification	1 to 4 digits	
Total face value of traded bonds		
Average yield of traded bonds		
Average spread of traded bonds		
Average duration of traded bonds		
Average rating of traded bonds	In a numerical rank, from 1 (highest quality) to 10	Weighted average by bond market value

Civil service institutions in the database

Civil service institution	Notes	Definition of ranks within institution
IDF (Army)	Only officers from the level of Lieutenant Colonel (<i>Sgan Aluf</i>) are considered.	Head – Chief of General Staff (<i>Rav Aluf</i>) and Major General (<i>Aluf</i>), Senior – Brigadier General (<i>Tat Aluf</i>), Colonel (<i>Aluf Mishne</i>) and Lieutenant Colonel (<i>Sgan Aluf</i>)
Police	Only officers from the level of Chief Superintendent (<i>Sgan Nitzav</i>) are considered. Also included are the top 2 ranks in the Israel Prison Service and the Israel Fire and Rescue Services	Head – Commissioner (<i>Rav Nitzav</i>) and Deputy Commissioner (<i>Nitzav</i>), Senior – Assistant Commissioner (<i>Tat Nitzav</i>), Commander (<i>Nitzav Mishne</i>) and Chief Superintendent (<i>Sgan Nitzav</i>).
GSS		Head – the head of the GSS and its Departments.
Mossad		Head – the head of the Mossad and its Departments.
Minister	A member of the government	Head.
Member of Knesset (MK)		Head.
Diplomat	An ambassador or council	Senior.
Israel Security Authority (ISA)		Head – the head of the ISA and its Departments. Senior – deputies or heads of second-layer units. Workers – other.
Antitrust Authority (today known as Israel Competition Authority)		Head – the head of the Authority and its Departments. Senior – deputies or heads of second-layer units. Workers – other.
Bank of Israel (BoI)	Banking supervision is done by the Bank of Israel	Head – the head of the BoI and its Departments. Senior – deputies or heads of second-layer units. Workers – other.
Ministry of Finance		Head – the general manager of the Ministry and its Departments. Senior – deputies or heads of second-layer units. Workers – other.
Tax Authority	A unit of the Ministry of Finance	Head – the head of the Authority and its Departments. Senior – deputies or heads of second-layer units. Workers – other.
The Budget Department	A unit of the Ministry of Finance	Head – the head of the Department. Senior – deputies or heads of second-layer units. Workers – other.
The Capital, Insurance and Savings Department	A unit of the Ministry of Finance. In November 2016 it became an independent authority.	Head – the head of the Department. Senior – deputies or heads of second-layer units. Workers – other.
Ministry of Prime Minister		Head – the general manager of the Ministry and its departments. Senior – deputies or heads of second-layer units. Workers – other.

Ministry of Economy		ditto.
Ministry of Interior		ditto.
Ministry of Transport		ditto.
Ministry of Communications		ditto.
Environmental Protection Ministry		ditto.
Ministry of Religious Services		ditto.
Ministry of Defense		ditto.
Ministry of Construction and Housing	Including the Israel Land Administration	ditto.
Ministry of Health		ditto.
Ministry of Agriculture and Rural Development		ditto.
Ministry of Justice		ditto.
Ministry of Energy		ditto.
Ministry of Foreign Affairs	Excluding diplomatic staff	ditto.
Ministry of Tourism		ditto.
Local Authorities	Including city councils, regional councils, local councils	Head - the head of the Local Authority and its Departments. Senior - deputies or heads of second-layer units. Workers - other.
Advisor	An official advisor of a high-level civil servant (e.g., Prime Minister, Minister, Head of Department, etc.)	

APPENDIX B. CONSTRUCTING AN INDUSTRY REGULATION INDEX (IRI)

Purpose

The contribution of regulation to business conduct and consumer protection is indisputable. In recent years, the right quantity of regulation has been a theme of many discussions in many countries, and reducing regulatory burden has emerged as a crucial issue. However, quantifying the regulatory burden imposed on a firm is a great challenge, with no clear consensus on how it is to be done.

The most popular method constructed for the U.S. economy uses the number of pages in the Code of Federal Regulations devoted to each industry (Dawson and Seater, 2013) or the sizes of digitized versions of state-level statutes as a proxy for real state-level regulation (Mulligan and Shleifer, 2005). Coffey et al. (2012) proxy the total number of pages published annually and quarterly in the Federal Register, the United States government's daily journal of bureaucratic activity, including proposed and final regulations. Crews (2011) counts both the annual number of final regulations published in the Federal Register and the annual number of Federal Register pages devoted to final regulations. An important recent work is Al-Ubaydli and McLaughlin (2017), who use text analysis to count binding constraints in the wording of regulations, as codified in the Code of Federal Regulations, and to measure the applicability of regulatory text to different industries. The database, called RegData, quantifies the regulatory burden imposed on every industry in the U.S., and spans from 1997 to 2012.

In the absence in Israel of a report similar to the Code of Federal Regulations, I adopt an alternative method for quantifying the level of regulation in each industry.

My first source is the Governmental Book of Regulators. This is an official document written within the framework of Government Resolution no. 708, which authorizes the General Manager of the Prime Minister's Office to map the regulators in the government to their relevant industries. The Book was published in June 2015 and identifies the regulating unit in each government office and its function. For example, within the Ministry of Economy there is a unit supervising

hazardous toys. According to the description, its function is to publicly announce toys it deems hazardous and to set regulations for their use.

In the first step I manually find which regulators regulate each industry, using the 1993 CBS industry classification, which classify firms by 1-, 2-, 3- and 4-digit level classification. Some of the regulators regulate a 2-digit industry, some a 3-digit industry, and some only a 4-digit industry. For example, the supervisor of diamonds is a relevant regulator for all firms whose 2-digit industry classification is 12 (diamond mining) or 37 (diamond industry) and for firms whose 4-digit industry classification is 5135 (wholesale trading in diamonds) or 5136 (diamond brokerage). An industry might be regulated by more than one regulator. For example, manufacturing of medical, scientific, or industrial equipment for control and supervision (2-digit industry classification 34) has five relevant regulators: two within the Ministry of Economy: Supervisor of Weights, Measurements, and Standards, Supervisor of the Export of Dual-Purpose (i.e., civilian and military) Equipment; two within the Ministry of Health: Directorate of Medical Technologies, Medical Device Division; and one within the Ministry of Defense: Defense Export Controls Agency.

Some of the regulators are relevant for all industries. For example, the Equal Employment Opportunity Commission, which enforces the Employment (Equal Opportunities) Law 1988-5748, does not focus on one or a few industries but rather on every industry that employs people. Another example is the Antitrust Authority. In addition, there are regulators who act as an independent authority and not a government office, such as the Bank of Israel as the banking supervisor. I include these authorities as well.

This mapping enables me to count the number of units that regulate each firm within a given industry. However, not all regulators are equal: there is only one banking regulator while there are a few regulators for small agricultural industries. Ignoring the scope of regulation can be misleading when it comes to rating the regulatory burden that is imposed on a firm. Therefore, I take the following steps in order to get some quantifiable measure of the scope of regulation of each unit.

Nevo (2015) develops a methodology for assessing the size and scope of the Israeli regulatory budget. Using Israel's State Budget Report for 2014, Nevo identifies the exact budget of each regulatory unit in each government office. To this direct regulatory cost he adds the relative cost of each unit (based on the number of workers in the unit) that serves the entire office, e.g., the cost of the technical support unit, human resources, etc. Aggregating the budget for each regulatory unit over the office and dividing it by the total office budget yields the regulatory budget of each office.

I utilize Nevo's calculation of each office's regulatory budget to assign each regulatory unit its own budget. In some cases, the regulatory unit explicitly appears in Budget Report and so its total budget is directly known. However, this is not usually the case. Therefore, I calculate the budget in the following way: using the Governmental Book of Regulators, I find for each office the number of regulating units and then divide the total regulatory budget, as calculated by Nevo, by the number of regulating units. In this way I roughly know the budget of each unit, since the total regulatory budget belongs only to these regulating units. Then, using the matching between regulatory units and industries, I calculate the sum of budget invested in all regulatory units relevant to an industry. Since industries differ from each other in size, I divide the total budget by the number of businesses in each industry. As an alternative, I divide the total budget by the number of employees in each industry instead of the number of businesses.

Some exceptions are dealt with separately, using other sources of information. For example, the Banking Supervision Division of the Bank of Israel is the banking regulator, and so I take the share of employees working in the Division and multiply it by the sum of the expenses for salaries and related functions (IT, HR, etc.). Dividing the sum by the number of regulated entities (bank and credit card companies) yields the amount of regulation imposed on firms in this industry.

The above calculations result in two regulation measures for fifty-four 2-digit industries, two 3-digit industries, and seven 4-digit industries. I match between firms and regulation measures using the most detailed level of industry. Therefore,

if a firm belongs to one of the seven 4-digit industries for which I have regulation measures, these measures are attached. If not, I check whether the firm belongs to a 3-digit industry and attach these regulation measures. If not, I attach the 2-digit industry regulation measures. The natural log of the attached regulation measure is the Industry Regulation Index (IRI), while the index that divides the regulation cost by the number of employees in each industry is the employee-adjusted Industry Regulation Index (eIRI).

The advantage of these measures, as opposed to word- or page-counting, is that they are based not on the number of regulations but rather on the resources invested in regulation. Words and pages are almost free, while resources are costly. Using the budget the state allocates to produce regulation is more accurate and better reflects the real regulatory burden imposed on firms. However, since some of the regulating units not only create regulations but also monitor compliance, the index is a biased measure of regulation and is more precisely both a regulation, monitoring and compliance index. I see this alleged bias as an advantage for the purposes of my research since firms might be motivated to employ former civil servants to help them cope not only with regulations that limit in some way their conduct of business but also with the work entailed by compliance. For example, banks may employ a former banking regulator to help them better understand capital requirements, but also to help them more efficiently prepare for the on-site inspections regularly conducted by regulators.

While the IRI can be related to the regulatory burden imposed on different industries, it might also be a consequence of firms' behavior in that industry. Under this view, the index might also measure the level of corruption or misbehavior in the industry.

These measures have two shortcomings. First, the implementation of the methodology is time-consuming and so a time series of this index is hard to produce. Second, there are economies of scale in regulation and inspection: the budget needed for regulating and inspecting 100 entities is not twice as much as the budget needed for 50 entities. In the same sense, regulation can be very

inexpensive for the regulatory unit to produce but very expensive for the regulated firm to bear.

The IRI of 54 industries is presented in Figure B.1 (dashed lines represent industries in which the number of businesses is very small) and the eIRI is presented in Figure B.2. In the absence of a clear benchmark by which the index results can be examined, the only measure is the common perception of the extent of regulation each industry is under. According to the IRI, the most regulated industry is the mining of ores and diamonds. However, as indicated by the dashed line, this industry includes very few firms and therefore the results can be misleading. The same goes for the next most regulated industry, the extraction of crude petroleum and natural gas. The banking industry is in third place, in line with the common perception that this industry is heavily regulated. Surprisingly, the insurance and social insurance funds industry is in the lower part of the distribution. The explanation is that although the regulatory budget is relatively high, the number of businesses is very large and so the quotient is small. In addition, every individual fund is legally listed as an independent business, while in fact most of the funds are subsidiaries of 40 big firms. Dividing the total regulatory budget by this figure instead of the official number of businesses yields a much higher index that reaches tenth place in the index, which better accords with the common perception of the extent of regulation for this industry. All the results included in the paper are not sensitive to this variation. They are also not sensitive to the replacement of the IRI with the eIRI, partly because of the high correlation between these two measures (0.74).

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Figure B.1. The Industry Regulation Index (IRI)

This figure shows the Industry Regulation Index (IRI) of fifty-four 2-digit level CBS industries. The index is based on the regulatory units that regulate each industry, the budget allocated to these units, and the number of firms in the industry. From the total cost I take the natural log. Dashed lines indicate industries with a very small number of firms.

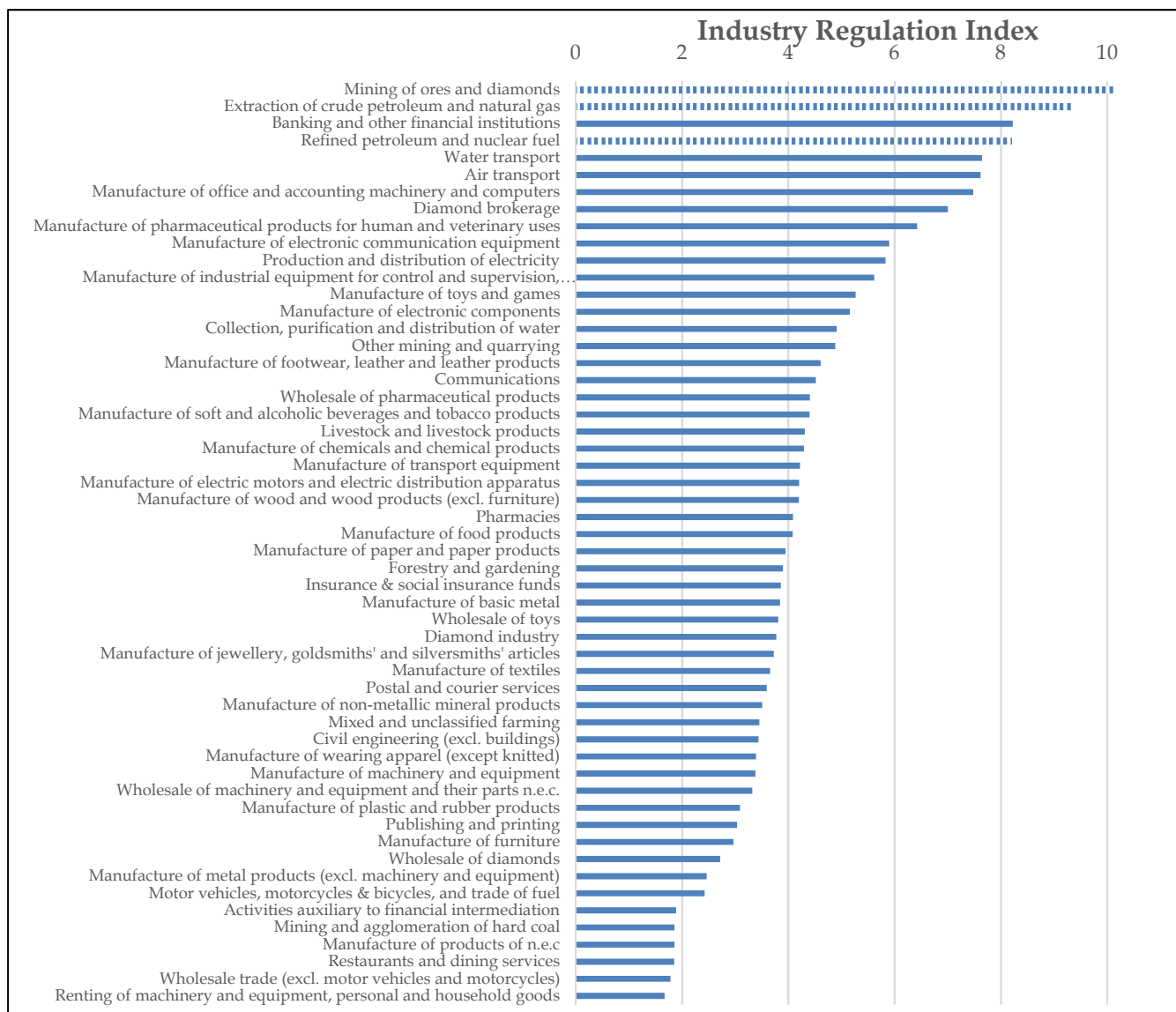


Figure B.2. The Employee-adjusted Industry Regulation Index (eIRI)

This figure shows the employee-adjusted Industry Regulation Index (eIRI) of fifty-four 2-digit level CBS industries. The index is based on the regulatory units that regulate each industry, the budget allocated to these units, and the number of employees in the industry. From the total cost I take the natural log.

