

**Antecedents and Consequences of the Revolving Door between  
U.S. Regulatory Agencies and Regulated Firms**

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## **ABSTRACT**

### **Antecedents and Consequences of the Revolving Door between U.S. Regulatory Agencies and Regulated Firms**

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In three essays, I investigate the antecedents and consequences of the firm-government revolving door, a type of employee mobility between firms and their regulators. In contrast to previous studies, which categorize the revolving door as a type of corporate political strategy, I suggest that both firms and governmental entities actively participate in the revolving door for their own strategic purposes. I argue that firms may hire former regulators in order to acquire their regulatory expertise, as well as their connections to current regulators. On the other hand, governmental entities, such as regulatory bodies, may hire individuals with regulated industry experience in order to build industry support for regulatory initiatives, as well as to learn how to regulate more effectively. Finally, as a consequence of this type of personnel movement, firms may obtain more favorable regulatory outcomes due both to the cognitive and regulatory capture of current regulators through past or (potential) future employment, respectively. Using a novel database containing career histories of all commissioners who served on 17 U.S. Independent Regulatory Commissions from 1887-2000, in Chapters II and III, I find evidence in support of firms and regulatory bodies both partaking in revolving door for their strategic ends. Furthermore, using another unique database of revolving doors between the USDA and its regulated agribiotechnology firms, in Chapter IV I find

evidence for the revolving door contributing to more favorable regulatory outcomes for firms during the revolving regulators' tenures. Thus, this project sheds light on the antecedents and the consequences of cross-sector mobility. The results of my study suggest that firms are able to skew regulatory outcomes in their favor, by using their new revolver hires to learn about, and influence the regulatory process. However, any negative consequences of such skewness may be at least partially balanced by the positive consequences of the regulatory agencies' learning and support building with industry, which may improve regulatory quality.

# TABLE OF CONTENTS

## **Antecedents and Consequences of the Revolving Door between U.S. Regulatory Agencies and Regulated Firms**

Ivana V. Katic

<b>LIST OF CHARTS, GRAPHS, ILLUSTRATIONS.....</b>	<b>iv</b>
<b>ACKNOWLEDGMENTS.....</b>	<b>vii</b>
<b>DEDICATION.....</b>	<b>ix</b>
<b>CHAPTER I. Introduction .....</b>	<b>1</b>
References.....	8
<b>CHAPTER II. Who Knows What vs. Who Knows Whom: Antecedents of Employee Mobility between U.S. Independent Regulatory Commissions and the Private Sector, 1887- 2000.....</b>	<b>11</b>
Abstract .....	11
Introduction .....	12
The Role of Expertise and Connectedness in the Exit Revolving Door.....	15
Empirical Context.....	19
Data and Methods .....	22
Results.....	26
Discussion.....	38
References.....	54

### **CHAPTER III. Bringing the Regulatory Commission Back In: Firm-to-Government**

<b>Employee Mobility as Support-Building and Learning</b> .....	60
Abstract.....	60
Introduction .....	61
Firm-to-Government Employee Mobility as Support-Building and Learning .....	65
Empirical Context .....	73
Data and Methods .....	74
Results.....	79
Discussion.....	88
References.....	102

### **CHAPTER IV. Caught in the Revolving Door: Firm-government Ties as Determinants of**

<b>Regulatory Outcomes</b> .....	109
Abstract.....	109
Introduction .....	110
Revolving Doors and Interorganizational Tie Formation .....	113
Revolving Doors and Firm Regulatory Outcomes.....	117
Empirical Context .....	123
Data and Methods .....	125
Results.....	133
Discussion.....	137
References.....	152

<b>CHAPTER V. Conclusion</b> .....	161
References.....	166

## LIST OF CHARTS, GRAPHS, ILLUSTRATIONS

### Tables and Figures in Chapter I

Figure 1 - Directions of the Revolving Door.....	7
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### Tables and Figures in Chapter II

Table 1 - Structure of Data by Independent Regulatory Commission.....	43
Table 2 - Descriptive Statistics.....	44
Table 3 - Results of the Main Logit Analysis .....	45
Table 4 – Robustness Check Using Alternative Commission Operationalization.....	46
Table 5 - Robustness Check Using Alternative Connectedness Operationalization.....	47
Table 6 – Main Model Using Imputed Data .....	48
Table 7 – Supplementary Analysis Examining Hypothesis 1.....	49
Table 8 - Supplementary Analysis Examining Hypothesis 2.....	50
Figure 1 - IRC Commissioners’ First Job Post-Tenure, Across IRCs.....	51
Figure 2 - IRC Commissioners’ First Job Post-Tenure, Across Time.....	51
Figure 3 - Illustration of the Theoretical Framework.....	52
Table A1 in the Appendix - Descriptive Statistics (Including Variables from Robustness Checks and Supplementary Analyses).....	53



### **Tables and Figures in Chapter III**

Table 1 - Major Legislative Acts and Commission Rules.....	93-95
Table 2 - Descriptive Statistics.....	96
Table 3 - Main Analysis.....	97
Table 4 - Analysis Including Additional Controls.....	98
Table 5 - Robustness Checks.....	99
Table 6 – Supplementary Analysis.....	100
Table A1 in the Appendix - Descriptive Statistics (Including Variables Used in Robustness Checks and Supplementary Analysis).....	101

### **Tables and Figures in Chapter IV**

Table 1 - Descriptive Statistics .....	143
Table 2 - Breakdown of the Companies in the Sample.....	144
Table 3 - Probit Results.....	145
Table 4 - The Results of Log-Logistic AFT Survival Models with Company Frailty.....	146
Figure 1 - Diagram of Revolving Doors Types According to Direction and Timing.....	147
Table A1 in the Appendix - Results Using Cox Semi-Parametric Regression.....	148
Figure A1 in the Appendix - Cox-Snell Residuals for Model 4: Cox Semi-Parametric Model..	149

Figure A2 in the Appendix - Cox-Snell Residuals for Model 4: Log-Logistic AFT Survival Model.....	149
Figure A3 in the Appendix - Cox-Snell Residuals for Model 4: Exponential Survival Model.....	150
Figure A4 in the Appendix - Cox-Snell Residuals for Model 4: Log-Normal Survival Model.....	150
Figure A5 in the Appendix - Cox-Snell Residuals for Model 4: Weibull Survival Model....	151

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## **DEDICATION**

To my parents, Zorana and Vojislav Katic,  
for giving me the roots to grow and the wings to fly.

# CHAPTER I

## INTRODUCTION

The firm-government revolving door, a type of employee mobility between firms and their regulators, is a highly prevalent, hotly debated, and poorly understood practice (Cohen 1986). In the United States (Coates 2012; Eckert 1981; Etzion and Davis 2008), as well as around the world (Braun and Raddatz 2010; Brezis 2012; Horiuchi and Shimizu 2001), individuals transition between regulatory and corporate positions with great frequency. This cross-sector mobility is often strongly condemned by the general public, the media, as well as civil society organizations, as a potential deterrent to fair and equal regulation. The main concern is that revolving doors may lead to regulatory capture, whereby individuals in regulatory positions would skew regulatory outcomes in the favor of their former or future corporate employers (Dal Bó 2006; Stigler 1971). A lively debate on the meaning of the phenomenon exists in political science (see, for example, Cohen (1986) and Gormley (1979)), economics (see, for example, Dal Bó (2006)), and organizational studies (see Etzion and Davis 2008; Haveman, Jia, Shi, and Wang 2014; Hillman, Zardkoohi, and Bierman 1999). Mostly, however, the revolving door is treated as an example of corporate political strategy (Hillman and Hitt 1999; Hillman, Zardkoohi, and Bierman 1999)—an attempt to influence regulatory outcomes either by placing former employees on regulatory bodies (POGO 2013), or by hiring former regulators (Dal Bó 2006). Although studies have documented a number of important consequences of the revolving door on regulatory outcomes (deHaan, Kedia, Koh, and Rajgopal 2011; Gormley 1979; Grace and Phillips 2008; Katic and Kim 2014), and indirectly, on firm performance (Haveman, Jia, Shi and Wang 2014; Hillman 2005; Hillman, Zardkoohi, and Bierman 1999),

antecedents of the phenomenon remain scarcely understood. In this dissertation, in addition to documenting the consequences, I importantly refocus attention on the antecedents of the firm-government revolving door. I do this in order to show that this type of cross-sector employee mobility does not only represent corporate attempts at influence seeking, as previous literature would suggest, but a more complex process, involving multiple actors with different motivations.

In this dissertation, I argue that the process through which revolving door mobility occurs may be better understood as interorganizational network formation. Despite the common emphasis on the firm as the driver of revolving doors, both firms and governmental entities participate in revolving door. I suggest that both firms and regulatory bodies may actively take part in the revolving door for their own, strategic purposes. This fact is best understood by observing the locus of hiring decision-making power across the two directions of the revolving door. Figure 1 shows the two directions of the revolving door graphically.

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Insert Figure 1 about here

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In the entry (or firm-to-government) direction, individuals transition from corporate to regulatory positions. There, the locus of hiring arguably rests with the governmental entity. In the exit (or government-to-firm) direction of the revolving door, it is the firm that makes the decision to hire a former regulator. Therefore, in order to understand revolving door formation, it is crucial to examine the possible motives of both firms and governmental entities in the process.

Across the chapters of this dissertation, I shed light on both the firms' and the regulatory agencies' motivations in hiring revolvers (i.e. individuals who switch from regulatory to corporate positions, and vice versa), as well as the firms' regulatory outcomes received as a consequence of this hiring practice. In Chapter II, I focus on the firm as the driver of exit revolving doors, while in Chapter III, I turn my attention to governmental entities and their role

in the formation of the entry revolving door. Specifically, in Chapter II, I argue that regulated firms may hire former regulators both for their expertise and connectedness to other regulators remaining in power. In other words, the exit revolving door presents these firms with the potential to exchange expertise, as well as to seek influence from regulatory bodies. In particular, I suggest that firms with high regulatory burdens may have a higher need for regulatory expertise in their revolver hires, whereas firms with low public scrutiny of their employee movement will be better able to take advantage of the connectedness of their hires, in order to achieve more favorable outcomes for their clients, directly regulated firms. In Chapter III, I argue that regulatory bodies hire individuals with regulated industry experience in attempts to build industry support, as well as to learn how to regulate effectively. I suggest that, although regulatory bodies possess coercive power (DiMaggio and Powell 1983), they also need to ensure their stakeholders' support in order to maintain their legitimacy (Hiatt and Park 2013). Furthermore, regulatory bodies often rely on firms' voluntary participation in the regulatory process, particularly when they are resource constrained (Gupta and Lad 1983). They also may rely on learning-by-hiring in order to design and implement more effective regulation. Thus, in Chapter III, I suggest that in the conditions where support-building and learning motives are more important, hiring individuals with regulated industry backgrounds will be more prevalent.

Finally, in Chapter IV, I turn to examining the consequences of the revolving door phenomenon for regulated firms. In particular, I empirically investigate whether entry and exit revolving doors contribute to more favorable regulatory outcomes. This is a way of testing whether the firms' strategic employment of former and future regulators may, in fact, be effective as a corporate political strategy. I suggest that firms may benefit from both directions of the revolving door. In the firm-to-government (entry) direction of the revolving door, revolving



regulators may be cognitively captured by their former employers (Rajan 2010). In the government-to-firm direction of the revolving door, I suggest that the benefits that accrue to firms are due to regulatory capture through the offer of future employment given to regulators (Dal Bó 2006; Stigler 1971). Thus, while the mechanisms for influencing regulatory outcomes are different across the two directions, I argue that the effect is the same: more favorable outcomes are received by connected firms.

In Chapters II and III, I use a unique new database, containing career histories for all individuals who served as commissioners on 17 U.S. Independent Regulatory Commissions (IRCs) from 1887-2000 (Nixon 2005) to conduct two empirical studies of the antecedents of the revolving door between IRCs and regulated firms. I find support for the idea that both firms and governments participate in the revolving door for their own, strategic purposes. While regulated firms may hire former regulators in order to learn from their regulatory expertise, as well as to influence their colleagues remaining in power, regulatory bodies may hire from regulated firms in order to become more effective in regulatory efforts, as well as to manage their relationships with the regulated industry. Thus, it is clear that revolving door formation process is a much more complex process than the existing literature has made it out to be. In order to fully understand it, I suggest that we must examine antecedents from both sides of the phenomenon: the corporate, as well as the governmental side.

Then, in Chapter IV, I employ another unique database, which contains information on the revolving door movements of USDA regulators, as well as on the regulatory outcomes of agribiotechnology firms, from 1995-2010. I find that agribiotech producers indeed benefit from their revolving door ties, but only while the regulator is still tenured at the USDA. After the regulator transitions to the firm from the USDA, the improved regulatory outcomes disappear,

suggesting that directly regulated firms may not, in fact, benefit from the expertise of their hires, but only from their influence wielded during regulatory tenure. Furthermore, I also find that there is a selection effect, such that firms with historically worse regulatory performance tend to be more likely to form revolving door ties. This further confirms that the revolving door is used strategically by firms to manage their performance in the regulatory arena.

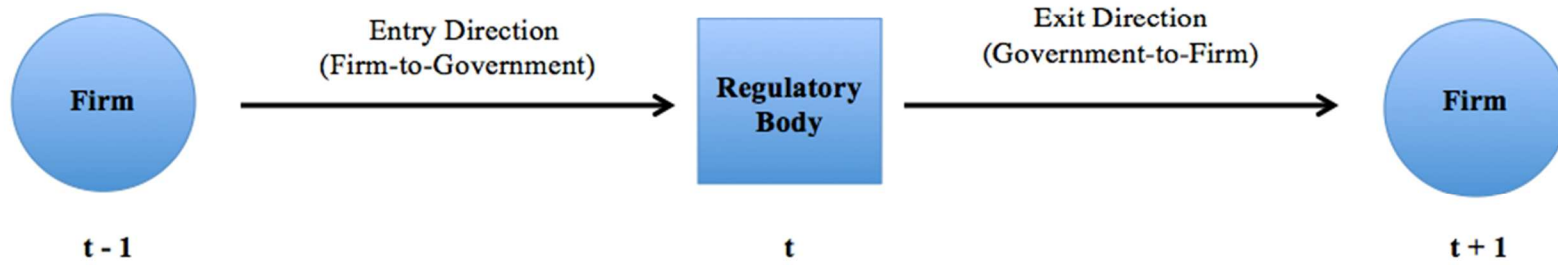
This dissertation makes several theoretical contributions to the studies of the revolving door. First, it develops and tests a theoretical model that disentangles the effects of individual regulators' regulatory expertise and connectedness as drivers of the revolving door. By doing this, Chapter II allows us a better understanding of what it is that firms are obtaining through the exit revolving door. Second, Chapter III illuminates the regulatory bodies' motivations for participating in the entry revolving door. In doing so, it supplements the commonly-held notion of the revolving door as corporate political strategy by shedding light on the oft-disregarded agentic role of governmental entities in revolving door formation. Third, Chapter IV empirically shows that both directions of the revolving doors, in fact, contribute to more favorable outcomes for regulated firms who employ them. Finally, and most importantly, the chapters taken together reconcile the roles of regulated firms and regulatory bodies as jointly shaping cross-sector employee mobility. I conclude that any accounts of the revolving door phenomenon must include both types of organizations that participate in it.

Methodologically, this dissertation uses two unique databases that allow me to shed light on the revolving door phenomenon. One is the most comprehensive available database, spanning industry sectors, different regulatory agencies, and historical time (1887-2000) (Nixon 2005). As such, it provides an unprecedented look at this phenomenon, which has often been studied within the context of single industries, or a few agencies at a single point in time. Of course, the primary

reason for this has been the sparse data availability on individual career histories. The IRC database resolves this issue, and allows an in-depth empirical study of the antecedents of the revolving door, which I conduct both on the level of the individual, and on the level of the commission. The second database is also hand-assembled, and contains detailed data on both regulatory outcomes and the revolving door movements of key USDA regulators from 1995-2010. This allows me to study the effect of the revolving door on the speed of regulatory approvals of the GMO seeds, while controlling for firm characteristics, GMO crop qualities, and the regulatory environment. The narrowing of the empirical setting from the 17 regulatory agencies across a large swath of historical time in Chapters II and III, to a single agency in a recent period in Chapter IV, is a necessary step, as regulatory procedures and the types of regulatory outcomes vary widely across different agencies and time. While the wide coverage of the IRC database provides an ideal setting for studying the revolving door antecedents, shedding a light on the consequences of the revolving door required the deep and narrow focus provided by the database of USDA revolving doors.

Overall, then, this dissertation provides novel theoretical and empirical insights on a socioeconomic phenomenon with important consequences for individual regulators, firms, and regulatory bodies alike.

**Figure 1. Directions of the Revolving Door**



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## CHAPTER II

### **Who Knows What vs. Who Knows Whom: Antecedents of Employee Mobility between U.S. Independent Regulatory Commissions and the Private Sector, 1887-2000**

#### ABSTRACT

Despite the high prevalence and the important potential consequences of the revolving door, a type of employee mobility between firms and their regulators, there is no clarity in terms of the antecedents of this practice. In this chapter, I ask: What individual characteristics of regulators make them more likely to be hired away by regulated firms? Using a unique new dataset, containing career histories of regulators from 17 U.S. Independent Regulatory Commissions from 1887-2000, I find that both expertise and connectedness increase the likelihood of private sector employment post-tenure. In particular, expertise increases the likelihood of transitioning to high regulatory burden firms, including directly regulated, law and consulting firms, whereas connectedness increases the likelihood of transitioning to the low public scrutiny firms, including law and consulting firms. The results of this study suggest that ex-regulators present their new corporate employers with the potential for expertise exchange with the government, as well as for regulatory capture of the state.

**Keywords:** expertise, connectedness, employee mobility, hiring, revolving door



## INTRODUCTION

Organizational hiring decisions happen behind closed doors, and represent *black boxes*, in which the decision-making regarding job candidates is visible only to select few organizational members. While organizational scholars have shed light on the role of job seekers' individual characteristics, particularly in terms of their human and social capital (Bills 1988; Bills 1992; Erickson 2001; Granovetter 1995; Rivera 2012) in securing private sector jobs, employee mobility between sectors has largely been unexplained. In this chapter, I open the black box of employee mobility between the public and private sectors by studying its individual level antecedents. In particular, I focus on the firm-government revolving door, defined as the movement of personnel between regulated firms and their regulatory agencies (Cohen 1986)<sup>1</sup>. Even more specifically, this chapter investigates the exit, or government-to-firm direction of the revolving door, zeroing in on the regulators who revolve from their regulatory appointments to regulated firm employment.

The revolving door is a highly prevalent practice, both in the United States (Coates 2012; Eckert 1981; Etzion and Davis 2008) and globally (Braun and Raddatz 2010; Brezis 2012; Horiuchi and Shimizu 2001). Despite its prevalence and potential consequences for regulatory outcomes (deHaan, Kedia, Koh, and Rajgopal 2011; Gormley 1979; Grace and Phillips 2008; Katic and Kim 2014) and firm performance (Haveman, Jia, Shi and Wang 2014; Hillman 2005; Hillman, Zardkoohi, and Bierman 1999), there is a notable lack of attention to the antecedents of this practice. As such, a question of large theoretical and practical importance has gone unanswered. Namely, what are the characteristics that make individual regulators more likely to

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<sup>1</sup> The revolving door may also be defined more broadly, as an exchange of employees between firms and the government, or across the private and the public sectors. Previous literature has employed different conceptualizations, and given the relative scarcity of the literature, I report findings across definitions both broad and narrow.

have a revolving door with (directly or indirectly) regulated firms? In this chapter, I explore the effects of expertise and connectedness of individual regulators on their likelihood of being hired away from their regulatory posts and into private sector employment.

Two main views exist regarding the firm-government employee exchange: one, that the revolving door is a form of corporate political strategy (Hillman and Hitt 1999; Hillman, Zardkoohi, and Bierman 1999), which, if successful, may result in regulatory capture of the state by corporate actors (Dal Bó 2006; Stigler 1971), and another, that it is a simple exchange of expertise between the private and the public sectors (Braun and Raddatz 2010; Che 1995). While a firm's motivation for hiring an individual may be unobservable, due to the implausibility of peeking inside the black box of organizational hiring, examining the individual characteristics of revolving commissioners may illuminate what the firms are obtaining through the revolving door. The individual characteristics of the regulators who get hired away by firms are indicative of what it is that the firms are gaining through the revolving door practice: expertise, connections, both, or neither. Hiring regulators for their expertise exclusively would be consistent with a pure expertise exchange between the public and the private sectors, while hiring based on connectedness only would support the regulatory capture view. By examining the revolving door's antecedents, then, this chapter makes a theoretical contribution to our understanding of the phenomenon as a whole, and the role it may play within corporate political strategy. More broadly, this study contributes to the literature on hiring and employee mobility by separately illuminating the roles of social and human capital in these processes.

In addition, I propose and test a theoretical framework that explains the differential effects of individual expertise and connectedness on the regulators' likelihood of being hired away by various types of private sector firms. In particular, these different firm types include

directly and indirectly regulated firms. In this dissertation, I refer to directly regulated firms as those that exchange employees with the specific regulatory body that has regulatory jurisdiction over their activity. In contrast, law, consulting and lobbying firms do not fall under that same regulatory jurisdiction. While the clients of law, consulting, and lobbying firms may be directly regulated, these three types of firms are not subject to direct oversight themselves, and I refer to them as indirectly regulated.

In my theoretical framework, I differentiate between these various firms on two key dimensions: regulatory burden and public scrutiny. I suggest that the firms high in regulatory burden, including directly regulated firms as well as law and consulting firms, will particularly value the regulatory expertise of their revolver hires (i.e. individuals who participate in the revolving door), who help these firms to manage their complex and economically costly regulatory processes. I further argue that, in contrast to directly regulated and lobbying firms, firms with low public scrutiny of their personnel movement, such as law and consulting firms, will be able to extract more value from the connectedness of their revolver hires, providing these firms with an avenue to influence current regulators to act in favor of their clients. In other words, I suggest that regulatory expertise will predict the likelihood of regulators being hired by directly regulated firms, as well as law and consulting firms, whereas connectedness will predict the likelihood of being hired by law and consulting firms.

In order to study the revolving door and its individual-level antecedents, this chapter draws on a novel database of career histories for commissioners from 17 U.S. Independent Regulatory Commissions (IRCs), from 1887-2000 (Nixon 2005). Methodologically, this database allows for the first examination of the revolving door across various industry sectors, regulatory agencies, as well as across a large timespan. In fact, the revolving door is notably

prevalent among the IRCs—as 12 percent of all regulators take their first job post-tenure in directly regulated firms, 19 percent take jobs in law or consulting firms, and another seven percent exit directly to lobbying firms. Figures 1 and 2 show the prevalence of the exit revolving door across various IRCs, as well as across different time periods.

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Insert Figures 1-2 about here

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In a logistic regression, designed to explore the roles of expertise and connectedness in the government-to-firm revolving door, I find that the regulatory expertise of former regulators increases their likelihood of transitioning to high regulatory burden firms, including directly regulated firms, as well as law and consulting firms. I also find that connectedness significantly increases the likelihood of transitioning to low public scrutiny firms, including law and consulting firms. Thus, my results suggest that firms may use the exit revolving door as a way to obtain regulatory expertise, as well as an avenue to seek influence with the government.

## **THE ROLE OF EXPERTISE AND CONNECTEDNESS IN THE EXIT REVOLVING DOOR**

In general, a job candidate's expertise and connectedness improve her odds of securing private sector employment. Individuals of relatively higher human capital, particularly those that are more knowledgeable, are arguably more likely to be viewed as desired candidates by firms. Importantly, firms place a premium on expertise, as they are able to extract value from hiring experts. Employee mobility increases knowledge transfers to the focal organization, and consequently, its performance, as well (Almeida and Kogut 1999; Argote and Ingram 2000; Song, Almeida, and Wu 2003). In particular, individuals bring knowledge accrued in their previous positions to their new employers (Baty, Evan and Rothermel 1971; Boeker 1997). Inflows of experts to the firm have also been linked to increased creativity and innovation within organizations (Rao and Drazin 2002).

In addition to expertise, the job seekers' social capital plays an important role in the hiring process. The reason for the role of social connectedness in the hiring process is twofold. Firstly, a job seeker's social capital may provide easier access to a job (Fernandez, Castilla, and Moore 2000; Granovetter 1973). Secondly, firms may also view the social capital of their job candidates as an important job qualification and may therefore be more likely to hire well-connected candidates (Erickson 2001). As with expertise, employees' social capital brings benefits to the hiring firm. Incoming hires may bring their client relationships with them upon joining a new firm (Broschak 2004; Somaya, Williamson, and Lorinkova 2008; Wezel, Cattani, and Pennings 2006). Furthermore, new hires may use their social ties in order to access their former employer's reservoirs of knowledge, thereby increasing knowledge transfers to their new employer. In other words, former regulators may use their brokerage positions (Burt 1992), spanning the regulatory commissions and private sector firms, in order to obtain information and influence within the commissions for the benefit of their new employers. A new hire's ties may also increase her new employer's influence in the industry (Dokko and Rosenkopf 2010).

However, while the value of new hires' expertise and connectedness has been well-documented in the private sector in general, there is less clarity when it comes to the government-to-firm revolving door hires. In particular, we lack the crucial understanding of the relative values of expertise and connectedness in revolving door formation. Lester et al. (2008) found that the joint measure of former government officials' human and social capital significantly increased the likelihood of them becoming board directors to private companies subsequently. However, that particular study does not disentangle the effects of expertise and connectedness on the private sector employment of former regulators. In order to understand what it is that private sector employers are gaining through the revolving door—whether

expertise, connections, both or neither—it is critical to theorize and model the relative values of expertise and connectedness separately. Here, I develop separate theoretical arguments for expertise and connectedness. Moreover, unlike Lester et al. (2008), this chapter provides an empirical test of these arguments in the context of firm employment, rather than board memberships.

My theoretical framework proposes two main dimensions along which firms may differ in terms of their need for regulatory expertise, as well as their ability to take advantage of connectedness. In short, I suggest that firms that have high regulatory burdens will be more likely to hire regulators for their regulatory expertise. On the other hand, I suggest that firms that have low public scrutiny will be well positioned to use their new revolving hires' connectedness, and will therefore be more likely to hire for it. Figure 3 summarizes my theoretical predictions, and I elaborate on them below.

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Insert Figure 3 about here

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### **Regulatory Burden**

Regulatory burden is the first firm dimension, which may affect a firm's likelihood of hiring former regulators for their expertise. I refer to regulatory burden as the difficulties and costs that the regulatory process imposes on regulated firms. Directly regulated firms (i.e. those that are under the direct regulatory jurisdiction of the 17 IRCs in my data) are heavily involved in the regulatory process. They have to abide by the rules and regulations administered by the IRCs. Moreover, directly regulated firms often rely on regulatory approval for their actions, and may be monitored for transgressions against the regulatory codes. Law and consulting firms may do the same—however, their participation in the regulatory process is typically done on behalf of their clients, which may include directly regulated firms. Thus, firms with high regulatory

burdens—including directly regulated firms, as well as law and consulting firms, may have great needs for regulatory expertise. For both directly regulated firms, as well as law and consulting firms, having employees with significant regulatory expertise may make the regulatory process easier to navigate, as well as less costly. Anecdotally, firms extol the value of expertise that former commissioners bring with them. For example, a press release following the hire of a former FEC Commissioner by a political data-mining company emphasized the importance of “[the former commissioner’s] successful management of complex legislative, budgetary and compliance initiatives” (PR Newswire 2010). As such, I suggest that the firms with a high regulatory burden will be likely to hire former regulators for their expertise. In other words, I suggest the following:

*Hypothesis 1: **Expertise** of individual regulators will increase their likelihood of post-tenure employment in a high regulatory burden firm.*

When it comes to lobbying firms, I argue that these firms are low on the regulatory burden dimension. Namely, lobbying firms do not participate in regulatory affairs to the same extent as directly regulated firms, as well as law and consulting firms. They tend to engage with policy makers on larger issues, rather than the minutiae of the regulatory efforts of their clients. As such, they are not grouped with the high regulatory burden firms in the analysis.

### **Public Scrutiny**

The second key dimension I propose is public scrutiny. Here, public scrutiny refers to the extent to which the revolving door may receive attention (and consequently, disapproval) from the general public, as well as from the regulatory body itself. The general public often perceives the firm-government revolving door to be highly problematic due to its potential to skew regulatory outcomes through the capture of regulators by their former or future employers (Dal

Bó 2006; Stigler 1971). This is particularly the case for the movement of regulators to and from directly regulated firms, as well as lobbying firms. The interests of the regulated industry and those that may lobby on its behalf are often considered to be orthogonal to those of the regulatory agencies. As a result of this perception of revolving door's impropriety by the public, U.S. regulatory bodies have had legal limitations imposed on the movement of personnel to and from regulated industry and lobbying (White House 2009). Due to the high amount of scrutiny they face, I suggest that directly regulated and lobbying firms may encounter difficulties in their potential attempts to influence regulation through revolving door hires. In particular, any attempts to hire regulators will be monitored by the regulatory commissions themselves, as well as by the general public. As such, it may be difficult to obtain any benefits from the connectedness of their new revolver hires. I therefore suggest that, due to their high public and regulatory scrutiny, directly regulated and lobbying firms will be likely to outsource their influence attempts to law and consulting firms. These firms do not undergo the same amount of scrutiny, and may be able to successfully hire, and extract benefits from the connectedness of their hires in order to exercise influence on current commissioners. Thus, I suggest that individuals higher in connectedness will be seen as more attractive candidates by law and consulting firms, for their potential ability to help with influence-seeking on behalf of these firms' clients. Put differently, I predict the following:

*Hypothesis 2: **Connectedness** of individual regulators will increase their likelihood of post-tenure employment in a low public scrutiny firm.*

## **EMPIRICAL CONTEXT**

A number of U.S. Independent Regulatory Commissions, those included in the IRC database (Nixon 2005), provide the empirical context for this chapter. Despite their constitutional



status as part of the executive branch of the U.S. government, IRCs are designed to create and enforce regulation that is free of political influence. IRCs “exercise control over commerce and business necessary to the orderly conduct of the Nation’s economic life” (The President’s Committee on Administrative Management 1937: 36). As for the IRCs’ mandate, these commissions “have been given broad powers to explore, formulate, and administer policies of regulation; they have been given the task of investigating and prosecuting business misconduct; they have been given powers, similar to those exercised by courts of law, to pass in concrete cases upon the rights and liabilities of individuals under the statutes” (The President’s Committee on Administrative Management 1937: 36). Each independent regulatory commission is set up to deal with a specific sector, such as railroad transportation, banking or radio.

Moreover, each commission consists of a small number (typically around five) of presidentially-nominated, Senate-confirmed experts. IRCs are designed to promote bipartisanship, and as such, numbers of Republican and Democratic members are generally balanced on commissions. Additionally, each commission has a hierarchical structure: it is presided over by a Chair (either elected by commissioners or nominated by the President of the United States) and has supporting staff.

The criteria for including specific IRCs in the IRC database are multifold. Selected commissions engage in important decision-making. Additionally, they were chosen to present variation in terms of commission characteristics (Nixon 2000). In particular, selected commissions show variation in founding dates (ranging from 1887 to 1977), size, amounts of institutional change experienced, partisan membership restrictions, agency clientele, as well as policy arenas (Nixon 2000).

The IRCs included in this study are: Civil Aeronautics Board (CAB) (1938-1984<sup>2</sup>), Consumer Product Safety Commission (CPSC) (1972-2000), Equal Employment Opportunity Commission (EEOC) (1965-2000), Federal Communications Commission (FCC) (1934-2000) and its predecessor Federal Radio Commission (FRC) (1926-1934), Federal Election Commission (FEC) (1975-2000), Federal Energy Regulatory Commission (FERC) (1977-2000) and its predecessor Federal Power Commission (FPC) (1930-1977), Board of Governors of the Federal Reserve (BGF) (1935-2000) and its predecessor, Federal Reserve Board (FED) (1913-1935), Federal Trade Commission (FTC) (1914-2000), Interstate Commerce Commission (ICC) (1887-1995), National Labor Relations Board (NLRB) (1935-2000), National Transportation Safety Board (NTSB) (1967-2000), Nuclear Regulatory Commission (NRC) (1974-2000) and its predecessor Atomic Energy Commission (AEC) (1946-1974), and Securities and Exchange Commission (SEC) (1934-2000). These commissions regulate private activity in a range of fields, including labor (NLRB, EEOC), election financing (FEC), transportation by rail, truck, pipeline, ship or airplane (CAB, ICC, NTSB), credit, banking (FED/BGF), securities on and off exchanges (SEC), trade practices (FTC) and consumer safety (CPSC), communications such as radio, television, telegraph, and telephone (FCC/FRC), as well the development, sale and distribution of electric and nuclear power (FERC/FPC, NRC/AEC) (The Commission on Organization of the Executive Branch of the Government 1949). Table 1 shows the structure of the data by commission.

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Insert Table 1 about here

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<sup>2</sup> The years in parentheses denote the period of observation for each commission. For each commission, the period of observation starts with the commission's founding, and ends either with the commission's dissolution, or the year 2000, whichever comes sooner.

## DATA AND METHODS

The IRC database is the primary source of data for this chapter. In addition to the data collected and entered by Nixon (2005), I used the primary sources attached to the database, as well as the webpages of various commissions, in order to create additional variables (such as chairmanship or educational variables), as well as to fill in missing data, where possible. The IRC database contains information on each individual who served as a commissioner of any of the 17 Independent Regulatory Commissions (including AEC, BGF, CAB, CPSC, EEOC, FCC, FEC, FERC, FED, FPC, FRC, FTC, ICC, NLRB, NTSB, NRC, and SEC) from the commission's founding to either year 2000, or the commission's dissolution. For commissions that were dissolved before 2000, including the AEC, FED, FPC, and FRC, their successor commissions are included in the data. To be included in the database, a commissioner has to have been appointed before December 31, 2000<sup>3</sup>. For each individual commissioner, the IRC database provides the following:

1) Career history, including four positions held before the regulatory position, and four held after. Each of these positions is assigned a numerical code for the type of employment activity. Employment activity types include: direct employment by regulated industry, indirect employment by regulated industry (such as consulting or legal representation<sup>4</sup>), public interest employment, commission staff, other federal agency staff, state agency staff, congressional staff, academia/think tank, unrelated private sector, unrelated public sector, state elective office, federal elective office, appointive state commissioner/agency head, appointive federal

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<sup>3</sup> The original database makes an exception to this rule by also including 12 individuals who were nominated in 2001, and began serving after the cut-off date. I retain them in my analysis.

<sup>4</sup> I refine this category by recoding it into law/consulting and lobbying firms. To identify lobbying firms (as opposed to law firms), I use the list of registered lobbying firms maintained by Open Secrets.

commissioner/agency head, state judicial, federal judicial, farmer, related military service, related public sector, and ambassadorial and international commission.

2) Biographical information, including date of birth, sex, race, universities attended<sup>5</sup>, highest educational degree attained, state of residence and political party affiliation.

3) Regulatory appointment circumstances, including dates of appointment, exit circumstances (such as death in office, resignation, expiration of term, not confirmed by Senate, transfer to a new seat, impeachment, or seat abolishment), chairmanship<sup>6</sup>, whether the appointment was a holdover from the previous term (i.e. whether a regulator had to fill his spot until a replacement has been found, after his or her expiration date), recess appointment (i.e. whether the President granted an appointment while Congress was in recess).

Using data on career histories, appointments, as well as personal characteristics of the 755 regulators from 17 Independent Regulatory Commissions, I examine what characteristics make regulators more likely to enter the private sector upon leaving their regulatory positions. In addition to the IRC database, in supplemental analyses, I also use historical data on the regulatory environment (Federal Register 2015), as well as the political ideologies of Congress (Ornstein, Mann, Malbin, and Rugg 2013; Poole and Rosenthal 2015). In addition, I used Compustat to collect firm revenues to calculate the Herfindahl-Hirschman Index, a measure of industry concentration, for regulated industries in my sample. Finally, I also employed the regulatory agencies' categorization scheme used by Dudley and Warren (2003).

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<sup>5</sup> Data on the educational background of regulators were included in the supplementary files provided to me by David Nixon, the author of the IRC database. I coded and entered the data for use in this project.

<sup>6</sup> The original IRC database did not include data on chairmanships. I collected that variable manually, relying on IRC websites.

## **Dependent Variables**

The dependent variables in the main analysis reflect the first job held upon a commissioner's exit from an IRC. In order to test Hypothesis 1, I use a 0/1 dummy for the *regulatory burden* of the commissioner's first employer post-tenure. The first job post-tenure in this classification may be with a high regulatory burden firm (1), such as a directly regulated firm, as well as a law or consulting firm, or it may be with any other employer (0), including various other private and public sector employment.

In order to test Hypothesis 2, I use a 0/1 dummy for the *public scrutiny* of the commissioner's first employer post-tenure. In particular, this variable takes the value of 1, if the commissioner transitioned to a low public scrutiny firm, such as a law or consulting firm. For any other type of employment, including others in the public and private sectors, the variable takes the value of 0.

## **Independent Variables**

I operationalize regulatory expertise as the duration of the commissioner's *IRC tenure* (in years). Connectedness is operationalized as the number of commissioners (remaining in office at the time of the focal commissioner's departure) with whom a focal commissioner has a tie. A tie is defined as having served together on a commission for a period longer than a year<sup>7</sup>.

## **Control Variables**

For each commissioner, I also include a number of control variables. In particular, I include controls for the commissioners' sex, race (1 if white, 0 if non-white), age (at the time of departure from the regulatory commission), a 0/1 dummy for DC-area residence (1 if residence

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<sup>7</sup> As some commissioners in the IRC database have tenures overlapping with others not captured in the database (due to the fact that their tenure began after the data collection cutoff in 2000), for the calculation of this variable, I collected additional data on all commissioners who have ever served on the 17 commissions to the present date (through September 2014).

in Washington, DC, Virginia or Maryland, 0 otherwise), party affiliation (1 if Republican, 0 otherwise), whether the commissioner held the chairmanship of the commission during her regulatory tenure (1 if the commissioner held the chairmanship during her regulatory tenure, and 0 otherwise), as well as whether she resigned her regulatory appointment early (1 if the appointment was left before its expiration, and 0 otherwise). In addition, to control for any time effects related to the time of departure from the commission, I include the commissioner's departure year from the IRC. Moreover, I also control for educational and professional expertise. Educational expertise is operationalized as the highest degree of education attained by the individual. This variable ranges from 1 (high school degree) to 4 (PhD or equivalent doctoral degree). In addition, I include a 0/1 dummy for the individual holding a law degree. Professional expertise is operationalized as a 0/1 dummy for the commissioner having relevant private sector experience (in the four jobs held prior to regulatory tenure), defined as having had previous work experience in the directly regulated industry, law/consulting, and lobbying. Finally, regulatory expertise serves as a control in the models testing the public scrutiny hypothesis (H2), and connectedness serves as a control in the models testing the regulatory burden hypothesis (H1).

## **Analysis**

At the end of her regulatory tenure, an individual commissioner faces a choice for future professional activity that ranges between no employment and various types of private and public sector jobs. I adopt a logistic regression to reflect the competition between different employment alternatives, viewed in terms of the employers' regulatory burden and public scrutiny.

Observations are on the level of the individual, with commission fixed effects.

Descriptive statistics are presented in Table 2. Individuals who died during their regulatory tenure were dropped from the analysis, as they were not able to participate in the job

market post-tenure. I also drop individuals who did not pursue further employment options (i.e. those who retired after their tenure). Moreover, 14 individuals had missing data and were also dropped from the analysis. Further, some variables also had missing values on a few observations, resulting in a total sample, which includes 585 commissioners who served from 1887-2012.

The logistic model specification is:

$$\log \frac{p(Y=1)}{1-p(Y=1)} = \alpha_i + X\beta,$$

where  $\alpha_i$  represents the IRC fixed effect, X represents independent and control variables, and  $\beta$  stands for regression coefficients.

## RESULTS

Models testing Hypotheses 1 and 2 are presented in Table 3. In Table 3, Model 1 refers to the baseline specification of the logit regression testing Hypothesis 1, including the control variables: age, race, sex, political affiliation, chairmanship, Washington DC-area residence dummy, an early resignation dummy, departure year, educational and professional expertise, a law degree dummy, and connectedness. Similarly, Model 3 is the baseline specification of the logit regression testing Hypothesis 2, including the same set of controls (while replacing connectedness with regulatory expertise). Thus, Model 2 additionally includes regulatory expertise as the independent variable, whereas Model 4 adds connectedness. Due to the small size of the dataset, I report coefficients significant at  $p < 0.1$ , as well.

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Insert Table 3 about here

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### Control Variables' Effects

In Table 3, Model 1 reports the effects of control variables for the likelihood of a regulator pursuing employment in a high regulatory burden firm. Being white ( $p < 0.05$ ), and

having directly regulated firm experience ( $p < 0.001$ ), as well as law/consulting experience ( $p < 0.001$ ), all significantly increase the likelihood of high regulatory burden firm employment. On the other hand, having a law degree significantly decreases the likelihood of post-tenure employment in a high regulatory burden firm ( $p < 0.05$ ). Connectedness also significantly increases the likelihood of high regulatory burden firm employment, although this relationship becomes only marginally significant at  $p < 0.1$  in Model 2.

Model 3 in Table 3 shows the effects of control variables on the likelihood of post-tenure employment in a low public scrutiny firm. Having had resigned before the end of term decreases the likelihood of employment in a low public scrutiny firm ( $p < 0.01$ ), as do (historically) more recent years of departure from a commission ( $p < 0.01$ ). Educational expertise ( $p < 0.05$ ), directly regulated firm experience ( $p < 0.05$ ), as well as law/consulting firm experience ( $p < 0.001$ ), all increase the likelihood of low public scrutiny employment. Interestingly, regulatory expertise does not have a significant relationship with the likelihood of low public scrutiny employment post-tenure.

### **Effects of Expertise and Connectedness on Private Sector Employment**

Model 2 tests Hypothesis 1, while Model 4 tests Hypothesis 2, in order to assess whether the likelihood of former regulators' private sector employment post-tenure varies by the regulatory burden and public scrutiny of the hiring firms.

Regulatory expertise, as operationalized by the regulators' tenure, significantly increases the likelihood of post-tenure employment in a high regulatory burden firm ( $p < 0.05$ ). This finding lends support to Hypothesis 1. For firms with high regulatory burdens, then, the regulatory expertise of former regulators makes them more attractive as new hires.



Connectedness of regulators also seems to play a role in the hiring process. In fact, connectedness significantly ( $p < 0.05$ ) increases the likelihood of transitioning to law or consulting employment, supporting Hypothesis 2. In other words, former regulators' connectedness to other remaining regulators plays a role in transitioning to law and consulting firms, which I suggest bear low public scrutiny when they engage in the revolving door.

### **Robustness Checks**

Next, I run several tests to confirm the robustness of my main results. Descriptive statistics for the variables included in robustness checks, as well as in supplementary analysis, are available in Table A1 in the Appendix.

#### *Commission Operationalization*

Firstly, I check that the operationalization of commissions themselves does not affect my results. While in my main analysis, I treat each of the 17 IRCs in the data as separate entities, here I group successor commissions (NRC, BGF, FERC, and FCC) with their predecessors (AEC, FED, FPC and FRC, respectively), resulting in a total of 13 IRCs. This different IRC grouping does not affect my main results, as can be seen in Table 4. However, using this commission operationalization, connectedness also becomes a significant predictor of transitions to high regulatory burden firms ( $p < 0.05$ ).

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Insert Table 4 about here

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#### *Connectedness Operationalization*

The other factor I consider is the operationalization of connectedness. In my main analysis, I operationalize connectedness as the number of remaining commissioners, with whom a focal commissioner has served on the focal IRC for at least a year. I require individuals to serve together at least for a year, in order to consider them as close ties, which may be used in

post-commission life as a potential source of first-hand information and influence. The reasoning here is that relationships between coworkers take some time to develop, and to become close enough for individuals to be willing to exchange favors. In Table 5, I use different lengths of time for the operationalization of commissioner overlap, including 30, 90, 180 and 1095 days. I also include the results using the original operationalization of 365 days from Model 4 for comparison.

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Insert Table 5 about here

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The results from Models 4b-4e show some differences to my main model, Model 4. In particular, the effect of connectedness operationalized as overlap of at least 30, 90 and 1095 days is not significant, albeit still positive. As an explanation of this discrepancy, I suggest that serving together for a period less than 180 days does not necessarily build the kind of strong tie required for a commissioner to be open to attempts at influence by a former colleague. On the other hand, individuals who have served with a revolving commissioner for at least three years (or 1095 days) are likely to be outgoing in the near term, which would make them less valuable as a source of influence. As such, it appears that the length of the co-working relationship matters for the potential value of connectedness.

#### *Multiple Imputation*

As a robustness check, I also ran a multiple imputation of the missing data using the mi impute option in Stata. Table 6 shows the results of Models 3 and 4 run on the imputed data, and the results are identical to those in the main analysis (run on the non-imputed sample). As such, I conclude that data missingness does not bias my results either.

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Insert Table 6 about here

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## **Supplemental Analysis**

In this section, I seek to illuminate the government-to-firm revolving door further by examining some contingencies. Here I examine the factors, which may moderate the influence that regulatory expertise and connectedness may have on post-tenure employment. First, in Table 7, I consider how the effect of regulatory expertise on the likelihood of high regulatory burden employment differs by the regulatory intensity of the government, the type of commission, as well as by the ideology of the present government, the commissioner herself, as well as of that of the IRC's founding Congress. Second, in Table 8 I focus on the factors that may moderate the effect of connectedness on the likelihood of low public scrutiny employment, such as regulated industry competition, as well as the ideologies of the present government, the commissioner, and the IRC's founding Congress.

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Insert Tables 7-8 about here

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### **The Relationship between Regulatory Expertise and High Regulatory Burden Employment**

#### *Regulatory Intensity*

Table 7 shows the subsample analysis that explores the relationship between regulatory expertise and high regulatory burden firm employment. First I consider the moderating effect of regulatory intensity on this relationship. In times of high regulatory intensity, regulatory burdens may be even higher for directly regulated firms, as well as for law and consulting firms. Additionally, when regulatory intensity decreases, regulatory expertise may become less necessary for firms.

I use a common operationalization of regulatory intensity: the number of pages of the Federal Register, a compilation of all rules and regulations promulgated by the U.S. federal government in a given year (Federal Register 2015). I use these data to classify regulatory

intensity as decreasing (when the change in the number of pages of the Federal Register, relative to the previous year, is negative), and increasing (when the change is positive, compared to the previous year's edition of the Federal Register). Model 3b in Table 7 presents the results for the subsample where regulatory intensity decreased relative to the previous year, and Model 3c presents the results of the subsample where regulatory intensity increased relative to the previous year.

The results run counter to my prediction. In the subsample where regulatory intensity decreased (Model 3b), regulatory expertise has a positive and significant effect ( $p < 0.05$ ) on the likelihood of transitioning to a firm with a high regulatory burden. On the other hand, in the subsample where regulatory intensity increased (Model 3c), regulatory expertise does not have a significant effect on the likelihood of transitioning to a high regulatory burden firm. This finding suggests that in the years when relatively fewer regulations are being promulgated in general, the expertise of former regulators may be a sufficient qualification for employment in a high regulatory burden firm. However, when regulatory intensity increases, the content of rules and regulations affecting regulated firms may also be changing, which would render the regulatory expertise of former commissioners no longer helpful in navigating the high regulatory burdens of these firms.

#### *Commission Type*

Here I consider whether regulatory expertise acquired by being on a specific type of commission differentially influences the likelihood of post-tenure employment. Specifically, I consider two commission characteristics that may moderate this relationship. Firstly, in models 3d and 3e, I subsample commissions based on whether they regulate single industries, or are cross-sectoral. Regulatory expertise acquired in a commission with a narrower jurisdiction may

be more useful to prospective employers who have a high regulatory burden. Individuals who serve on commissions such as the CPSC or the FTC, which regulate across sectors, may not possess as deep a knowledge of the rules and regulations affecting a specific prospective employer's activity. The empirical results support this idea of differential usefulness of regulatory expertise: in the subsample of single sector IRCs, regulatory expertise is a significant ( $p < 0.05$ ) and positive predictor of transitioning to a high regulatory burden firm, while the coefficient becomes insignificant in the subsample of cross-sectoral IRCs.

Secondly, in models 3f and 3g, I consider whether the type of regulation promulgated by the commission moderates the effect of regulatory expertise. Following Dudley and Warren (2003), here I use the categorization of commissions into those that primarily produce either social or economic regulation. Economic regulation may be more technical, and less subject to interpretation by individual regulators than social regulation. As such, firms with a high regulatory burden may find the regulatory expertise of commissioners coming from economic regulatory bodies particularly useful. This is, in fact, what I find: in the subsample of economic regulatory commissions, the regulatory expertise of commissioners significantly ( $p < 0.05$ ) increases the likelihood of transitioning to high regulatory burden firms, and the effect loses its significance in the subsample of social regulatory commissions.

### *Ideology*

Finally, I also examine how ideology may moderate the effect of regulatory expertise. I consider three distinct effects of ideology. First, I conduct an analysis of the moderating effect of the Senate's prevailing ideology at the time of a commissioner's departure from the IRC. Second, I consider the moderating effect of a commissioner's personal politics. Third, I investigate the moderating effect of Senate ideology at the time of a commission's founding.

I first subsample by the control of the U.S. Senate in the departure year of the commissioner. As the prevailing ideology of Congress may affect the regulatory environment, making it more (in the case of Democrats) or less pro-regulation (in the case of Republicans), it might also affect the usefulness of regulatory expertise. I therefore suggest that regulatory expertise would be particularly important when Congress is more Democratic in its political leaning.

In Table 7, Model 3h is run on the Democratic Senate subsample at the time of the commissioner's departure, and Model 3i is run on the Republican Senate subsample at the time of departure. I use Poole and Rosenthal's (2015) NOMINATE scores, based on roll call voting patterns, to classify the Senate as Democratic or Republican in a particular year. Here I find that, when the Senate is Republican-leaning in its voting at the time of a commissioner's exit, regulatory expertise is positively related to the likelihood of post-tenure employment in a high regulatory burden firm ( $p < 0.001$ ). On the other hand, when Senate is more liberal, expertise has a non-significant negative coefficient. One potential explanation for these findings may be that, because Democrats may promulgate more complex and burdensome regulation, any existing regulatory expertise of former commissioners may be rendered obsolete by new rules and regulation. This would also be consistent with the findings from Models 3b and 3c, which suggest that regulatory expertise does not have a significant effect on the likelihood of a high regulatory burden job, when regulatory intensity increases.

Next, I run a subsample analysis that separates commissioners by their personal politics. In Table 7, Model 3j is run on the subsample of Democratic commissioners, and Model 3k is run on the subsample of Republican commissioners. Employers may perceive the qualities of individuals with different personal politics in different ways. Democratic commissioners may be

perceived as being pro-regulation, and as such, they may also be assumed to have particularly deep knowledge of the regulatory process. I do, in fact, find that for Democratic commissioners, regulatory expertise is a positive and significant predictor of transitioning to high regulatory burden firms ( $p < 0.05$ ), but the same is true for Republican commissioners, albeit to a lower significance level ( $p < 0.1$ ). In other words, there are no notable differences between the two subsamples in terms of the importance of regulatory expertise—it matters for both Republican and Democratic commissioners. This would suggest that perceptions of regulatory expertise may not be affected by the personal ideology of the commissioners.

Lastly, I consider the possibility that a commission may be imprinted with the ideological values of the Congress that created it, and that this imprinting may affect revolving door formation. Organizational theory recognizes that an organization's early post-founding period is a crucial one, when organizations may be imprinted by the external environment in which they were created (Stinchcombe 1965). Table 7 presents Models 3l and 3m, which are run on two subsamples of IRCs: commissions founded by a Democratic Congress, and those founded by a Republican Congress. Most commissions in the IRC database are founded by a Democratic Congress, which is consistent with the widely-held idea of the Democratic party being more pro-regulation than the Republican party. Only several IRCs were founded by a Republican Congress, including the FRC, the FPC, and the ICC. At the time of their founding, these three commissions may have been imbued with the values of the Republican Party that created it. In particular, Democratic-imprinted commissions may promulgate more regulations of higher complexity. This would render regulatory expertise of former commissioners from these commissions particularly necessary for firms in their jurisdiction, who need to navigate their high regulatory burdens. My findings, indeed, support this idea: regulatory expertise is

significant and positive in the subsample of Democratic-imprinted IRCs, and has no significant effect in the subsample containing Republican-imprinted IRCs.

### **The Relationship between Connectedness and Low Public Scrutiny Employment**

In this section, I turn to examining how industry concentration, as well as the three types of ideology (that of Congress at the time of a commissioner's departure, the commissioner's own personal ideology, and that of Congress at IRC's founding) affect the relationship between connectedness and low public scrutiny firm employment.

#### *Industry Concentration*

First, I look at the moderating role of industry concentration. Industries that are more concentrated generally have lower levels of competition, as market power is held by several large companies, rather than shared among many smaller ones (Shughart 2008). I suggest that the connectedness of former commissioners may be highly valued by their employers in highly concentrated industries, as a way to obtain influence over the regulatory process. The impact of the regulatory process may be particularly strongly felt by the companies in highly concentrated industries, due to their large size. As such, connectedness may play a particularly important role in concentrated industries.

In order to obtain the measure of industry concentration by IRC, I first determine what industries each IRC regulates. Then, using firm revenue data from Compustat, I calculate the Hershfindhal-Hirschman index (HHI) for all the firms in the industry regulated by a specific IRC. For those IRCs, which regulate several specific industries, I calculate the HHI for the IRC as an average of the HHI for the industries it regulates. Finally, for those IRCs that are truly cross-sectoral in that they could regulate any sector of the economy with regard to a specific jurisdictional issue (such as, for example, labor), I do not calculate an HHI. In the subsample



analysis, I divide IRCs into those that regulate highly concentrated industries ( $HHI \geq 1800$ ) and all others ( $HHI < 1800$ ).

Connectedness does, in fact, have a large and significant effect ( $p < 0.05$ ) on the likelihood of transitioning to low public scrutiny firms in the high industry concentration subsample. It has a non-significant negative effect in the other subsample. This finding suggests that connectedness of former commissioners might be an especially important trait in a new hire, when the regulated industry is dominated by a few market-dominating companies.

### *Ideology*

As in the subsample analysis of the effects of regulatory expertise, here I also consider how the ideologies of Congress (both in the year of a commissioner's departure from the IRC, as well as at the time of a commission's founding), and the personal ideology of the commissioner herself, may moderate the effect of connectedness. Each of the variables is operationalized in the same way as described in the previous section above.

First, I consider how the politics of Congress at the time of a commissioner's departure may moderate the relationship between connectedness and transitioning to a low public scrutiny firm. Connectedness may become more important when Congress is dominated by Republicans, who may create a less intense regulatory environment. In such a regulatory environment, the level of scrutiny for the revolving door participants may be lower, too. As such, connectedness may become a more useful (and less monitored against) tool to obtain influence through. I do in fact find that in the subsample where the Senate leans more Republican, connectedness is significant ( $p < 0.01$ ) and positive as a predictor of transitions to low public scrutiny firms. The same is not true for the subsample where the Senate is more liberal.

I also investigate whether the personal politics of the commissioners make them more likely to be hired for their connectedness by the low public scrutiny firms. As suggested before, commissioners may be perceived differently according to their politics. Republican commissioners may be assumed to be pro-business, and as such, they may be considered more open to using their connectedness with former colleagues to influence the regulatory process on behalf of their new employers. Consistent with that idea, I find that in the subsample of Republican commissioners, connectedness does have a positive and significant ( $p < 0.05$ ) effect on the likelihood of transition to low public scrutiny firms. There is no significant effect for connectedness in the subsample containing Democratic commissioners.

Finally, I consider the moderating impact of the potential imprinting by the Congress that created each commission. Here I suggest that Republican-imprinted commissions may be imbued with pro-business values at their founding. This may make the commissioners who serve on these commissions potentially more receptive to being influenced by their former colleagues to shift regulatory outcomes in favor of the regulated industry. Empirically, however, I find that in the subsample of commissions founded by a Democratic Congress, connectedness has a significantly positive effect on being hired by low public scrutiny firms, while the same is not true for Republican-imprinted commissions. A potential explanation for this may be that, due to its potential for shifting regulatory outcomes, connectedness may play a more important role when the IRC is imbued with pro-regulation values of the Democrats that founded it.

Overall, this subsample analysis reveals variation in the effects of connectedness and regulatory expertise by a number of important factors, including regulatory environment, ideology and regulated industry concentration. This variation is significant, in that it deepens our understanding of the mechanisms of the revolving door. In general, the results support the idea

that regulatory expertise is linked to the hiring firms' need to respond to costly regulatory demands, whereas connectedness is related to the firms' opportunities for influencing current regulators.

## **DISCUSSION**

Accounts of the revolving door between firms and the government often emphasize the possibility of regulatory capture through the mobility of employees between sectors. In a regulatory capture scenario, a firm may hire an individual due to her ability to contribute to better regulatory outcomes for the firm. This perspective stands sharply in contrast to the exchange of employees between sectors as a form of learning, or exchanging expertise. In this chapter, I focused on establishing the relative importance of expertise and connectedness as drivers of private sector employment for former regulators. By theorizing and empirically modeling the roles of expertise and connectedness separately, I am able to answer the question of what it is that firms obtain through this type of revolving door. In other words, do firms hire former regulators in order to access their regulatory expertise or their connections? My analysis thus helps us distinguish between two scenarios: revolving door as expertise exchange, and revolving door as influence seeking. I find evidence for both scenarios, in that a revolver's regulatory expertise increases the likelihood of high regulatory burden firm employment, whereas her connectedness to remaining regulators increases the likelihood of low public scrutiny firm employment.

Importantly, the effects of expertise and connectedness are sizeable. Holding all other variables constant at their means, increasing IRC tenure from 1 (minimum) to 34 years (maximum) would result in an increase of 49 percent in the predicted probability of high regulatory burden firm employment. Moreover, increasing the number of connected regulators

from 1 to 10 results in a 30 percent increase of predicted probability of low public scrutiny firm employment. Clearly, expertise and connectedness both have significant effects on the likelihood of securing distinct types of lucrative private sector employment for former regulators.

This study makes a threefold contribution to the revolving door literature. First, it taps into the (previously unmeasured) motivation for firms to participate in the exit revolving door, by studying its antecedents. Through understanding what it is that firms gain through this type of employee mobility, we begin to understand the phenomenon as a whole, and the place it holds in the corporate political strategy repertoire. Second, this chapter provides a new theoretical framework to explain the variation in the antecedents of the revolving doors across different types of firms. Rather than considering all types of firms together, I differentiate between firms according to their regulatory burden and public scrutiny, allowing for a more nuanced view of the revolving door phenomenon. Third, this chapter uses a large archival dataset, which allows an unprecedented look at the revolving door across time, sectors and agencies. Thus, the contributions made by this study are theoretical, as well as empirical.

It is also worth noting that regulatory expertise and connectedness, as defined in this study, are exogenous. That is, individuals have little control over their tenure and the other remaining commissioners' career paths. Given the potential for being replaced by incoming presidential administrations, commissioners may not have the ability to influence the length of their tenure. Furthermore, commissioners certainly do not have the ability to influence the tenure of other colleagues, with whom they may be competing for prestigious corporate jobs. Moreover, revolving commissioners are just as unable to influence which of their colleagues might remain in place after they transition to a corporate position. As such, I argue that the act of hiring provides a clean picture of the firms' motivations in revolving door formation. Future studies

may, however, attempt a different look at the data by matching regulators who are similar on other dimensions, excluding expertise and connectedness. Such a project would have to use a larger database of revolving regulators in order for the matching procedure to work, but it may be able to establish causality more firmly by seeing which individuals get hired when firms are confronted with a choice of regulators who are similar in all other respects.

Another point deserves additional clarification. Previous professional experience in the private sector contributes to the likelihood of returning to the private sector. However, that does not mean that commissioners revolve in circles, from firms to regulatory positions, and back to the same firms. Raw archival data from this study confirms that regulators do not necessarily go back to the same employer after their IRC tenures. Moreover, in the case of low scrutiny law and consulting firms, both experiences in law/consulting and in directly regulated firms increase the likelihood of employment. While these two facts support the idea of non-specific private sector experience being considered valuable in the hiring process, further research may be better able to establish the significance of prior professional experience through interviews with firms and regulators alike.

Another fruitful question for future research may be: how does hierarchy affect revolving door formation? More specifically, are individuals who are elected chairmen more likely to participate in the revolving door between firms and their regulators? The results of this study do not suggest any significant differences for the likelihood of chairmen being recruited away by the private sector. In fact, though the coefficients on chairmanship do not reach significance, they are all negative. It may be that the IRC chair positions do not hold particular advantage—after all, about 40 percent of the sample holds the position at one point in their tenure. It could also be that the chairs are too prominent and may be better left alone by the corporate employers. This

idea may call for a future study—which could examine whether there are differences in hiring patterns according to the levels of organizational hierarchy. For example, all IRCs have staff members, who are far more numerous and arguably more involved in the day-to-day regulatory process than the commissioners are. IRC staff also may have important connections to each other, as well as to IRC commissioners. As such, future work might include these individuals in the data, in order to examine how different the hiring patterns may be for staff compared to commissioners.

Interestingly, I also find that the year of departure has a significant negative effect on the exits to law and consulting firms. The significance of the time trend suggests that the low scrutiny firms hiring regulators may be responding to the changes in their regulatory environment. For example, to the extent that the firm-regulator revolving door is used as a type of corporate political strategy, we might expect to see more hiring from the public sector by these firms in response to expanding regulatory activity. Moreover, the scrutiny surrounding revolving doors may also be increasing with time, due to expanded awareness of the phenomenon by the general public and the media. Future research may look into the time trend in more detail, to establish whether it is tied to regulatory shocks, such as introduction of new legislation, or increased media and general public attention.

What are the implications of this study for firms, as well as for regulatory bodies? Regulatory bodies, and the public sector in general, compete with firms for employees. Firms hiring individuals with professional expertise away from regulatory bodies may result in commissions being staffed by professional public servants only, potentially over time leading to less effective regulation by those without previous work experience in the sector. On the other hand, it has also been suggested that the prospect of subsequent lucrative employment is what

attracts high quality regulators to the public sector in the first place, despite meager pay (Che 1995; Salant 1995). Thus, before any policy recommendations can be made regarding the revolving door, a clearer understanding of both directions of the phenomenon must be achieved. Moreover, given the mixed evidence from the studies on the revolving door's consequences, finding positive (Gormley 1979; Grace and Phillips 2008; Haveman, Jia, Shi and Wang 2014; Hillman 2005; Hillman, Zardkoohi, and Bierman 1999), negative (deHaan, Kedia, Koh, and Rajgopal 2011; Quirk 1981) and mixed (Cohen 1986) effects for connected firms, researchers should also devote their efforts to providing a clear answer on how the exchange of employees actually affects regulation. Due to the high importance of the revolving door for firms and regulators alike, future research in the area is direly needed.

In conclusion, in this chapter, I sought to examine the black box of corporate hiring from regulatory agencies. In particular, I focused on the roles of expertise and connectedness in the likelihood of regulators being hired away to the private sector, whether directly or indirectly regulated. Both expertise and connectedness increase the chances of a regulator being hired away by the private sector, but I also find variation across types of firms according to their regulatory burden and public scrutiny. This chapter provides a look at the revolving door phenomenon across 17 regulatory agencies, from 1887-2000, and it represents the first step towards a fuller understanding of revolving door's antecedents. My empirical results point to the need for future research to illuminate the phenomenon further, particularly in terms of its consequences for regulation, and firm outcomes in general.

## TABLES

**Table 1. Structure of Data by Independent Regulatory Commission**

<b>Commission</b>	<b>Regulatory Mandate</b>	<b>Number of Commissioners</b>	<b>Percent</b>	<b>Years</b>
Atomic Energy Commission (AEC)	atomic science and technology	36	4.77	1946-1974
Board of Governors of the Federal Reserve (BGF)	credit and banking	59	7.81	1935-2000
Civil Aeronautics Board (CAB)	airplane transport	45	5.96	1938-1984
Consumer Product Safety Commission (CPSC )	consumer safety	21	2.78	1972-2000
Equal Employment Opportunity Commission (EEOC)	labor	33	4.37	1965-2000
Federal Communications Commission (FCC)	communications such as radio, television, telegraph, and telephone	74	9.8	1934-2000
Federal Election Commission (FEC)	election financing	18	2.38	1975-2000
Federal Reserve Board (FED)	credit and banking	21	2.78	1913-1935
Federal Energy Regulatory Commission (FERC)	electric power	24	3.18	1977-2000
Federal Power Commission (FPC)	electric power	41	5.43	1930-1977
Federal Radio Commission (FRC)	communications such as radio, television, telegraph, and telephone	12	1.59	1926-1934
Federal Trade Commission (FTC)	trade practices	75	9.93	1914-2000
Interstate Commerce Commission (ICC)	rail transport	103	13.64	1887-1995
National Labor Relations Board (NLRB)	labor	54	7.15	1935-2000
Nuclear Regulatory Commission (NRC)	nuclear power	25	3.31	1974-2000
National Transport Safety Board (NTSB)	transportation by rail, truck, pipeline, ship or airplane	31	4.11	1967-2000
Securities and Exchange Comission (SEC)	securities on and off exchanges	83	10.99	1934-2000
Total		755	100	1887-2000



**Table 2. Descriptive Statistics**

<b>Variable</b>	<b>Mean</b>	<b>Std. Dev.</b>	<b>Min</b>	<b>Max</b>	<b>(1)</b>	<b>(2)</b>	<b>(3)</b>	<b>(4)</b>	<b>(5)</b>	<b>(6)</b>	<b>(7)</b>	<b>(8)</b>	<b>(9)</b>	<b>(10)</b>	<b>(11)</b>	<b>(12)</b>	<b>(13)</b>	<b>(14)</b>	<b>(15)</b>	<b>(16)</b>
(1) regulatory burden	0.31	0.46	0	1																
(2) public scrutiny	0.19	0.39	0	1	0.73															
(3) age (years)	53.60	10.52	29.41	87	-0.07	-0.01														
(4) race	0.91	0.29	0	1	0.07	0.05	0.14													
(5) female	0.12	0.33	0	1	-0.03	-0.06	-0.15	-0.16												
(6) Republican	0.48	0.50	0	1	-0.01	0.00	0.03	0.12	0.01											
(7) Chair	0.39	0.49	0	1	-0.01	0.02	0.15	0.06	-0.07	0.06										
(8) DC, VA or MD residence	0.16	0.37	0	1	-0.04	-0.05	-0.12	-0.03	0.08	0.00	0.00									
(9) early resignation	0.48	0.50	0	1	-0.04	-0.11	-0.08	0.00	-0.08	0.03	0.11	-0.08								
(10) departure year	1969.28	24.04	1889	2012	0.00	-0.06	-0.10	-0.23	0.32	0.06	-0.01	0.21	-0.20							
(11) highest degree of education	2.87	0.71	1	4	0.03	0.09	-0.15	-0.10	-0.01	-0.04	0.02	0.05	0.01	0.26						
(12) law degree	0.54	0.50	0	1	0.02	0.08	-0.19	-0.08	-0.05	0.02	0.13	0.03	0.01	0.12	0.20					
(13) dir. regulated firm experience	0.17	0.37	0	1	0.10	-0.02	0.08	0.06	-0.08	-0.03	-0.07	-0.05	-0.02	-0.09	-0.20	-0.22				
(14) law/consulting experience	0.51	0.50	0	1	0.10	0.18	-0.09	-0.09	-0.04	-0.01	0.15	-0.03	0.01	0.00	0.19	0.62	-0.27			
(15) lobbying experience	0.05	0.23	0	1	0.06	0.05	-0.16	-0.19	0.05	-0.05	-0.04	0.05	0.00	0.20	0.07	0.16	-0.02	0.01		
(16) IRC tenure (years)	5.93	5.06	0.20	34.78	0.00	0.03	0.55	0.06	-0.02	-0.02	0.19	-0.01	-0.14	0.04	-0.04	-0.05	-0.02	-0.03	-0.08	
(17) overlap with remaining Commissioners (obs=691)	3.66	1.95	0	10	0.10	0.11	0.20	0.12	-0.16	0.02	0.06	-0.02	0.07	-0.24	-0.03	0.04	0.00	0.02	-0.06	0.23

**Table 3. Results of the Main Logit Analysis**

Variables	DV:	Model 1	Model 2	Model 3	Model 4
		Regulatory burden	Regulatory burden	Public scrutiny	Public scrutiny
Controls	age (low-high)	0.000 (0.01)	-0.014 (0.01)	0.011 (0.01)	0.011 (0.01)
	race (1= white, 0= non-white)	0.827* (0.39)	0.810* (0.39)	0.822+ (0.48)	0.792+ (0.48)
	female (1 if female, 0 otherwise)	-0.068 (0.31)	-0.104 (0.32)	-0.300 (0.39)	-0.208 (0.40)
	Republican (1 if Republican, 0 otherwise)	0.048 (0.19)	0.069 (0.19)	0.158 (0.22)	0.134 (0.22)
	Chair (1 if Chair, 0 otherwise)	-0.098 (0.21)	-0.184 (0.21)	-0.193 (0.24)	-0.177 (0.25)
	DC area residence (1 if DC-area residence, 0 otherwise)	-0.214 (0.26)	-0.236 (0.27)	-0.393 (0.32)	-0.435 (0.33)
	early resignation (1 if resigned early, 0 otherwise)	-0.307 (0.20)	-0.265 (0.20)	-0.786** (0.24)	-0.814*** (0.24)
	departure year (low-high)	0.001 (0.01)	-0.001 (0.01)	-0.016** (0.01)	-0.015* (0.01)
	highest degree of education (1=HS, 2=college, 3=masters, 4=PhD)	0.048 (0.15)	0.045 (0.16)	0.406* (0.19)	0.390* (0.19)
	law degree (1 if law degree holder, 0 otherwise)	-0.529* (0.27)	-0.510+ (0.27)	-0.374 (0.30)	-0.442 (0.31)
	dir. regulated firm experience (1 if any, 0 otherwise)	0.956*** (0.27)	1.017*** (0.28)	0.666* (0.34)	0.661* (0.34)
	law/consulting experience (1 if any, 0 otherwise)	1.006*** (0.27)	1.007*** (0.27)	1.262*** (0.31)	1.296*** (0.31)
	lobbying experience (1 if any, 0 otherwise)	0.432 (0.40)	0.432 (0.40)	0.656 (0.45)	0.717 (0.45)
	<b>Regulatory expertise</b>	IRC tenure (low-high)		0.065* (0.03)	0.045 (0.03)
<b>Connectedness</b>	overlap with remaining Commissioners (low-high)	0.138* (0.07)	0.127+ (0.07)		0.186* (0.09)
	constant	-4.504 (10.65)	-1.157 (10.84)	27.610* (12.04)	24.270+ (12.42)
	N	585	585	585	585
	Pseudo R2	0.09	0.10	0.13	0.14

+ p<0.10, \* p<0.05, \*\* p<0.01, \*\*\* p<0.001

**Table 4. Robustness Check Using Alternative Commission Operationalization**

Variables	DV:	Model 3a	Model 4a	
		Regulatory burden	Public scrutiny	
Controls	age (low-high)	-0.016 (0.01)	0.009 (0.01)	
	race (1= white, 0= non-white)	0.828* (0.39)	0.825+ (0.48)	
	female (1 if female, 0 otherwise)	-0.082 (0.31)	-0.228 (0.40)	
	Republican (1 if Republican, 0 otherwise)	0.055 (0.19)	0.119 (0.22)	
	Chair (1 if Chair, 0 otherwise)	-0.129 (0.20)	-0.177 (0.24)	
	DC area residence (1 if DC-area residence, 0 otherwise)	-0.225 (0.26)	-0.436 (0.32)	
	early resignation (1 if resigned early, 0 otherwise)	-0.278 (0.20)	-0.801*** (0.24)	
	departure year (low-high)	0.002 (0.00)	-0.012* (0.01)	
	highest degree of education (1=HS, 2=college, 3=masters, 4=PhD)	0.059 (0.15)	0.413* (0.19)	
	law degree (1 if law degree holder, 0 otherwise)	-0.574* (0.27)	-0.483 (0.30)	
	dir. regulated firm experience (1 if any, 0 otherwise)	1.077*** (0.27)	0.680* (0.33)	
	law/consulting experience (1 if any, 0 otherwise)	0.998*** (0.27)	1.293*** (0.31)	
	lobbying experience (1 if any, 0 otherwise)	0.512 (0.40)	0.755+ (0.45)	
	<b>Regulatory expertise</b>	IRC tenure (low-high)	0.061* (0.03)	0.041 (0.03)
	<b>Connectedness</b>	overlap with remaining Commissioners (low-high)	0.133* (0.06)	0.195* (0.08)
	constant	-6.585 (9.60)	19.285+ (11.37)	
	N	585	585	
	Pseudo R2	0.09	0.13	
	Fixed effects	13 IRC dummies	13 IRC dummies	

+ p<0.10, \* p<0.05, \*\* p<0.01, \*\*\* p<0.001

**Table 5. Robustness Check Using Alternative Connectedness Operationalization**

		Model 4b	Model 4c	Model 4d	Model 4	Model 4e
Variables	DV:	Public scrutiny				
Controls	age (low-high)	0.011 (0.01)	0.011 (0.01)	0.011 (0.01)	0.011 (0.01)	0.011 (0.01)
	race (1= white, 0= non-white)	0.847+ (0.48)	0.829+ (0.48)	0.826+ (0.48)	0.792+ (0.48)	0.822+ (0.48)
	female (1 if female, 0 otherwise)	-0.241 (0.40)	-0.245 (0.39)	-0.221 (0.40)	-0.208 (0.40)	-0.296 (0.39)
	Republican (1 if Republican, 0 otherwise)	0.162 (0.22)	0.163 (0.22)	0.158 (0.22)	0.134 (0.22)	0.157 (0.22)
	Chair (1 if Chair, 0 otherwise)	-0.173 (0.24)	-0.177 (0.24)	-0.180 (0.24)	-0.177 (0.25)	-0.193 (0.24)
	DC area residence (1 if DC-area residence, 0 otherwise)	-0.417 (0.32)	-0.420 (0.32)	-0.420 (0.32)	-0.435 (0.33)	-0.393 (0.32)
	early resignation (1 if resigned early, 0 otherwise)	-0.811*** (0.24)	-0.807*** (0.24)	-0.806*** (0.24)	-0.814*** (0.24)	-0.785** (0.24)
	departure year (low-high)	-0.015* (0.01)	-0.015* (0.01)	-0.015* (0.01)	-0.015* (0.01)	-0.016** (0.01)
	highest degree of education (1=HS, 2=college, 3=masters, 4=PhD)	0.393* (0.19)	0.394* (0.19)	0.388* (0.19)	0.390* (0.19)	0.406* (0.19)
	law degree (1 if law degree holder, 0 otherwise)	-0.443 (0.31)	-0.442 (0.31)	-0.443 (0.31)	-0.442 (0.31)	-0.377 (0.30)
	dir. regulated firm experience (1 if any, 0 otherwise)	0.647+ (0.33)	0.646+ (0.34)	0.650+ (0.34)	0.661* (0.34)	0.666* (0.34)
	law/consulting experience (1 if any, 0 otherwise)	1.296*** (0.31)	1.296*** (0.31)	1.315*** (0.31)	1.296*** (0.31)	1.261*** (0.31)
	lobbying experience (1 if any, 0 otherwise)	0.735 (0.45)	0.728 (0.45)	0.731 (0.45)	0.717 (0.45)	0.658 (0.45)
<b>Regulatory expertise</b>	IRC tenure (low-high)	0.044 (0.03)	0.043 (0.03)	0.043 (0.03)	0.042 (0.03)	0.045 (0.03)
<b>Connectedness (different operationalizations)</b>	overlap with remaining Commissioners (low-high) (30 days min)	0.144 (0.09)				
	overlap with remaining Commissioners (low-high) (90 days min)		0.126 (0.09)			
	overlap with remaining Commissioners (low-high) (180 days min)			0.152+ (0.08)		
	overlap with remaining Commissioners (low-high) (365 days min)				0.186* (0.09)	
	overlap with remaining Commissioners (low-high) (1095 days min)					0.010 (0.08)
	constant	23.992+ (12.44)	24.247+ (12.41)	24.284* (12.39)	24.270+ (12.42)	27.513* (12.07)
	N	585	585	585	585	585
	Pseudo R2	0.13	0.13	0.13	0.14	0.13

+ p<0.10, \* p<0.05, \*\* p<0.01, \*\*\* p<0.001

**TABLE 6. Main Model Using Imputed Data**

Variables	DV:	Model 3 mi	Model 4 mi
		Regulatory burden	Public scrutiny
Controls	age (low-high)	-0.014 (0.01)	0.011 (0.01)
	race (1= white, 0= non-white)	0.812* (0.39)	0.779 (0.48)
	female (1 if female, 0 otherwise)	-0.100 (0.32)	-0.214 (0.39)
	Republican (1 if Republican, 0 otherwise)	0.097 (0.19)	0.187 (0.22)
	Chair (1 if Chair, 0 otherwise)	-0.185 (0.21)	-0.193 (0.24)
	DC area residence (1 if DC-area residence, 0 otherwise)	-0.181 (0.26)	-0.323 (0.31)
	early resignation (1 if resigned early, 0 otherwise)	-0.291 (0.20)	-0.844** (0.24)
	departure year (low-high)	-0.002 (0.01)	-0.016* (0.01)
	highest degree of education (1=HS, 2=college, 3=masters, 4=PhD)	0.060 (0.15)	0.418* (0.19)
	law degree (1 if law degree holder, 0 otherwise)	-0.532* (0.27)	-0.464 (0.31)
	dir. regulated firm experience (1 if any, 0 otherwise)	1.020*** (0.28)	0.649+ (0.33)
	law/consulting experience (1 if any, 0 otherwise)	1.048*** (0.27)	1.319*** (0.31)
	lobbying experience (1 if any, 0 otherwise)	0.416 (0.40)	0.679 (0.45)
	<b>Regulatory expertise</b>	IRC tenure (low-high)	0.064* (0.03)
<b>Connectedness</b>	overlap with remaining Commissioners (low-high)	0.123+ (0.07)	0.177* (0.09)
	constant	0.562 (10.79)	26.712* (12.37)
	N	593	593

+ p<0.10, \* p<0.05, \*\* p<0.01, \*\*\* p<0.001

**TABLE 7. Supplementary Analysis Examining Hypothesis 1**

		Model 3b	Model 3c	Model 3d	Model 3e	Model 3f	Model 3g	Model 3h	Model 3i	Model 3j	Model 3k	Model 3l	Model 3m	
<b>Variables</b>	<b>DV:</b>	<b>Regulatory burden</b>												
<b>Controls</b>	age (low-high)	-0.017 (0.02)	0.010 (0.02)	-0.021 (0.01)	0.036 (0.03)	-0.026+ (0.01)	0.025 (0.03)	0.008 (0.02)	-0.023 (0.02)	-0.006 (0.02)	-0.029 (0.02)	-0.011 (0.01)	-0.016 (0.03)	
	race (1= white, 0= non-white)	0.752 (0.59)	1.392* (0.57)	1.041* (0.51)	0.381 (0.68)	1.128* (0.54)	0.350 (0.64)	2.060** (0.79)	0.142 (0.50)	1.338** (0.51)	-0.487 (0.86)	0.709+ (0.40)	0.000 (.)	
	female (1 if female, 0 otherwise)	-0.065 (0.49)	-0.308 (0.47)	0.038 (0.38)	-0.169 (0.66)	-0.108 (0.40)	0.132 (0.56)	-0.474 (0.51)	-0.014 (0.44)	-0.246 (0.45)	0.333 (0.51)	-0.010 (0.33)	-2.071 (1.42)	
	Republican (1 if Republican, 0 otherwise)	-0.327 (0.34)	0.005 (0.30)	0.037 (0.22)	0.012 (0.45)	0.181 (0.23)	-0.110 (0.41)	-0.045 (0.32)	0.105 (0.27)	0.000 (.)	0.000 (.)	0.047 (0.21)	0.516 (0.52)	
	Chair (1 if Chair, 0 otherwise)	-0.485 (0.37)	-0.370 (0.33)	-0.170 (0.25)	-0.712 (0.49)	-0.071 (0.25)	-0.636 (0.44)	0.284 (0.35)	-0.455 (0.29)	-0.316 (0.32)	-0.115 (0.32)	-0.418+ (0.24)	1.013+ (0.58)	
	DC area residence (1 if DC-area residence, 0 otherwise)	0.268 (0.41)	-0.737+ (0.42)	-0.193 (0.32)	-0.248 (0.54)	-0.279 (0.35)	0.251 (0.45)	-0.150 (0.42)	-0.288 (0.39)	-0.154 (0.38)	-0.781+ (0.44)	-0.414 (0.29)	0.920 (0.87)	
	early resignation (1 if resigned early, 0 otherwise)	0.077 (0.35)	-0.574+ (0.32)	-0.162 (0.24)	-0.584 (0.43)	-0.135 (0.24)	-0.905+ (0.46)	-0.018 (0.34)	-0.327 (0.29)	-0.601* (0.30)	0.151 (0.33)	-0.270 (0.23)	-0.420 (0.52)	
	departure year (low-high)	-0.007 (0.01)	-0.002 (0.01)	0.008 (0.01)	-0.032** (0.01)	-0.000 (0.02)	-0.011 (0.02)	0.010 (0.01)	-0.006 (0.01)	-0.000 (0.01)	0.001 (0.01)	-0.004 (0.01)	0.008 (0.01)	
	highest degree of education (1=HS, 2=college, 3=masters, 4=PhD)	0.166 (0.29)	0.096 (0.25)	-0.056 (0.18)	0.346 (0.37)	0.031 (0.19)	-0.011 (0.30)	0.171 (0.29)	0.002 (0.21)	0.145 (0.22)	0.076 (0.26)	-0.043 (0.17)	0.189 (0.39)	
	law degree (1 if law degree holder, 0 otherwise)	-0.039 (0.43)	-0.769+ (0.42)	-0.446 (0.31)	-0.318 (0.63)	-0.522 (0.32)	-0.326 (0.58)	-0.870+ (0.49)	-0.165 (0.36)	-0.832* (0.37)	0.129 (0.46)	-0.581* (0.29)	-0.395 (0.87)	
	dir. regulated firm experience (1 if any, 0 otherwise)	0.948* (0.46)	1.114* (0.45)	1.015*** (0.30)	1.445 (0.91)	1.029** (0.34)	0.874 (0.54)	1.410** (0.48)	0.872* (0.38)	1.257** (0.42)	1.067* (0.43)	1.048*** (0.30)	1.127 (0.85)	
	law/consulting experience (1 if any, 0 otherwise)	0.604 (0.45)	1.314** (0.43)	1.092*** (0.30)	0.781 (0.68)	1.341*** (0.32)	0.260 (0.58)	0.772+ (0.47)	1.151** (0.38)	0.820* (0.40)	1.268** (0.40)	1.188*** (0.30)	0.734 (0.89)	
	lobbying experience (1 if any, 0 otherwise)	0.392 (0.57)	0.643 (0.64)	0.434 (0.46)	0.694 (0.96)	0.582 (0.47)	0.067 (0.97)	0.971 (0.70)	-0.019 (0.54)	0.845 (0.54)	0.268 (0.71)	0.371 (0.42)	0.000 (.)	
	<b>Regulatory expertise</b>	IRC tenure (low-high)	0.088* (0.04)	0.065 (0.04)	0.069* (0.03)	0.103 (0.07)	0.066* (0.03)	0.076 (0.06)	-0.054 (0.05)	0.118*** (0.03)	0.095* (0.04)	0.073+ (0.04)	0.072* (0.03)	0.041 (0.06)
	<b>Connectedness</b>	overlap with remaining Commissioners (low-high)	0.150 (0.12)	0.088 (0.13)	0.148* (0.08)	0.587* (0.27)	0.146+ (0.08)	0.030 (0.22)	-0.072 (0.12)	0.249* (0.10)	0.058 (0.10)	0.225+ (0.12)	0.110 (0.10)	0.123 (0.13)
	constant	12.485 (23.99)	-0.501 (20.62)	-17.653 (13.41)	58.404* (23.91)	-1.336 (12.23)	17.628 (32.64)	-24.715 (20.93)	9.401 (15.07)	-3.541 (15.42)	-2.274 (17.30)	6.508 (12.99)	-18.616 (26.64)	
	N	223	279	446	139	425	160	249	316	311	271	483	97	
	Pseudo R2	0.12	0.15	0.12	0.13	0.12	0.11	0.16	0.13	0.14	0.16	0.10	0.19	

+ p<0.10, \* p<0.05, \*\* p<0.01, \*\*\* p<0.001

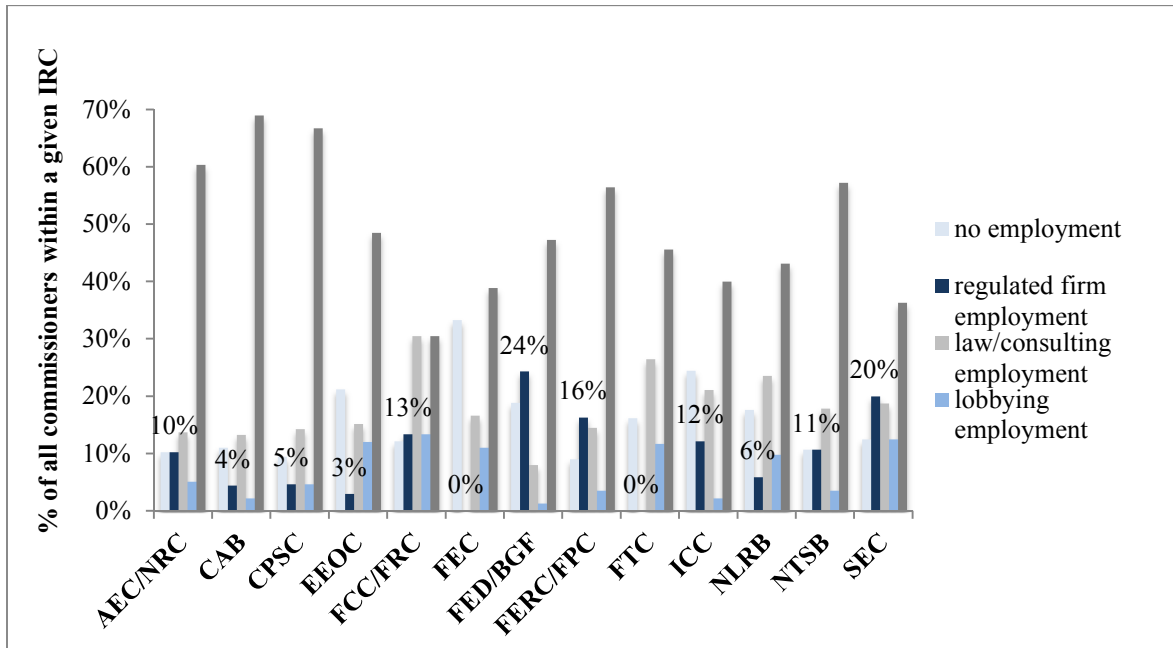
**TABLE 8. Supplementary Analysis Examining Hypothesis 2**

		Model 4f	Model 4g	Model 4h	Model 4i	Model 4j	Model 4k	Model 4l	Model 4m
Variables	DV:	Public scrutiny							
Controls	age (low-high)	0.065*	0.003	0.029	0.007	0.003	0.016	0.015	0.002
		(0.03)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.04)
	race (1= white, 0= non-white)	1.107	1.015+	2.150*	-0.080	0.866	0.074	0.708	0.000
		(1.00)	(0.62)	(0.97)	(0.61)	(0.58)	(1.07)	(0.49)	(.)
	female (1 if female, 0 otherwise)	0.426	-0.592	-0.323	-0.461	-0.259	0.192	-0.054	0.000
		(0.76)	(0.53)	(0.61)	(0.59)	(0.55)	(0.65)	(0.41)	(.)
	Republican (1 if Republican, 0 otherwise)	0.039	0.152	0.186	0.042	0.000	0.000	0.127	-0.168
		(0.48)	(0.27)	(0.38)	(0.32)	(.)	(.)	(0.25)	(0.58)
	Chair (1 if Chair, 0 otherwise)	-0.139	-0.276	0.083	-0.289	0.020	-0.265	-0.328	0.315
		(0.54)	(0.30)	(0.42)	(0.35)	(0.36)	(0.38)	(0.27)	(0.67)
	DC area residence (1 if DC-area residence, 0 otherwise)	0.457	-0.684+	-0.259	-0.530	-0.757	-0.440	-0.497	-1.187
		(0.64)	(0.41)	(0.53)	(0.48)	(0.47)	(0.53)	(0.35)	(1.24)
	early resignation (1 if resigned early, 0 otherwise)	-1.426**	-0.689*	-0.817*	-0.855*	-1.130**	-0.385	-0.784**	-1.221+
		(0.53)	(0.30)	(0.40)	(0.36)	(0.36)	(0.39)	(0.27)	(0.64)
	departure year (low-high)	-0.089*	-0.013+	-0.009	-0.018*	-0.013	-0.021*	-0.019*	0.001
	(0.04)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)	
highest degree of education (1=HS, 2=college, 3=masters, 4=PhD)	1.116*	0.214	0.747*	0.283	0.276	0.581+	0.427+	0.292	
	(0.46)	(0.23)	(0.38)	(0.25)	(0.25)	(0.35)	(0.22)	(0.44)	
law degree (1 if law degree holder, 0 otherwise)	-0.098	-0.843*	-0.450	-0.477	-0.656	-0.260	-0.414	-1.070	
	(0.62)	(0.40)	(0.58)	(0.42)	(0.42)	(0.54)	(0.34)	(0.94)	
dir. regulated firm experience (1 if any, 0 otherwise)	1.271*	0.566	1.013+	0.512	0.577	0.971+	0.759*	0.352	
	(0.62)	(0.45)	(0.59)	(0.47)	(0.48)	(0.54)	(0.37)	(0.95)	
law/consulting experience (1 if any, 0 otherwise)	1.075+	1.897***	1.236*	1.569***	0.982*	1.858***	1.372***	1.604	
	(0.60)	(0.44)	(0.57)	(0.46)	(0.46)	(0.50)	(0.35)	(1.00)	
lobbying experience (1 if any, 0 otherwise)	2.442**	0.262	1.947*	-0.359	0.594	1.383+	0.610	0.000	
	(0.94)	(0.62)	(0.76)	(0.74)	(0.60)	(0.82)	(0.48)	(.)	
<b>Regulatory expertise</b>	IRC tenure (low-high)	-0.026	0.059+	-0.104	0.099**	0.067	0.048	0.039	0.092
		(0.07)	(0.03)	(0.07)	(0.04)	(0.04)	(0.05)	(0.03)	(0.06)
<b>Connectedness</b>	overlap with remaining Commissioners (low-high)	-0.150	0.259*	-0.033	0.341**	0.120	0.372*	0.290*	-0.003
		(0.22)	(0.11)	(0.14)	(0.13)	(0.12)	(0.15)	(0.12)	(0.14)
	constant	165.258*	22.104	10.154	31.001+	21.029	36.702+	30.947*	-5.504
		(68.46)	(14.26)	(23.41)	(17.46)	(17.49)	(20.65)	(14.89)	(30.97)
	N	185	392	249	316	311	259	483	91
	Pseudo R2	0.23	0.16	0.19	0.20	0.13	0.22	0.14	0.20

+ p<0.10, \* p<0.05, \*\* p<0.01, \*\*\* p<0.001

## FIGURES

**Figure 1. IRC Commissioners' First Job Post-Tenure, Across IRCs**



**Figure 2. IRC Commissioners' First Job Post-Tenure, Across Time**

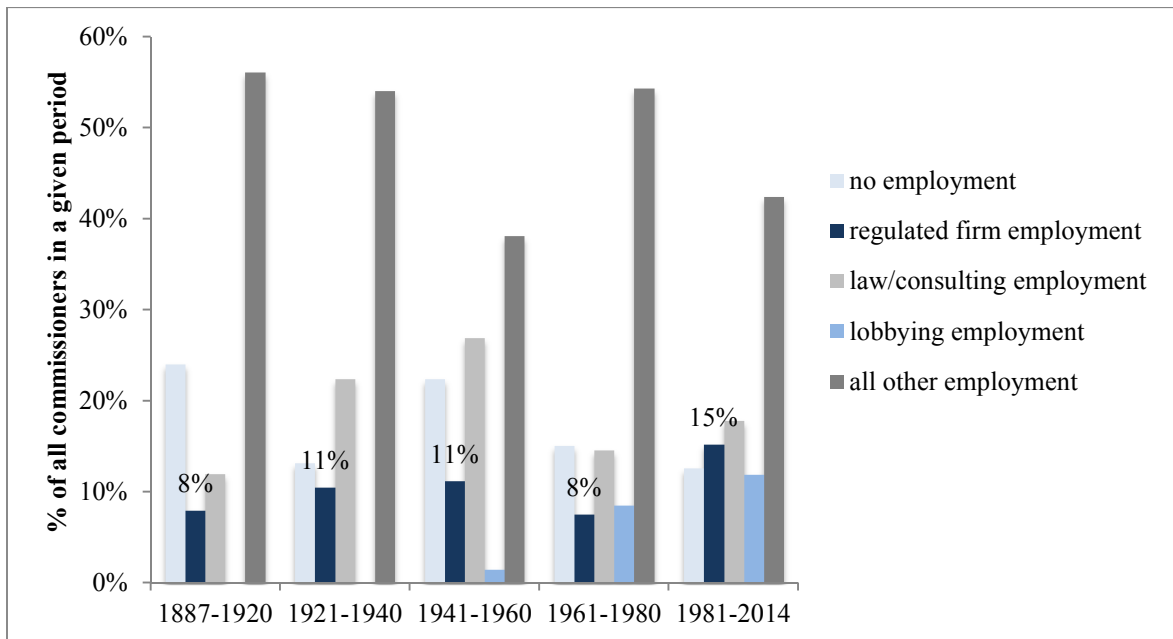
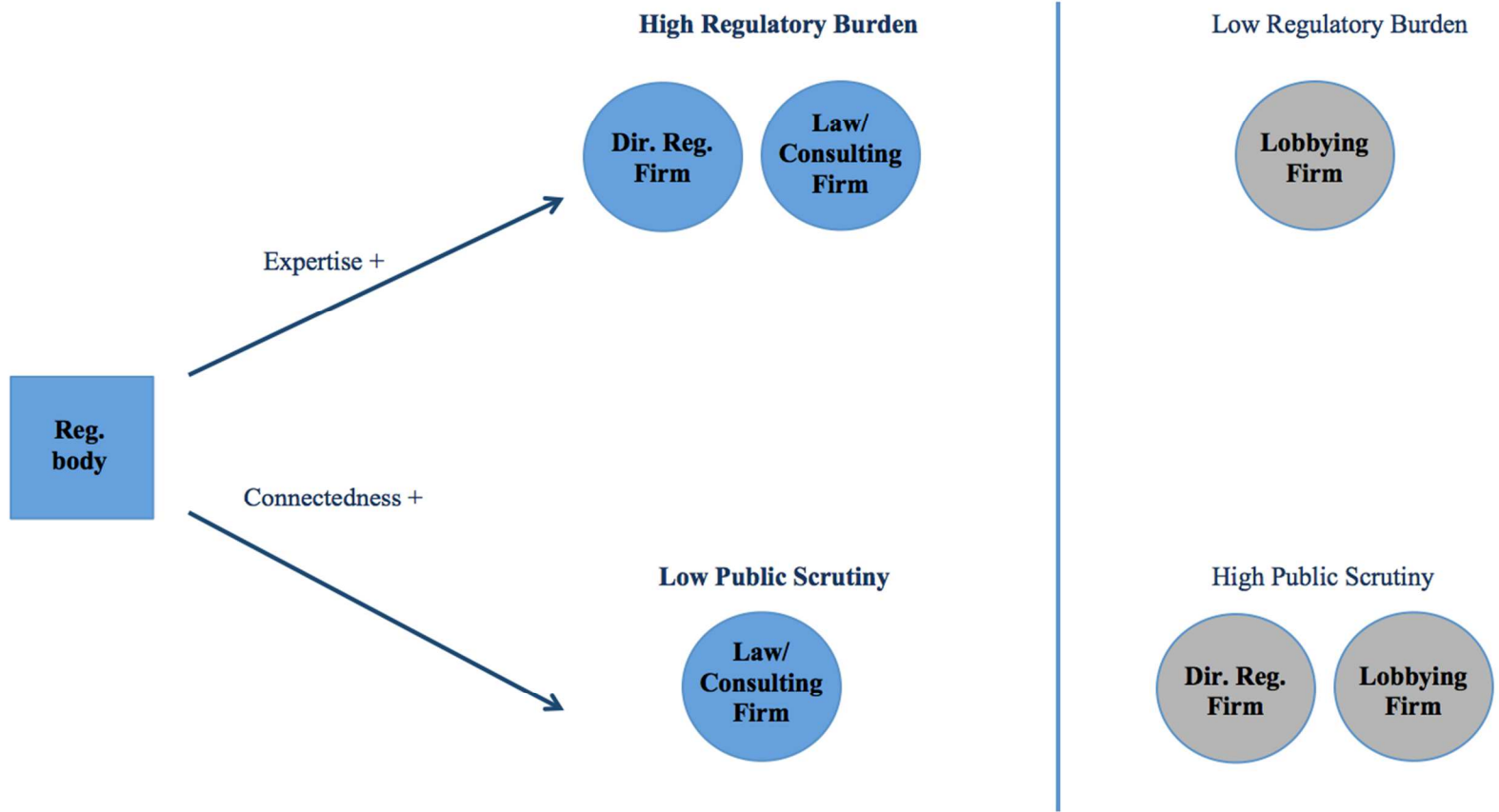




Figure 3. Illustration of the Theoretical Framework

52



APPENDIX.

TABLE A1. Descriptive Statistics (Including Variables from Robustness Checks and Supplementary Analyses)

Variable	Obs	Mean	Std. Dev.	Min	Max	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)		
(1) regulatory burden	703	0.304	0.460	0	1																												
(2) public scrutiny	703	0.189	0.392	0	1	0.68																											
(3) age (years)	699	53.581	10.491	29.41	87	-0.12	-0.01																										
(4) race	703	0.908	0.290	0	1	0.06	0.03	0.10																									
(5) female	703	0.119	0.325	0	1	0.05	0.01	-0.19	-0.09																								
(6) Republican	703	0.477	0.500	0	1	0.00	0.01	0.04	0.17	0.03																							
(7) Chair	703	0.387	0.487	0	1	0.00	0.02	0.16	0.12	-0.10	0.09																						
(8) DC, VA or MD residence	703	0.169	0.375	0	1	-0.03	-0.03	-0.11	-0.04	-0.03	0.01	0.01																					
(9) early resignation	703	0.475	0.500	0	1	-0.04	-0.13	-0.02	-0.02	-0.06	0.07	0.12	-0.07																				
(10) departure year	703	1969.337	24.010	1889	2012	0.09	-0.04	-0.17	-0.17	0.31	0.09	-0.10	0.19	-0.13																			
(11) highest degree of education	696	2.871	0.704	1	4	0.05	0.07	-0.13	-0.09	0.01	-0.07	0.04	0.04	0.04	0.18																		
(12) law degree	697	0.541	0.499	0	1	0.09	0.15	-0.23	-0.05	-0.08	-0.05	0.15	0.02	0.08	-0.06	0.14																	
(13) dir. regulated firm experience	702	0.167	0.373	0	1	0.10	0.01	0.15	0.04	-0.09	-0.03	-0.05	-0.01	-0.04	0.06	-0.17	-0.19																
(14) law/consulting experience	702	0.509	0.500	0	1	0.14	0.20	-0.19	-0.06	-0.06	-0.03	0.19	0.01	0.06	-0.04	0.11	0.62	-0.27															
(15) lobbying experience	702	0.056	0.229	0	1	0.10	0.10	-0.22	-0.21	0.09	-0.09	-0.08	0.08	0.03	0.16	0.03	0.22	-0.04	0.01														
(16) IRC tenure (years)	703	5.907	5.027	0.20	34.78	-0.03	0.02	0.60	0.08	-0.08	-0.04	0.19	-0.05	-0.10	-0.16	-0.10	-0.03	0.05	-0.07	-0.12													
(17) overlap with remaining Commissioners (30 days)	703	4.300	1.957	0	10	0.10	0.09	0.22	0.05	-0.15	-0.04	0.11	-0.09	0.10	-0.38	0.00	0.09	0.00	0.03	-0.03	0.33												
(18) overlap with remaining Commissioners (90 days)	703	4.189	1.979	0	10	0.10	0.10	0.22	0.05	-0.15	-0.05	0.09	-0.09	0.09	-0.36	0.01	0.10	0.00	0.03	-0.04	0.32	0.98											
(19) overlap with remaining Commissioners (180 days)	703	4.021	1.969	0	10	0.11	0.12	0.22	0.05	-0.16	-0.04	0.09	-0.08	0.07	-0.35	0.03	0.10	0.00	0.02	-0.02	0.32	0.95	0.97										
(20) overlap with remaining Commissioners (365 days)	703	3.651	1.941	0	10	0.12	0.13	0.21	0.07	-0.14	-0.01	0.12	-0.07	0.06	-0.32	-0.01	0.13	-0.01	0.04	0.00	0.31	0.91	0.92	0.95									
(21) overlap with remaining Commissioners (1095 days)	703	2.378	1.856	0	9	0.06	0.05	0.17	0.05	-0.11	-0.07	0.14	-0.11	0.03	-0.31	-0.05	0.13	-0.01	0.02	-0.02	0.30	0.79	0.80	0.82	0.84								
(22) regulatory intensity increase	622	0.539	0.499	0	1	0.07	0.12	0.03	-0.03	-0.07	0.02	-0.03	-0.04	0.07	-0.18	-0.02	0.11	-0.13	0.13	0.02	-0.05	0.07	0.08	0.07	0.08	0.01							
(23) cross-sectoral IRC	703	0.246	0.431	0	1																												
(24) social regulatory IRC	703	0.272	0.445	0	1	-0.06	-0.03	0.02	-0.01	-0.02	-0.01	-0.06	0.21	-0.13	0.08	0.09	-0.24	0.09	-0.17	-0.05	-0.14	-0.25	-0.23	-0.22	-0.24	-0.30	-0.03						
(25) Senate political leaning	703	-0.001	0.063	-0.16	0.16	0.08	0.11	0.01	-0.08	0.08	-0.11	-0.04	0.01	-0.15	-0.06	-0.05	-0.13	0.05	-0.11	0.04	0.06	-0.02	-0.03	0.00	-0.05	0.00	-0.18						
(26) Senate control at IRC founding	703	0.186	0.390	0	1	-0.06	-0.03	0.07	0.03	-0.05	0.01	0.16	-0.05	-0.09	-0.15	-0.06	0.14	-0.13	0.11	-0.09	0.21	0.38	0.36	0.34	0.33	0.34	-0.01						
(27) Herfindahl-Hirschman Index (HHI) for IRC (obs=348)	351	1828.696	2146.510	166.97	10000	0.06	0.05	0.02	0.10	-0.10	0.01	0.02	-0.06	0.11	-0.38	-0.18	0.15	-0.04	0.14	-0.01	0.02	0.15	0.15	0.10	0.10	0.11	0.09						

53

N.B. Not all of these variables were used in the same analysis. As can be seen from the correlation matrix, when the sample is limited to the non-missing observations for all the variables, cross-sectoral IRC dummy does not show any variation and the correlation with other variables cannot be calculated.

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## CHAPTER III

### Bringing the Regulatory Commission Back In:

#### Firm-to-Government Employee Mobility as Support-Building and Learning

#### ABSTRACT

Revolving door, a type of employee mobility between firms and their regulators, has generally been viewed as a corporate political strategy. Here I suggest that the firm-to-government revolving door (i.e. the movement of employees from firms to regulatory agencies) may serve the strategic purposes of governmental entities, as well. In particular, I argue that regulatory agencies use hiring from regulated industry to learn from it, as well as to build industry support for regulatory initiatives. I find supportive evidence for this in that the firm-to-government revolving door is more likely to occur in the conditions where learning and support-building through hiring are more important, while it is less likely when these factors are less important. Regulatory agencies are more likely to hire from regulated industry when regulatory staff numbers are low, and they are less likely to hire from it when regulatory workloads are low, and there are regulated-industry hires already on board. Future work is needed to examine directly how successful governmental entities are in using the firm-to-government revolving door for their strategic purposes, as well as how their efforts might affect regulation.

**Keywords:** revolving door, regulatory agency, learning, support-building, regulatory capture

## INTRODUCTION

The interdisciplinary debate surrounding the firm-government revolving door, defined as employee mobility between regulated firms and their regulators, has generally emphasized the potential of this hiring practice to skew regulatory outcomes through the capture of regulators (Cohen 1986; Dal Bó 2006; Stigler 1971). Revolving door has been viewed as a type of corporate political strategy, a form of strategic firm behavior, which attempts to produce more favorable conditions for firms through political means (Hillman 2005; Hillman and Hitt 1999; Hillman, Zardkoohi, and Bierman 1999; Walker and Rea 2014). However, focusing on the regulated firms as the sole driver of the revolving door disregards the agentic role that governments may play in the process. Much like firms, governmental entities also act in self-interested ways (North 1990; Skocpol 1985) and need to actively manage their relationships with various stakeholders (Hiatt and Park 2013).

In attempts to disentangle agentic behavior of firms and governments in the formation of firm-government revolving doors, it is important to consider where the locus of hiring power rests for each of the two directions in employee mobility. For the entry (firm-to-government) revolving door, governmental entities hire former corporate executives from regulated firms, whereas in the case of the exit (government-to-firm) revolving door, corporate decision makers hire former regulators. The different locus of hiring power across the two directions means that, while firms may be able to recruit regulators with a view to furthering favorable outcomes for themselves, they may arguably be less able to place former employees on governmental entities on demand. This is particularly true of high-level political appointees for regulatory positions, which are the subject of this study. These positions require presidential nominations, as well as congressional approval—and presidents typically select individuals who will “sail through the

confirmation process without a minimum of conflict” (Cohen 1985:63). Therefore, interest group attempts to place industry supporters may be curbed by the thorough vetting process of the nominees for regulatory commissioners (Maranto 2005). In this chapter, I argue that governmental entities are in the position to exercise agency over the appointments to regulatory agencies (Graham and Kramer 1976), and that they may participate in the revolving door for their own strategic purposes.

Revolving door provides regulatory agencies with an important mechanism for managing the relationship with one of their key stakeholders, regulated firms. First, despite their coercive power (DiMaggio and Powell 1983), regulatory agencies often operate with limited resources and may rely on regulated firms’ cooperation, particularly with voluntary regulatory efforts (Gupta and Lad 1983; MacLauchlan 1977; McConnell and American Farm Bureau Federation 1953). Moreover, withdrawal of support from the regulated industry may jeopardize an agency’s key resource—legitimacy perceptions of other stakeholders (Carpenter 2004; Hiatt and Park 2013). Regulators with regulated industry experience may therefore allow agencies to engage industry members in support-building for regulatory initiatives. Second, employee mobility increases interorganizational knowledge transfers (Almeida and Kogut 1999; Argote and Ingram 2000; Song, Almeida, and Wu 2003). On the exit side of the revolving door, firms value public policy expertise in their new ex-government hires (Hillman, Cannella, and Paetzold 2000; Lester, Hillman, Zardkoohi, and Cannella 2008). On the entry side of the revolving door, staffing regulatory entities with individuals from the regulated industry may also contribute to an easier flow of information across organizational boundaries. Overall, employee mobility from firms to regulatory agencies may allow governments to create more effective regulation, to monitor

firms' compliance (and punish transgression against regulations), as well as to get industry support for regulation.

In this chapter, I focus on the regulatory agencies' support-building, as well as learning efforts, through hiring regulators with regulated firm experience. Thus, unlike in Chapter II, which focuses on the firms' needs in hiring from regulatory agencies, here I shift to studying the regulatory agencies' hiring patterns from regulated firms. In particular, I examine the conditions under which regulatory agencies are more likely to engage in hiring from regulated firms. First, this allows me to show that the conditions under which governments appoint individuals with previous regulated firm experience to regulatory commissions are consistent with a learning and support-building role of the entry revolving door. Second, this approach solves the empirical problem of the unknown risk set of all firm employees who may possibly be nominated for regulatory positions. Contrary to the full risk set of exit revolvers, utilized in Chapter II, here the available data necessitate an analysis that focuses on the conditions of the transitioning process, rather than on the individuals who transition.

Specifically, I ask: When are regulatory agencies more or less likely to hire individuals from regulated firms? I suggest that a number of conditions are associated with an increased likelihood of hiring from a regulated firm, including agency newness, increased agency workload, and decreased resources. On the other hand, I also suggest that existing regulators with regulated industry backgrounds will decrease the likelihood of additional hires from regulated industry. I test my theoretical propositions using a novel dataset, based on Nixon's (2005) database of 17 U.S. Independent Regulatory Commissions (IRCs), observed from their founding to year 2000 (or the commission's dissolution, in the case of several IRCs in the data). I find that regulatory agencies are indeed more likely to participate in the revolving door when the

importance of support-building and learning from industry is relatively high—namely, when agency resources are low. Conversely, they are less likely to participate in the revolving door when support-building and learning from industry are less urgent: when they already have a regulated industry revolver on board, and when their workloads are low.

The contribution of this chapter is twofold. First, it provides a novel perspective on an important social phenomenon, the revolving door, which is the subject of interest and lively debate by economists (see, for example, Dal Bó (2006)), political scientists (see, for example, Cohen (1986) and Gormley (1979)) and organizational scholars alike (see Etzion and Davis 2008; Haveman, Jia, Shi, and Wang 2014; Hillman, Zardkoohi, and Bierman 1999). By focusing on the other central actor in the revolving door—the government, or more narrowly, the regulatory commission, this study sheds light on the full complexity of the phenomenon. Acknowledging the regulatory commission, and its support-building and learning motives, as another driving force in revolving door participation, importantly supplements the commonly held view of the regulated firms' capture motives as the primary driver of the phenomenon. Second, and even more significantly, this research recognizes the proactive, and often neglected role of the government in firm-government relations. While organizational studies of firms' actions in managing the non-market environment abound (for a review, see Hillman, Keim, and Schuler (2004)), scant attention is paid to the government's attempts to manage corporations, which represent one of its primary stakeholders (Hiatt and Park 2013; Holburn and Vanden Bergh 2002). In an attempt to remedy the relative neglect<sup>8</sup> of public organizations in

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<sup>8</sup> While the state is often included as an actor in organizational theory, Kelman (2007) laments the separation that occurred between public management research and mainstream organization studies in the past decades, and the resulting lack of interest in studying key organizational issues in the context of the public sector.

contemporary organizational theory (Kelman 2007), this chapter invites further scholarly attention to the government's actions in the non-market arena.

## **FIRM-TO-GOVERNMENT EMPLOYEE MOBILITY AS SUPPORT-BUILDING AND LEARNING**

As noted, extant research on revolving door exclusively focuses on the agentic role of the firm. The non-market strategy literature primarily emphasizes the hiring of former regulators and government employees as a corporate political strategy (Cohen 1986). In this scenario, firms offer jobs to these individuals as a form of “covert bribe” (Dal Bó 2006: 214) and in exchange, they may receive more favorable outcomes (Grace and Phillips 2008; Haveman, Jia, Shi, and Wang 2014; Hillman 2005). Additionally, even in the other, firm-to-government direction of the revolving door, it has been argued that firms may try to place their former employees on regulatory bodies in order to ensure more favorable regulation (Cohen 1986; Project on Government Oversight (POGO) 2013). In all these accounts, regulated firms are viewed as the driving force behind the formation of the revolving door, and employee mobility between the public and the private sectors is portrayed as being in the service of the regulated private sector. In order to truly understand the drivers and the consequences of the revolving door, however, it is crucial to also recognize the agentic role of the government in this process. Governmental entities, such as regulatory agencies, may pursue their own interests, rather than act strictly in the interest of the public (North 1990; Skocpol 1985). Prior work has shown that regulatory agencies may try to increase their budgets (Niskanen 1971), as well as their staff numbers (Weatherby 1971). In this chapter, I argue that governmental hiring of regulated firm executives serves a learning and support-building function: through this type of employee mobility, regulatory

agencies may learn how to regulate more effectively, as well as how to manage relationships with the regulated firms in their jurisdiction.

### **The Relationship between Regulators and the Regulated**

Organizational scholars widely acknowledge the existence of a resource dependence relationship between firms and the government (Pfeffer and Salancik 1978). Most studies, however, emphasize the firms' attempts to manage this resource dependence with the government through corporate political strategy, but governments, too, have to actively manage this relationship. Despite the well-documented coercive power that the state has at its disposal (DiMaggio and Powell 1983), much like other organizations, governmental entities depend on their stakeholders for support. In the case of regulatory agencies, some of the key stakeholders include regulated firms, colleges and universities, the media, consumer groups, social movements, and the general public. Regulatory agencies may act in strategic ways to maintain their legitimacy, and to ensure their stakeholders' support (Hiatt and Park 2013).

#### *Support-Building*

Hiring well-connected individuals from a regulated industry is one way to achieve support for regulatory efforts among the key constituents. For example, in his historical account of the Securities and Exchange Commission's founding, McCraw (1984) detailed how the commission hired a former banker to enlist the support of his industry colleagues for major banking regulation. In general, social ties acquired during an individual's career history are an important source of that individual's value to a new employer (Dokko and Rosenkopf 2010; Godart, Shipilov, and Claes 2014; Somaya, Williamson, and Lorinkova 2008). Much like private organizations, governmental entities may rely on their new hires' ties to former corporate employers in order to gain support for their activity.

Despite their ability to apply coercive power, agencies often attempt to develop cooperative relationships with the firms they regulate. Having a cooperative relationship with regulated firms not only allows regulatory agencies to maintain their perceived legitimacy in the eyes of their various stakeholders, but it also allows for an easier regulatory process in the face of limited agency budgets. Regulatory agencies often have limited resources with which to execute their tasks of creating and enforcing anti-trust, economic and social regulation (Hillman, Zardkoohi, and Bierman 1999), and as such, they may rely on firms to self-regulate (Gupta and Lad 1983). For example, despite its legal authority in setting financial reporting standards, the Securities and Exchange Commission (SEC) has historically relied on industry bodies, including the American Institute of Certified Public Accountants and the Financial Accounting Standards Board, to accomplish this task (Gupta and Lad 1983). Similarly, agencies often rely on regulated firms to voluntarily provide them with technical information (MacLauchlan 1977). Regulated industry may even be consulted in the process of policy crafting and implementation, such as in the example of the United States Department of Agriculture reliance on farm organizations to interpret New Deal provisions for agriculture (McConnell and American Farm Bureau Federation. 1953). Given the limited resources with which regulatory agencies have to execute their missions, the support of regulated industry enables a variety of regulatory mechanisms, such as self-regulation, which are crucial to the agencies' functioning more efficiently.

### *Learning*

In addition to ensuring support from regulated firms, as well as their cooperation with various regulatory initiatives, regulatory agencies need to learn how to create and enforce regulation effectively. Reducing information asymmetry between firms and their regulators reduces the cost of regulation (Fremeth and Holburn 2012), and may increase its effectiveness. In



order to reduce the asymmetry, regulatory agencies must acquire knowledge about their regulated industries. Having individuals with regulated industry experience serve on regulatory commissions is one way to acquire the relevant knowledge. Employee mobility is, of course, recognized as an important mechanism in increasing knowledge transfers across organizations (Almeida and Kogut 1997; Argote and Ingram 2000; Song, Almeida, and Wu 2003). Industry professionals bring a wealth of expertise about the industry's inner workings, which is particularly helpful for monitoring against any otherwise concealed wrongdoing (Masters 2012). In the words of Franklin Delano Roosevelt, the former banker Joseph Kennedy was tapped for the SEC because the president thought it best to "set a thief to catch a thief" (Moe 2013:78).

Of course, regulatory agencies have a variety of ways to learn about the regulated industry. However, a number of these learning efforts are external to the organization, in that they require interacting with the regulated industry. In general, knowledge internal to an organization is relatively easy to access and use (Cyert and March 1963), and managers prefer to use readily-available, local knowledge (Neale 1984; Tversky and Kahneman 1973). An internal source of industry knowledge, such as a regulator with previous regulated industry experience, could act as a substitute for other learning mechanisms that are more external in nature. For example, rather than having to rely on extensive meetings with industry representatives to learn about the industry in order to determine how to best implement regulations, an agency could tap its revolver's knowledge of existing industry practices in order to define the most effective regulatory solutions. Moreover, even in the cases where revolvers do not have access to specific requisite industry information, they may be able to reach out to their social networks within the regulated industry in order to locate it. Furthermore, much like with support-building, the importance of learning through hiring may be particularly high when regulatory agency

resources, such as budgets and staff, are limited. Under resource constraints, regulatory agencies' attempts to acquire industry information may have to shift from the costly and time-consuming interactions with the regulated industry in favor of utilizing the revolving regulators' knowledge, which comes at no additional cost beyond the regulators' wages.

Finally, learning by hiring is certainly acknowledged as an important mechanism in the government-to-firm direction of the revolving door. Hillman, Cannella, and Paetzold (2000) argued that former government officials are an important source of intimate knowledge about public policy to their new corporate employers. Empirically, Lester, Hillman, Zardkoohi, and Cannella (2008) found that a joint measure of a former government official's human and social capital is predictive of the likelihood of becoming a corporate board member. Chapter II of this dissertation investigated regulatory commissioners transitioning to the private sector, and found that the former commissioners' regulatory expertise is a significant predictor of the likelihood of getting hired by law and consulting firms. In this chapter, I suggest that learning by hiring may also be at work in the firm-to-government direction of the revolving door. In the next section, I outline my specific hypotheses.

## **Hypotheses**

As argued above, having individuals with prior regulated sector experience on board of regulatory agencies facilitates support-building with the regulated industry, as well as learning from it. The suggested support-building and learning motives may be particularly powerful under a set of organizational conditions, which I identify below.

Firstly, I consider agency newness. In a study of regulatory agencies' life cycles, Bernstein (1955:79) found that in their earliest gestation stage, agencies "lack administrative experience, [their] policy and objectives are vague or unformed, [their] legal powers are unclear

and untested, and [their] relations with Congress are uncertain.” In the early period, regulatory agencies may therefore have low legitimacy with their stakeholders. The lack of legitimacy that organizations experience in their early life may expose them to increased risk of adverse consequences, including failure (Freeman, Carroll, and Hannan 1983). As such, obtaining the support of the regulated industry may be particularly important in order to avoid the “liability of newness” while agencies are in their infancy (Stinchcombe 1965). Moreover, young organizations may have an increased need for learning through hiring. Previous research documented the importance of learning through employee mobility for early stage start-ups (Almeida, Dokko, and Rosenkopf 2003) and other nascent organizations. Thus, in order to address the issues of low legitimacy and lacking industry knowledge, I suggest that, while they are in their early post-founding stages, commissions will be more likely to hire from regulated industry. In other words, I make the following prediction:

*Hypothesis 1: Regulatory agency **newness** will have a positive effect on the likelihood of hiring a regulator with regulated industry experience.*

Secondly, the workload of a regulatory agency may also impact appointment patterns. Although higher workloads generally may increase hiring, hiring decisions in regulatory commissions are subject to more constraints than those in private corporations. In particular, IRCs have fixed numbers of commissioners over time, and so for them, the hiring decision is a question of whom, rather than how many individuals to hire. Moreover, I argue that the reason why we might see increased hiring of individuals with industry experience has to do with learning and industry-support motives.

Increased regulatory activity may meet with resistance from regulated industry, which would render support-building through hiring individuals with regulated industry background

even more important. Further, as regulatory activity increases, internal knowledge about the industry may also become more valuable. For example, following the introduction of new legislation regarding an industry, a regulatory agency has to interpret the new legislation in order to develop rules. An internal source of knowledge, in the form of an ex-industry regulator, may play a very helpful role in the process of determining how best to craft rules. Given that agency workload may impact both the agency's need for industry support, as well as its need for industry-specific knowledge, I predict the following:

*Hypothesis 2: Regulatory agency **workload** will have a positive effect on the likelihood of hiring a regulator with regulated industry experience.*

Thirdly, agency resources may influence both the commissions' needs for industry support, as well as their learning needs. When a commission is allocated a relatively low budget and/or a low staff count, it becomes resource constrained and may not be able to fulfill all its regulatory duties. Rather than being self-reliant in their regulatory efforts, IRCs may have to rely more on regulated industries to volunteer technical information (MacLauchlan 1977), as well as to self-regulate (Gupta and Lad 1983). In other words, the support of industry becomes especially important under resource constraints due to the increased reliance on industry cooperation. Similarly, a low budget and/or staff count may prompt commissions to use learning-by-hiring of regulators with regulated industry experience as a substitute for other kinds of learning through direct, but more costly interactions with the industry. Such interactions may include sending out IRC staff to gather information about regulated firms and their actions, in order to design more effective regulation and monitor against misconduct. In the absence of funds or staff required to launch such external learning initiatives, IRCs will rely on in-house

knowledge possessed by its own commissioners and staff. Having commissioners with previous experience in the regulated industry may be a cost-effective way of learning about the industry.

I therefore make the following hypothesis:

*Hypothesis 3: Regulatory agency **resources** will have a negative effect on the likelihood of hiring a regulator with regulated industry experience.*

Finally, I suggest that the present need for industry knowledge may be influenced by previously acquired industry knowledge. In other words, having regulators with regulated industry experience (i.e. revolvers) on board should reduce the likelihood of hiring more such individuals in the future. I argue that the goal of learning about the regulated industry may be achieved with a single revolver, and that adding more revolvers would provide redundant knowledge, as well as redundant ties to industry. In other words, ex-industry regulators may be considered structural equivalents (Burt 1992), and as such, any additional ex-industry hires may not provide advantages over those afforded by such existing hires. Previous research has shown that knowledge transfers are more likely to occur following the hiring of individuals with non-redundant backgrounds to that of the hiring firm (Corredoira and Rosenkopf 2010). Therefore, it stands to reason that redundant hires would not increase knowledge flows to regulatory agencies.

Studies of employee mobility confirm that redundant hires have diminishing marginal utility. Dokko and Rosenkopf (2010) found that tie redundancy negatively moderated the relationship between hiring new personnel and the firm's social capital. It then stands to reason that increasing ex-industry presence on regulatory agencies' boards would not necessarily expand the reach of the agencies' social capital, and it would therefore not allow agencies further support-building efforts among regulated firms. Even if agencies were able to get additional boosts in their support-building by being connected, via the revolving door, to more than one

regulated firm in the industry, those marginal benefits would have to be weighed against the reputational damage of being perceived as captured by the industry. Namely, having multiple revolvers on a regulatory commission may attract scrutiny and disapproval from other stakeholders, such as the general public, thereby risking damage to organizational legitimacy. As such, I suggest that commissions do not hire multiple revolvers in order to maximize the reach of their support building campaign. In sum, I predict the following:

*Hypothesis 4: **Revolver redundancy** will have a negative effect on the likelihood of hiring an (additional) regulator with regulated industry experience.*

## **EMPIRICAL CONTEXT**

As in Chapter II, 17 U.S. Independent Regulatory Commissions (IRCs) represent the empirical context for this study, including the AEC, BGF, CAB, CPSC, EEOC, FCC, FEC, FED, FERC, FPC, FRC, FTC, ICC, NLRB, NTSB, NRC, and SEC. Further background information on these commissions is available in Chapter II.

Unlike in the previous chapter, which considers firms hiring former regulators, the focus of this study is on the appointments to IRCs. As noted, in order to become commissioners, individuals have to be nominated by the President, and confirmed by Congress—a potentially political process that includes a number of interested parties. In their analysis of the appointment process at the FCC and the FTC, Graham and Kramer (1976: 378) identified the stakeholders in the process as “the regulated industries and their spokesmen, the Congress, the party structure, the chairman of the particular agency, and of course, the President’s advisers.” Generally, individuals interested in agency positions come forward themselves, and may be quite aggressive in campaigning for positions (Cohen 1985; Graham and Kramer 1976; Maranto 2005). A successful candidate’s name usually does not originate from regulated industry, although the

industry may later express support or opposition to a specific candidate (Graham and Kramer 1976). The most crucial actors in the nomination process are Congress, the White House, as well as the agency itself (Graham and Kramer 1976). Presidents often wield influence over the nomination, and Congress members may sponsor individuals for the regulatory posts, as well. Agencies participate in the process through their Chairman, who advocates for the agency's needs.

Controversial nominations are, by and large, avoided. Graham and Kramer (1976) suggest that the appointment of a regulator who is friendly to industry, rather than from the industry, may be a more effective way to achieve industry-favoring regulation. Arguably, if the regulated industry attempted to actively place individuals on board of IRCs, it may be easier to escape detection or lengthy investigations of the potential candidate, by avoiding ex-industry individuals in favor of those that may simply hold pro-industry views on regulation. This would suggest that any instances of the firm-to-government revolving door may, in fact, be driven by government, rather than by industry. Although the influence of other interest groups cannot be ruled out entirely (and needs to be accounted for empirically), governmental entities, including the regulatory agencies themselves, do play a major role in IRC appointments. As such, they are able to pursue these appointments with their own strategic goals in mind, suggesting that the revolving door is not simply a reflection of corporate political strategy.

## **DATA AND METHODS**

The IRC database is used as the primary source of the data here, as well as in Chapter II (Nixon 2005). This database compiles information on each individual who served on 17 U.S. Independent Regulatory Commissions, including AEC, BGF, CAB, CPSC, EEOC, FCC, FEC, FERC, FED, FPC, FRC, FTC, ICC, NLRB, NTSB, NRC, and SEC. The database includes

information on each commissioner’s career history, biographical information, as well as on the circumstances of regulatory appointment. In this chapter, I rely on the information about regulatory appointments. In particular, I use the commissioners’ nomination and departure dates from their regulatory appointments, their career histories, as well as their educational backgrounds. However, the original variables from the IRC database are recoded from the individual commissioner’s level (as they originally appear in the IRC database) to commission level, for the needs of this chapter. These commission-level data cover the period from each commission’s founding to its dissolution, or year 2000, which is the end of data coverage for the IRC database. For commissions that were dissolved before 2000, including the AEC, FED, FPC, and FRC, their successor commissions are included in the data.

Further, I also collected information on major legislative acts and commission rules affecting the 17 IRCs, using the commissions’ websites and their histories. These sources readily identify, and label as such, the key pieces of legislation passed by Congress, as well as the major rules passed by the commissions themselves. Table 1 shows a comprehensive list of legislation and rules compiled due to their importance for the IRCs’ functioning, as well as the years when they were passed.

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Insert Table 1 about here

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In addition, I use several publicly available sources of historical data. Information on national gross domestic product (GDP) growth is included from the U.S. Department of Commerce’s Bureau of Economic Analysis, which compiles and publishes annual GDP statistics (Bureau of Economic Analysis (BEA) 2015). I also include the government share of GDP (Teorell, Charron, Dahlberg, Holmberg, Rothstein, Sundin, and Svensson 2013), as well as budget and staff data for a subset of the IRC-years for which these data are compiled



(Weidenbaum Center et al. 2015). Finally, I use historical data on the political leanings of Congress and (Poole and Rosenthal 2015), as well as on the Presidents' ideology (The White House 2015). Compustat data on firm revenues were also used in the calculation of the Herfindahl-Hirschman Index (HHI) by IRC. Lastly, I used the typology of regulatory agencies from Dudley and Warren (2003).

### **Dependent Variable**

The dependent variable is *directly regulated firm hire*, a 0/1 dummy, where 1 denotes that in a given year, a given commission nominated a commissioner with previous work experience in a directly regulated firm, and 0 otherwise. In the original IRC database (Nixon 2005), which represents the basis of the data used here, an individual is coded as having previous work experience in a directly regulated firm if one (or more) of his four positions held immediately prior to the regulatory position were with a directly regulated firm. For each commission, a directly regulated firm is one whose activity is under the regulatory jurisdiction of the commission.

### **Independent Variables**

In order to operationalize regulatory agency newness (H1), I include a continuous measure of the *IRC age* in years.

In order to test the workload hypothesis (H2), I include *lagged major legislation*, which is a 0/1 dummy variable with the value of 1 when major legislation was passed in the previous year, and 0 otherwise. This variable is lagged to account for the delay in the IRC's implementation of the legislation or rule. The median delay in the promulgation of regulation by regulatory agencies is estimated to be about 12 months (Yackee and Yackee 2012).

In a test of H3, I include a measure of *IRC staff*, operationalized as the yearly count of staff members employed by each IRC. IRC budget (in millions of constant 2009 dollars) is also available as an alternative operationalization of IRC resources. As the two measures are highly correlated, I proceed with the staff count, as it is a theoretically superior measure of IRC resources, specifically in terms of manpower available to each IRC.

For the redundancy hypothesis (H4), I include a measure of previously hired individuals with directly regulated firm experience. More specifically, *lagged revolvers on board* captures the count of individuals with directly regulated firm experience who were on board of an IRC on December 31<sup>st</sup> of the year prior.

### **Control Variables**

In order to control for the technical expertise needs of the regulatory commissions, I include PhD count, which is the number of individuals with Ph.D. degrees nominated for the focal commission in a given year.

Furthermore, controlling for any firm efforts at strategically placing individuals on commissions is very important for the soundness of the analysis. However, accounting for such covert firm behavior is also challenging, as it is “difficult to pinpoint the role of the regulatory industry in the [commissioner] selection process” (Graham and Kramer 1976:378). Here, I employ the count of regulator exits directly to the regulated industry in a given year as a measure of industry attempts at regulatory capture. Namely, regulated firms’ hiring of former regulators may be considered a proxy for corporate political activity through hiring: to the extent that firms are participating in the exit revolving door by hiring former regulators, they may also be actively trying to place individuals on the regulatory commission. Thus, for each commission in a given

year, I include exit to directly regulated firm, as the count of regulators who took their first post-IRC job within the directly regulated industry.

Importantly, in the main analysis, I include IRC and year fixed effects, which preclude the inclusion of variables that vary only by commission or only by year. However, in a subset of the analyses, I drop the year fixed effects, in order to include control variables that vary only by year, and not by IRC. Specifically, I include GDP percent change, government share of GDP, Senate ideological leaning, ideological leaning of the House of Representatives and presidential ideology, which are all measured on the national level for the United States, and would therefore be collinear with the year dummies. GDP percent change represents the annual U.S. economic growth (in percentage). Government share of GDP measures government spending per year, expressed as a function of the total size of the U.S. economy. Congressional ideology variables are variables from the NOMINATE data by Poole and Rosenthal (2015), which have negative values if the Senate or the House average voting pattern was liberal/Democratic, and positive values if the Senate or the House had conservative/Republican voting pattern in a given year. Finally, presidential ideology is captured by the presidency variable (1 if the president is Republican in a given year, 0 otherwise).

### **Analysis**

Given the binary nature of the dependent variable, I adopt a logit model for my main analysis here. Observations are on the level of the IRC-year. To account for the unobserved heterogeneity across IRCs, as well as across time, the model includes IRC and year fixed effects. Descriptive statistics are presented in Table 2.

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Insert Table 2 about here

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The logit model specification is:

$$\log \frac{p(Y=1)}{1-p(Y=1)} = \alpha_i + \alpha_t + X\beta,$$

where  $\alpha_i$  represents the IRC fixed effect,  $\alpha_t$  represents the year fixed effect, X refers to the matrix of independent and control variables, and  $\beta$  is the matrix of regression coefficients. As mentioned, a subset of the analyses drops the year fixed effects.

## RESULTS

Table 3 presents the results of the main analysis. Model 1 includes control variables, as well as IRC and year fixed effects. Model 2 additionally includes three of my four independent variables: newness, workload and revolver redundancy. In the subsequent models, I show the results of Model 2 in two subsamples: before (Model 2a) and after 1970 (Model 2b). Finally, I include the fourth independent variable, IRC resources: operationalized as IRC staff in Model 3, and IRC budget in Model 3b. Including the fourth variable, IRC resources, results in a much smaller number of observations, so I show the results for the first three separately in Models 2/2a/2b, and then Model 3 uses all four independent variables together. Given the small size of the dataset, I report statistically significant findings, as well as those that are marginally significant ( $p < 0.1$ ).

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Insert Table 3 about here

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### Control Variables' Effects

Model 1 in Table 3 reports the effects of control variables on the likelihood of an IRC nominating an individual from the directly regulated industry in a given year. In this particular model, exits to directly regulated industry in the same year are not significantly related to the dependent variable. However, the effect is positive, and reaches significance ( $p < 0.05$  or  $p < 0.1$ ) in a few other models, most notably in Model 8 in Table 5, run on imputed data. In other words,

regulated firms' hiring of former regulators may be related to the regulatory commissions' appointing of former industry executives, suggesting that both the hiring of former regulators and placing former employees on regulatory boards may be examples of corporate political strategy.

Furthermore, the count of nominated Ph.D. holders in a year is positive albeit not significantly associated with the likelihood of hiring a revolver. In other words, I do not find statistical support for the idea that technical expertise (as operationalized by PhD-holding nominees) and professional expertise (as operationalized by the dependent variable, directly regulated firm hires) may act as complements in the nomination process.

### **Independent Variables' Effects**

Model 2 introduces three independent variables: newness, workload and revolver redundancy, testing Hypotheses 1, 2, and 4. IRC age is not significantly associated with the likelihood of hiring an industry revolver, indicating a lack of support for H1.

Next, contrary to H2, I find that major legislation or rule passed in the previous year significantly ( $p < 0.05$ ) decreases the likelihood of hiring an individual from the regulated industry in a given year. However, this surprising finding may be explained by the differential content of these acts. Namely, legislation acts and commission rules do not always increase regulatory burdens on firms. In fact, acts or rules may be deregulatory in nature, such as the Railroad Revitalization and Reform Act in 1976, which started the deregulation of railroad transportation (Peoples 1998). Therefore, in order to better specify the effect of agency workloads, I account for the different regulatory eras by modeling the deregulatory movement, which started in the 1970s in the United States (Crain 2007). I run Model 2 on two subsamples: one before 1970 (Model 2a), and one after (Model 2b). Here I find that major legislative acts or rules have a non-significant (albeit positive) effect before 1970, and a significant ( $p < 0.01$ ) and negative effect

after 1970. In other words, after 1970, when regulatory workloads are decreasing due to deregulation, major acts and rules do have a negative effect on the likelihood of hiring industry revolver, but the same is not true when regulatory workloads are being increased by legislative acts and rules. Viewed this way, these results may offer partial support for Hypothesis 3.

As predicted in H4, revolver redundancy has a significant negative effect on the likelihood of hiring an industry revolver in Model 2. In other words, the count of industry revolver at the close of the previous year significantly ( $p < 0.05$ ) reduces the likelihood of hiring additional revolver in the current year. This finding supports the idea that additional hires from the regulated industry are redundant, and do not bring additional opportunities for the regulatory agency to engage in support-building or learning from industry.

Finally, Model 3 includes the fourth independent variable, IRC resources, operationalized as IRC staff number. Here I find that the greater an IRC's staff is in a given year, the less likely the IRC is to hire an industry revolver, as suggested by H3. This result, however, is significant only at the  $p < 0.1$  level. Furthermore, in the alternative specification of IRC resources as the commission's budget, the coefficient is not significant, albeit negative. This suggests that, when agency staff numbers are constrained, but not when agency budgets are low, hiring individuals with regulated firm experience may become a valuable substitute for external learning and support building initiatives involving the regulated industry.

### **Robustness Checks**

I also conduct a number of different robustness checks for my main analysis. Descriptive statistics for robustness checks and supplementary analyses are available in Table A1 in the Appendix to this chapter. First, I include a variety of national level control variables, while

dropping year fixed effects in order to avoid collinearity. Table 4 presents Model 3 for comparison purposes, along with Model 4, which includes additional controls.

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Insert Table 4 about here

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The new set of control variables includes GDP growth, government share of GDP, Senate and House of Representatives political leaning, as well as presidential ideology. I include these variables as they may influence commissions' hiring patterns. However, I find that none of these additional variables are significant. Thus, these additional controls do not add much information to the main analysis. Moreover, Model 4, including these control variables, has a much worse fit relative to Model 3, which has year fixed effects instead. As such, I proceed with Models 1-3 as my main results.

Second, in Table 5, I show a variety of models, which test the robustness of my main analysis. Again, Model 3 is shown for comparison purposes.

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Insert Table 5 about here

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Model 5 uses a different dependent variable. Instead of using a dummy variable for the IRC hiring an industry revolver, it uses a count of industry revolvers hired by an IRC in a given year. Due to the different dependent variable, I adopt OLS regression as my method of analysis in this model. This approach allows me to check whether model specification affects my results. I find that model specification does not influence the results greatly, although in this specification, I do find support for the effect of IRC age being negatively related to the likelihood of nominating an industry revolver to an IRC. Also, the effect of staff number becomes non-significant in this specification. However, all the results remain directionally the same as in the main models.

Model 6 also uses a different operationalization of the dependent variable. Rather than using an individual's four jobs held before the regulatory appointment, here I use just the first job before regulatory appointment to define *directly regulated firm hires, first order*. Similar to directly regulated firm hire used in the main analysis, this dummy variable has the value of 1 if, in a given year, an IRC hired an individual whose last job before the regulatory appointment was in the regulated industry. In this model, I also use a lagged measure of the first order (lagged) revolver count (instead of the lagged measure of the revolver count of individuals who had held at least one of their four previous jobs in the regulated industry). Here I test the idea that different processes may be driving the hiring of an individual with industry experience in general and the hiring of someone transitioning immediately from the industry. From the perspective of a governmental entity, the goals of industry support-building and learning may be achieved by hiring an individual with industry experience in general. In fact, individuals transitioning straight from industry jobs may be met with controversy by the general public. On the other hand, if a firm were interested in placing an individual on a regulatory body for strategic purposes, it may be easier to incentivize a current employee (relative to a former one) to transition to public service (POGO 2013).

In Model 6, I find that the two types of hires (including those with regulated firm experience, and those coming directly from a regulated firm) may work very similarly. In fact, the effects of the variables that tap into the learning and support-building motivations for hiring (including workload, redundancy, and resources) show the same patterns of significance and direction. This finding further strengthens the idea that hiring of individuals with regulated firm experience is not driven by the firms themselves, somehow placing their former employees into regulatory roles. If that were the case, one might expect to see different patterns for those



transitioning from an industry job immediately before, as they would be potentially easier to incentivize, via accelerated stock option vesting, to participate in such a corporate political strategy (POGO 2013). The lack of differences between the Models 3 and 6, then, supports the idea of this direction of the revolving door being driven by governmental entities.

In Model 7, I restrict my analysis only to the years where at least one nomination actually occurred for the focal IRC. While individuals may hypothetically be nominated in any year (whether because there is a vacancy on the IRC board, or because the President has the power to replace regulators), here I check whether restricting my sample to just the nomination years affects my results. Although all the relevant coefficients for workload, redundancy and resources maintain their direction, I do find that redundancy and resources lose their statistical significance. Given that the results remain directionally the same, I consider that the lack of significance may be due to the large drop in the number of observations, rather than the sample restriction *per se*.

Finally, in order to check that data missingness does not affect my results, I also impute variables with missing observations. I use Stata's *mi impute* routine, which utilizes variables with full observation sets to generate missing values. Model 8 is run on imputed data, raising the number of observations to 560, as some observations are dropped in the analysis. I find a significant and negative effect of lagged major legislation ( $p < 0.05$ ), and a marginally significant negative effect of the lagged count of revolvers on board ( $p < 0.05$ ). However, the effect for IRC staff count becomes non-significant.

Thus, I conclude that the effects of agencies' workload and revolver redundancy find generally robust support across models, while the significance of the effect for the agencies' resources is less robust in some specifications.

## Supplementary Analysis

Next I conduct a supplementary analysis, in which I investigate whether the learning and support-building motives are affected by regulatory commission type, industry concentration and the political ideology of Congress and the President. Similar to the supplementary analysis in Chapter II, here I also compare the effects of independent variables found in different subsamples, in order to improve our understanding of the main effects and the mechanisms driving them. Table 6 below shows the results of the supplementary analysis.

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Insert Table 6 about here

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### *Commission Type*

First, I consider two important commission characteristics: whether the IRC is a single-industry regulator, or a cross-sectoral one, and whether the regulation it creates is primarily economic or social in nature. I suggest that the dependence of an IRC on one of its main stakeholders, the regulated firms, may be greater if those firms are all concentrated in a single industry. That would increase the importance of generating industry support for regulatory initiatives. In fact, what I find in Model 9, conducted on the single-industry IRCs, is that the effects of several of my independent variables, including workload and redundancy, increase both in terms of statistical significance and effect sizes, compared to Model 3. Interestingly, however, the count of IRC staff changes sign and becomes significant and positive, suggesting that commission manpower may be a complement, rather than a substitute for revolver hires, for these single-industry IRCs. Given the low number of observations in the other subsample of the analysis, and the fact that some of the variables are omitted, and most are not significant, I do not discuss the results of Model 10, conducted on the cross-sectoral IRCs.

Next, I consider the type of regulation created by a commission. Here I consider IRCs that produce economic (in Model 11) vs. those that produce social regulation (in Model 12). Economic regulation may arguably be more technical, and may require a deeper knowledge of the regulated industries to craft. As such, I would expect the effects of learning to be stronger in Model 11. The results generally follow that expectation, in that the coefficients on workload and redundancy are both greater in size than in Model 3, and also reach higher significance than those in Model 11, conducted on the social regulatory IRCs. The effect of staff, however, is positive and marginally significant for the economic regulatory IRCs, which may mean that the learning motive is so important for these commissions, that staff simply cannot act as a substitute for revolvers, and both internal and external learning tactics are employed.

#### *Industry Concentration*

As mentioned before, when industry concentration is high, market power is consolidated by a few large firms. As such, high industry concentration may increase the need for building industry support via hiring revolvers. Thus, here I conduct my subsample analysis to see whether the main effects of workload, resources, and redundancy are stronger for IRCs that regulate highly concentrated industries ( $HHI \geq 1800$ , in Model 14) compared to those that regulate less concentrated ones ( $HHI < 1800$ , in Model 13). That is exactly what I find—the coefficients for those three variables in Model 14 are larger and mostly reach greater statistical significance. Interestingly, while the effect of staff numbers is highly significant ( $p < 0.001$ ) and negative in Model 14, it is positive and significant ( $p < 0.05$ ) in Model 13. A possible explanation might lie in the redundancy mechanism. When firms in the regulated industry are less consolidated, it is possible that the redundancy mechanism is not at play. Due to relatively larger number of firms

from which to learn and with whom to network, the redundancy effect may be reversed in order to fulfill those needs through any capacities possible.

### *Congressional and Presidential Ideology*

Finally, I examine whether Congressional and Presidential ideologies moderate the main effects of this study. As Congress and the President may affect the nomination process itself (Graham and Kramer 1976), their political leanings may be expressed through the process. Moreover, the political ideology of Congress and the President may affect the workload and resources assigned to the IRCs, which would in turn affect whom the IRCs wish to hire. In general, when Congress and the President are Republican, we might expect a constriction of government spending, as well as of regulatory activity. The opposite might be true in times of Democratic Congress and Presidency. In other words, the coefficients on major legislation and staff should be more negative when government leans Republican. While I find support for a more negative effect of major legislation when the Senate is more Republican in its voting preferences, and when the President is Republican, I do not find any differences when it comes to the effect of staff across subsamples.

Overall, I do find that commission type, industry concentration and Congressional and Presidential ideologies moderate the effects of workload, redundancy and resources. Generally, when learning and industry support-building become more pressing, the results become statistically stronger and often amplified in their magnitude. Future research should investigate these moderators in greater detail, in order to better understand the mechanisms of the relationship between the IRCs' learning and support-building motives and their participation in the entry revolving door. In particular, further supplementary analysis could be used in order to

separate the two motives, in order to understand when learning from industry becomes more important, compared to support-building, and vice versa.

## **DISCUSSION**

What factors drive the hiring of former regulated industry employees for regulatory commissioners? Here, I suggest that, much like firms use the revolving door for their own corporate political agenda, regulatory agencies use it in order to gain the support of regulated industry, as well as to learn how to regulate effectively. In particular, I investigate the conditions under which 17 U.S. Independent Regulatory Commissions are more or less likely to hire individuals with regulated firm experience, and I find evidence that suggests hiring may represent IRCs' attempts at support-building and learning. Regulatory agencies are less likely to hire regulated industry revolvers when their regulatory workloads are low (although they are not significantly more likely to hire them when the workloads are high), when there are industry revolvers on board already, and when IRC staff counts are low.

Moreover, these effects are of a sizeable magnitude. Having five revolvers on board reduces the likelihood of hiring another one by 12 percent. After 1970, when the deregulatory era begins, the occurrence of major legislative acts or rules decreases the likelihood of hiring a revolver by eleven percent. Finally, increasing the IRC staff from its minimum occurring in the sample (35) to close to its maximum (3000) by one standard deviation decreases the likelihood of hiring a revolver by 21 percent. Thus, revolver redundancy, as well as agency budgets and workloads, importantly affect the regulatory agencies' hiring patterns.

In contrast to the widely assumed role of the revolving door in corporate political strategy, here I shed light on the conditions under which governments may be more or less likely to participate in the revolving door. This chapter supplements our understanding of the revolving

door as a non-market strategy—but one that may serve both types of participants in it: firms, as well as governmental entities. Consequently, I bring governmental entities, such as regulatory agencies, back to center stage. Despite their importance, regulatory agencies are relatively neglected in organizational scholarship (Hiatt and Park 2013). This study seeks to correct some of that oversight, as well as to improve our understanding of the agentic, self-interested role governments may play in the non-market arena, more generally.

While the evidence here is suggestive of the role of the entry revolving door in support-building and learning efforts of the regulatory agencies, this study does not directly show the effect of the revolving door on industry support enjoyed by the agencies, or the industry knowledge accumulated through this type of employee mobility. Future work might gather direct measures of success for the entry revolving door, in terms of strategic outcomes it helps regulatory agencies achieve. One such study could examine the effects of hiring industry revolvers on regulatory speed, quality, or volume, as well as on the relationship between regulatory firms and IRCs. Research in this vein would deepen our understanding of how regulatory agencies may be able to use hiring from regulated industry as their own strategy.

Further, studies may also probe the role of regulated firms in the entry revolving door. It has been previously suggested that regulated firms may try to place their former employees on regulatory commissions, in order to have them advocate for more favorable outcomes for the firms (Cohen 1986; POGO 2013). In my analysis, the variable representing the regulated industry's use of exit revolving doors, arguably a corporate political strategy, has a positive although not consistently significant effect across models. This finding suggests that the role of the firm in the entry revolving door may be limited. Moreover, the commissioner nomination process is a highly political one, with many parties arguably playing a more important role in it

than firms (Graham and Kramer 1976). However, future work may delve into the pre-nomination process, and examine how the odds of securing a nomination are affected by having regulated industry support. Such a study would, of course, require complete rosters of individuals put forward for commissioner positions in the early stages of the pre-nomination process, but would allow us to have a more definitive answer regarding the role of the regulated firms in the entry revolving door.

As I have argued here, revolving door formation is shaped by firms (primarily in the exit direction) and governmental agencies (in the entry direction). Another interesting and important aspect of this employee mobility regards the employees themselves. On the individual level, little is known about the motivations of individuals who participate in the revolving door. While on the exit side of the revolving door, individual regulators may be drawn to the private sector due to the more lucrative pay (Cohen 1986), the entry side of the revolving door is less well explained. Suggestions have been made of possible financial incentives, such as accelerated vesting of firm stock options upon transition to high-level governmental positions, which firms may use to incentivize these transitions. For our complete understanding of the revolving door phenomenon, it is crucial to shed light on how the motivations of the different actors, on different levels of observation, add up to create the phenomenon. As such, future studies might examine whether financial incentives are the reason why individuals transition from the regulated private to the public sector. For example, one could use the introduction of restrictions on revolving doors, particularly those introducing limitations on stock options from the regulated industry. As the regulations surrounding the revolving door tightened over time, it would be interesting to see whether the patterns of hiring changed as a result. Interviews with former

regulators may also be helpful in determining the individual level motivations for participation in the revolving door.

As for the practical implications of this study, my results indicate that governmental agencies may use the hiring of regulated industry professionals as a way to learn and build support with the industry. This finding casts a positive light on the entry direction of the revolving door phenomenon. However, any positive effects need to be balanced with the potential negative consequences. Namely, even putting aside any regulators potentially placed on regulatory commissions by their former employers, revolvers may exhibit a bias towards their former employers due to cognitive capture (Rajan 2010). The fact that individuals may have positive affect and loyalty towards former employers, as well as sympathy for their regulatory issues (Makkai and Braithwaite 1992), may cause differential regulatory outcomes for these specific firms, and may even bias a regulator's stance towards an entire industry. Regulation prohibiting individuals from working on issues related to former employers specifically may alleviate this problem, but the issue of being pro-industry in general may remain. However, much like commissions are designed to be bipartisan, they could also be designed to have a split of individuals with industry experience, career bureaucrats, as well as consumer group representatives. Given that revolving door regulations' provisions are often difficult to monitor and effectively enforce, and prohibiting the revolving door outright might lower the quality of regulators, ensuring that commission design gives voice to multiple interested parties may be a more effective way to safeguard against one interest group prevailing against others on regulatory commissions.

In conclusion, this chapter provides a novel perspective on the revolving door by focusing on the role that this type of employee mobility may serve for governmental entities'



strategic goals. I find that regulatory agencies are more likely to hire individuals from regulated industry in times when learning and support-building with industry are particularly important, such as when their staff numbers are low. Regulatory agencies are less likely to hire these industry revolvers when learning and support-building motives are less prevalent, such as when the regulatory workloads are lower, and when such hires would be redundant. Despite the controversial role of the revolving door, often perceived to be exclusively a corporate political strategy, this exchange of employees may contribute to important governmental goals of learning about regulated industries and maintaining cooperative relationships with them. In the words of a former senator, commenting on the selection of a former broadcaster to the FCC: “I can’t escape the feeling that if I have pneumonia, I want a doctor, and that the person most likely to know something about broadcasting is a broadcaster” (Graham and Kramer 1976:399). While this chapter sheds some light on the agentic role of governmental entities in the revolving doors, it also invites direly needed future inquiry into the phenomenon—and its antecedents and consequences for economies and societies alike.

## TABLES AND FIGURES

**TABLE 1. Major Legislative Acts and Commission Rules**

<b>IRC</b>	<b>Year of enactment</b>	<b>Major legislative act or rule affecting the work of IRC</b>
AEC	1946	McMahon/Atomic Energy Act
AEC	1954	The Atomic Energy Act of 1954
AEC	1969	National Environmental Policy Act of 1969
AEC	1974	Energy Reorganization Act of 1974
BGF	1935	Banking Act of 1935
BGF	1946	Employment Act of 1946
BGF	1951	Federal Reserve-Treasury Department Accord of 1951
BGF	1956	Bank Holding Company Act of 1956
BGF	1977	Federal Reserve Reform Act
BGF	1978	International Banking Act
BGF	1978	Full Employment and Balanced Growth (Humphrey Hawkins) Act
BGF	1980	Depository Institutions Deregulation and Monetary Control Act
BGF	1982	Garn-St Germain Depository Institutions Act of 1982
BGF	1989	Financial Institutions Reform, Recovery and Enforcement Act of 1989
BGF	1991	Federal Deposit Insurance Corporation Improvement Act of 1991
BGF	1994	Riegle-Neal Interstate Banking and Branching Efficiency Act of 1994
BGF	1999	Gramm-Leach-Bliley Act
CAB	1946	Federal Airport Act of 1946
CAB	1958	Federal Aviation Act
CAB	1966	Department of Transport Act of 1966
CAB	1978	Airline Deregulation Act of 1978
CAB	1984	Civil Aeronautics Boards Sunset Act of 1984
CPSC	1970	Poison Prevention Packaging Act
CPSC	1972	Consumer Product Safety Act
CPSC	1972	Refrigerator Safety Act
CPSC	1972	Flammable Fabrics Act
CPSC	1994	Child Safety Protection Act
EEOC	1963	The Equal Pay Act of 1963
EEOC	1964	Title VII of the Civil Rights Act of 1964
EEOC	1967	The Age Discrimination in Employment Act of 1967
EEOC	1973	Sections 501 and 505 of the Rehabilitation Act of 1973
EEOC	1978	The Pregnancy Discrimination Act
EEOC	1990	Title I of the Americans with Disabilities Act of 1990
EEOC	1991	Sections 102 and 103 of the Civil Rights Act of 1991
FCC	1934	Communications Act of 1934
FCC	1941	Chain Broadcasting Regulations
FCC	1984	Cable Communications Policy Act of 1984
FCC	1988	Satellite Home Viewer Act of 1988
FCC	1990	Children's Television Act of 1990
FCC	1992	Cable Television Consumer Protection and Competition Act of 1992
FCC	1996	Communications Decency Act of 1996
FCC	1996	Telecommunications Act of 1996
FEC	1971	Federal Election Campaign Act of 1971
FEC	1974	FECA Amendment
FEC	1976	FECA Amendment
FEC	1979	FECA Amendment
FED	1913	Federal Reserve Act
FED	1927	McFadden Act
FED	1932	Banking Acts of 1932
FED	1933	Glass Steagall Act
FED	1933	Emergency Banking Act
FED	1934	Gold Reserve Act
FED	1935	Banking Act of 1935

**TABLE 1. Major Legislative Acts and Commission Rules (continued)**

<b>IRC</b>	<b>Year of enactment</b>	<b>Major legislative act or rule affecting the work of IRC</b>
FERC	1977	Department of Energy Organization Act in 1977
FERC	1978	Public Utility Regulatory Policies Act
FERC	1978	Powerplant and Industrial Fuel Use Act of 1978
FERC	1978	Natural Gas Policy Act of 1978
FERC	1980	Energy Security Act
FERC	1986	Electric Consumers Protection Act
FERC	1989	Natural Gas Wellhead Decontrol Act of 1989
FERC	1992	Energy Policy Act of 1992
FPC	1920	Federal Water Power Act
FPC	1935	Federal Power Act of 1935
FPC	1936	Rural Electrification Act
FPC	1938	Natural Gas Act
FPC	1946	Atomic Energy Act
FPC	1974	Energy Reorganization Act of 1974
FPC	1975	Energy Policy and Conservation Act
FPC	1977	Department of Energy Organization Act in 1977
FRC	1927	Radio Act of 1927
FRC	1934	Communications Act of 1934
FTC	1914	The Federal Trade Commission Act of 1914
FTC	1914	The Clayton Antitrust Act
FTC	1917	Trading with the Enemy Act
FTC	1918	Webb-Pomerene Act
FTC	1933	Securities Act of 1933
FTC	1936	Robinson-Patman Act
FTC	1938	Wheeler-Lea Act
FTC	1939	Wool Products Labeling Act
FTC	1950	Celler-Kefauver Act
FTC	1951	Fur Products Labeling Act
FTC	1958	Textile Fiber Products Identification Act
FTC	1970	Fair Credit Reporting Act
FTC	1975	1975 Federal Trade Commission Improvement Act
FTC	1976	1976 Hart-Scott-Rodino Act
FTC	1977	Fair Debt Collection Practices Act
FTC	1994	1994 Telemarketing and Consumer Fraud and Abuse Prevention Act
ICC	1887	Interstate Commerce Act
ICC	1903	Elkins Act
ICC	1906	Hepburn Act
ICC	1910	Mann-Elkins Act
ICC	1920	Esch Cummins Act
ICC	1935	Motor Carrier Act of 1935
ICC	1973	Regional Rail Reorganization Act
ICC	1976	Railroad Revitalization and Reform Act
ICC	1980	Motor Carrier Act
ICC	1980	Staggers Act of 1980
ICC	1982	Bus Regulatory Reform of 1982
ICC	1986	Surface Freight Forwarder Deregulation Act of 1986
ICC	1993	The Negotiated Rates Act of 1993
ICC	1994	Trucking Industry Regulatory Reform Act of 1994
ICC	1995	ICC Termination Act of 1995
NLRB	1935	National Labor Relations Act
NLRB	1947	Taft-Hartley Act
NLRB	1959	Landrum Griffin Act
NLRB	1974	Health Care Rule

**TABLE 1. Major Legislative Acts and Commission Rules (continued)**

<b>IRC</b>	<b>Year of enactment</b>	<b>Major legislative act or rule affecting the work of IRC</b>
NRC	1974	Energy Reorganization Act of 1974
NRC	1978	Uranium Mill Tailings Radiation Control Act of 1978
NRC	1978	Nuclear Non-Proliferation Act of 1978
NRC	1982	Nuclear Waste Policy Act of 1982
NRC	1985	Low-Level Radioactive Waste Policy Amendments Act of 1985
NTSB	1926	Air Commerce Act of 1926
NTSB	1974	Independent Safety Board Act of 1974
NTSB	1996	Aviation Disaster Family Assistance Act
SEC	1933	Securities Act of 1933
SEC	1933	Glass Steagall Act
SEC	1934	Securities Exchange Act of 1934
SEC	1935	Public Utility Holding Company Act
SEC	1938	Maloney Act 1938
SEC	1939	Trust Indenture Act of 1939
SEC	1940	Investment Company Act of 1940
SEC	1940	Investment Advisers Act of 1940
SEC	1942	Rule 10b-5
SEC	1951	Arizona Securities Act
SEC	1956	Uniform Securities Act
SEC	1964	Securities Act Amendments
SEC	1970	Securities Investor Protection Act of 1970
SEC	1974	Safe Harbor Rules
SEC	1974	The Employee Retirement Income Security Act
SEC	1975	Securities Acts Amendments
SEC	1976	Sunshine Act
SEC	1977	The Foreign Corrupt Practices Act
SEC	1978	Rule G-15
SEC	1978	Proposition 13
SEC	1982	Regulation D
SEC	1982	Garn-St. Germain Depository Institutions Act
SEC	1982	Futures Trading Act
SEC	1984	The Insider Trading Sanctions Act
SEC	1985	The Revised Uniform Securities Act
SEC	1986	One Share, One Vote Rule
SEC	1986	The Tax Reform Act of 1986
SEC	1988	Rule 19c-4
SEC	1989	Rule 15c2-12
SEC	1990	Market Reform Act
SEC	1990	Regulation S
SEC	1990	Securities Enforcement Remedies and Penny Stock Reform Act of 1990
SEC	1995	Private Securities Litigation Reform Act of 1995
SEC	1996	National Securities Market Improvement Act of 1996
SEC	1996	Rule G-38
SEC	1998	Regulation ATS
SEC	1998	Cracker Barrel Decision
SEC	1999	Gramm-Leach-Bliley Act
SEC	2000	Regulation FD
SEC	2000	Commodity Futures Modernization Act

**TABLE 2. Descriptive Statistics**

<b>Variable</b>	<b>Mean</b>	<b>Std. Dev.</b>	<b>Min</b>	<b>Max</b>	<b>(1)</b>	<b>(2)</b>	<b>(3)</b>	<b>(4)</b>	<b>(5)</b>	<b>(6)</b>	<b>(7)</b>
(1) directly regulated firm hire (0/1)	0.118	0.323	0	1							
(2) exits to directly regulated firm (count)	0.101	0.322	0	2	0.07						
(3) PhD hire (count)	0.146	0.449	0	3	0.07	0.18					
(4) IRC age	38.107	24.746	0	108	-0.08	0.08	-0.05				
(5) major legislation	0.154	0.362	0	1	-0.06	0.01	0.07	0.12			
(6) revolvers on board (count)	0.859	1.028	0	5	0.43	0.11	0.19	0.00	0.05		
(7) IRC budget (millions of constant 2009 \$)	155.649	160.429	0	967	0.04	0.07	0.10	-0.10	0.05	0.13	
(8) IRC staff (count)	1374.887	920.666	35	3498	-0.02	0.05	-0.08	0.11	0.06	-0.08	0.74
(Obs=467)											

**TABLE 3. Main Analysis**

Independent variables	DV: Directly regulated firm hire	Model 1	Model 2	Model 2a	Model 2b	Model 3	Model 3b
Controls	Exit to directly regulated firm	0.562 (0.36)	0.841* (0.40)	1.567* (0.62)	0.767 (0.59)	0.824 (0.57)	0.863 (0.57)
	PhD hire	0.441 (0.29)	0.278 (0.30)	0.982+ (0.56)	-0.212 (0.46)	-0.257 (0.42)	-0.314 (0.42)
Newness	IRC age		-0.373 (0.71)	0.408 (1.21)	-0.589 (0.73)	-0.626 (0.73)	-0.618 (0.74)
Workload	Major legislation (lagged)		-1.008* (0.44)	0.433 (0.72)	-2.261** (0.73)	-1.889** (0.66)	-1.838** (0.66)
Redundancy	Revolvers on board (lagged)		-0.337* (0.16)	-0.640* (0.30)	-0.250 (0.22)	-0.477* (0.21)	-0.464* (0.21)
Resources (1)	IRC staff count					-0.001+ (0.00)	
Resources (2)	IRC budget (2009 constant \$)						-0.003 (0.00)
	Constant	-12.419 (955.04)	19.070 (37.03)	-8.870 (27.21)	17.513 (760.77)	34.454 (37.98)	34.616 (38.26)
	Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
	IRC fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
	N	576	560	218	297	369	369
	Pseudo R2	0.21	0.23	0.27	0.20	0.20	0.20

+ p<0.10, \* p<0.05, \*\* p<0.01, \*\*\* p<0.001

**TABLE 4. Analysis Including Additional Controls**

<b>Independent variables</b>	<b>DV: Directly regulated firm hire</b>	<b>Model 3</b>	<b>Model 4</b>
Controls	Exit to directly regulated firm	0.824 (0.57)	0.500 (0.45)
	PhD hire	-0.257 (0.42)	-0.103 (0.35)
	GDP growth (%)		0.152 (0.10)
	Government share of GDP		0.405 (0.26)
	Senate political leaning		5.098 (6.59)
	House political leaning		-4.516 (6.94)
	Presidential ideology		0.562 (0.49)
Newness	IRC age	-0.626 (0.73)	0.108* (0.05)
Workload	Major legislation (lagged)	-1.889* (0.66)	-1.332* (0.58)
Redundancy	Revolvers on board (lagged)	-0.477* (0.21)	-0.400* (0.19)
Resources	IRC staff count	-0.001+ (0.00)	-0.000 (0.00)
	Constant	34.454 (37.98)	-8.540+ (4.54)
	Year fixed effects	Yes	No
	IRC fixed effects	Yes	Yes
	N	369	437
	Pseudo R2	0.20	0.14

+ p&lt;0.10, \* p&lt;0.05

**TABLE 5. Robustness Checks**

		<b>Model 3</b>	<b>Model 5</b>	<b>Model 6</b>	<b>Model 7</b>	<b>Model 8</b>
<b>Independent variables</b>	<b>DV</b>	Directly regulated firm hire (0/1)	Directly regulated firm hire (count)	Directly regulated firm hire, first order (0/1)	Directly regulated firm hire (0/1)	Directly regulated firm hire (0/1)
Controls	Exit to directly regulated firm	0.824 (0.57)	0.090 (0.07)	-0.342 (1.18)	0.738 (0.63)	0.839* (0.40)
	PhD hire	-0.257 (0.42)	0.009 (0.05)	0.160 (0.96)	-1.343* (0.53)	0.263 (0.31)
Newness	IRC age	-0.626 (0.73)	-0.007* (0.00)	0.914 (1.50)	0.237 (0.85)	-0.379 (0.71)
Workload	Lagged major legislation	-1.889* (0.66)	-0.143* (0.06)	-2.946* (1.40)	-1.846* (0.76)	-1.008* (0.44)
Redundancy	Revolvers on board (lagged)	-0.477* (0.21)	-0.047+ (0.03)		-0.352 (0.26)	-0.337* (0.16)
Redundancy	Revolvers on board, first order (lagged)			-2.115* (0.73)		
Resources	IRC staff	-0.001+ (0.00)	-0.000 (0.00)	-0.003* (0.00)	-0.001 (0.00)	-0.000 (0.00)
	Constant	34.454 (37.98)	0.944* (0.27)	-36.052 (72.96)	-8.611 (43.99)	
	Year fixed effects	Yes	Yes	Yes	Yes	Yes
	IRC fixed effects	Yes (17)	Yes (17)	Yes (17)	Yes (17)	Yes (17)
	Method	logit	OLS	logit	logit	logit, imputed data
	Sample restriction	No	No	No	nomination years	No
	N	369	465	127	221	560
	Pseudo R2/R2	0.20		0.35	0.24	N/A

+ p<0.10, \* p<0.05



**TABLE 6. Supplementary Analysis**

Independent variables	DV: Directly regulated firm hire	Model 9	Model 10	Model 11	Model 12	Model 13	Model 14	Model 15	Model 16	Model 17	Model 18
Controls	Exit to directly regulated firm	1.996** (0.76)	0.000 (.)	1.786+ (0.95)	0.938 (1.38)	4.225** (1.37)	-5.113+ (2.65)	0.163 (0.81)	3.000* (1.40)	4.100* (1.66)	0.384 (0.79)
	PhD hire	-0.652 (0.49)	0.000 (.)	-0.586 (0.57)	2.604* (1.28)	-0.695 (0.70)	0.000 (.)	-0.860 (0.60)	0.388 (0.76)	-1.187 (1.06)	0.169 (0.53)
Newness	IRC age	-0.535 (1.82)	-0.338 (1.10)	0.096 (1.04)	1.452 (1.85)	-2.391 (2.26)	-0.871 (1.02)	-1.530 (1.56)	-0.308 (0.75)	-0.521 (0.88)	0.875 (1.40)
Workload	Lagged major legislation	-2.748** (0.84)	-21.786 (780.96)	-2.488** (0.97)	-3.383+ (1.79)	-3.624** (1.28)	-5.078* (2.07)	-1.933* (0.87)	-4.091* (1.85)	0.522 (1.20)	-3.851** (1.20)
Redundancy	Revolvers on board (lagged)	-0.988** (0.30)	-13.013+ (7.39)	-0.913* (0.38)	-0.672 (0.49)	-1.515** (0.49)	-2.995** (1.07)	-0.924** (0.31)	0.080 (0.47)	-2.642* (1.11)	-0.482+ (0.28)
Resources	IRC staff	0.002* (0.00)	-0.020+ (0.01)	0.002+ (0.00)	-0.002* (0.00)	0.005* (0.00)	-0.005*** (0.00)	-0.001 (0.00)	-0.000 (0.00)	-0.001 (0.00)	-0.001 (0.00)
	Constant	28.727 (92.08)	72.462 (78.22)	-12.259 (66.38)	-70.472 (93.34)	121.582 (114.23)	66.131 (66.07)	76.818 (74.19)	18.779 (48.42)	34.667 (46.13)	-39.097 (65.54)
	Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	IRC fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	N	247	29	173	81	128	114	197	97	90	212
	Pseudo R2	0.28	0.67	0.26	0.25	0.32	0.45	0.20	0.32	0.28	0.27

+ p<0.10, \* p<0.05, \*\* p<0.01, \*\*\* p<0.001

**APPENDIX.**

**Table A1. Descriptive Statistics (Including Variables Used in Robustness Checks and Supplementary Analysis)**

Variable	Obs	Mean	Std.Dev.	Min	Max	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
(1) directly regulated firm hire (0/1)	794	0.134	0.340	0	1																		
(2) directly regulated firm hire (count)	794	0.160	0.456	0	5	0.93																	
(3) directly regulated firm hire, first order (0/1)	794	0.052	0.221	0	1	0.64	0.67																
(4) exits to directly regulated firm (count)	794	0.088	0.305	0	2	0.06	0.06	0.04															
(5) PhD hire (count)	794	0.128	0.412	0	3	0.09	0.12	0.14	0.19														
(6) IRC age	794	30.064	23.738	0	108	-0.12	-0.11	-0.03	0.08	-0.06													
(7) major legislation	794	0.156	0.363	0	1	-0.08	-0.08	0.01	-0.01	0.02	0.16												
(8) revolvers on board (count)	794	0.932	1.103	0	5	0.40	0.43	0.27	0.04	0.19	-0.02	0.01											
(8) revolvers on board, first order (count)	794	0.276	0.537	0	4	0.27	0.29	0.40	0.00	0.29	0.06	0.07	0.63										
(9) IRC budget	467	155.649	160.429	0	967	0.02	0.02	-0.01	0.05	0.09	-0.21	0.04	0.09	0.05									
(10) IRC staff	469	1369.561	922.311	35	3498	-0.06	-0.08	-0.11	0.09	-0.10	0.08	0.10	-0.08	-0.22	0.76								
(11) GDP growth (%)	714	7.473	6.114	-23.1	28.3	0.01	0.05	0.00	-0.05	-0.03	-0.07	0.03	-0.09	-0.16	-0.02	-0.02							
(12) government spending (% of GDP)	565	10.280	2.451	6.13	16.09	-0.01	-0.02	-0.01	-0.12	-0.05	-0.14	-0.22	-0.10	-0.15	-0.33	-0.24	-0.08						
(13) political leaning of the Senate	-794	0.003	0.067	-0.21	0.16	0.08	0.06	0.06	0.04	0.02	0.11	0.07	0.18	0.24	0.25	0.16	-0.28	-0.63					
(14) political leaning of the House	-794	0.024	0.070	-0.17	0.17	0.00	-0.03	0.00	0.07	0.02	0.12	0.02	0.05	0.16	0.23	0.14	-0.51	-0.53	0.77				
(15) Republican President (0/1)	794	0.535	0.499	0	1	0.12	0.12	0.08	-0.01	0.04	0.01	0.03	0.22	0.17	-0.05	-0.05	0.00	0.04	0.10	-0.33			
(16) cross-sectoral IRC (0/1)	794	0.275	0.447	0	1																		
(17) social regulatory IRC	794	0.278	0.448	0	1	0.12	0.10	0.07	-0.05	0.12	-0.52	-0.15	0.15	0.11	0.45	-0.01	-0.01	-0.13	0.10	0.08	0.02		
(18) Herfindhal-Hirschman Index for IRC (obs=296)	363	1761.845	2070.652	166.57	10000.00	-0.06	-0.08	-0.06	0.03	-0.19	0.12	0.03	-0.29	-0.20	-0.25	0.03	0.01	0.30	-0.21	-0.17	-0.04		-0.14

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## CHAPTER IV

### **Caught in the Revolving Door: Firm-government Ties as Determinants of Regulatory Outcomes**

(co-authored with Jerry W. Kim)

#### **ABSTRACT**

How does the revolving door between firms and their regulators affect firm regulatory outcomes? Despite extant research on interfirm mobility, as well as on corporate political strategies, we know relatively little about how employee movement between firms and their regulators affects firm regulatory outcomes. This chapter provides a careful explanation of the different theoretical mechanisms, which may lead to improved regulatory outcomes for firms with revolving door ties to their regulators. Within the context of the agribiotechnology industry and its main regulator, the United States Department of Agriculture (USDA), we find that firms receive better regulatory outcomes during a revolving regulator's tenure, whether the regulator previously worked for a regulated firm, or moved on there after his regulatory tenure. We also find that the improved regulatory outcomes only occur during the regulator's tenure—once the regulator transitions to the firm, the firm no longer benefits. Additionally, we find and account for the selection effect in terms of which firms have revolving door ties to the USDA. Taken together, our results suggest that revolving door ties are an effective business political mobilization strategy, undertaken by firms with historically worse regulatory performance in order to improve future regulatory outcomes.

**Keywords:** revolving doors, business political mobilization, regulatory capture, biotechnology

## INTRODUCTION

The revolving door between government and firms has long been the subject of controversy and debate. For some, individuals moving between regulators and regulated firms facilitate communication, as well as the exchange of expertise across the public and the private sectors (Che 1995). Critics, however, contend that personnel movement between regulator and regulated creates significant conflicts of interest, hampering fair enforcement of regulations designed to protect the public interest (U.S. Government Accountability Office (GAO) 2011). In the wake of recent failures in regulation (e.g. Lounsbury and Hirsch (2011)), the revolving door has become an important topic in the broader discussion of the rising influence of corporations in the political domain (Mizruchi 2013; Perrow 2002; Walker and Rea 2014).

While the revolving door's impact on public interest is still heavily debated, both critics and defenders implicitly agree that private actors—namely, corporations—benefit from the practice. Be it access, information or influence, firms are presumed to gain an advantage when they hire former government officials, or have their executives take government positions. Despite the intuitive appeal of this assumption, the empirical support for corporate advantage is surprisingly limited, and what exists is often contradictory (Carpenter and Moss 2013). Extant research points to positive (Gormley 1979; Grace and Phillips 2008; Hillman 2005; Hillman, Zardkoohi, and Bierman 1999), negative (deHaan et al. 2011; Quirk 1981) and mixed (Cohen 1986) outcomes for industries and firms that have a revolving door to their regulators, or the government in general.

The conflicting evidence for revolving door related corporate advantage poses an intriguing empirical puzzle to be resolved. Sorting out whether corporations benefit from personnel movement not only has important implications for policy and legislation, but should

also shed greater light on the tactics firms employ to shape their non-market environments. While much work has focused on the effects of lobbying (De Figueiredo and Silverman 2006; Hill et al. 2013; Richter, Samphantharak, and Timmons 2009) and Political Action Committee (PAC) contributions (Ansolabehere, de Figueiredo, and Snyder 2003; De Figueiredo and Edwards 2007; Hadani and Schuler 2013; Quinn and Shapiro 1991) on regulatory outcomes or firm performance, the revolving door has been mostly ignored by the sociological and management literatures (Etzion and Davis 2008). Moreover, extant studies, mostly within political science, have focused on industry-level outcomes of firm-government revolving doors (Cohen 1986; Gormley 1979; Grace and Phillips 2008; deHaan et al. 2011; Quirk 1981), while more recent work in strategy has adopted indirect measures of the firm-level regulatory outcomes, such as firm financial performance or valuation (Hillman 2005; Hillman, Zardkoohi, and Bierman 1999). As such, despite the high prevalence of the revolving door phenomenon (Braun and Raddatz 2010; Coates 2012; Eckert 1981), there is a significant gap in our understanding of how the exchange of employees between firms and their regulators may affect regulatory outcomes for individual firms.

But beyond being an understudied topic, the revolving door is a particularly relevant phenomenon for organizational scholars in that deep and durable social relationships are forged between the firm and government by virtue of individuals moving across boundaries. The organization theory and strategy literatures have long recognized that interfirm mobility of individuals creates ties between organizations through which valuable knowledge and resources flow (Rao and Drazin 2002; Song, Almeida, and Wu 2003; Corredoira and Rosenkopf 2010; Godart, Shipilov, and Claes 2014). With growing interest in business mobilization in political arenas (Fligstein and McAdam 2012; Walker and Rea 2014), examining the effects of the

revolving door provides a unique opportunity to deepen our understanding of the social and organizational processes underlying government-firm relationships.

The purpose of this chapter is to conceptualize the movement of individuals through the revolving door as the formation of ties between firms and governments, and to identify how these ties determine regulatory outcomes for firms. We argue that these links are neither coincidental, nor purely transactional in nature; rather, they are the result of, and facilitator of complex social and organizational processes that shape both regulator and firms. Focusing on the dyadic nature of these ties, we propose a typology of revolving door ties based on the direction of flow (i.e., government-to-firm vs. firm-to-government) and the timing of the tie (i.e., pre or post regulatory event). This categorization allows us to develop a deeper understanding of the social mechanisms involved, and provide greater clarity to the contradictory findings of prior work. Our dyadic perspective on the revolving door phenomenon also provides an opportunity to address a critical methodological issue plaguing prior research, namely, that a firm's decision to initiate a non-market strategy is correlated with the firm's regulatory outcome (Bonardi, Holburn, and Vanden Bergh 2006). By examining the firm-specific outcomes of revolving door ties, one can better account for the selection bias in the adoption of these particular strategies. In addition, as firms arguably forge corporate political strategies such as revolving door ties in order to shape their individual outcomes (Baysinger 1984), rather than to pursue unified industry interests, studying firm-level outcomes of the revolving door ties provides for a more precise analysis of the ties' effectiveness.

We study revolving door ties in the agribusiness industry as our empirical context due to its heavily regulated status, as well as the alleged close ties to government (Ferrara, 1998; Mattera 2004; Monsanto 2011). In particular, we focus on the biotechnology segment of this

industry by studying the planting approvals of genetically engineered (GE) crops by the US Department of Agriculture (USDA) (Hiatt and Park 2013). We collected the career histories of all 252 executives of the USDA during the time period of 1995-2010, and linked these individuals to firms applying for product approvals. The data set contains information on PAC and lobbying expenditures, patent applications, as well as the more general firm characteristics for each of the GE crop producers.

The results of our analysis suggest that firms connected to the USDA via revolving doors do indeed benefit from improved regulatory outcomes. Firms whose former employees go on to serve at the USDA have faster regulatory approvals for their products during their former employees' regulatory tenure. Moreover, firms that hire former regulators have faster regulatory outcomes during the regulators' tenure, but not when the regulators actually transition to the firms' staff. Importantly, we also find, and account for, the selection bias in terms of which firms form revolving doors to the USDA. In particular, firms that have previously had worse regulatory outcomes are more likely to form revolving doors to their regulators. Overall, our results are consistent with the use of firm-government revolving doors as a type of business political mobilization.

## **REVOLVING DOORS AND INTER-ORGANIZATIONAL TIE FORMATION**

Interactions with the government are of unique importance to firms. Governments shape the competitive environments for firms, and provide access to opportunity sets (Baron 1995). In response, firms engage with governmental entities to gain access to and influence over government-controlled outcomes. A rich literature in political science, economics, sociology, and management have investigated the variety of ways in which firms have attempted to shape the political arena (for reviews, see Dal Bó (2006); Hart (2004); Hillman, Keim, and Schuler (2004);

Walker and Rea (2014)). In particular, much attention has been given to lobbying (e.g. Baumgartner et al. 2009; Hall and Deardorff 2006; Kerr, Lincoln, and Mishra 2014), political campaign contributions (Ansolabehere, de Figueiredo, and Snyder 2003; Mizuchi 1989), and more recently, grassroots campaigns (McDonnell 2015; Walker and Rea 2014).

An often overlooked, but important, channel through which corporations and governments influence each other is the movement of employees between firms and governmental entities (Etzion and Davis 2008). In an early study of three U.S. federal commissions, Eckert (1981) found that about 21 percent of commissioners came from the related private sector, whereas around 51 percent took related private sector jobs post-tenure. More recently, eleven percent of Standard & Poor's 500 companies' CEOs sampled by Coates (2012) in 2000 went on to hold political office by 2011. Interestingly, the revolving door rates have been shown to differ between administrations, such that the Bush administration was much more likely to draw officials from a corporate talent pool than the Clinton one (Etzion and Davis 2008). On the flip side of the phenomenon, former financial regulators were many times more likely than citizens to hold board memberships at banks around the world (Braun and Raddatz 2010).

Despite the prevalence of personnel migration between government and the private sector, studies on the consequences of the practice have been few and far between (Carpenter and Moss 2013). Early work focused mostly on federal commissions, and found weak or absent evidence that firms benefit from revolving doors. Gormley (1979) studied voting patterns on the FCC, and found that commissioners with broadcasting experience do vote somewhat more pro-industry, although political ideology seemed to have more effect on voting than prior employment. Cohen's (1986) work on the FCC actually found evidence of regulators being less

supportive towards the regulated industry before revolving out of their position into an industry one. Similarly, Quirk (1981) interviews with 50 high level officials from four US regulatory agencies did not demonstrate support for the revolving door leading to capture—quite the opposite, as industry career aspirations made regulators more aggressive in their regulation of firms.

Recent studies offer more mixed evidence. Makkai and Braithwaite (1992) found that identification with the industry by the inspectors in the revolving door (but not the revolving door itself), lead to more favorable ratings. Grace and Phillips (2008) showed weak support for the prospective employment influencing regulation in the insurance industry, showing only mildly higher prices (by 1.5 percent) for insurance during a regulator’s tenure where the regulator then entered the industry post-tenure. Helland and Sykuta (2004) found that when the natural gas extraction industry was deregulated in 1986, there was a decrease in the number of “political” directors on boards. The presence of political directors on boards was associated with a more intense resource-dependence on politicians, and it declined after the issue at hand was resolved. Finally, deHaan et al. (2011) found that lawyers at the Securities and Exchange Commission (SEC) were more aggressive in their enforcement efforts prior to leaving the agency to take on jobs at private law firms.

As most of the prior work is from scholars in political science, the focal actor has been the regulatory commission or agency, and not the firm receiving or sending individuals. Committee votes, enforcement of regulations, or regulated prices are all important outcomes from a policy or social welfare perspective, yet, it sheds little light on how individual firms fare when their employees revolve from or into government positions. By focusing on agency decisions, prior work implicitly assigns benefits or harm to corporate interests as a single entity,



when, in fact, business is becoming ever more fragmented in its efforts to influence politics (Mizruchi 2013). In fact, the murky picture regarding corporate benefits of the revolving door could be the result of a subset of firms benefiting from revolving door ties, while the majority of other firms receiving no advantage or even seeing (relatively) worse outcomes.

We propose that focusing on the advantages that accrue to specific firms provides a clearer understanding of the effects of the revolving door. More specifically, we view revolving doors as establishing a tie between firm and government mediated by individual employees. Furthermore, we view this as a deliberate strategic action on behalf of the firm to influence the state for favorable outcomes. Firms themselves have argued that any overlap of individuals is purely coincidental, driven by the fact that both firms and the government seek the best talent.<sup>9</sup> Yet, media accounts of firms wooing top regulators with post-government positions (e.g., Jensen and Wald (2014); Taibbi (2012)) paint a more calculated effort by firms to obtain advantages on certain regulatory matters. Also, many firms explicitly incentivize top executives to take positions in government regulatory agencies or run for public office by accelerating the vesting of options or awarding additional stock grants when leaving for public service (Project on Government Oversight (POGO) 2013).

Management scholars have considered such strategic action in the political domain as corporate political activity (Hillman and Hitt 1999). While drawing heavily on work in this stream, we view the forging of ties through revolving doors as an instance of business political mobilization (Walker and Rea 2014: 13.3) to draw attention to “firms’ and industries’ roles as political actors that, while linked to their interests in the marketplace, are rooted in social, organizational, and cultural processes.” The movement of individuals between governments and

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<sup>9</sup> For example, the agricultural biotechnology company Monsanto, referred to as the “champion of the revolving door” by some critics (Robin 2010) notes on its company blog that “[i]n no way, does Monsanto control the government. We simply seem to have a shared goal of hiring good people” (Monsanto 2012).

firms is neither driven by market mechanisms of supply and demand, nor is it independent of the economic interests of the parties involved. Once a tie is forged, the relationship is influenced not only by the bargaining power and interests of the two parties involved, but also by the broader field of state and non-state actors seeking to maintain or disrupt institutionalized practices (Fligstein and McAdam 2012).

## **REVOLVING DOOR TIES AND FIRM REGULATORY OUTCOMES**

A firm-government tie can shape regulatory outcomes for firms through a number of different channels, from providing firms with greater expertise (Bertrand, Bombardini, and Trebbi 2011), to influencing regulatory judgments via the allure of future employment (Dal Bó 2006). To better distinguish between these potential mechanisms, we categorize these firm-government ties along two dimensions. The first is the *direction of the tie* (i.e., whether an individual moves from government to firm, or vice versa). The second is the *timing of the tie* (i.e., whether the movement of the individual happens prior to, or after the regulatory event for a focal regulated firm). When the tie precedes regulation, the link acts as a channel or “pipe” through which information or influence flows to have a causal effect on regulatory outcomes. In contrast, when the tie follows regulation, the relationship can be viewed as an outcome or reward for actions that have already influenced regulatory outcomes.

This leads to four distinct types of revolving door relationships. An individual from the firm can take a regulatory position, and the firm subsequently experiences a regulatory event. Alternatively, a regulator can take a firm position, with the firm going through the regulatory event post-movement. The forming of the tie can also happen after the regulatory event, where a regulator moves to a private sector job subsequent to a regulatory event, or an executive moves to a regulatory position subsequent to a regulatory event. As executives who transition to

regulatory jobs in future periods may arguably not influence regulatory outcomes in the present (as their social or human capital related to the USDA regulatory process has not been acquired yet), we only focus on the remaining three types of ties, which have clear mechanisms for affecting the regulatory process. Figure 1 shows a visual representation of the revolving door typologies according to tie direction and timing.

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Insert Figure 1 about here

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### **Firm-to-Government Prior to Regulation (Type 1 Revolving Door)**

We first consider revolving door ties where a firm executive takes a government position prior to the firm's product being regulated. Regulators with prior employment in the regulated industry may show more support for that industry due to a number of factors. Positive experiences in the industry, loyalty to the former employer, and sympathy to the problems the industry is facing in meeting standards constitute affect-based reasons why firms would receive more favorable outcomes when a firm employee moves from the firm to the government (Makkai and Braithwaite 1992). In addition, there are knowledge-based reasons to expect better outcomes in this situation, as those individuals may have deep knowledge of the firm's satisfactory records in the regulated domain (such as health or environmental safety) that are otherwise unobservable (Makkai and Braithwaite 1992). It is worth noting that this support may not stem from attempts at regulatory capture by firms, but may rather be a form of personal bias, or "cognitive capture" (Rajan 2010: 180-181) by the regulator recruited from industry.

Having former employees take on government positions also leads to greater connectedness between the two organizations. Even if the regulator is barred from decisions related to her former employer, the personal and professional ties she made during her time at the regulated firm still exist unsevered, and outside monitoring or regulation of these relationships is

virtually impossible. Corredoira and Rosenkopf (2010) found that semiconductor firms losing an employee (“outbound mobility”) were more likely to cite the patents of the firms to which their employee moved, implying that knowledge and information was flowing back to the sending firm via social connections. In a study of fashion houses, Godart, Shipilov and Claes (2014) found that the firms’ outward centrality was associated with creative performance, suggesting that fashion houses leveraged their former employees long after they moved on to competitors. By facilitating communication and access to the regulator and allowing knowledge about regulatory matters to flow back to the firm, firm-to-government revolving door individuals (i.e., Type 1 revolving door) can improve regulatory performance for firms.

The fact that some firms actively encourage their employees to pursue jobs in government strongly implies that firms believe that there are benefits to having former employees in regulatory roles (POGO 2013). Be it affect, knowledge, bias or social networks, we expect the presence of a firm-to-government tie prior to regulation should help the focal firm obtain better regulatory outcomes. Thus,

*Hypothesis 1: A company with firm-to-government ties prior to regulation will have better regulatory outcomes.*

### **Government-to-Firm Prior to Regulation (Type 2 Revolving Door)**

Firms hiring former regulators also stand to benefit in future instances of regulation. There are two potential channels through which having individuals with government experience can help the regulatory performance of firms in subsequent regulatory matters. First, individuals with careers in government bring expertise regarding the inner-workings of the agency that firms must navigate (Lester et al. 2008). Hiring external individuals has long been understood as a way to import valuable knowledge and expertise (Almeida, Dokko, and Rosenkopf 2003; Song,

Almeida, and Wu 2003). The regulatory process for many products involves numerous administrative steps, and more knowledge of the process can be a considerable asset in obtaining more favorable outcomes. Former regulators are likely to have intimate knowledge regarding the appropriate methods in preparing documents, or strategically positioning products to enhance the strengths and cover the weaknesses of firms in the eyes of regulators. Much of the knowledge for regulatory success is tacit by nature, and bringing in individuals within the boundary of the firm can maximize the acquisition of such valuable knowledge (Song, Almeida and Wu 2003).

A second mechanism through which government employees' move to a firm could improve regulatory performance is through the social capital individuals bring to the firm, and more specifically, the ties to existing regulators these employees possess (Lester et al. 2008). In a study of firm influence in wireless standard committees, Dokko and Rosenkopf (2010) found that firms hiring individuals with richer social capital ended up with more influence in technical standard committees. Having individuals with more connections allows greater knowledge gathering and learning, while also facilitating coalition building, which can help in advancing the firm's cause in contentious situations.

Social capital not only provides informational and political advantages, but also signals legitimacy and promotes trust between actors. Studies on strategic alliances have argued that homophily is a key driver of alliance formation, and the career affiliations of top managers have been shown to be significantly correlated with the alliance formation patterns for firms (Kim and Higgins 2007). Having a former regulator on the staff enhances the credibility of the firm in the eyes of the regulator, and having the perspective of the regulator can potentially reduce frictions that arise between firms and the government.

All in all, we expect revolving door ties where former government employees flow to corporations to enhance the subsequent regulatory performance of firms.

*Hypothesis 2: A company with government-to-firm ties prior to regulation will have better regulatory outcomes.*

### **Government-to-Firm Post-Regulation (Type 3 Revolving Door)**

While ties formed prior to regulatory events have the most direct impact on firm regulatory outcomes, the ties that form following a regulatory event can also be indicative of influence. In particular, revolving door ties from government to firm post-regulatory event have long been suspected as a means towards regulatory capture (Dal Bó 2006; Stigler 1971). The prospect of a future job is argued to be the mechanism that drives the support of regulators for a specific industry during their tenure (Cohen 1986; Spiller 1990). A number of studies are in line with this regulatory capture view. In the US insurance industry, insurance prices have been shown to be higher during a regulator's tenure if the regulator then entered industry post-tenure (Grace and Phillips 2008). Moreover, the deregulation of the natural gas extraction industry in 1986 was followed by a decrease in the number of former regulators on corporate boards within the industry, which may be interpreted as evidence of regulators being hired for political rent-seeking purposes (Helland and Sykuta 2004).

At the same time, regulators who go on to form revolving door ties may have an incentive to be harsher to firms in order to enhance their prospective value, which would hurt the regulatory performance of firms. The tollbooth view of regulation suggests that regulation is captured not by firms, but instead by politicians and bureaucrats who trade their approval for campaign contributions, votes, post-tenure positions or even bribes (Shleifer and Vishny 1998). In this perspective, it is the regulators who may create red tape, or unnecessarily complicated

procedures, in order to increase their own importance in the regulatory process. As a result, unlike with the capture view, predictions here are not beneficial for firms: regulators may be harsh in order to signal their supreme human capital to firms (Che 1995). Quirk's (1981) study of four US regulatory agencies suggested that industry career aspirations made regulators more aggressive in their regulation of firms. In a similar vein, Cohen (1986) found that regulators were less supportive towards the regulated industry before revolving out of their position into an industry one. Furthermore, Securities and Exchange Commission (SEC) lawyers taking on private sector positions were found to be more enthusiastic in their regulatory enforcement efforts (deHaan et al. 2011).

The regulatory capture and tollbooth view of regulation offer contradictory predictions regarding the association between post-regulation revolving door ties and regulatory performance. In both cases, regulatory performance may in fact be driving the formation of ties—in other words, favorable regulation may earn the regulator a plum position at the beneficiary firm (i.e., regulatory capture), or unfavorable regulation may earn the regulator a position because she may stand out as a competent individual (i.e., tollbooth). However, if we focus on how ties shape regulatory performance, we argue that the regulatory capture view (i.e., favoring the regulator's future employer) is more likely to apply to situations when (unobserved) ties are shaping performance, and expect that once the selection of tie formation is accounted for, the net direction of the effect of revolving door ties will be positive.

*Hypothesis 3: A company with government-to-firm ties after regulation will have better regulatory outcomes.*

## **EMPIRICAL CONTEXT**

Recombinant DNA technique was developed in California in 1973, which enabled scientists to extract a specific gene from the DNA of one organism and insert it into another for the first time (Cohen et al. 1973). Since then, scientists have applied this technology to bacteria, plants and animals. In terms of agricultural applications, genetic engineering has enabled scientists to create pest and viral resistant plants, as well as those with herbicide tolerance, modified oil structure, reproductive sterility, as well as delayed ripening and softening.

Due to the desirable properties that GE plants have been engineered for, large numbers of farmers have readily adopted them. GE crops adoption rates are very high, particularly for the key crops in the United States such as corn, soybeans and cotton—ranging from 80 percent for corn to 92 percent for soybeans (GAO 2008). However, domestic consumers, organic farmers and social movements have expressed concerns over these crops (Hiatt and Park 2013; Schurman and Munro 2010). In particular, they worry that the release of GE material might pose environmental risks, as well as that ingesting these modified plants might be associated with long-term human health risks (GAO, 2002). Overall, proponents and opponents of agribiotechnology make passionate arguments about the potential benefits and costs that GE foods introduce to social welfare.

### **Agribiotechnology Regulation**

Genetically engineered crops go through a number of stages before reaching consumers. Firstly, corporate scientific teams develop and patent these new plant varieties. Secondly, federal regulators evaluate the crops. The first part of the regulatory process is a phase of field experiments, contingent on the approval by the regulatory agencies for planting and dissemination on designated plots of land (GAO 2008). The USDA's Animal and Plant Health



Inspection Service (APHIS) has primary responsibility in the field trial process, although the Environmental Protection Agency (EPA) must also approve crops engineered to have herbicides in them (Heisey and Schimmelpfennig 2006). Since 1986, when the first GE crop was approved for planting, around 19,000 crops have been planted in field trials (Biotechnology Regulatory Services (BRS) 2014).

As the second regulatory step following a field trial's successful demonstration of a crop's desired properties, as well as a lack of any undesired traits, the crop-developing firms may petition the USDA to deregulate their GE crops. APHIS decides whether to accept the firms' petitions for non-regulated status of the GE crops, which allows these plants to be grown commercially and sold without further monitoring, tracing or labeling. Moreover, firms may voluntarily consult the FDA in order to obtain additional safety reports prior to introducing GE crops into food or feed supply (GAO 2008). The first GE crop to be sold in supermarkets was Calgene's Flavr Savr tomato in 1994 (Bruening and Lyons 2000). Since then, over 140 GE foods have been evaluated for deregulation (BRS 2014).

In general, U.S. governmental entities have overlapping jurisdictions in the regulation of GE products. The FDA is responsible for GE foods and drugs, the USDA for GE crop plants and animals, the EPA for organisms released into the environment for pest control, and even the National Institutes of Health (NIH) participate in the process by overseeing GE organisms that could affect public health (Ferrara 1998). Due to its key role in the regulation of agribiotechnological products in particular, in this chapter we focus on the USDA and its alleged revolving door to biotech crop companies. Moreover, we study the first stage of regulation, field trials, which have less overlap in jurisdiction across agencies. Further research may expand this survey to all regulatory bodies that deal with biotechnological products.

## **DATA AND METHODS**

In order to test our theory, we compiled a data set from various sources, all of which are described in detail below.

### **Dependent Variables**

#### *Regulatory Outcomes*

In terms of regulatory outcomes, two things matter to firms: gaining approval for their products and the speed of doing so. Obtaining approval to market its products is crucial for a firm's ability to cash in on its investments in research and development of new products, but the duration of the regulatory process itself is highly important, as well. The significance of the duration (or the speed of the regulatory process) lies in waiting costs, which are incurred because firms have to delay their releases of new products (Heisey and Schimmelpfennig 2006). Because each firm has exclusive rights to their patented GE plant products for a limited time of 20 years from the patent filing date, any delay in bringing products to market causes a loss in potential revenue to the firm. Hiatt and Park (2013) estimate that each day a Monsanto GE crop spends in the regulatory process may cost the firm up to \$2 million in foregone revenue. Furthermore, for the particular regulatory outcome of planting notifications, most of the GE crop producers (i.e. around 96 percent of our sample) eventually obtain the requested planting approval in the period from 1998-2006. However, the length of time required to obtain approval varies widely, from 0 to 452 days for different crops. For descriptive data, see Table 1.

Following previous studies that show differential outcomes of the regulatory process (Carpenter 2002; Hiatt and Park 2013; Kim 2013), we focus on the time to regulatory approval. Data on regulatory approval rates for GE crops were obtained from Biotechnology Regulatory Services, a part of USDA-APHIS that publishes a database containing dates when planting

requests were received and issued (BRS 2014). For each crop, we have a date0 (i.e. date when request was received), and for those that are approved, we have date1 (i.e. date when approval was issued). The time between date1 and date0 is the duration of the regulatory process. We adopt an event history approach for the main part of our analysis in order to model the speed of regulatory approval. More specifically, we employ a log-logistic survival model with firm-level frailty. Further details on our models are provided in the Analysis section.

## **Independent Variables**

### *Revolving Door Ties*

Our main independent variables are the three distinct types of revolving door ties between an agribiotechnology firm and the USDA: firm-to-government ties prior to regulation (Type 1), government-to-firm ties prior to regulation (Type 2), and government-to-firm ties post-regulation (Type 3). For each firm in a given year, each of these three variables is operationalized as a dummy (0/1) for the particular kind of revolving door between the focal company and one of the relevant executive USDA positions. We define executive USDA positions as all political appointments, as well as relevant APHIS positions (including APHIS leadership positions below the Administrator level). As APHIS is the key regulator of biotechnology crops, our definition of relevant USDA positions also implies that we consider all the positions placed above APHIS in decision-making power. Thus, the USDA executive positions we take into account encompass the Office of the Secretary, as well as all Undersecretaries, Agency Administrators, as well as APHIS decision-makers. For an organizational chart of the USDA, see the USDA 2008 fiscal year report (USDA 2008: 2).

A revolving tie between a focal firm and the USDA is indicated by an individual switching from an executive position at the USDA to one with a manufacturer of GE crops, and

vice versa. We consider corporate executive positions including corporate directorships as well as executive roles. Throughout, we only consider manufacturers for whom we have regulatory activity, and therefore ties to agribiotechnology producers without previous notifications of field trials in the period from 1995-2010 are not included. Moreover, we record whether the revolving individual held his executive position with the agribiotech firm before (firm-to-government ties prior to regulation, or *Type 1 revolving door*), or after his USDA appointment (government-to-firm ties post-regulation, or *Type 3 revolving door*). Finally, for the government-to-firm ties prior to regulation, we create a variable called *Type 2 revolving door*, which is assigned the value of one, if the agribiotechnology firm has a former USDA regulator on its staff, and zero otherwise.

For example, Monsanto has a value of one for the Type 1 revolving door from 2001-2004, when Ann Veneman, a former executive of a Monsanto-acquired firm Calgene, served as USDA Secretary. Conversely, Monsanto has a value of one for the Type 3 revolving door variable in 1995, as Michael Taylor, then Food Safety and Inspection Service Administrator, took a position as a Monsanto Vice President for Public Policy after his USDA tenure. Finally, Monsanto has a Type 2 revolving door to the USDA between 1996 and 2000, when Michael Taylor was on its staff.

In order to collect revolving door data, we first lodged a Freedom of Information Act (FOIA) request with the USDA. Once we received a roster of political nominations from the USDA for the period from 2000-present, we supplemented it through additional research. A combination of USDA newsletters, Legislative Calendar from the Congress, Congressional Directory, as well as the United States Government Printing Office documents were searched to populate the previously defined set of USDA positions from 1995-2010. Next, we established which USDA executives had ties to industry as described above. For this task we used CapitalIQ,

LinkedIn, as well as revolving door data from OpenSecrets.org. When necessary, further information was found on each person by conducting thorough online searches. Importantly, a tie was not inferred unless at least two sources could corroborate it. Our cautious approach ensures the accuracy of all inferred firm-government ties. Of 252 individuals<sup>10</sup> in executive USDA positions accounted for in the period from 1995-2010, we found that seven regulators had revolving door ties to agribiotechnology firms (of those, three were firm-to-government, and four were government-to-firm).

## **Control Variables**

### *Firm-Level Controls*

Certain firm characteristics, such as firm size, knowledge base and innovativeness are thought to be important for firm regulatory outcomes (Kim 2013; Olson 1997). In particular, firm size and research and development intensity act as signals of the quality of firms' products and may therefore lead to shorter regulatory review times. For each firm within a given year we include *total assets* (in USD thousands), as well as *R&D expenditures* (in USD thousands) from Compustat. An additional variable for firm size, used in a subset of our models, is *employee number* (in thousands) from Compustat.

Furthermore, a firm's research intensity may also be operationalized by the number of approved patents granted to the firm. We include a count of *plant patents* by firm by year. Plant patent counts are available from the United States Patents and Trademark Office (USPTO), which published a report covering all organizational patentees with five or more patent applications accepted between 1986-2010 (USPTO 2011). Additionally, we used *utility patent*

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<sup>10</sup> The actual number of appointments made during this time is larger at 292, but given the fact that some individuals are appointed several times to different positions, the number of unique individuals filling those positions is smaller.

*data* in a subset of our models. NBER utility patent data were obtained from Bronwyn Hall's website, which covers all applications up to 2006 (Hall 2011).

We also control for firm lobbying and PAC contributions, as they have been shown to influence firm outcomes (Quinn and Shapiro 1991; Richter, Samphantharak, and Timmons 2009). From the Center for Responsive Politics (CRP 2011), we include a measure of *lobbying expenditures* (in USD million) for each company within a given year from 1998<sup>11</sup>-2010, as well as *PAC donations* (in USD thousands).

Finally, as firm origin has been shown to impact regulatory success for GE crops (Hiatt and Park, 2013), we also control for the GE crop producer's nationality. Firms are assigned a value of one for the *foreign* dummy if they are of non-US origin, and zero otherwise.

#### *Crop-Level Controls*

The area on which GE crops are planted may impact the risk of spreading for the GE crop. We therefore include the variable *acreage* from the BRS (2014) data. Furthermore, not all GE crops are of the same economic significance. Corn, soybean and cotton are key crops grown in the United States. Due to their high agricultural significance, as well as high GE adoption rates, we consider whether corn, soybeans and cotton may have a somewhat altered regulatory time than other less important crops. We use the data from the Biotechnology Regulatory Services (BRS, 2014), which reports the type of crop that each field trial application was submitted for, in order to create (0/1) dummy indicators for *corn*, *soybean* and *cotton* crops.

Due to the fact that GE plants with plant incorporated protectants (PIPs) are also monitored by the EPA, and may therefore have a slightly different regulatory process, we follow Hiatt and Park (2013) in including binary dummies (*PIPs*) for such crops (1 if the crop contains

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<sup>11</sup> Lobbying data is not available prior to 1998.

PIPs, and 0 otherwise). Similarly, we control for the number of phenotype traits that have been altered in a given crop with the variable called *phenotype variety*.

### *Regulatory Environment Controls*

Government ideology may influence regulatory environments (Carpenter, 2002), as administrations may have their specific views about particular issues, such as biotechnology. We therefore include a dummy for the ideology of the *United States President* (1 if liberal (Democrat), 0 otherwise). Dummies for the House of Representatives, as well as for the Senate were not included due to lack of variation during the period of our study.

Another important aspect of the regulatory environment is the amount of regulator workload at a given time. A large number of regulatory approval applications being processed around the same time may create a traffic jam, slowing the speed of approval (Hiatt and Park, 2013). We therefore control for the possibility of a *traffic jam*, by including a measure of the number of concurrent applications in our models.

Lastly, there are two tracks in the regulatory approval process for field trials of GE crops. We control for whether the crop was submitted to the more streamlined notification process, as opposed to the longer permit process with the dummy variable called *process type* (1 if the process is streamlined, and 0 otherwise).

### **Analysis**

Since our dependent variable is operationalized as the speed of regulatory approval, we use an event history approach. In our analysis, we estimate a log-logistic accelerated failure time (AFT) model with frailty, due to its favorable fit compared to other semi-parametric and parametric models, including Cox and piecewise exponential models. Figures A1-A5 in the Appendix show the plots of the Cox-Snell residuals from Model 4 run with various different

specifications. Good fit is indicated by residuals falling close to the 45-degree line, and as such, the semi-parametric Cox and the log-logistic AFT survival models provide the best fit. However, since the proportional hazard assumption is violated, an AFT model is more suitable than the Cox model. Our results are perfectly robust to using the Cox model, as well (see Table A1 in the Appendix).

Further, firms that succeed in either placing their former executives on a governmental regulatory body, or those that are able to recruit new employees from a regulatory body, may not be randomly selected. The importance of accounting for any potential selection bias is highlighted by Bonardi, Holburn and Vanden Bergh (2006), who showed that a firm's decision to initiate a non-market strategy is positively correlated with the performance of the nonmarket strategy. In our context, there may be either positive or negative selection bias when it comes to revolving door formation. The firms that establish firm-government revolving door ties may be the firms that would, due to some unobserved heterogeneity (such as having solid safety records, producing high quality GE crops or being a producer with high status or legitimacy), be more likely to have a speedy approval in any case. Conversely, firms that have particular difficulties with the regulatory process may also seek out ways to influence it through forming revolving door ties. Following Bonardi, Holburn, and Vanden Bergh (2006) in order to eliminate such possible endogeneity issues, we employ a selection model and incorporate it into the main survival models. In the first stage of our 2-stage Heckman analysis, we run a probit for the effects of firm characteristics on the chance of having a firm-USDA revolving door in a given year:

$$\text{Firm-USDA revolving door}_{it} = F(\delta' W_{it} + u_{it}),$$



where  $F(\cdot)$  represents the cumulative density function inverted, *Firm-USDA revolving door*<sub>it</sub> is the Type 1, Type 2 or Type 3 revolving door dummy respectively (1 when there is a revolving door between a given firm and the USDA, 0 otherwise), and  $W_{it}$  is the matrix of independent and control variables including firm size (operationalized as employee number), utility patent count, and lobbying expenditures for firm  $i$ . In addition,  $W_{it}$  includes *lagged duration*, which is the average duration of the regulatory process for the firm's crops for all years prior. This variable represents the exclusion restriction for our Heckman models, and is not a significant predictor in the second stage survival model including control variables. The three probit models are used to form the inverse Mills ratios,  $(\lambda = \frac{f(\delta'W_{it})}{F(\delta'W_{it})})$  for the formation of revolving door ties (whether Type 1, Type 2 or Type 3), which are then introduced into our second stage survival models, allowing us to control for any possible selection bias in those models (Heckman, 1979). In the final model, Model 4, all three tie types and consequently, all three IMRs are included<sup>12</sup>.

We then estimate the following second stage survival model:

$$S_{ij}(t | \xi_{ij}) = \frac{1}{1+(a_{ij}*t)^\gamma},$$

where  $a_{ij} = \exp(\beta_0 + X_{ij}\beta + \xi_i)$ . In other words,  $S$  is the survival of GE crop  $j$  for company  $i$  in the regulatory process (or the time until the crop gets approved),  $X$  refers to explanatory variables (such as firm and crop characteristics, regulatory environment controls and revolving door dummies, as well as the appropriate inverse Mills ratios),  $\beta$  are regression parameters to be estimated, and  $\gamma$  is the shape parameter for the log-logistic distribution. As our observations are on the level of the crop, we also include firm frailty (or random effect),  $\xi_i$ , which accounts for the correlation of regulatory outcomes for crops produced by the same firm. The subscript  $t$  for the given year is suppressed for notational convenience. In this AFT model, the dependent variable

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<sup>12</sup> For examples of multiple selection treatment, see Krishnan (1990) and Muller and Riedl (2002).

is interpreted as the survival time (i.e. how long a GE crop stays in the sample until it is approved)—with negative coefficients indicating a faster approval, and positive coefficients indicating a slower regulatory process.

## RESULTS

Our data contains observations on 4,603<sup>13</sup> applications for planting of GE crops between 1998-2006. Although 20 companies are included in our analysis, Monsanto's applications represent 78 percent of the sample. Monsanto's dominance in our sample is reflective of their overall market position: 90 percent of U.S. soybean crop, and 80 percent of the corn and cotton crops are grown using Monsanto seeds (Langreth and Herper, 2009). In a supplemental analysis (not shown), we include a dummy for a crop being produced by Monsanto (1 if Monsanto crop, 0 otherwise), which does not affect our results. We also run our analyses on two stratified subsamples, containing Monsanto and non-Monsanto crops. While the subsamples do not contain all the possible tie directions and timings, the results from these models are consistent with our unified sample results. Table 1 provides descriptive statistics for our sample, and Table 2 provides the breakdown of applications by company.

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Insert Tables 1 and 2 about here

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We first examine results from the probit models on the likelihood of firms having different kinds of revolving doors to the USDA. As the dependent variable, Probit model 1 uses the *Type 1 revolving door* dummy, Probit model 2 uses the *Type 2 revolving door* dummy, and Probit model 3 uses the *Type 3 revolving door* dummy. The results of these three models are presented below.

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Insert Table 3 about here

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<sup>13</sup> Two observations are dropped in the analysis because their time to approval was 0 days (i.e. they were approved on the first day of the regulatory process).

What can we tell about companies that have revolving door ties? Across the three models, lagged regulatory process duration has a strong positive effect ( $p < 0.001$ ), indicating that companies that had previously experienced longer waiting for a regulatory approval are more likely to form revolving doors. Moreover, more research-intensive companies (i.e. those that have more utility patents) are significantly more likely to have any type of revolving door to the USDA. On the other hand, company size (as indicated by employee numbers) and political involvement (as indicated by lobbying expenditures) did not seem to have robust effects across the different types of revolving doors. While larger companies are more likely to have Type 3 ties, they are less likely to have Type 1 ties. Companies that had higher lobbying expenditures were more likely to form Type 1 ties, and less likely to have Type 2 and Type 3 ties.

We next examine the effects of firm-government ties on the duration of the regulatory process. Our log-logistic AFT models with frailty are presented below. In Table 4, Model 0 represents our baseline model, containing only control variables: total firm asset size and R&D expenditures, firm lobbying and PAC contributions, count of firm plant patents, foreign firm dummy, GE crop acreage, dummies for corn, soybean and cotton, dummy for PIPs, GE phenotype variety, liberal President dummy, measure of USDA traffic jam and a dummy for the regulatory process type. Model 1 additionally includes the Type 1 tie dummy, while Model 1b also includes  $IMR_{type1}$ , the inverse Mills ratio from Probit model 1. In Model 2, in addition to the baseline control variables, we include Type 2 ties. Model 2b then includes  $IMR_{type2}$ , the inverse Mills ratio from Probit model 2. Model 3 includes the baseline control variables, as well as the Type 3 dummy, while Model 3b also includes  $IMR_{type3}$ . Finally, Model 4 includes all three types of revolving door dummies, as well as all their respective IMRs.

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Insert Table 4 about here

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Our baseline model, Model 0, shows the effects of control variables. Larger firms (i.e. those with greater total assets) receive a significantly faster approval for their GE crop planting applications, although it may be noted that this effect does not persist across all models. R&D intensity, as operationalized by R&D expenditures and plant patent count, does not have a significant effect. Further, while greater lobbying expenditures increase the speed of approvals for biotechnology producers ( $p < 0.001$ ), their PAC contributions do not have a significant effect. Whether a crop producer is foreign does not have a significant effect, and neither does the proposed surface area for GE crop planting. Strategically important plants for US agriculture, corn, soybean and cotton, all appear to take longer to be reviewed ( $p < 0.001$  for all three). These important GE crops are not rushed through the planting application process—in fact, quite the opposite is true. More varied phenotypes also take longer to approve, although GE crops including plant incorporated protectants (PIPs) take less time ( $p < 0.001$  for both). As for ideological variables, liberal Presidency speeds up crop review times at the USDA ( $p < 0.001$ ). Finally, the number of concurrent GE crop planting requests lengthens the wait for regulatory approval ( $p < 0.001$ ), and a submission to the more streamlined regulatory process shortens it ( $p < 0.001$ ).

### **Selection Bias**

Inverse Mills Ratios created from our probit models help us determine whether selection bias exists. In other words, significant coefficients of the IMRs indicate that the formation of a revolving door between a given firm and the USDA is also correlated with the firm's regulatory outcome. Models 1b, 2b, and 3b in Table 4 show that selection bias occurs for all three types of revolving door ties, as *IMRtype1*, *IMRtype2* and *IMRtype3* all have significant coefficients.

### **Firm-to-USDA Pre-Regulation Ties (i.e.Type 1) (H1)**

Type 1 revolving doors significantly increase the speed of the regulatory process, whether selection bias is accounted for (in Model 1b) or not (Models 1 and 4). In other words, firms that have former employees who become regulators have better outcomes during the former employees' regulatory tenure.

### **USDA-to-Firm Pre-Regulation Ties (i.e. Type 2) (H2)**

Type 2 revolving doors significantly decrease the speed of regulatory approvals. The effect of these ties, however, is not highly significant in Model 2b ( $p < 0.05$ ), which controls for the selection bias, and it becomes insignificant in Model 4. We thus conclude that firms that have former regulators on their staff do not experience better regulatory outcomes.

### **USDA-to-Firm Post-Regulation Ties (i.e. Type 3) (H3)**

Finally, Type 3 revolving doors also significantly increase the speed of regulatory approvals. Interestingly, however, not accounting for selection bias here would alter our findings, making the coefficient not significant in Model 3. However, in Models 3b and 4, we see that firms that hire regulators away have better outcomes during their future employees' tenure.

How much does a revolving door matter? Using coefficients from our Model 4, we are able to calculate the marginal effect of having a revolving door to the USDA (vs. not having one). With all explanatory variables held constant at their averages, having a Type 1 revolving door to the USDA shaves off around 2.5 days from the regulatory approval time for a GE crop. On the other hand, a Type 3 revolving door to the USDA reduces the approval time by around 7 days. Using Hiatt and Park's (2013) waiting cost estimate of \$2 million/day, it is clear that companies stand to benefit from their revolving door practices in an economically significant

way: a Type 1 revolving door would save \$5 million, and a Type 3 revolving door would save \$14 million in foregone revenue due to regulatory waiting costs.

## **DISCUSSION**

Despite the relative lack of attention that revolving door ties receive compared to other corporate political strategies (such as lobbying or PAC contributions), the results of our study demonstrate a clear advantage for firms connected to their regulators via exchanging employees. Importantly, the benefits to firms accrue during the revolving regulator's tenure, whether the regulator previously worked for a regulated firm, or moved on to it after their regulatory tenure. In fact, the benefits of a faster regulatory outcome only accrue during the regulator's tenure—once the regulator transitions to the firm, the firm no longer benefits. Moreover, we find that there is a selection bias in the formation of revolving door ties, such that firms that have historically fared worse, are more likely to have revolving door ties in the subsequent period.

Anecdotally, examining the backgrounds of the revolving regulators supports the idea that firms use the revolving door as a corporate political strategy. Of the seven revolving regulators in our sample, five individuals are lawyers, and none had degrees related to agriculture or biotechnology. More importantly, across both directions of the revolving door, six individuals held corporate positions that put them in charge of their firm's external relations, most often with government entities (such as Head of Government Relations, VP for Public Policy, and General Counsel). Finally, most revolvers were from the higher echelons of the USDA, with just one revolver directly in the biotechnology-regulating APHIS. Overall, the revolving regulators in our sample have legal rather than technical expertise, come from positions of higher power within the USDA, and hold corporate roles in which they may be required to interface with the USDA and other governmental entities. As such, the exchange of employees between the USDA and the

regulated agribiotechnology firms does not seem to create an exchange of technical expertise related to biotechnology products. Instead, the revolving door seems to promote an exchange of regulatory process knowledge across the USDA and regulated firms. Moreover, the fact that most revolvers hold corporate external relations positions is suggestive of hiring decisions as a part of a corporate political strategy. This holds particularly for the government-to-firm revolvers, whose regulatory expertise, as well as USDA contacts, makes them excellent candidates to manage a firm's relations with the USDA and other governmental bodies. Future research might examine how the characteristics of individual regulators influence their propensity to become revolvers, and consequently, to affect regulatory outcomes.

Empirically, the evidence for the revolving door as a corporate political strategy is threefold. Firstly, firms that perform worse tend to be more likely to form ties, which suggests that firms may hire former regulators, or encourage their former employees to transition to regulatory jobs, as a way to address previously lengthy regulatory waits. Secondly, benefits occur during the regulatory tenure of revolving regulators, which is suggestive of regulators with revolving door ties influencing the regulatory outcomes in their former or future employer's favor. Thirdly, there are no benefits to firms hiring former regulators once they are on their staff, suggesting that the regulators may not necessarily be hired due to the expertise and social capital they bring to the firm. These results, taken together, indicate that firms may strategically use revolving door relationships as a means to shaping regulatory outcomes.

This chapter contributes to the organizational literature in several different ways. First, by viewing revolving door personnel movements as instances of strategic tie formation between firms and governments, we answer recent calls to investigate the social and organizational processes through which corporations mobilize and shape their political environments (Walker

and Rea 2014). Second, while past studies on the revolving door have focused on agency- or industry-level outcomes such as committee votes, enforcement by the regulator, etc., we focus on firm-specific outcomes of ties, allowing us to pinpoint the advantages for the firms adopting this strategy, and the consequences for competitors in the industry. Finally, our empirical approach allows us to correct for a methodological issues plaguing prior studies (i.e., selection bias), and as a result, the chapter provides a clearer resolution to the conflicting evidence regarding revolving doors.

An important feature of our chapter is the empirical context within the agribiotechnology and its main regulator, USDA. The agribiotechnology sector is a particularly suitable setting due to its heavy regulation. Heavily regulated industries, due to their high dependence on the government (Pfeffer and Salancik 1978), engage more in corporate political strategies (Lux, Crook, and Woehr 2011). However, while choosing a highly regulated industry as the focus of our study may have allowed us to observe more corporate political activity, both less and more regulated industries have been shown to achieve better performance as a result of their hiring of former politicians (Hillman 2005). As such, the choice of a highly regulated industry is not expected to bias our results.

Additionally, the agribiotechnology sector has often come under criticism for the high levels of revolving doors. Interestingly, in our sample, we find that of the regulators studied, only three percent were, in fact, revolvers. Previous studies have shown the rates of revolving doors to be higher, ranging from 11 to 51 percent for government-to-firm (Coates 2012; Eckert 1981), as well as 21 percent for firm-to-government revolving door ties (Eckert 1981). However, despite the ties' relatively low prevalence, compared to other agencies, the USDA's regulatory outcomes were significantly affected by the revolving doors. A possible reason for the significance of the



relatively small amount of ties may lie in the structure of the industry, which is highly consolidated. Thus, although relatively few firms are connected to the USDA via the revolving door, those same firms submit most of the applications for approval, and are therefore able to extract significant benefits from the revolving doors.

It is, however, important to note that exchanging resources for policy or regulatory outcomes is illegal in the United States and most developed countries (Lux, Crook, and Woehr 2011). Given the illegal nature of transacting over policy and the consequent lack of contractability in these political exchanges, how do firms ensure that the revolvers will act favorably towards the firm after receiving their reward? Moreover, as firms extract most of the value from the revolvers while they are still in their regulatory roles, how do government-to-firm revolvers ensure that their corporate employers do not terminate their employment at the earliest opportunity post-transition? Unlike economic transactions governed by contracts, political exchanges may be governed by trust between the parties (Lux, Crook, and Woehr 2011), making them more of a social exchange (Blau 1964). Trust is likely to characterize interactions between firms and their former employees, as well as the repeated dealings between regulators and regulated firms. Future research is needed to fully understand the complexities of these firm-government interactions on the micro-level.

Of course, given the prevalence of the revolving door ties, as well as their potential to skew regulatory outcomes, safeguards have been developed in order to ensure a fair regulatory process. Federal procedures attempt to limit the potential for conflicts of interest arising due to revolving door ties. Political appointees entering the USDA from industry are barred from taking official action on matters concerning their former employers. When their job description puts them in the position of regulating on such issues, regulators may have to recuse themselves from

the process, as well as divest any financial instruments tied to the former employer, and they may even be assigned to a different position altogether. Of course, while regulators may not have direct decision-making power over their former employers, they may be able to influence their colleagues who are able to legally affect regulatory outcomes. Moreover, while regulators who leave the USDA for industry have “cooling-off” periods during which their contact with the USDA is prohibited, our study indicates that undue influence may occur not after the regulator’s transition to the firm, but before. While there are rules prohibiting regulatory decision-making on potential future employers, any infractions may be difficult to monitor. Our empirical findings suggest that, despite the criminal and regulatory statutes designed to limit the impact of revolving doors, differential regulatory outcomes for connected firms persist.

However, despite our findings, we caution against taking extreme policy actions, such as prohibiting revolving doors altogether. While our results suggest that firms may not benefit significantly from having revolving regulators on their staff, it has been suggested that the government is able to attract higher quality regulators, due to the regulators’ ability to subsequently convert their regulatory experience into lucrative job offers in industry (Brezis 2012). Moreover, former corporate executives who become regulators, despite possibly distorting the regulatory process, may also bring valuable industry knowledge that could improve aspects of the process. Although our study cannot adjudicate on whether there are benefits to the regulatory process due to the movement of employees, policy decisions regarding the revolving door should carefully weigh the pros and the cons of the phenomenon. Thus, there is a critical need for future research that might improve our understanding of this complex social phenomenon, as well as its implications for individuals, firms, and the government.

In conclusion, our study provides an empirically-supported theoretical model of how firm-government revolving doors are used as a corporate political strategy to extract advantages in the regulatory process. Firms with historically worse regulatory outcomes are more likely to pursue this strategy, and they reap benefits from it while the revolving regulator is at the regulatory agency. Despite its impactful economic significance for firms, as well as the important implications for the fairness of the regulatory process, firm-government revolving doors have been relatively neglected in the management literature. Our study places the revolving door in its rightful place in the corporate political strategy repertoire, along with lobbying and PAC contributions, and invites scholars to contribute to a better understanding of its many antecedents and consequences at individual and organizational levels.

# TABLES

## Table 1. Descriptive Statistics

Variable	Mean	Std. Dev.	Min	Max	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)
(1) outcome (0/1)	0.96	0.20	0	1																					
(2) regulatory process duration	34.76	19.51	0	452	0.17																				
(3) total assets (thousands)	12.33	9.73	0.02	73.76	0.01	-0.01																			
(4) employee number	20.61	19.78	0.061	115.4	-0.01	-0.03	0.95																		
(5) R&D expenditure (thousands)	0.04	0.17	0	2.25	0.04	-0.01	0.20	0.29																	
(6) lobbying expenditure (millions)	1.39	1.50	0	3.64	-0.06	0.15	-0.04	0.03	0.23																
(7) PAC contribution (thousands)	34.67	22.47	0	484.55	0.00	0.12	0.19	0.21	0.23	0.47															
(8) plant patent count	1.73	9.63	0	79	0.03	0.07	-0.01	-0.01	-0.04	-0.05	0.19														
(9) utility patent count	222.66	206.21	0	1810	-0.11	0.02	0.24	0.31	0.51	0.17	0.21	-0.05													
(10) foreign company	0.11	0.31	0	1	0.00	0.00	0.58	0.64	-0.08	-0.10	0.11	0.51	0.02												
(11) acreage	104.85	484.43	0	14400	0.01	0.05	0.00	0.00	0.10	0.02	0.05	0.07	0.03	-0.02											
(12) corn	0.62	0.49	0	1	-0.04	0.08	-0.02	-0.05	-0.02	-0.03	0.02	0.02	0.03	-0.06	0.01										
(13) soybean	0.11	0.31	0	1	0.02	0.06	0.01	0.04	0.15	0.25	0.16	-0.03	0.17	-0.07	-0.02	-0.44									
(14) cotton	0.08	0.28	0	1	0.03	-0.03	0.20	0.18	-0.06	-0.06	-0.08	0.06	-0.02	0.22	0.07	-0.39	-0.11								
(15) PIPS	0.40	0.49	0	1	-0.03	-0.08	0.00	-0.04	-0.12	-0.18	-0.12	0.04	-0.04	0.02	0.05	0.35	-0.18	0.06							
(16) variety	1.23	0.61	1	10	-0.19	0.08	0.10	0.14	-0.01	0.21	0.09	-0.01	0.10	0.08	0.03	0.10	-0.01	-0.05	0.25						
(17) liberal President	0.17	0.38	0	1	-0.05	-0.08	0.04	0.02	0.11	-0.36	-0.02	-0.08	0.38	-0.06	-0.03	0.00	-0.07	0.00	0.06	-0.12					
(18) USDA traffic jam	297.54	156.94	12	1592	0.17	0.33	-0.03	-0.04	-0.02	-0.11	-0.02	0.00	0.01	-0.05	0.08	0.10	-0.03	0.04	0.17	-0.03	-0.06				
(19) reqtype	0.99	0.09	0	1	-0.01	-0.33	-0.07	-0.06	-0.05	0.03	-0.03	-0.02	-0.02	-0.06	-0.13	-0.01	0.01	0.03	0.04	-0.29	-0.03	-0.08			
(20) Firm-to-USDA pre-regulation (i.e. Type 1 rev door) (0/1)	0.59	0.49	0	1	0.01	0.05	-0.28	-0.34	-0.28	0.18	-0.06	-0.21	-0.07	-0.42	0.01	0.14	0.06	-0.08	0.07	0.04	-0.54	0.14	0.08		
(21) USDA-to-firm pre-regulation (i.e. Type 2 rev. door) (0/1)	0.11	0.31	0	1	0.03	0.00	0.06	0.00	0.18	-0.27	0.08	-0.06	0.42	-0.12	0.01	-0.04	-0.03	0.03	0.01	-0.09	0.77	-0.03	-0.04	-0.42	
(22) USDA-to-firm post-regulation (i.e. Type 3 rev. door) (0/1)	0.02	0.15	0	1	0.03	0.04	0.11	0.13	0.34	0.00	0.23	0.79	0.29	0.31	0.06	0.01	0.05	0.01	-0.02	-0.02	0.04	0.01	0.00	-0.19	0.09

**Table 2. Breakdown of the Companies in the Sample**

<b>Company</b>	<b>Number of observations</b>	<b>Percent</b>
Agritope	14	0.3
Aventis	78	1.69
BASF	60	1.3
Bayer CropScience	72	1.56
Coors	3	0.07
Delta and Pine Land	1	0.02
Dow AgroSciences	83	1.8
Du Pont	42	0.91
Heinz	1	0.02
International Paper	1	0.02
Monsanto	3,601	78.23
Novartis	54	1.17
Pioneer Hi-Bred International Inc.	155	3.37
R J Reynolds	2	0.04
Scotts	152	3.3
SemBioSys Genetics	1	0.02
Seminis Vegetable Seeds	38	0.83
Syngenta	242	5.26
Union Camp	2	0.04
Zeneca	1	0.02
Total	4,603	100

**Table 3. Probit Results**

	<b>Probit 1</b>	<b>Probit 2</b>	<b>Probit 3</b>
<b>DV</b>	<b>Type 1 revolving door</b>	<b>Type 2 revolving door</b>	<b>Type 3 revolving door</b>
employee number	-0.047*** (0.00)	0.001 (0.00)	0.005* (0.00)
lobbying expenditure (millions)	0.239*** (0.01)	-7.660*** (1.29)	-0.154*** (0.04)
utility patent count	0.001*** (0.00)	0.017*** (0.00)	0.002*** (0.00)
lagged regulatory process duration	0.025*** (0.00)	0.063*** (0.01)	0.061*** (0.01)
constant	-0.318** (0.12)	-7.286*** (0.46)	-4.235*** (0.19)
N	4982	4982	4982
chi2	1050.414	2368.430	293.836
AIC	5822.076	936.583	840.101

\* p<0.05, \*\* p<0.01, \*\*\* p<0.001

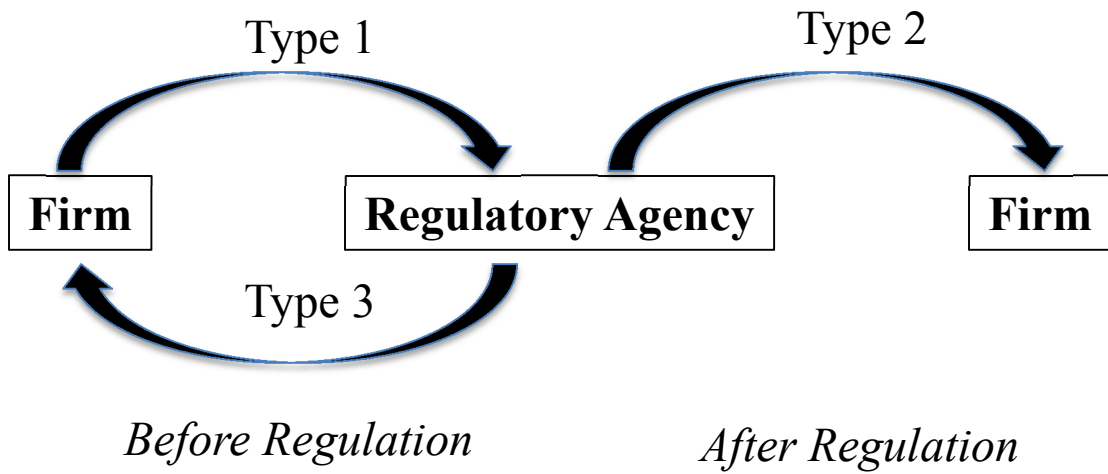
**Table 4. The Results of Log-Logistic AFT Survival Models with Company Frailty**

Independent variables		Model 0	Model 1	Model 1b	Model 2	Model 2b	Model 3	Model 3b	Model 4
Firm controls	total assets (thousands)	-0.007*** (0.00)	-0.007*** (0.00)	0.007*** (0.00)	-0.006*** (0.00)	0.002 (0.00)	-0.007*** (0.00)	0.002 (0.00)	-0.000 (0.00)
	R&D expenditures (thousands)	0.057 (0.04)	-0.010 (0.05)	-0.271*** (0.05)	-0.010 (0.04)	-0.248*** (0.04)	0.045 (0.04)	-0.208*** (0.04)	-0.309*** (0.06)
	lobbying expenditures (millions)	-0.027*** (0.00)	-0.026*** (0.00)	0.051*** (0.01)	-0.020*** (0.00)	0.118*** (0.02)	-0.027*** (0.00)	0.073*** (0.01)	0.199*** (0.04)
	PAC contributions (thousands)	-0.000 (0.00)	-0.000 (0.00)	-0.002*** (0.00)	0.000 (0.00)	-0.002*** (0.00)	-0.000 (0.00)	-0.002*** (0.00)	-0.002*** (0.00)
	plant patent count	-0.001 (0.00)	-0.001 (0.00)	0.004*** (0.00)	-0.001 (0.00)	0.004*** (0.00)	-0.002 (0.00)	0.006*** (0.00)	0.008*** (0.00)
	foreign firm dummy (0/1)	0.065 (0.04)	0.017 (0.04)	0.002 (0.05)	0.050 (0.04)	0.007 (0.04)	0.072 (0.04)	-0.009 (0.04)	-0.134* (0.06)
Crop controls	acresage	0.000 (0.00)	0.000 (0.00)	0.000 (0.00)	0.000 (0.00)	0.000 (0.00)	0.000 (0.00)	0.000 (0.00)	0.000 (0.00)
	corn (0/1)	0.210*** (0.02)	0.213*** (0.02)	0.214*** (0.02)	0.218*** (0.02)	0.211*** (0.02)	0.209*** (0.02)	0.210*** (0.02)	0.212*** (0.02)
	soybean (0/1)	0.180*** (0.02)	0.183*** (0.02)	0.190*** (0.02)	0.185*** (0.02)	0.180*** (0.02)	0.179*** (0.02)	0.177*** (0.02)	0.172*** (0.02)
	cotton (0/1)	0.121*** (0.02)	0.122*** (0.02)	0.119*** (0.02)	0.126*** (0.02)	0.120*** (0.02)	0.120*** (0.02)	0.120*** (0.02)	0.125*** (0.02)
	PIPs (0/1)	-0.131*** (0.01)	-0.127*** (0.01)	-0.143*** (0.01)	-0.133*** (0.01)	-0.144*** (0.01)	-0.130*** (0.01)	-0.145*** (0.01)	-0.141*** (0.01)
	phenotype variety	0.032*** (0.01)	0.032*** (0.01)	0.022* (0.01)	0.031*** (0.01)	0.017 (0.01)	0.032*** (0.01)	0.015 (0.01)	0.011 (0.01)
Regulatory envi. controls	liberal President (0/1)	-0.123*** (0.01)	-0.181*** (0.02)	0.108*** (0.02)	-0.209*** (0.02)	0.065 (0.04)	-0.122*** (0.01)	0.155*** (0.02)	0.038 (0.04)
	USDA traffic jam	0.001*** (0.00)	0.001*** (0.00)	0.001*** (0.00)	0.001*** (0.00)	0.001*** (0.00)	0.001*** (0.00)	0.001*** (0.00)	0.001*** (0.00)
	process type (0/1)	-0.856*** (0.04)	-0.868*** (0.04)	-0.831*** (0.07)	-0.856*** (0.04)	-0.836*** (0.07)	-0.856*** (0.04)	-0.821*** (0.07)	-0.840*** (0.07)
Revolving door ties	<b>Firm-to-USDA pre-regulation (Type 1) (0/1) (H1)</b>		-0.080*** (0.02)	-0.051** (0.02)					-0.080*** (0.02)
	<b>USDA-to-firm pre-regulation (Type 2) (0/1) (H2)</b>				0.126*** (0.03)	0.092* (0.04)			0.031 (0.05)
	<b>USDA-to-firm post-regulation (Type 3) (0/1) (H3)</b>						0.073 (0.05)	-0.188** (0.07)	-0.246** (0.08)
Inverse Mills Ratios	IMRtype1			-0.064* (0.03)					0.043 (0.03)
	IMRtype2					-0.008** (0.00)			-0.017** (0.01)
	IMRtype3						-0.122*** (0.03)		-0.038 (0.05)
constant	4.065*** (0.05)	4.131*** (0.06)	3.845*** (0.08)	4.041*** (0.05)	3.839*** (0.08)	4.066*** (0.05)	4.123*** (0.11)	4.052*** (0.15)	
N	7093	7093	4601	7093	4601	7093	4601	4601	
chi2	2103.909	2121.118	965.579	2127.843	971.669	2106.101	982.351	1000.289	
AIC	7945.313	7930.104	3684.312	7923.38	3678.222	7945.121	3667.54	3657.602	

\* p<0.05, \*\* p<0.01, \*\*\* p<0.001

**FIGURES**

**Figure 1. Diagram of Revolving Doors Types According to Direction and Timing**





## APPENDIX

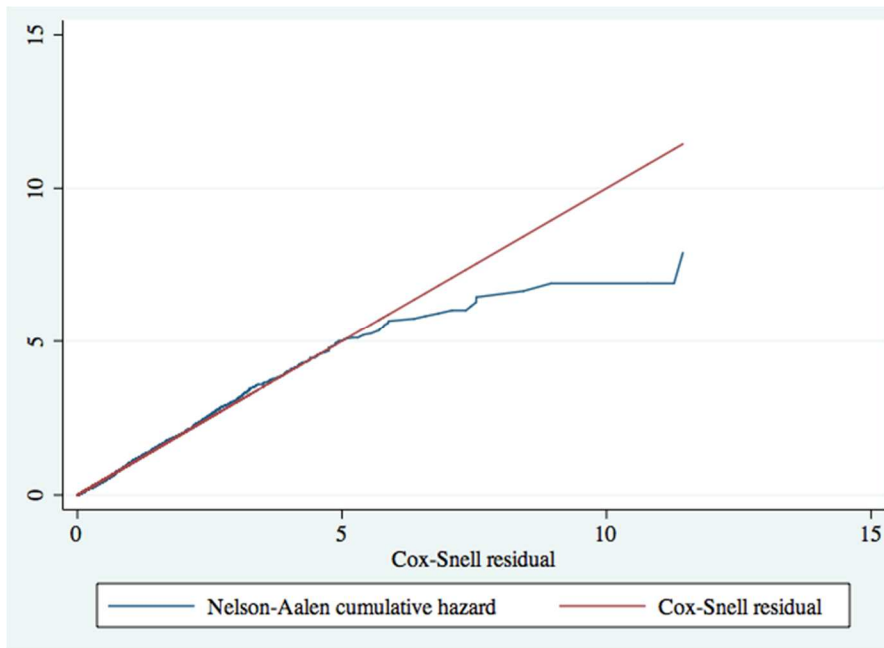
**Table A1. Results Using Cox Semi-Parametric Regression**

	Independent variables	Model 0	Model 1	Model 1b	Model 2	Model 2b	Model 3	Model 3b	Model 4
Firm controls	total assets (thousands)	0.026*** (0.00)	0.026*** (0.00)	-0.026*** (0.01)	0.026*** (0.00)	-0.007 (0.01)	0.026*** (0.00)	-0.007 (0.01)	-0.011 (0.01)
	R&D expenditures (thousands)	0.020 (0.11)	0.315* (0.13)	0.595*** (0.17)	0.159 (0.12)	0.391** (0.14)	0.022 (0.11)	0.370* (0.15)	0.704*** (0.21)
	lobbying expenditures (millions)	0.067*** (0.01)	0.060*** (0.01)	-0.110*** (0.02)	0.047*** (0.01)	-0.354*** (0.07)	0.067*** (0.01)	-0.199*** (0.02)	-0.302** (0.12)
	PAC contributions (thousands)	0.000 (0.00)	0.000 (0.00)	0.002 (0.00)	0.000 (0.00)	0.002 (0.00)	0.000 (0.00)	0.003* (0.00)	0.004** (0.00)
	plant patent count	-0.002 (0.00)	-0.002 (0.00)	-0.008** (0.00)	-0.002 (0.00)	-0.009*** (0.00)	-0.001 (0.00)	-0.018*** (0.00)	-0.019*** (0.01)
	foreign firm dummy (0/1)	-0.991** (0.31)	-0.951** (0.34)	-0.465 (0.30)	-0.943** (0.31)	-0.304 (0.34)	-0.994** (0.30)	-0.185 (0.33)	-0.170 (0.36)
Crop controls	acreeage	-0.000 (0.00)	-0.000 (0.00)	-0.000 (0.00)	-0.000 (0.00)	-0.000 (0.00)	-0.000 (0.00)	-0.000 (0.00)	-0.000 (0.00)
	corn (0/1)	-0.528*** (0.04)	-0.533*** (0.04)	-0.665*** (0.05)	-0.541*** (0.04)	-0.648*** (0.05)	-0.527*** (0.04)	-0.646*** (0.05)	-0.652*** (0.05)
	soybean (0/1)	-0.420*** (0.05)	-0.416*** (0.05)	-0.511*** (0.06)	-0.428*** (0.05)	-0.479*** (0.06)	-0.418*** (0.05)	-0.474*** (0.06)	-0.474*** (0.06)
	cotton (0/1)	-0.304*** (0.06)	-0.302*** (0.06)	-0.353*** (0.07)	-0.321*** (0.06)	-0.355*** (0.07)	-0.305*** (0.06)	-0.340*** (0.07)	-0.344*** (0.07)
	PIPs (0/1)	0.342*** (0.03)	0.337*** (0.03)	0.441*** (0.04)	0.343*** (0.03)	0.427*** (0.04)	0.341*** (0.03)	0.436*** (0.04)	0.434*** (0.04)
	phenotype variety	-0.086*** (0.02)	-0.090*** (0.02)	-0.075* (0.03)	-0.083*** (0.02)	-0.059 (0.03)	-0.085*** (0.02)	-0.059 (0.03)	-0.058 (0.03)
Regulatory envi. controls	liberal President (0/1)	0.352*** (0.03)	0.523*** (0.05)	-0.139 (0.08)	0.547*** (0.06)	-0.006 (0.15)	0.351*** (0.03)	-0.319*** (0.05)	-0.102 (0.16)
	USDA traffic jam	-0.002*** (0.00)	-0.002*** (0.00)	-0.002*** (0.00)	-0.002*** (0.00)	-0.002*** (0.00)	-0.002*** (0.00)	-0.002*** (0.00)	-0.002*** (0.00)
	process type (0/1)	1.708*** (0.10)	1.754*** (0.10)	1.535*** (0.19)	1.725*** (0.10)	1.584*** (0.19)	1.714*** (0.10)	1.547*** (0.19)	1.558*** (0.19)
Revolving door ties	<b>Firm-to-USDA pre-regulation (Type 1) (0/1) (H1)</b>		0.239*** (0.05)	0.167* (0.07)					0.241** (0.09)
	<b>USDA-to-firm pre-regulation (Type 2) (0/1) (H2)</b>				-0.288*** (0.07)	-0.287 (0.17)			0.037 (0.19)
	<b>USDA-to-firm post-regulation (Type 3) (0/1) (H3)</b>						-0.108 (0.12)	0.676** (0.24)	0.678** (0.25)
Inverse Mills Ratios	IMRtype1			0.394*** (0.11)					0.145 (0.13)
	IMRtype2					0.026** (0.01)			0.019 (0.02)
	IMRtype3						0.350*** (0.08)		0.225 (0.15)
	N	7093	7093	4601	7093	4601	7093	4601	4601
	chi2	1781.511	1804.144	816.222	1825.470	806.499	1781.382	817.798	829.581
	AIC	104386.901	104365.714	64694.065	104370.705	64698.551	104388.075	64682.455	64680

\* p<0.05, \*\* p<0.01, \*\*\* p<0.001

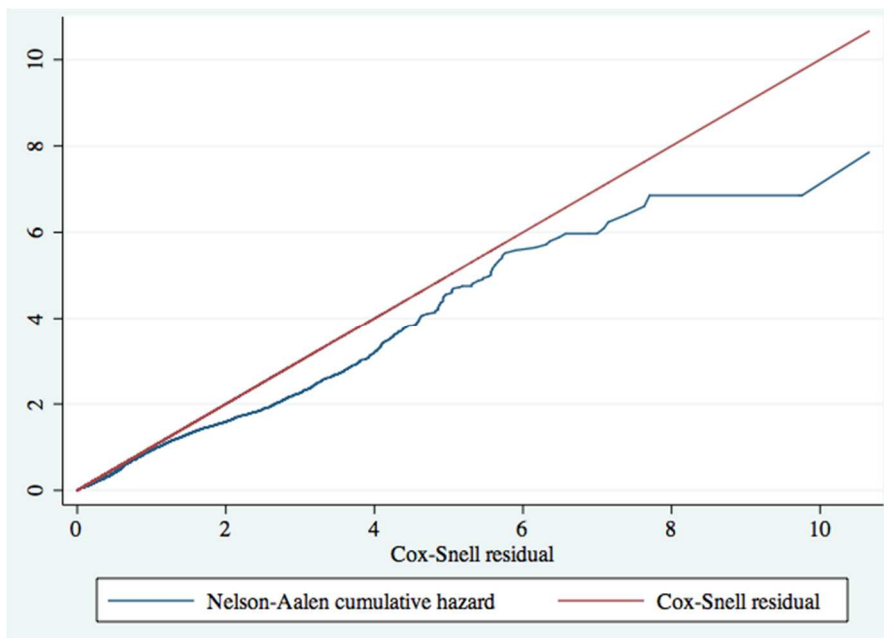
Cox semi-parametric regression models the hazard of an observation leaving the risk set, and therefore, coefficients here have the opposite interpretation to our main models: positive coefficients indicate a faster approval time, and negative coefficients indicate a slower approval time.

**Figure A1. Cox-Snell Residuals for Model 4: Cox Semi-Parametric Model**

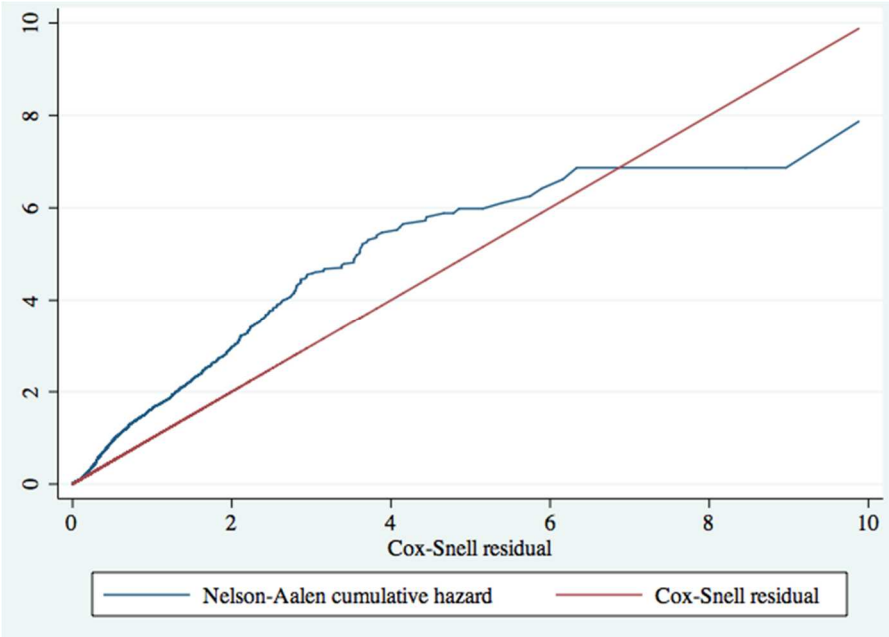


Figures A1-A5 present the Cox-Snell residuals for Model 4, run using various semi-parametric and parametric models with different distributions. The closer the residuals fall to the 45-degree line, the better the fit of the model.

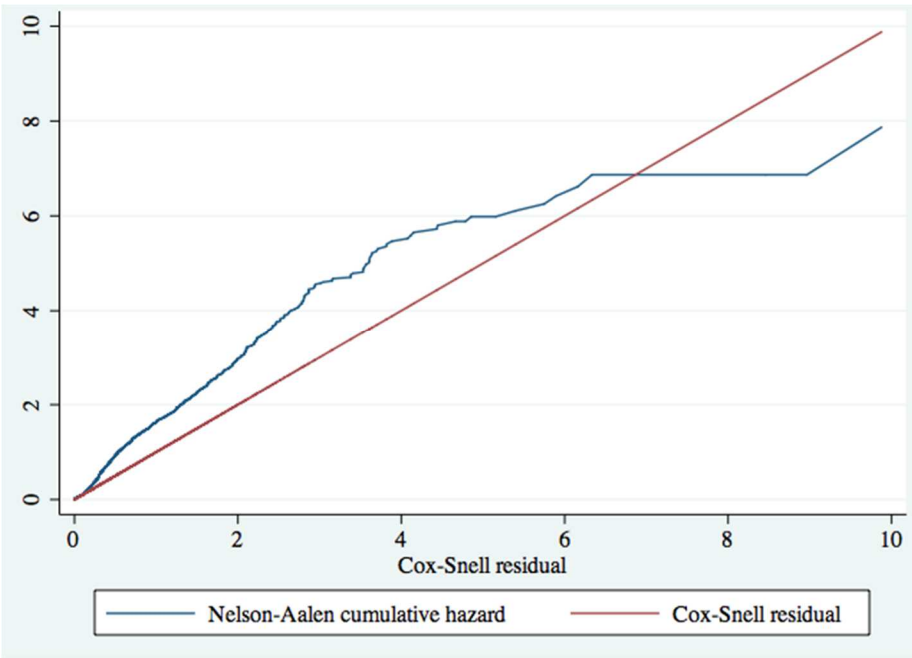
**Figure A2. Cox-Snell Residuals for Model 4: Log-Logistic AFT Survival Model**



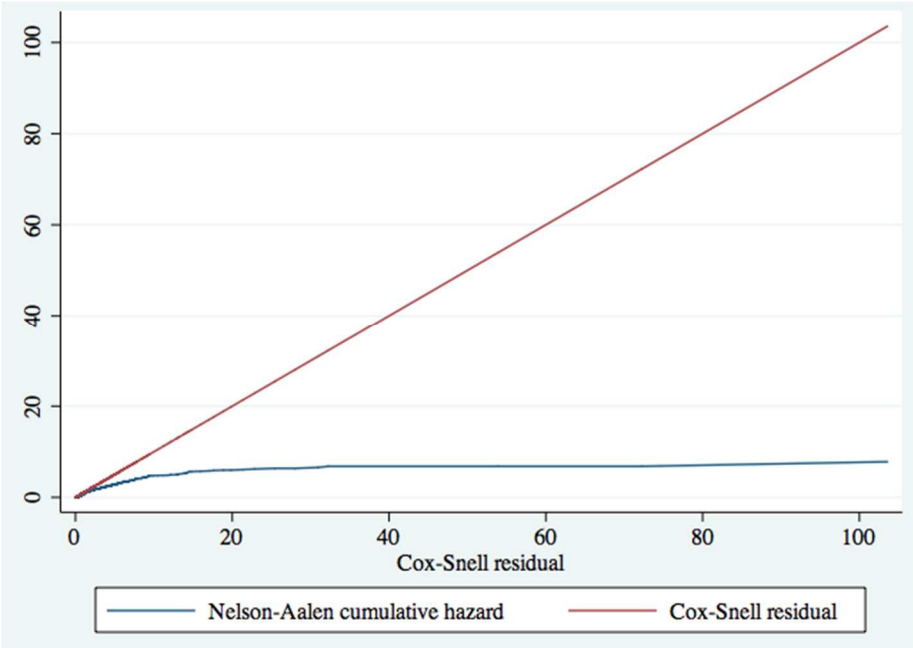
**Figure A3. Cox-Snell Residuals for Model 4: Exponential Survival Model**



**Figure A4. Cox-Snell Residuals for Model 4: Log-Normal Survival Model**



**Figure A5. Cox-Snell Residuals for Model 4: Weibull Survival Model**



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## CHAPTER V

### CONCLUSION

Across three empirical chapters, this dissertation investigates the antecedents and the consequences of a very common, and scarcely understood social phenomenon—that of employee exchange between regulators, and regulated firms. Chapter II sheds light on regulatory expertise and connectedness as determinants of transitions to directly and indirectly regulated firms. Chapter III provides insight into the regulatory agencies' motivations for participating in the revolving door, including the need to learn about the regulated industry, and to build support for their regulatory initiatives. Finally, Chapter IV demonstrates the benefits to firms of having social political capital in the form of revolving doors, such that they receive improved regulatory outcomes as a consequence. Overall, the three chapters provide a unique new perspective on this specific type of employee mobility. Together, they suggest that the revolving door phenomenon may be shaped by both firms and governmental bodies, serving the different strategic purposes of these two types of entities alike.

While this dissertation is a first step in developing a comprehensive picture of the antecedents and consequences of the revolving door, future research is direly needed in the area in order to definitely answer several important questions. Firstly, and most importantly, what is the overall result of the firm-government revolving door on social welfare? In other words, does the strategic hiring of ex-industry revolvers by regulatory commissions produce benefits (in terms of higher quality regulations and more effective implementation) in addition to costs (in terms of skewed regulatory process favoring some firms over others) due to the firms' hiring of former commissioners? Further, given that the revolving door has been shown to skew regulatory outcomes in one regulatory agency, does this effect generalize across different agencies and

regulated industries? Moreover, does the use of the revolving door by firms and regulatory agencies vary across national settings? Additionally, what are the effects of laws limiting revolving doors in terms of improving the fairness of the regulatory process, as well as the quality of regulation? Also, do firms utilize their revolving door ties to produce better outcomes specifically for themselves, or do they also use them to benefit the entirety of the industry? Finally, what is the effect of the firms' use of revolving doors as a corporate political strategy on their reputation? Below, I suggest a future research agenda that may contribute to answering these questions.

The first question has to do with comparing the benefits and the costs of the revolving door. Arguably, while the entry revolving door may create benefits through allowing regulatory agencies to craft and implement more effective regulation, the exit revolving door may create social costs through unfairly favoring some firms in the regulatory process. As such, in order to compare the benefits and costs of the revolving door, it is necessary to measure both. For example, one could operationalize regulatory quality as the speed of converting legislation into regulation by the IRCs, a task that all IRCs engage in, and then study regulatory quality as a feature of entry revolving door occurrence. Another variable that might successfully operationalize the performance of an agency may be a count of court cases filed against it, as well. Such a study of an agency's performance might help us confirm the learning and support-building motivations of the regulatory agencies for participating in the revolving door, and it would present a test of the effectiveness of the agencies' hiring strategy. Moreover, studying the benefits of the revolving door may allow us to fully assess the impact of the phenomenon, in contrast to previous work, which exclusively focused on potential costs in terms of the skewed regulatory process.

Furthermore, future work is needed to demonstrate whether the effects of the revolving door on regulatory outcomes extend beyond the USDA and the few other studied agencies. As mentioned, previous work has found that the revolving door contributes to both more (Gormley 1979; Grace and Phillips 2008) and less favorable firm outcomes (Cohen 1986; deHaan, Kedia, Koh, and Rajgopal 2011). As such, a comprehensive study of various agencies (including the 17 IRCs studied in this dissertation) would provide an important perspective on the consequences of the revolving door cross-sectorally. However, the difficulty lies in collecting data on regulatory outcomes that do not vary significantly in their nature across agencies. I envision two paths forward, in order to avoid this issue. One solution would be to focus on a subset of agencies that may have similar regulatory functions, such as enforcement actions against regulated firms. Another solution would be to adopt an indirect measure of firm regulatory outcomes: firm financial performance. This is a measure commonly adopted by non-market strategy scholars (e.g. Hillman (2005); Hillman, Zardkoohi, and Bierman (1999)), with the idea that firm financial performance may be thought of as a reflection of, among other things, its successful use of corporate political strategy. Thus, employing one of these proposed measures may be a helpful step in measuring the effects of the revolving doors across agencies and sectors.

Moreover, previous research has documented the global prevalence of the revolving door (Braun and Raddatz 2010; Brezis 2012; Haveman, Jia, Shi and Wang 2014; Horiuchi and Shimizu 2001). As such, it is important to think about how the revolving doors may be used differently in different national contexts. For example, countries that exhibit high levels of corruption and weak governmental institutions may suffer greater costs from the revolving door's role in regulatory capture. Furthermore, the agencies in such countries may also not be able to extract benefits from their hiring of ex-industry people—as in different contexts, even the



entry direction of the revolving door may be driven by industry. Although global datasets containing revolving door data are difficult to compile, Faccio (2006) does provide coverage of 47 countries in terms of political connections of large, publicly traded firms. Such a dataset might allow a preliminary study of global trends in the revolving door.

Recently, “cooling-off” laws have been introduced in order to limit the possibility of a conflict of interest due to the revolving door, at least in the United States (White House 2009). Such laws typically ask regulators to recuse themselves from cases where they may have to adjudicate on a former employer, and they limit their ability to represent their new, post-tenure employers in regulatory matters before agencies for a number of years. The introduction of such laws may provide a quasi-natural experimental setting, in which the causal effect of the laws may be estimated on the perseverance of the revolving door, the quality of regulation produced, as well as firm outcomes. Such a study would provide an opportunity to examine both the effectiveness of these laws, and by extension, it would also allow an insight into how the revolving door was used prior to the introduction of the “cooling-off” laws.

In my study of the revolving doors in the agribiotechnology industry, I argue that the revolving door is used by firms for their individual benefit. In other words, this is a strategy that firms are using to enhance their own competitiveness rather than acting on behalf of the industry. Thus, the revolving door may be thought of as yet another example of the fracturing of the American corporate elite (Mizruchi 2013). Yet, one could imagine certain larger regulatory issues may motivate firms to band together in pursuit of more favorable regulation. Furthermore, there may be occasions where influencing regulation in favor of one company may produce benefits for the entire industry. As of now, however, it remains an empirical question whether firms truly pursue the hiring of former regulators for their individual benefit, or whether they

sometimes do so in order to influence industry outcomes. A cross-industry study could answer this question by relating industry indicators that could be proxies for industry unity (such as industry concentration as a rough measure), to measures of regulatory outcomes on firm and industry levels.

Finally, while the revolving door may be able to improve regulatory outcomes for firms, it may at the same time tarnish firm reputations to be seen as engaging in behavior that has potential for regulatory capture of the state (Dal Bó 2006; Stigler 1971). As such, from a non-market strategy perspective, it would be important to study the effect of the use of this particular corporate political strategy on corporate reputations. Using Open Secrets data, one might also compare the portfolio of corporate political strategies (including lobbying and political donations) in terms of their effects on firms' reputation. Such a study could also document any effects of media attention that might amplify reputation dangers of engaging in corporate political strategies.

Overall, then, despite the unique theoretical and empirical insights that this dissertation offers on the revolving door, much work remains to be done. The agenda presented above provides several burning questions that would benefit from future study. Given the important theoretical and practical implications of the revolving door, non-market strategy scholars should strive to answer these questions with great urgency, as well as much rigor.

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