

# Revolving door laws and state public utility commissioners

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## Abstract

This paper investigates the effects of revolving door regulations – laws that restrict the post-government employment opportunities of public sector workers – on the characteristics of state public utility commissioners. We find that commissioners from states with revolving door regulations have less expertise, serve shorter terms, and are less likely to be subsequently employed by the private sector, compared with their counterparts from states without revolving door laws. These findings suggest that revolving door regulations may have costly unintended consequences.

**Keywords:** political economy, public utility commissioners, regulation, revolving door laws, unintended consequences

## 1. Introduction

Regulatory capture has long been an important research topic for scholars of regulation (Bernstein 1955; Stigler 1971; Peltzman 1976). The potential for capture to induce wealth transfers among producer and consumer groups, the associated rent-seeking costs, and the negative effects on economic efficiency have led both academics and policymakers to explore the causes of and possible solutions to the problem of regulatory capture (see Dal Bó 2006 for an overview of the literature). With respect to one channel through which the regulated industry may capture the regulatory agency, the so-called “revolving door,” a solution seems to have been found. In the United States regulations have been passed at the federal, state, and local levels that impose restrictions on former regulators who seek employment opportunities in the industries they regulate after leaving their government jobs (Boehm 1996; Harris 2005; Holman 2005). Similar regulations have been adopted in other countries.

Although these post-government employment restrictions, sometimes called “revolving door laws,” may reduce the incentives for regulators to cater to the interests of regulated firms and help ensure that regulation is enforced impartially and in ways that improve efficiency, revolving door laws may also have costly unintended consequences. Restrictions on future employment opportunities may preclude welfare-enhancing inter-

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actions between the private and public sectors, or reduce an individual regulator's incentive to invest in industry-specific knowledge (Che 1995; Salant 1995). Additionally, by imposing restrictions on their future career choices, revolving door laws reduce the option values associated with government regulatory jobs, thus increasing the turnover rate of existing regulators and lowering the quality of new regulators.<sup>1</sup> To the extent that experience and expertise are important for regulatory decision-making, this suggests that revolving door laws may have negative consequences for the quality of regulatory enforcement.

This paper focuses on the issue of how revolving door laws affect the selection of individuals into the regulatory agency and their characteristics. Specifically, we investigate the relationships among state-level revolving door regulations, state public utility commissioners – regulators who set the rates charged by electricity, gas, and, in some instances, telecommunications firms – and their career outcomes. Using individual-level data on state public utility commissioners, we analyze whether commissioners from states with revolving door laws differ systematically in terms of their educational attainment, expertise, tenure, and post-government career outcomes from their counterparts in states without these regulations. In so doing we shed light on how these laws affect the selection of individuals into public service.

Our study relates to several strands of literature. First, we contribute to the literature on the revolving door phenomenon between industry and government. Little scholarly attention has been paid to whether revolving door regulations influence the characteristics and behavior of regulators. Instead, previous studies have investigated whether personnel capture is prevalent, and whether the potential for future employment by regulated firms influences regulators' decision making while in office (Berry 1979; Gormley 1979; Navarro 1982; Freitag 1983; Cohen 1986). In addition, a paper by Gely and Zardkoohi (2001) studies the effects of revolving door laws on stock returns and finds that firms associated with cabinet members appointed during the Carter, Reagan, and Bush Sr. administrations experienced above-normal returns, but those associated with cabinet members appointed during the Clinton administration obtained lower returns. As federal post-employment restrictions were first introduced during the Clinton administration, the findings support the argument that revolving door regulations significantly reduce the value of connections established while working for the government.

More generally, as an important mechanism through which a regulatory agency becomes captured by the regulated industry, our study of the revolving door phenomenon draws upon the literature on regulatory capture (Bernstein 1955; Stigler 1971; Peltzman 1976). In particular, it relates to the research on how regulators regulate (Hilton 1972; Eckert 1981; Atkinson & Nowell 1994; Fields *et al.* 1997; Heyes 2003; Law 2006; Quast 2008). This literature, in turn, sheds light on the incentives faced by government officials and bureaucrats (Niskanen 1971; Boylan & Long 2005). Finally, our study follows the long tradition of analyzing the unintended consequences of regulation.

To preview the results, we find that public utility commissioners in states with post-government employment restrictions tend to have less professional expertise, spend less time in office, and are less likely to obtain employment from the private sector after leaving office. These results suggest that these regulations may, to some degree, be effective in curtailing the influence of the revolving door. But, on the other hand, by affecting the selection and tenure of state regulators, the laws may also negatively affect the quality of state regulators.

The remainder of the paper is structured as follows: Section 2 begins with an overview of state-level revolving door regulations and how they may influence the characteristics of public sector employees, with a specific focus on public utility commissioners. The empirical tests of the hypotheses outlined in section 2 are presented in section 3. Finally, section 4 concludes.

## 2. Hypotheses

Since the 1930s state-level public utility commissions (henceforth PUCs) have played an important role in regulating public utility companies in the United States. PUCs perform a wide variety of duties, including setting the rates charged by public utilities, regulating the quality of products and services, supervising the safety standards of the firms, and, in general, overseeing the operations of the industries they regulate. A group of commissioners heads the PUC of each state. Commissioners are either elected by statewide ballot or nominated by the state governor and then confirmed by their respective state senates. As of 2005, the last year in our sample, 12 of the 50 states elected their PUC commissioners. Commissioners in the remaining states were nominated by their respective governors (see Table 1).

Since state PUCs have immense power over the industries they regulate, commissioners are in a position to accumulate valuable industry-specific human capital. Working on a PUC gives commissioners familiarity with the technical details of state regulation and allows them to establish relationships, both professional and personal, with other regulators. The knowledge and connections that are acquired by working on a PUC make former commissioners valuable as employees or consultants to regulated firms. Indeed, it appears that a substantial portion of regulators have taken advantage of their government experience and joined the private sector after leaving their PUC positions. Of the 129 commissioners in our sample who left their jobs between 1994 and 2005, 45 (35 percent) joined the private sector, mostly working for public utility companies in the same state in which they were commissioners.

The primary purpose of revolving door regulation is to reduce the risk of conflict of interest between public officials and the private sector. In the context of state PUCs, the potential for current regulators to find future employment with a public utility may result in the regulator being more lenient with utility companies when rates are set. Thus revolving door statutes adopted in many states either explicitly prohibit former commissioners from becoming employees of regulated firms, make it illegal for former commissioners to work as consultants for regulated firms, or place other restrictions on the employment opportunities of former regulators. As a result, we will use the terms “revolving door laws” and “post-government employment restrictions” interchangeably throughout the paper.

Although all revolving door laws prohibit former government employees from certain activities for certain periods of time, different states impose different restrictions on the types of jobs public sector workers can take after leaving the government, as well as how long the restrictions last. Based on information we collected from multiple sources, as of 2005, 33 states and the District of Columbia imposed statutory or administrative restrictions on the post-government employment options of departing commissioners, while the remaining states did not. Among states with revolving door regulations, most states (17) forbid former PUC commissioners from representing cases in which they had been

**Table 1** Descriptive statistics for commissioner characteristics (1994–2005)

Variable	N	Mean	S. D.	Min	Max
<i>Panel A: Commissioner characteristics</i>					
Commissioner age at job commencement	253	47.87	10.12	27	75
Commissioner is an expert in a specialized field	459	0.51	0.50	0	1
Commissioner has a master's degree or higher	448	0.71	0.46	0	1
Commissioner age at job completion	94	55.85	10.67	29	81
Years of tenure	101	6.63	5.17	0	24
Former commissioner works for private sector	129	0.35	0.48	0	1
<i>Panel B: Commission characteristics</i>					
Revolving door regulation indicator (at time of arrival)	365	0.51	0.50	0	1
Revolving door regulation indicator (at time of departure)	339	0.56	0.50	0	1
Commissioner forbidden to work for regulated utilities (at time of arrival)	365	0.07	0.24	0	1
Commissioner forbidden to work for regulated utilities (at time of departure)	339	0.08	0.25	0	1
Commissioner forbidden to work on previous cases (at time of arrival)	365	0.10	0.30	0	1
Commissioner forbidden to work on previous cases (at time of departure)	339	0.11	0.31	0	1
Elected commissioner indicator	516	0.19	0.39	0	1
Stipulated term length for commissioners	516	5.39	0.98	4	8
Number of commissioners on commission by statute	516	4.21	1.33	3	7
Commissioner salary relative to per capita income in state (at time of arrival)	327	3.30	0.61	1.79	5.29
Commissioner salary relative to per capita income in state (at time of departure)	274	3.06	0.51	1.93	4.45
South dummy	516	0.32	0.47	0	1

*Sources:* Online.

*South* is a regional indicator that takes the value of 1 for the following states: Florida, Georgia, Maryland, North Carolina, South Carolina, Virginia, West Virginia, and Delaware (the South Atlantic States), Alabama, Kentucky, Mississippi, and Tennessee (East South Central States), and Arkansas, Louisiana, Oklahoma, and Texas (West South Central States).

*Sources:* Commissioner characteristics, stipulated term length for commissioners, stipulated number of commissioners, as well as the selection method for commissioners, are from various NARUC publications (including the NARUC Annual Convention and Regulatory Symposium Proceedings, the Profiles of Regulatory Agencies of the United States and Canada, and the Membership directory) and the authors' web searches. Information on post-employment restrictions is from the COGEL Blue Book (2003–2005), the authors' survey of state ethics commissions and state Attorney General Offices, as well as on-line searches. Commissioner salary is from the State Book, and state education level is from the U.S. Statistical Abstract.

substantially involved while working in the commission. Five states have adopted a much stricter form of regulation that prohibits regulators from future involvement in any matter in which they merely participated.

The most direct form of employment restriction is adopted in four states which prohibit former state employees from accepting employment with entities that do busi-

ness with or that are subject to regulation by their former agencies. In addition, six states have laws that prohibit former state employees from representing clients on matters for which they had official or supervisory responsibility, and another six states have passed laws that prohibit former state employees from providing representation concerning matters involving the agency for which they worked, regardless of whether they were involved in the matter.

Another dimension along which state revolving door regulations vary is the length of time that restrictions are binding. In three states, the restrictions last for six months, whereas in most other states the rules are binding for one to two years. But when the restrictions concern matters in which the former commissioner was involved, they usually last for the commissioner's lifetime.

Consequently, commissioners from states with revolving door laws may be less likely to find subsequent private sector employment, either because these laws directly reduce the attractiveness of commissioners as potential employees, or because the presence of a revolving door law results in the selection of less ambitious (and perhaps less employable) individuals into public utility commissions. Accordingly, our first hypothesis is as follows:

*Hypothesis 1: Commissioners from states with revolving door regulations are less likely to be subsequently employed by the private sector.*

Because much of the knowledge needed to become an effective public utility commissioner is specific to the industry, revolving door laws may reduce the level of investment that commissioners are willing to make in acquiring industry-specific knowledge since that investment cannot be easily recouped outside the utility sector (Che 1995). While the level of investment made by a commissioner in acquiring industry-specific knowledge is unobservable, it may be positively correlated with the length of time spent on the commission. Accordingly, we posit that employment restrictions also shorten the desirable tenure for commissioners, especially for those who view government jobs as opportunities for future career enhancement in the private sector.<sup>2</sup>

As the more cases a commissioner is involved in while working for the government imply more restrictions on her subsequent career options, this type of restriction greatly reduces the incentives for the commissioner to remain in office for longer than minimally necessary. On the other hand, if revolving door laws result in less ambitious individuals being selected into public service, it is also possible that these laws will increase the length of time spent on the commission, perhaps because such individuals have fewer outside options. Accordingly, we will attempt to parse out the effect of revolving door laws on the length of tenure separately for skilled and less skilled individuals. Our second hypothesis is, therefore, as follows:

*Hypothesis 2: Commissioners in states with revolving door laws, especially laws that prevent former commissioners from working on cases in which they were previously involved, will spend fewer years on the commission, particularly those commissioners whose skills furnish them with better job options in the private sector.*

Employment restrictions may also have upstream implications for who chooses to enter public service in the first place. Individuals considering a career as a utility commissioner presumably take into account the effect of revolving door laws on their future career options. Since these restrictions reduce their post-commissioner career option values, revolving door regulations are especially binding for individuals whose private

sector options are attractive. Individuals with more education or who have specialized skills and valued work experience are therefore less likely to become commissioners in states with revolving door regulations. This idea is captured in our third hypothesis:

*Hypothesis 3: Commissioners in states with revolving door regulations will have less education and are less likely to have specialized skills or valued work experience.*

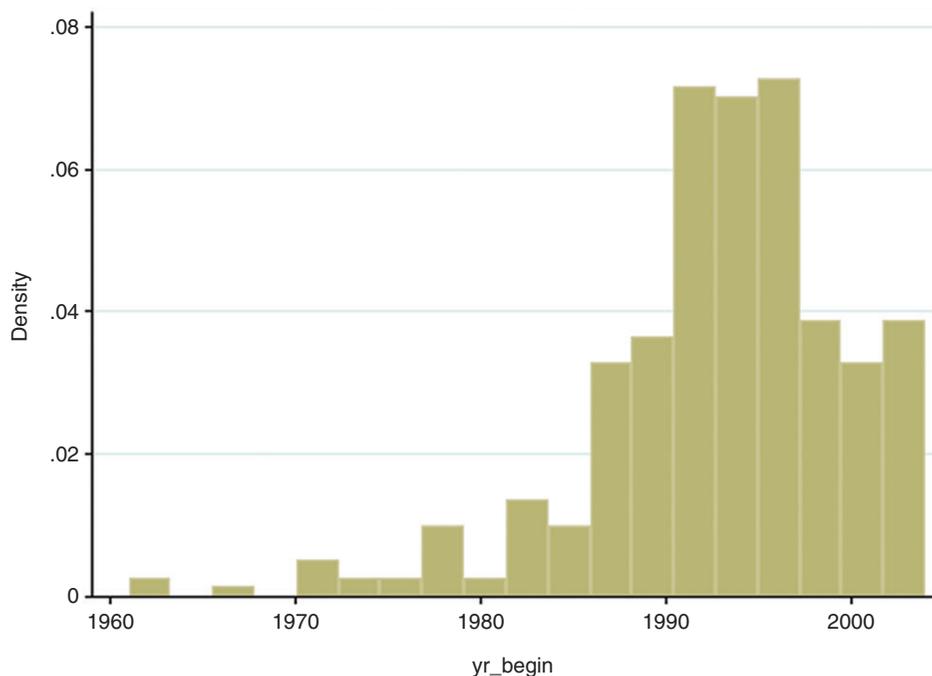
### 3. Empirical analysis

To test the hypotheses outlined above, we rely on several sources for information on employment restrictions. The 2003–2005 editions of the COGEL Blue Book published by the Council on Governmental Ethics Laws provides information on state ethics laws that were applicable in those years. We then surveyed state ethics commissions and state attorney general offices to identify the year in which states adopted their first revolving door law. For states from which we did not receive survey responses, we searched online for the original texts of these laws to determine their dates of enactment.

Based on the information thus obtained we first construct a variable that indicates the presence of a state's revolving door law (equal to 1 for states with revolving door laws [of any of the above types] in a given year, and 0 otherwise). In addition, we create corresponding indicators for two specific types of revolving door regulations: the most strict form of regulation, which makes it illegal for former government employees to work on any cases she was involved in while working for the government ("side switching"), and the most direct form of employment restriction, which prohibits former commissioners from working for a regulated firm or its affiliates.<sup>3</sup> Whenever appropriate we explore the different effects of these specific restrictions. One might expect the duration of a state's employment restrictions to influence the effects of revolving door regulations, but our findings suggest that it is primarily the existence of such laws that makes the difference.<sup>4</sup>

To construct our data set of state public utility commissioners we first obtained the names of all 516 individuals who served as commissioners at any time between 1994 and 2005, using various publications of the National Association of Regulatory Utility Commissioners (the NARUC).<sup>5</sup> We then used NARUC publications and online sources to obtain year of birth, year of initial appointment, education, prior work experience, year of departure, and later career information for as many of these commissioners as possible. Figures 1 and 2 show the distribution of commissioners in terms of their starting and departure years for those we found such information. Most state public utility commissioners (365 commissioners) included in our study started their commissioner posts between the mid-1980s and 2005. Among this group, those who left their government positions (129 commissioners) did so between 1994 and 2005.

Panel A in Table 1 presents descriptive statistics for all the commissioners for whom we could find data.<sup>6</sup> Commissioners were on average slightly younger than 48 years old when they started working for the state PUC (with the youngest at 27 and oldest at 75), while their average age at departure was just below 56 (with the youngest at 29 and oldest at 81). Among the commissioners in our sample, 71 percent have at least a master's degree and 51 percent were experts in some specialized field – where we categorize as experts judges, lawyers, accountants, and engineers, as well as anyone who had worked as a professor or a consultant. Among those who departed, the average tenure was six and



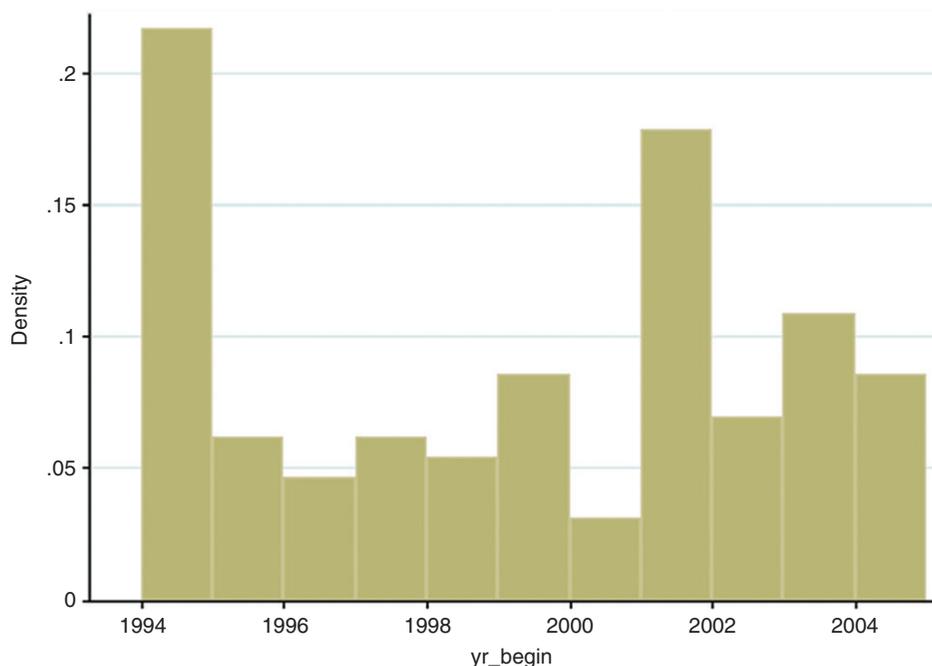
**Figure 1** Commissioner sample distribution by year of arrival.

*Sources:* The names of 516 state public utility commissioners who served at any time between 1994 and 2005 were collected using various publications of the National Association of Regulatory Utility Commissioners (the NARUC), while information on their year of initial appointment and year of departure was obtained from various NARUC publications and online sources.

a half years (with the shortest at less than a year and the longest at 24 years), and 35 percent found subsequent employment in the private sector.

Panel B in Table 1 provides information on the regulatory environment faced by commissioners. Fifty-one percent faced revolving door laws at the time they took their jobs and that proportion increased to 56 percent by the time they left.<sup>7</sup> In particular, when their commissioner careers began, 7 percent faced laws that forbade commissioners to work for utilities they formerly regulate, and over 10 percent faced laws that prohibited commissioners from being involved (after leaving office) in cases on which they previously worked. These percentages increased to 8 percent and 11 percent, respectively, by the time of their departure. The panel also sheds light on several other aspects of state PUCs. Nineteen percent obtained their positions through election. Their average statutory term was a little over five years (ranging from four to eight years), and on average they had three other colleagues serving on the commission (with the smallest commission having three commissioners and the largest seven).<sup>8</sup> Finally, commissioners were paid about three times the state per capita income, and this ratio has decreased over time.

To study the hypotheses outlined in Section 2, we assembled two separate subsamples of commissioners based on the original data set summarized above. Given that not all information is available for the whole population of commissioners, the overall sample summarized in Table 1 provides the best starting point for constructing our subsamples. Our first subsample includes commissioners for whom we have complete information on



**Figure 2** Commissioner sample distribution by year of departure.  
Sources: As for Figure 1.

their education and prior working experience, while the second subsample includes commissioners for whom we have information on both their tenure length and subsequent career. As the first group can potentially include all commissioners who have served on a state PUC at any time during the period of 1994–2005, while the second can only include commissioners who had left during this time period, the first subsample (263 commissioners) is substantially larger than the second (97 commissioners).<sup>9</sup>

Table 2 summarizes the various commissioner characteristics of these two subsamples. Panel A shows commissioners' individual characteristics whereas Panel B presents information on the legal environments they faced. When compared with Table 1, we see that the two subsamples are very similar to the overall sample in all respects except one: the subsample of departing commissioners is more likely to be from states with revolving door laws. Therefore, while our subsample of commissioners with prior biographical information is largely representative of the overall commissioner data set, the subsample of commissioners with later career information tends to over-represent those from revolving door law states. As information on subsequent employment is only available for commissioners who have departed, this difference between the departure sample and the population should not affect our analysis of commissioners' later careers. But the sample's over-representation of revolving door law states may have implications for the study of commissioner tenure length, which we will address using a hazard model.

We now turn to an empirical analysis of our commissioner data set with an eye to testing the three hypotheses outlined earlier. While the dependent variable of each model is determined by the specific hypothesis being tested and the main explanatory variables of interest are the various indicators of revolving door regulation, we use a common set of other variables as controls, including the commissioner's education level (indicated by

**Table 2** Summary statistics for regressions on commissioner characteristics (1994–2005)

Variable	N	Mean	S.D.	N	Mean	S.D.
<i>Panel A: Commissioner characteristics</i>						
Commissioner age at job commencement	178	48.43	10.70	Sample of departing commissioners	81	47.67
Commissioner is an expert in a specialized field	263	0.54	0.50		95	0.53
Commissioner has a master's degree or higher	263	0.70	0.46		93	0.69
Commissioner age at job completion	66	54.20	11.22		81	54.93
Years of tenure	68	4.76	2.36		97	6.63
Former commissioner works for private sector	74	0.42	0.50		97	0.36
<i>Panel B: Commission characteristics</i>						
Revolving door regulation indicator (at time of arrival)	263	0.53	0.50	Sample of departing commissioners	97	0.61
Revolving door regulation indicator (at time of departure)	263	0.57	0.50		97	0.66
Commissioner forbidden to work for regulated utilities (at time of arrival)	263	0.07	0.25		97	0.10
Commissioner forbidden to work for regulated utilities (at time of departure)	263	0.08	0.26		97	0.11
Commissioner forbidden to work on previous cases (at time of arrival)	263	0.08	0.27		97	0.12
Commissioner forbidden to work on previous cases (at time of departure)	263	0.10	0.30		97	0.13
Elected commissioner indicator	263	0.17	0.38		97	0.13
Stipulated term length for commissioners	263	5.38	0.99		97	5.40
Number of commissioners on commission by statute	263	4.38	1.30		97	4.45
Percentage of state population with college education	263	22.92	4.86		82	23.33
Commissioner salary relative to per capita income in state (at time of arrival)	263	3.29	0.59		88	3.30
Commissioner salary relative to per capita income in state (at time of departure)	223	3.08	0.50		97	3.11
South indicator					97	0.30

Sources: As for Table 1.

**Table 3** Revolving door regulation and future employment

	(1) Works for private sector	(2) Works for private sector	(3) Works for private sector
Revolving door regulation indicator (at time of departure)	-0.190 (0.137)		
Commissioner forbidden to work for regulated utilities (at time of departure)		-0.352* (0.209)	
Commissioner forbidden to work on previous cases (at time of departure)			-0.496*** (0.136)
Commissioner has a master's degree or above	-0.045 (0.112)	-0.071 (0.118)	-0.065 (0.110)
Commissioner salary relative to per capita income in state (at time of departure)	0.249 (0.190)	0.241 (0.198)	0.230 (0.180)
Elected commissioner indicator	-0.0933 (0.161)	-0.0522 (0.146)	-0.0659 (0.166)
Stipulated term length for commissioners	-0.0438 (0.0700)	-0.0513 (0.0874)	0.00808 (0.0701)
Stipulated number of commissioners on PUC	-0.0127 (0.0514)	-0.00288 (0.0595)	-0.0423 (0.0505)
South indicator	-0.327** (0.154)	-0.278 (0.169)	-0.312* (0.159)
Pseudo R-squared	0.053	0.052	0.095
N	70	70	70

\*\*\*indicates significance at 1% level, \*\*at 5% level, \*at 10% level.

The logistic model is used in (1)–(3). Coefficient estimates shown are marginal effects, with robust standard errors clustered at the state level in parentheses.

We define a former commissioner as working for the private sector if the commissioner is not working for the government or a non-profit organization.

whether he or she has a master's degree or above), the commissioner's salary relative to per capita income in the state, whether the state elects or appoints its public utility commissioners, the stipulated term length for commissioners, the number of commissioners on the PUC, as well as an indicator variable for whether the state is in the South.<sup>10</sup>

The first hypothesis posits that commissioners from states with revolving door regulations are less likely to obtain subsequent employment with the private sector. To test this hypothesis we regress an indicator variable (equal to 1 if a former commissioner obtained subsequent employment in the private sector and 0 otherwise) on our indicator for the presence of revolving door law and the control variables described above. Since state revolving door laws usually apply to anyone who leaves the government after the law went into effect, this variable is set equal to 1 if there was a revolving door law when the commissioner completed his employment and 0 otherwise (i.e. the revolving door regulation indicator at time of departure).<sup>11</sup> We estimate the equation using the logistic regression model. Marginal effects are presented, with standard errors estimated clustered at the state level reported in parentheses.

As shown in column (1) of Table 3, the coefficient on the revolving door indicator is negative but not statistically significant. However, when we use more specific measures of

state revolving door laws, a clearer picture emerges. As shown in columns (2) and (3), commissioners from states with revolving door laws that prohibit former commissioners from either working for regulated utilities or from being involved in cases that they may have been involved with as regulators are less likely to obtain subsequent employment in the private sector. These results are statistically significant at conventional levels, and their magnitudes are also substantial, with the existence of such regulations correlated with 35 to 50 percentage point decreases in the probability of gaining subsequent employment with the private sector. Among the control variables, only the *South* indicator is statistically significant, implying that commissioners in southern states are less likely to join the private sector after leaving the PUC.<sup>12</sup>

To investigate the second hypothesis, we use ordinary least squares to regress the number of years a commissioner serves on the PUC on the revolving door variable and the common set of control variables discussed previously, with robust standard errors clustered at the state level. As shown in column (1) of Table 4, commissioners from states with revolving door regulations serve shorter terms. Taken at face value, the point estimate indicates that revolving door regulation reduces a commissioner's period in office by about a year and a half. This effect is also statistically significant.

Columns (2) and (3) in Table 4 study whether specific measures of state revolving door laws affect commissioners' tenure length. Laws prohibiting former commissioners from working for regulated utilities also negatively affect the tenure length, although the effect is not statistically significant. But laws restricting former commissioners' engagement in cases that they may have been involved with as regulators have a statistically significant and negative effect, which is consistent with our second hypothesis. The presence of the second type of regulation is correlated with a 4½-year decline in tenure length. As shown in Column (3), commissioner salary and PUC size are both negatively correlated with tenure length, while the *South* indicator is positively correlated with tenure length.

The effect of revolving door laws on the length of tenure may also depend on how educated or skilled a commissioner is. In particular, the effect may be more negative for the more highly educated or skilled since these individuals have better outside options (see Hypothesis 2). To investigate this possibility, we include a dummy variable that equals 1 if the commissioner has a master's degree or above, as well as its interaction term with the revolving door law indicator. As shown in Column (4) of Table 4, when these additional explanatory variables are included, the revolving door law indicator no longer has a significant effect on tenure length. But an *F*-test shows that the joint effect of the revolving door law indicator and its interaction term with the master's degree dummy is significantly negative. In other words, post-employment restrictions only have negative effects on tenure length for commissioners with more education and thus better job opportunities outside the government.

One concern with the above approach is that the sample is truncated, as commissioners who were still serving as of May 2005 are not included in the analysis. The concern is relevant because, as mentioned earlier, the subsample of departing commissioners over-represents those from states with revolving door laws (see Panel B of Table 2). On the one hand, this pattern is consistent with our hypothesis that the adoption of revolving door laws tends to reduce tenure length of commissioners. But on the other hand, it is possible that commissioners who remain in office in states with revolving door regulation have particularly lengthy tenures, which will challenge our hypothesis.

**Table 4** Revolving door regulation and tenure length (OLS estimation)

	(1) Years of tenure	(2) Years of tenure	(3) Years of tenure	(4) Years of tenure
Revolving door regulation indicator (at time of departure)	-1.476* (0.756)	-1.816 (1.775)		1.042 (1.910)
Commissioner forbidden to work for regulated utilities (at time of departure)			-4.659*** (1.118)	
Commissioner forbidden to work on previous cases (at time of departure)				0.812 (1.715)
Commissioner has a master's degree or above				-1.320 (1.187)
Commissioner salary relative to per capita income in state (at time of departure)	-1.445 (1.045)	-1.608 (1.057)	-2.057** (0.881)	-1.320 (1.187)
Elected commissioner indicator	3.008 (2.350)	3.880 (2.429)	2.865 (2.262)	3.727 (2.842)
Stipulated term length for commissioners	0.187 (0.565)	0.003 (0.609)	0.460 (0.500)	0.329 (0.625)
Stipulated number of commissioners on PUC	-0.501 (0.434)	-0.399 (0.464)	-1.105** (0.450)	-0.357 (0.479)
South indicator	2.222 (1.416)	2.226 (1.332)	2.949*** (1.038)	2.378 (1.763)
(Master) * (Revolving door regulation indicator)				-3.238 (2.220)
Constant	12.26** (4.754)	12.41** (5.114)	14.79*** (4.585)	10.05* (5.365)
Adjusted R-squared	0.087	0.053	0.140	0.111
N	104	104	104	90

\*\*\*indicates significance at 1% level, \*\*at 5% level, \*at 10% level.

The OLS regression is used in (1)–(4), where in parentheses are robust standard errors clustered at the state level.

In Column (4), the  $F$ -test  $\beta(\text{revolving door}) + \beta(\text{revolving door} * \text{master degree or above}) = 0$  yields an  $F$  statistic of 2.99 ( $P$ -value of 0.092), implying a statistically significant negative effect of revolving door law on the tenure length of commissioners with master's degrees or above.

We thus use the Cox proportional hazard model to more carefully explore this issue, which allows commissioners remaining in office as of 2005 to be included in our sample, thus addressing the concern of data truncation.<sup>13</sup> Table 5 shows the results from the hazard estimation. The positive and significant coefficient on the revolving door regulation indicator in Column (1) implies that commissioners in states with such regulations have a higher likelihood of departure in a given year, compared to those in states without such laws. Specifically, commissioners in states with revolving door laws are 143 percent more likely to depart in any given year than commissioners in states without revolving door regulations. Thus, the hazard estimation yields qualitatively similar results to those presented in Table 4.

Again, we find that it is laws restricting former commissioners' involvement in their previously engaged cases (rather than regulations prohibiting former commissioners from working for regulated utilities) that significantly affect their departure decisions (see Columns 2 and 3). Finally, in Column 4 we include a dummy variable that equals 1 if the commissioner has a master's degree or above, as well as its interaction term with the revolving door law indicator. A chi-squared test indicates that the probability of departing in a given year is only statistically significant for commissioners with more education and potentially superior outside options.

Several control variables have statistically significant effects on the commissioners' departure decisions. Somewhat surprisingly, but qualitatively consistent with the results in Table 4, an increase in commissioner salaries relative to the state average tends to increase the probability of departure (see Columns 1–4).<sup>14</sup> Elected commissioners (see Columns 1–4) and those from southern states (see Column 3) are less likely to leave, while commissioners from larger PUCs are slightly more likely to quit (see Column 3).

The third hypothesis posits that revolving door laws have upstream consequences for commissioner quality. Specifically, commissioners from states with revolving door laws should have less specialized skills or less education. Since employment restrictions need to be in place in order to affect an individual's decision to work as a commissioner, the revolving door law indicator takes the value of 1 in this section of the analysis only if it came into effect *before* the individual joined the commission. To investigate the relationship between revolving door regulations and commissioner quality, we estimated two sets of regressions. In the first set of regressions (Columns 1–3 in Table 6), the dependent variable is an indicator equal to 1 if the commissioner has work experience or the qualifications to work in a specialized field and 0 otherwise. In the second set (Columns 4–6 in Table 6), the dependent variable is an indicator equal to 1 if the commissioner has a master's degree or higher and 0 otherwise. As independent variables in both sets of regressions, we use the same control variables as before as well as the percentage of a state's population with a bachelor's degree or higher to control for the average education level in the state. Since the dependent variable is binary, we estimate these regressions using the logistic model, with marginal effects presented in the tables, again with robust standard errors clustered at the state level.

The estimates displayed in Table 6 provide some suggestive evidence that employment restrictions have negative effects on commissioners' specialized skills. Column (2) in Table 6 indicates that regulations forbidding commissioners from working for formerly regulated utilities significantly reduce the likelihood of the commissioner being an expert in a specialized field. Accordingly, the evidence is consistent with the hypothesis that revolving door laws discourage higher skilled individuals from becoming public utility

**Table 5** Revolving door regulation and decision to depart (hazard estimation)

	Tenure by 2005			
	(1)	(2)	(3)	(4)
Revolving door regulation indicator (at time of departure)	1.435* (1.81)			1.353 (0.76)
Commissioner forbidden to work for regulated utilities (at time of departure)		1.241 (0.53)		
Commissioner forbidden to work on previous cases (at time of departure)			2.841*** (2.98)	
Commissioner has a master's degree or above				0.794 (-0.61)
Commissioner salary relative to per capita income in state (at time of departure)	1.476* (1.86)	1.490* (1.87)	1.697** (2.36)	1.624** (2.15)
Elected commissioner indicator	0.286*** (-3.26)	0.245*** (-3.80)	0.248*** (-3.78)	0.262*** (-3.18)
Stipulated term length for commissioners	1.145 (1.15)	1.134 (1.00)	1.0965 (0.55)	1.113 (0.85)
Stipulated number of commissioners on PUC	1.101 (1.05)	1.086 (0.88)	1.185** (1.82)	1.040 (0.40)
South indicator	0.649 (-1.58)	0.669 (-1.46)	0.580* (-1.94)	0.682 (-1.30)
(Master) * (Revolving door regulation indicator)				1.623 (1.24)
$\chi$ -squared	34.53***	32.41***	39.68***	31.61***
N	178	178	178	160

\*\*\*indicates significance at 1% level, \*\*at 5% level, \*at 10% level.

The Cox proportional hazards model is used (1)–(4), where coefficient estimates shown are hazard ratios and in parentheses are z-statistics.

In Column (4), the F-test  $\beta(\text{revolving door}) + \beta(\text{revolving door} * \text{master degree or above}) = 0$ , gives an F statistic of 5.57 (P-value of 0.018), implying a statistically significant positive effect of revolving door law on the departure probability of commissioners with master's degrees or above.

The larger-than-unity and significant coefficients on the revolving door regulation indicator imply that commissioners in states with such regulations have higher likelihood of departure in a given year. For example, their probability of departure is about 144% of that for commissioners in states without such regulations according to results in Column (1).

**Table 6** Revolving door regulation vs commissioner expertise & education

	(1)	(2)	(3)	(4)	(5)	(6)
	Commissioner is an expert in a specialized field			Commissioner has master's degree or higher		
Revolving door regulation indicator (at time of arrival)	0.044 (0.049)			0.066 (0.060)		
Commissioner forbidden to work for regulated utilities (at time of arrival)		-0.203** (0.083)			0.052 (0.143)	
Commissioner forbidden to work on previous cases (at time of arrival)			-0.049 (0.103)			-0.063 (0.119)
Commissioner salary relative to per capita income in state (at time of departure)	0.050 (0.049)	0.034 (0.049)	0.049 (0.049)	0.096* (0.056)	0.101* (0.058)	0.093 (0.058)
Percentage of state population with a bachelor's degree or higher	-0.009 (0.007)	-0.009 (0.007)	-0.009 (0.007)	-0.002 (0.006)	-0.002 (0.006)	-0.002 (0.006)
Elected commissioner indicator	-0.204** (0.083)	-0.212** (0.086)	-0.210** (0.085)	-0.158* (0.088)	-0.173* (0.090)	-0.169* (0.091)
Stipulated term length for commissioners	-0.003 (0.031)	-0.027 (0.031)	-0.007 (0.030)	0.007 (0.038)	0.006 (0.039)	0.002 (0.038)
Stipulated number of commissioners on PUC	-0.044* (0.024)	-0.034* (0.019)	-0.044* (0.021)	-0.023 (0.023)	-0.023 (0.021)	-0.022 (0.022)
South indicator	0.047 (0.069)	0.056 (0.064)	0.048 (0.068)	0.023 (0.063)	0.017 (0.066)	0.025 (0.065)
Pseudo R-squared	0.03	0.03	0.03	0.03	0.03	0.03
N	263	263	263	263	263	263

\*\*\*indicates significance at 1% level, \*\*at 5% level, \*at 10% level.

The logistic model is used in (1)–(6). Coefficient estimates shown are marginal effects, with robust standard errors clustered at the state level in parentheses.

A commissioner is classified as an expert in a specialized field if the commissioner has experience working as a professor, judge, lawyer, accountant, or engineer, or has the license to work as an attorney or an accountant.

regulators. Interestingly, however, there is no significant effect of revolving door regulation on a commissioner's likelihood of having a master's degree or higher.

There is also evidence that commissioners' expertise and education level are significantly dependent on whether they are elected or appointed, with elected commissioners less likely to be experts and less educated. This effect is robust across specifications and also economically significant: elected commissioners are approximately 20 percent less likely to be experts in a specialized field, and 16 percent less likely to have a master's degree or higher.<sup>15</sup> On the other hand, better-paid commissioners (with higher salary relative to state per capita income) are more likely to have a master's degree or higher, while those working in larger PUCs are less likely to be experts with professional skills.

#### 4. Conclusion

This paper evaluates the effects of post-government employment restrictions on the characteristics of public utility commissioners. We hypothesize that public utility regulators from states with revolving door laws should be less likely to be subsequently employed by the private sector, have shorter tenure on PUCs, and have less expertise. Using data on a sample of public utility commissioners, we find that the correlations between revolving door regulation and the characteristics of these commissioners are consistent with these hypotheses.

These findings are important because they provide some empirical evidence in support of the idea that there is a trade-off between reducing the likelihood of capture and regulator quality. Post-government employment restrictions, by lowering the likelihood of subsequent employment in regulated industries, may help foreclose the revolving door as a mechanism for capture. And this, in turn, may help generate greater levels of public confidence and trust in the government, and may also lead to a reduction in utility prices that benefits consumers.<sup>16</sup> However, the very effectiveness of these laws in curtailing the revolving door may also result in the selection of less ambitious and skilled individuals into government service, as well as encourage their premature departure from regulatory agencies. If experience and expertise matter for the quality of regulatory decision-making, it is then possible that these laws also reduce the effectiveness of regulatory enforcement.

Due to the cross-sectional nature of our data set, the relatively small sample size, and the parsimonious specifications of our regression models, we hesitate to draw strong causal inferences from these findings. To the extent that unobserved, state-specific differences in, say, political culture, the structure of public utility commissions, or attractive employment opportunities within a state are correlated with revolving door regulations, our findings may mistakenly attribute the influence of regulation on the outcomes we analyze. Nevertheless, the results are at least suggestive of the possibility that revolving door laws influence the types of individuals who are selected into state PUCs. Future work should investigate whether these findings are unique to commissioners, or apply to other PUC officials and staff, as well as other state regulatory agencies. Scholars should also examine whether the selection of lower-quality individuals into government service has consequences for the quality of regulatory decision-making and long-term economic outcomes in order to fully evaluate the costs and benefits of revolving door regulations.

Finally, given that revolving door laws are but one of many possible public policies for reducing the likelihood of regulatory capture, the feasibility and effectiveness of other mechanisms should be explored. For instance, the method by which regulators are selected (for instance, elected versus appointed) as well as how much they are paid may also influence regulator behavior and characteristics. Besley and Coate (2003) argue that elected regulators are less likely to be captured than appointed ones. The economic theory of efficiency wages suggests that paying regulators a premium may reduce their incentive to “shirk” and help solve the principal–agent problem that arises between regulators and their political masters (legislators or voters). Surprisingly little empirical work has attempted to identify the effects of these mechanisms on the characteristics and behavior of regulators. Our empirical analysis of public utility commissioners suggests that commissioners who are elected are less skilled and possess less education than those that are appointed, and that higher salaries tend to reduce commissioner tenure; however, we note that these findings could be driven by selection bias.<sup>17</sup> Future research should aim to identify more precisely the causal relationships at work, as well as the interactions among these various mechanisms for reducing capture.

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## Notes

- 1 Boehm (1996) reports that several lawyers left state employment after New York enacted legislation in 1987 that placed restrictions on employment opportunities of former government workers. This anecdote suggests that revolving door laws may have some impact on the types of individuals who serve in the public sector.
- 2 Boylan and Long (2005) provide evidence that federal prosecutors often join the government to accumulate expertise that eventually benefits their private sector careers.
- 3 We also used indicators for other specific types of restrictions, but their effects are similar to those of the general revolving door regulations. We have also used an index of revolving door stringency (as measured by the length of time post-government employment restrictions are binding), but do not find significant effects. Combined with the reported results, this suggests that it is the type rather than the length of restrictions that makes a difference.
- 4 Whether revolving door laws apply retroactively may also influence their effectiveness. We explore the effect of this aspect by excluding New York, the only state that had retroactive regulations, from our sample, and obtain very similar results.
- 5 Two commissioners in our sample each served in two different states, and are treated as separate individuals. Thus the total number of distinct individuals is 514. The NARUC publications include the NARUC Annual Convention and Regulatory Symposium Proceedings, the Profiles of Regulatory Agencies of the United States and Canada, and the Membership Directory.

- 6 Because we gathered data from different sources, and since not all information was available on all individuals, the sample sizes vary across individual characteristics in the table.
- 7 To determine whether a commissioner is subject to a revolving door law, we need to know the year of his appointment. This information is available for 365 commissioners. On the other hand, the existence of revolving door laws at time of departure can be inferred for those still in office in 2005; thus the corresponding sample size is larger than 129, the size of the departure sample (see Panel B in Table 1).
- 8 How commissioners were selected (elected vs. appointed) as well as stipulated term length and commission size did not change during this period. Accordingly we can calculate these averages for the entire population of commissioners who served between 1995 and 2005.
- 9 Constructing different subsamples using all available information for each variable leads to slightly larger sample sizes, but the regression results are very similar to those presented below. We focus on the more consistent subsamples to reduce confusion.
- 10 Southern states include the following: Florida, Georgia, Maryland, North Carolina, South Carolina, Virginia, West Virginia, and Delaware (the South Atlantic States), Alabama, Kentucky, Mississippi, and Tennessee (East South Central States), and Arkansas, Louisiana, Oklahoma, and Texas (West South Central States).
- 11 One exception is the enactment of New York state's revolving door law in 1987, which, according to the New York Supreme Court ruling in *Forti v. New York Ethics Commission*, applied even to those who left state office before the effective date of the law. Coding the New York law accordingly does not change our results.
- 12 Qualitatively similar results are found when we include a control variable for whether a commissioner has prior work experience in the private sector. The prior work experience variable, however, is not statistically significant. We do not include these results because we want to use the same set of the explanatory variables for all regressions and including the prior working experience variable severely reduces the sample size for other regressions.
- 13 Hauge *et al.* (2011) offer an alternative theoretical and empirical examination of the determinants of commissioner tenure. They also find that revolving door restrictions reduce tenure length.
- 14 This finding may reflect selection: higher salaries for commissioners may attract individuals for whom income is important, and who are therefore more likely to explore lucrative career opportunities outside the government (Wilson 1980).
- 15 This result may reflect voter preference for less skilled or educated commissioners, or the possibility that more highly skilled and educated individuals are reluctant to run for PUC election. In order to parse out what is driving this result we would need information on the characteristics of the individuals who are candidates in PUC elections.
- 16 Law and Long (2012) take advantage of cross-state and temporal variation in the introduction of revolving door laws to estimate the effects of these laws on electricity prices. They find that revolving door laws only temporarily reduce industrial electricity prices and have no effect on commercial or residential prices. At least with respect to electric utilities, it would seem that these regulations have negligible effects on long-term economic outcomes.
- 17 See footnotes 13 and 14.

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