The Effects of Revolving Doors on Financial Regulators' Enforcement Decisions: Evidence from Korea*

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Motivation

- Financial regulators have influence on financial companies.
  - Regulators monitor how financial firms manage their risks and run businesses.
  - If necessary, regulators require corrective actions or impose penalties.
- But, such authority may inappropriately lead to collusion between regulators and firms.
  - Regulated companies may offer side contracts to "capture" regulators.
    - One of such side contracts is "revolving door," i.e., hiring ex-regulators.
- However, real effects of the revolving door are controversial.
  - Firms may expect to be favored by regulators in exchange for hiring ex-regulators.
    - Laffont and Tirole (1991)
  - But, ex-regulators' expertise may arguably enhance firms' risk management skills.
    - Che (1995), Bond and Glode (2014);
    - Cornaggia et al. (2016) , Kempf (2017), Shive and Forster (2016)

What We Do & Find

- We empirically analyze financial firms' motive of hiring ex-regulators.
  - Do financial firms enhance their risk management by hiring ex-regulators?
  - Or, is the revolving door merely an outcome or means of regulatory capture?

- To this end, we build a unique dataset of Korean financial sector.
  - We track whether executives in financial firms used to work at regulatory agencies.
  - We also record all regulatory penalties and corrective actions on financial firms.

- Using this dataset, we show that:
  i. Newly hired ex-FSS regulators do not improve firms' financial risk management.
    - No post-employment improvement in RORWA in the following quarters.
  ii. But, the probability of penalties decreases after hiring ex-FSS regulators.

- We (arguably) find revolving door in Korea is consistent with "collusion" hypothesis.
  - The current regulators may unduly favor firms hiring ex-regulators.

Institutional Background of Financial Regulation in Korea

- Korea adopts a centralized supervisory system in financial sector.
  - There are several number of financial regulatory agencies:
    - Public Authorities: MoSF, FSC
    - Non-Public Institutions: BOK, FSS
  - MoSF is in charge of financial supervision.
  - But, most of practical tasks are delegated to FSS, including:
    - prudential regulation, consumer protection, resolution and recovery, ...
    - FSS also collects information about regulated firms.
    - FSS examines regulated firms' problems and imposes penalties if necessary.
- So, we focus on effects of hiring ex-FSS regulators as executives on financial firms.

Data Description

- Period: Jan 2010 – Jan 2017
- Data of regulated financial companies.
  - Source: KIS, DART (provided by FSS), Bloomberg, etc.
  - Financial characteristics of regulated firms, such as:
    - TA ratio, RORWA, regulatory capital ratios, total asset, Tobin Q, ...
  - Past records of regulatory corrective actions (or penalties) released by FSS.
- Data of executives at regulated companies.
  - Source: KIS-Line (which collects executives' profiles as PDFs)
    - demographics (name, age, education, hometown, etc.);
    - work experience in FSS;
    - work experience in other public sectors, such as BOK, MoSF, or FSC.

Data Description: Summary Statistics of Firms

	Asset (Tril. KRW)	Profit (Tril. KRW)	ROA (%)	ROE (%)	Asset Growth* (%)	Tobin Q	TA Ratio (%)	RORWA (%)	Regulatory Actions** (= 1 if penalized)
mean	43.41	0.26	0.38	3.38	6.77	0.99	4.59	6.53	0.26
std. dev.	83.76	0.49	3.85	29.60	56.58	0.38	8.90	27.69	0.44
min.	0.01	-0.52	-68.99	-976.11	-71.42	0.19	0.00	-394.37	0.00
max.	405.00	3.21	22.50	82.57	1774.53	9.16	94.03	149.27	1.00
no. obs.	1520	1520	1510	1510	1517	1279	1518	1320	1763
no. firms	72	72	71	71	71	77	71	68	90

* the percent increase of total assets from the previous quarter.

** quarterly-firm observations.

Data Description: Summary Statistics of Ex-Regulator Executives

	No. of Executives	Ex-Regulators	FSS	BOK	MoSF	FSC
mean	23.92	4.18	0.77	0.37	0.88	0.60
std. dev.	18.23	3.14	0.86	0.67	1.15	0.83
min.	4.00	0.00	0.00	0.00	0.00	0.00
max.	106.00	21.00	4.00	5.00	6.00	4.00
no. obs.	1753	1763	1763	1763	1763	1763
no. firms	84	90	90	90	90	90

Effects of Revolving Doors on Firms' Financial Risks

- We first study whether the revolving door influences firms' financial risks.
  - If schooling effects exist, firms hiring ex-regulators will be more financially sound.
  - If no improvement is observed, schooling effects do not exist on front of financial risks.
- We estimate the following panel model:

$$RORWA_{i,t} = \alpha + \sum_{j,k} \beta_{j,-k} NewHire_{i,j,t-k} + \gamma \cdot X_{i,t} + \delta_i + \theta_t + \varepsilon_{i,t}$$

  - $NewHire_{i,j,t-k}$: firm i hires j type ex-regulators at $t-k$;
    - $j \in \{FSS, FSC, MoSF, BOK\}$, $k \in \{1,2,3,4\}$
  - $X_{i,t}$: control variables (lagged No. of executives, total asset, asset growth, Tobin Q).
- Hiring ex-FSS regulators has no improvement in RORWA over the next 4 quarters.

Effects of Revolving Doors on Firms' Financial Risks: $j =$ FSS

Lags	(1) $\sim t-1$	(2) $\sim t-2$	(3) $\sim t-4$
FSS_{t-1}	-2.864*	-1.414	-2.856
	(1.706)	(2.590)	(3.306)
FSS_{t-2}		-0.499	-1.574
		(2.062)	(2.304)
FSS_{t-3}			-1.969
			(1.718)
FSS_{t-4}			-0.042
			(1.784)
Asset Growth	-0.105**	-0.082*	-0.046*
	(0.049)	(0.042)	(0.024)
...		...	
Obs.	873	799	668
No. of Firms	62	61	58
R^2	0.107	0.0875	0.0971

Effects of Revolving Doors on Firms' Financial Risks: $j =$ FSC

	(1)	(2)	(3)
Lags	$\sim t-1$	$\sim t-2$	$\sim t-4$
FSC_{t-1}	-3.618	-6.177	3.993
	(4.815)	(8.564)	(2.408)
FSC_{t-2}		-3.269	1.987
		(2.565)	(1.844)
FSC_{t-3}			1.745
			(3.275)
FSC_{t-4}			0.642
			(1.092)
Asset Growth	-0.105**	-0.082*	-0.046*
	(0.049)	(0.042)	(0.024)
...		...	
Obs.	873	799	668
No. of Firms	62	61	58
R^2	0.107	0.0875	0.0971

Effects of Revolving Doors on Firms' Financial Risks: $j =$ MoSF

	(1)	(2)	(3)
Lags	$\sim t-1$	$\sim t-2$	$\sim t-4$
MoSF_{t-1}	-2.186	-1.688	-5.041*
	(2.151)	(3.000)	(2.677)
MoSF_{t-2}		-1.957	-3.408*
		(1.438)	(1.812)
MoSF_{t-3}			-0.855
			(1.796)
MoSF_{t-4}			-0.943
			(1.571)
Asset Growth	-0.105**	-0.082*	-0.046*
	(0.049)	(0.042)	(0.024)
...		...	
Obs.	873	799	668
No. of Firms	62	61	58
R^2	0.107	0.0875	0.0971

Effects of Revolving Doors on Firms' Financial Risks: $j =$ BOK

Lags	(1) $\sim t-1$	(2) $\sim t-2$	(3) $\sim t-4$
BOK_{t-1}	3.505	3.863	2.076
	(2.638)	(3.323)	(2.278)
BOK_{t-2}		3.937*	6.077*
		(2.023)	(3.121)
BOK_{t-3}			6.325*
			(3.625)
BOK_{t-4}			0.449
			(1.684)
Asset Growth	-0.105**	-0.082*	-0.046*
	(0.049)	(0.042)	(0.024)
...		...	
Obs.	873	799	668
No. of Firms	62	61	58
R^2	0.107	0.0875	0.0971

Effects of Revolving Doors on Receiving Penalties

- We next analyze whether hiring ex-regulators affects likelihood of regulatory penalties.
  - No significance between hiring ex-FSS and financial risks of regulated firms.
  - If revolving doors from FSS lower likelihood of penalties, it is *susceptible* to collusion.
- To this end, we estimate the following panel-logit model:

$$\log\left(\frac{\pi_{it}}{1-\pi_{it}}\right) = \alpha + \sum_{j,k}\beta_{j,-k}\mathit{NewHire}_{i,j,t-k} + \gamma \cdot X_{i,t} + \delta_i + \theta_t$$

  - π_{it}: the probability that firm i receives regulatory actions (or penalties).
  - $\mathit{NewHire}_{i,j,t-k}$: firm i hires j type ex-regulators at $t-k$.
    - $j \in \{\mathit{FSS}, \mathit{FSC}, \mathit{MoSF}, \mathit{BOK}\}$, $k \in \{1,2,3,4\}$
  - $X_{i,t}$: control variables of firm i's financial characteristics.
- We find $\hat{\beta}_{\mathit{FSS},-1} < 0$, but $\hat{\beta}_{\mathit{FSS},-k} = 0$ for all $k > 1$.
  - This result is robust to lags $\sim t-1, \sim t-2$, and $\sim t-4$.

Effects of Revolving Doors on Receiving Penalties: $j =$ FSS

Lags	(1) $\sim t-1$	(2) $\sim t-2$	(3) $\sim t-4$
FSS_{t-1}	-0.595*	-0.777**	-0.765*
	(0.324)	(0.358)	(0.451)
FSS_{t-2}		0.188	-0.185
		(0.340)	(0.483)
FSS_{t-3}			0.502
			(0.440)
FSS_{t-4}			0.512
			(0.387)
TA ratios	0.085**	0.110**	0.130**
	(0.038)	(0.044)	(0.062)
...		...	
Obs.	802	745	597
No. of Firms	52	51	45
Log likelihood	-432.977	-400.176	-319.931

The Marginal Effect of Hiring Ex-FSS at Mean

	(1) FSS_{t-1}	(2) TA ratios	|(1)/(2)|
$\sim t-1$	-0.125**	0.018**	7.012
	(0.068)	(0.008)	
$\sim t-2$	-0.164**	0.023**	7.046
	(0.076)	(0.009)	
$\sim t-4$	-0.164*	0.028**	5.879
	(0.097)	(0.013)	

Effects of Revolving Doors on Receiving Penalties: $j =$ FSC

	(1)	(2)	(3)
Lags	$\sim t-1$	$\sim t-2$	$\sim t-4$
FSC_{t-1}	-0.189	-0.086	-0.176
	(0.392)	(0.419)	(0.527)
FSC_{t-2}		0.522	0.667
		(0.432)	(0.600)
FSC_{t-3}			-0.659
			(0.504)
FSC_{t-4}			-0.928*
			(0.560)
TA ratios	0.085**	0.110**	0.130**
	(0.038)	(0.044)	(0.062)
...		...	
Obs.	802	745	597
No. of Firms	52	51	45
Log likelihood	-432.977	-400.176	-319.931

Effects of Revolving Doors on Receiving Penalties: $j =$ MoSF

	(1)	(2)	(3)
Lags	$\sim t-1$	$\sim t-2$	$\sim t-4$
MoSF_{t-1}	-0.200	-0.411	-0.571
	(0.397)	(0.410)	(0.465)
MoSF_{t-2}		-0.375	-0.650
		(0.361)	(0.471)
MoSF_{t-3}			0.524
			(0.392)
MoSF_{t-4}			-0.137
			(0.416)
TA ratios	0.085**	0.110**	0.130**
	(0.038)	(0.044)	(0.062)
...		...	
Obs.	802	745	597
No. of Firms	52	51	45
Log likelihood	-432.977	-400.176	-319.931

Effects of Revolving Doors on Receiving Penalties: $j =$ BOK

	(1)	(2)	(3)
Lags	$\sim t-1$	$\sim t-2$	$\sim t-4$
BOK_{t-1}	-0.753	-0.340	-0.268
	(0.484)	(0.617)	(0.666)
BOK_{t-2}		-0.232	-0.238
		(0.572)	(0.765)
BOK_{t-3}			-0.641
			(0.821)
BOK_{t-4}			-1.570*
			(0.856)
TA ratios	0.085**	0.110**	0.130**
	(0.038)	(0.044)	(0.062)
...		...	
Obs.	802	745	597
No. of Firms	52	51	45
Log likelihood	-432.977	-400.176	-319.931

Interpretation from the Analysis with 2 Lags ($\sim t-2$): KDI Focus

- Our result does not fully identify regulatory capture of FSS by regulated firms.
  - Ex-FSS executives may have expertise in non-financial risk management.
  - If so, improvement in non-financial risks must be observed in the same period:

$$OPRisk_{i,t} = \alpha + \sum_{j,k} \beta_{j,-k} NewHire_{i,j,t-k} + \gamma \cdot X_{i,t} + \delta_i + \theta_t + \varepsilon_{i,t},$$

    - $OPRisk_{i,t}$: operation risks measured by minimum capital regulation.
    - To support schooling hypothesis, we must have $\hat{\beta}_{FSS,-1} < 0$.
    - However, we cannot reject $H_0 : \beta_{FSS,-1} = 0$.
- But, it is not fully convincing whether $OPRisk_{i,t}$ is a proxy of non-financial risks.

Interpretation from the Analysis with 2 Lags ($\sim t-2$): KDI Focus

Variable: Operation Risks		
	(1)	(2)
Lags	$\sim t-1$	$\sim t-2$
FSS_{t-1}	-0.050	-0.050
	(0.047)	(0.057)
FSS_{t-2}		-0.085*
		(0.048)
Obs.	864	789
No. of Firms	62	61
R^2	0.995	0.995

Interpretation from the Analysis with 2 Lags ($\sim t-2$): KDI Focus

- Our result is opposed to the finding of Shive and Forster (2016):
  - They find hiring ex-regulators leads to improvement in financial risks of firms.
  - But, no significance between hiring ex-regulators and likelihood of penalties.
- Difference between U.S. and Korea in financial supervisory system?
  - U.S: several supervisory agencies with different jurisdictions and functions:
    - Banks are regulated by multiple agencies, such as FRB, OCC, and FDIC.
    - The Financial Product unit of AIG was supervised by OTS.
    - SEC is in charge of consumer protection and market order preservation.
  - Korea: major supervisory tasks are delegated to FSS.
    - FSS *de facto* classifies important information on regulated firms' risks.
- Such difference in regulatory architecture may influence regulators' incentives for collusion.
  - A centralized supervisory system is more vulnerable to regulatory capture.
  - Laffont and Martimort (1999)

How to Interpret the Analysis with 4 Lags ($\sim t-4$)?

- It is unclear how to interpret the estimation result of the 4-lagged model.
  - Hiring ex-FSC and ex-BOK regulators affects likelihood of penalties in 4 quarters.
  - But, hiring ex-FSS regulators lowers likelihood of penalties only in the next quarter.
  - No improvement in operational risks is correspondingly observed.
- Is the delayed effect of revolving doors on penalties a good outcome?
  - If no, are revolving doors from FSC and BOK an outcome of collusion?

Concluding Remark

- We analyzed the effects of revolving doors in Korean financial sector.
  - Revolving doors do not lead to improvement in financial risks of hiring firms.
  - Meanwhile, revolving doors from FSS lowers likelihood of regulatory actions.
  - Revolving doors are seemingly consistent with collusion hypothesis.
- Future work:
  - Impacts of social ties between executives and high-ranked regulators on penalties.
  - In collaboration with an MP at National Policy Committee for HR data of FSS.

Thank You!