



Does Corruption Reduce Efficiency in Public Capital Spending?

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Study's Motivation

- ▶ Liu & Mikesell (2014): corruption → increased state capital spending
- ▶ Liu et al(2017): corruption → increased state-local debt
- ▶ How does the corruption elevate capital spending level?
 - ▶ Leviathan government
 - ▶ Greedy bureaucrats
- ▶ Do we have more specific (economic) explanation; and if so, is it tested?
 - ▶ Allocative Efficiency?
 - ▶ Technical Efficiency?

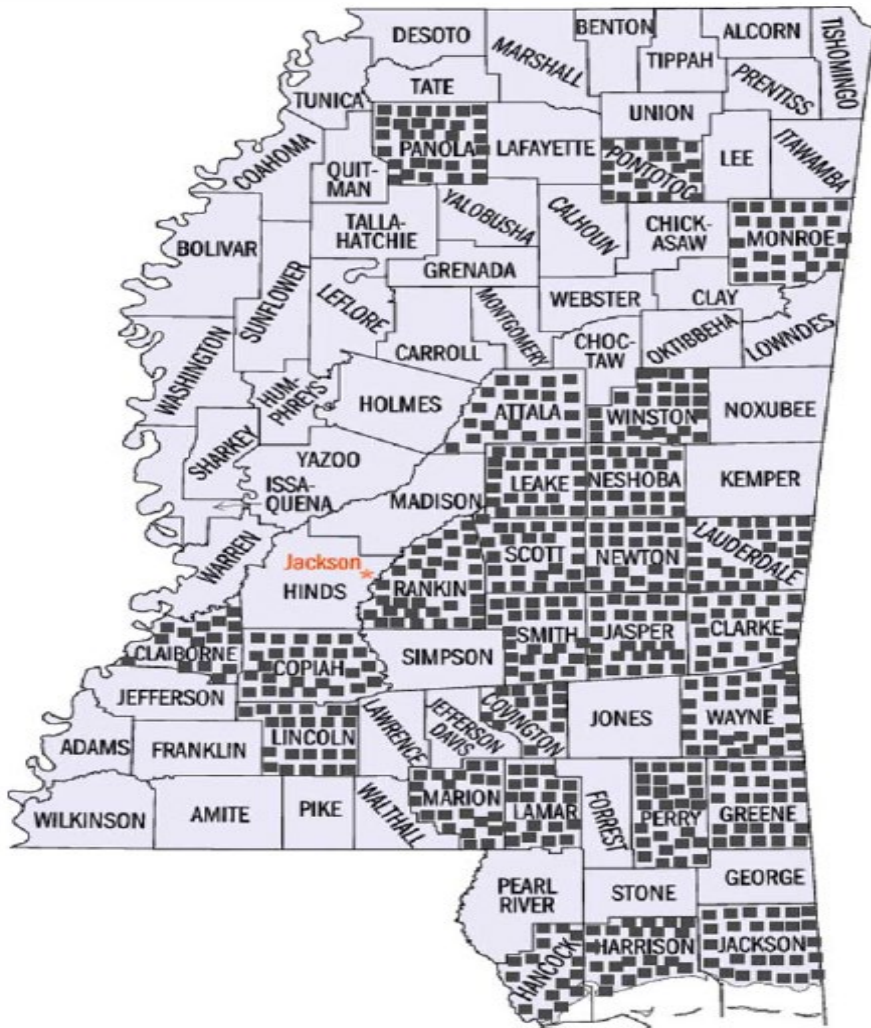
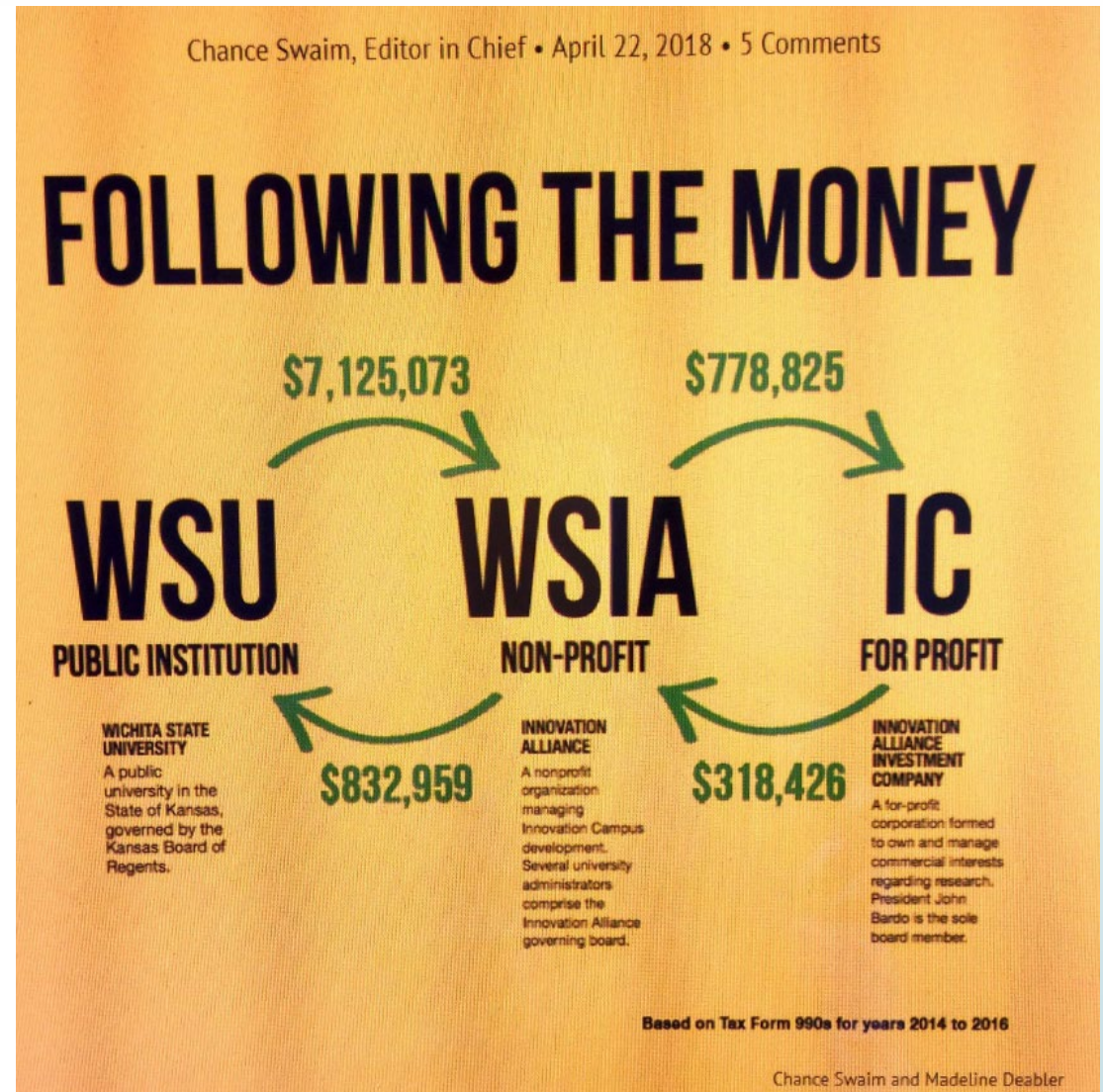


Fig.1 Corrupt and non-corrupt Mississippi counties. Squares indicate counties where one or more supervisors were convicted of corruption on charges brought under Operation Pretense



Source: Kalahan, Rossolini & Shughart II (2006) *Economics of Governance*, 7, 211-227.

Swaim, C. (2017) Wichita State Gave More Than \$7.1 Million to Innovation Campus Nonprofit in Its First 3 Years. Sunflower Newspaper.



Corruption and Public Spending

- ▶ Grease in the wheels *Versus* Sands in the wheels hypotheses (Moen, 2010)
- ▶ Rents and rent seeking behaviors in public projects (Aidt, 2016)
- ▶ Free market prices interrupted by bidding collusion (Arozamena & Weinschelbaum, 2009)
- ▶ Allocative efficiency:
 - ▶ lowest cost firms lose contract awards; higher prices for the similar qualities (Bose, 1995)
 - ▶ “white elephant projects” (Lambsdorff, 2003)
 - ▶ Project cost include bribes and kickbacks added by winning bidders (Dastidar & Mukherjee, 2014)
- ▶ Large projects saw more corruption; relatively low opportunity cost, if detected (Gautier & Goyette, 2016)



U.S. State Highway Production

- In 2014, 26,784 contracted projects; \$42 billion in total (American Road and Transportation Builders Association, 2015)
- Scoring auctions: cost, time, road user price (Dastidar & Mukherjee, 2014)
- Corruption Procurement Coalition (CPC) (Hudon & Garzon, 2016)
 - CPC was a set of informal networks
 - Members form different organizations with discretion and authorization power
 - Effects were to inflate contracting values, circumvent monitoring, and redistribute rents
 - When the Canadian government dismantled the CPC infrastructure contract values were reduced by 20-30%
 - *Modus operandi* in public construction projects
- Data availability (U.S. Federal Highway Administration, Highway Statistics, various years)

Model

- ▶ Cobb-Douglas Production Function*

$$Q(L,K) = A L^{\beta} K^{\alpha}$$

Where:

- Q is the quantity of products.
- L is the quantity of labor.
- K is the quantity of capital.
- A is a positive constant.
- β and α are constants between 0 and 1

- ▶ K/L, Natural Resources, Human Capital
- ▶ O'Toole & Tarp's (2014) Testing Model:

Productivity growth = $f(\text{capital, labor, natural resources, human capital, corruption incidences, cross-state variation in production process})$

Highway Spending Efficiency Measurement

Productivity Measurement

- Output/Input

Input:

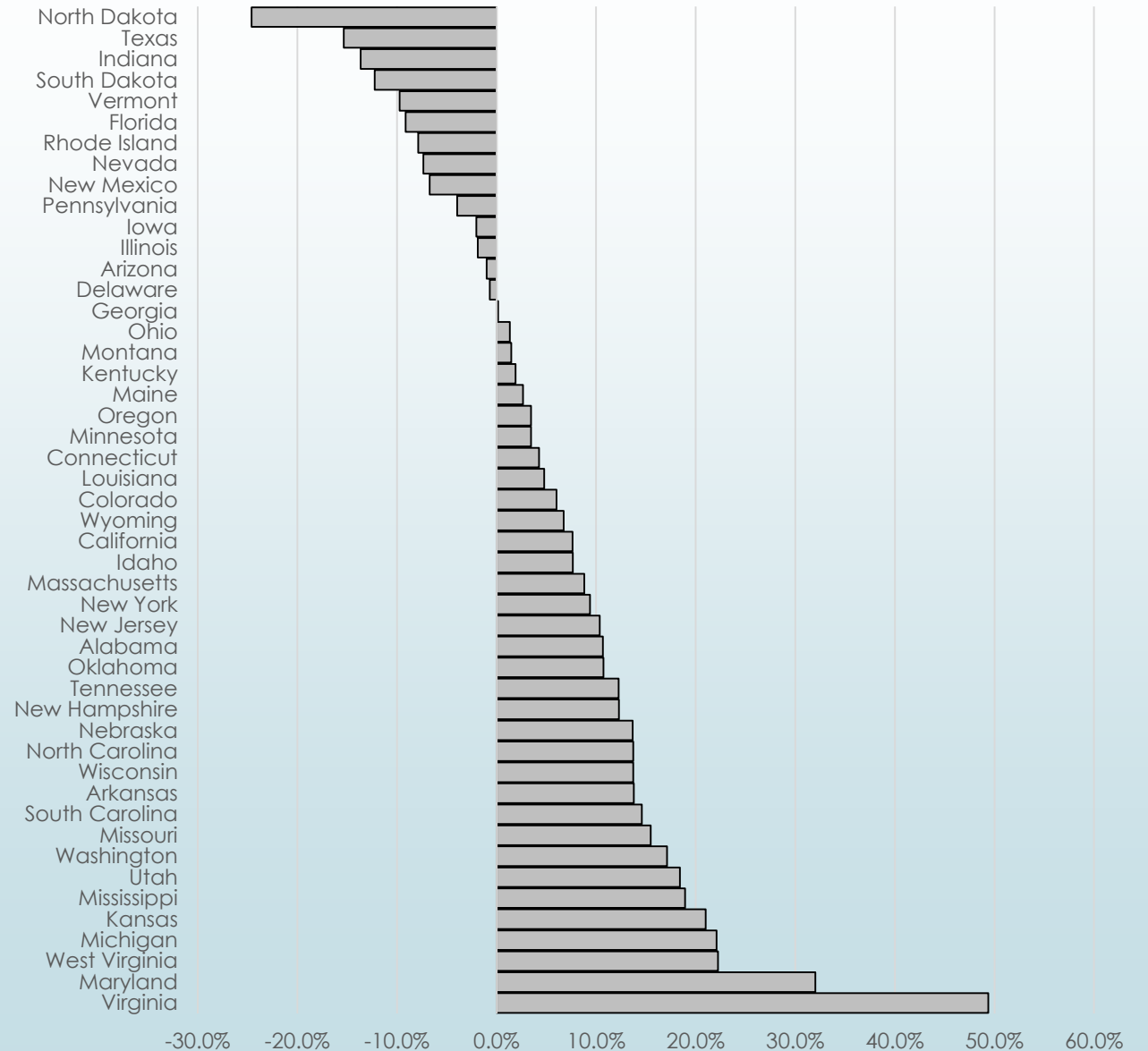
- Total state administered lane mile
- % mileage in good condition
- Total traffic flows

Output

- Total outlays for new projects
- Maintenance spending

Annual Productivity Growth Rate (%)

Observation	Mean	Standard Deviation	Minimum	Maximum
480	1.4	1.2	0.1	6.6



Variables	Coefficients	Standard Errors	t-values
Dependent Variable: Productivity Growth (Δ TFP)			
Δ Federal grant (% to total capital outlay)	-.324	.001	-243.19
Δ Construction size (total construction/total state highway disbursement)	.156	.000	356.59
Δ Administrative size (total state highway administrative spending/total state highway disbursement)	-.888	.006	-144.31
Δ Labor (total number of state government employment/total employment)	1.226	.071	17.8
Δ Human capital 1 (% civil engineers/total employment)	-.76	.02	-48.7
Δ Human capital 2 (% civil engineering technician/total employment)	.85	.009	87.43
Δ Natural resource (precipitation, inch of rain & snow)	.005	.000	141.01
Δ Corruption incidences (corrupt employees / 10,000 population)	-.133	.000	-197.58
Δ Corruption controlling effort (# caseloads per judge)	-.000	.000	-116.96
State fixed effects	INCLUDED		
Time fixed effects	INCLUDED		
State production processes	INCLUDED		
Adjusted R-square	0.68		

Summary Statistics (back-up)

Variable	Obs.	Mean	Std. Dev.	Min	Max
tfp	480	1.36	1.149	.09	6.62
fed	480	30.08	10.89	8.25	66.22
perconstruct	480	.66	.69	.16	8.40
peradmin	432	.12	.09	00.00	.50
L	480	.14	.02	.09	.21
-----+					
pcivileng	476	.12	.04	.05	.36
pciviltech	471	.05	.03	.00	.42
precip	480	36.69	15.34	5.37	72.67
corruptemp	478	.50	.39	00.00	2.73
per_caseload	480	448.17	160.97	138.00	2,452.00