

“What Lies Beneath? A Sub-National Look at Okun’s Law for the United States.”

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What the paper does and why

- Provides estimates of Okun's Law for '51' U.S. states (we confer temporary statehood on the District of Columbia)
- Explores industrial structure as an explanatory variable for the cross state variation in Okun coefficients

Okun's Law: What we estimate

Gaps version

$$u_t - u_t^* = \beta(y_t - y_t^*) + \epsilon_t$$

$$e_t - e_t^* = \beta^e(y_t - y_t^*) + \epsilon_{et}$$

$$l - l_t^* = \beta^l(y_t - y_t^*) + \epsilon_{lt}$$

Changes version

$$\Delta u_t = \alpha + \gamma \Delta y_t + \omega_t$$

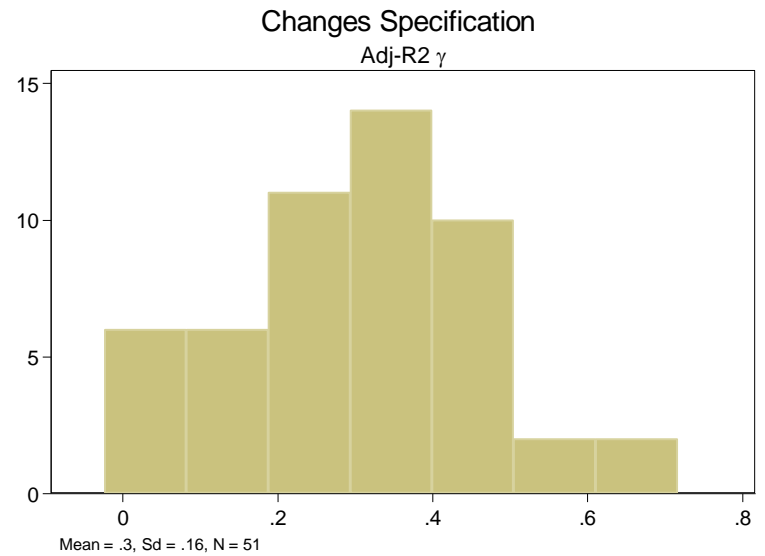
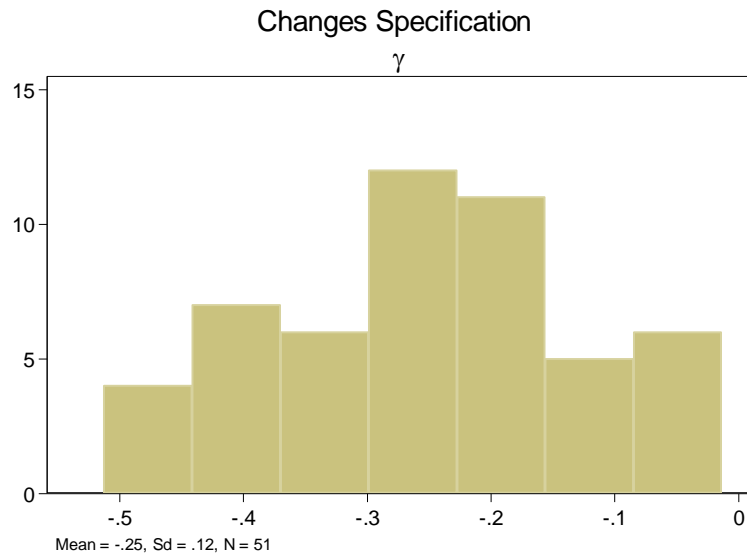
$$\Delta e_t = \alpha^e + \gamma^e \Delta y_t + \omega_{et}$$

$$\Delta l_t = \alpha^l + \gamma^l \Delta y_t + \omega_{lt}$$

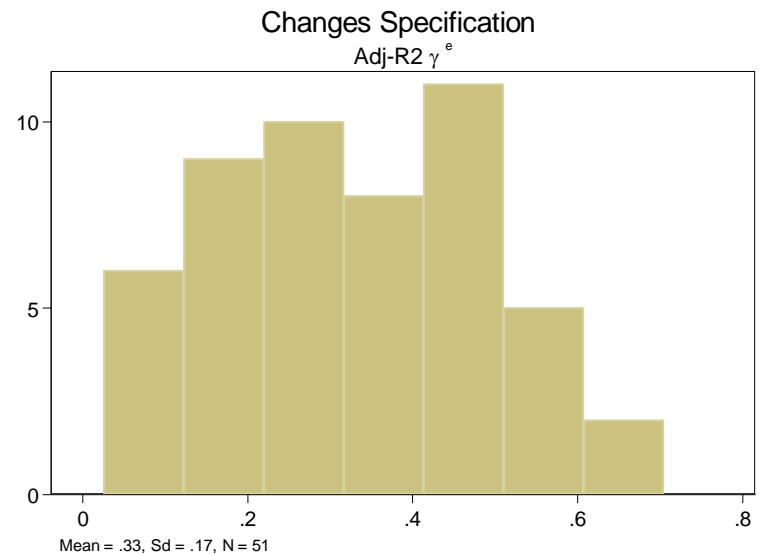
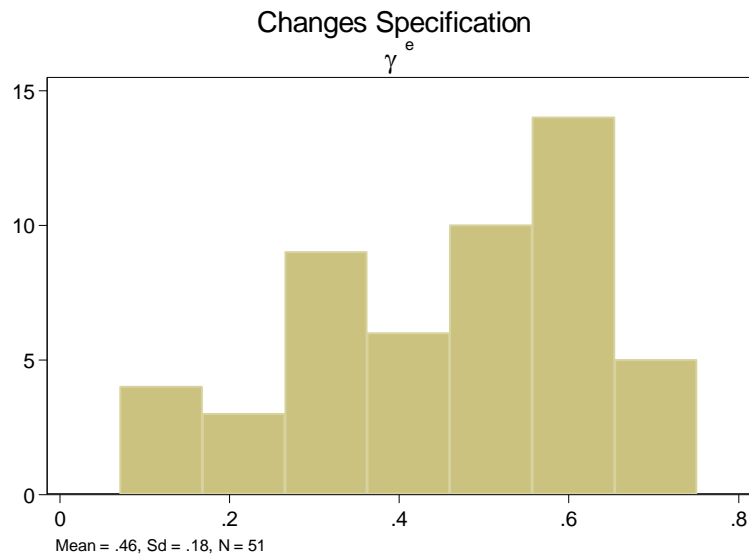
Summary statistics

Distribution of Okun coefficients across states

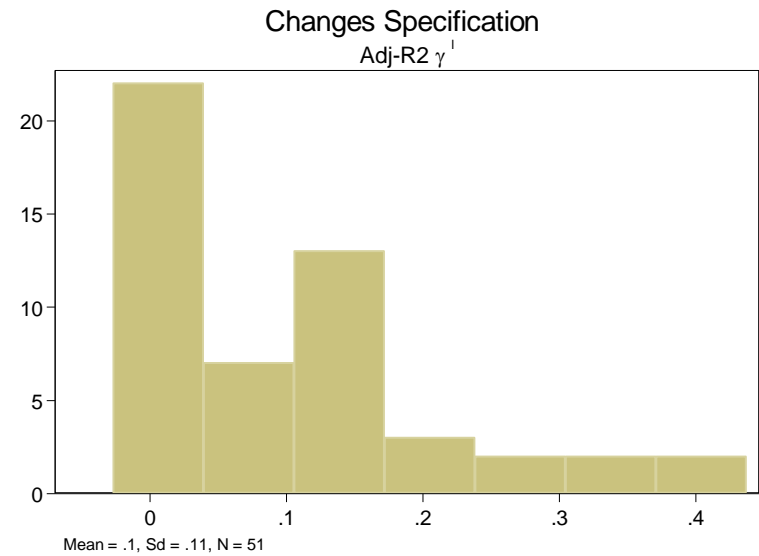
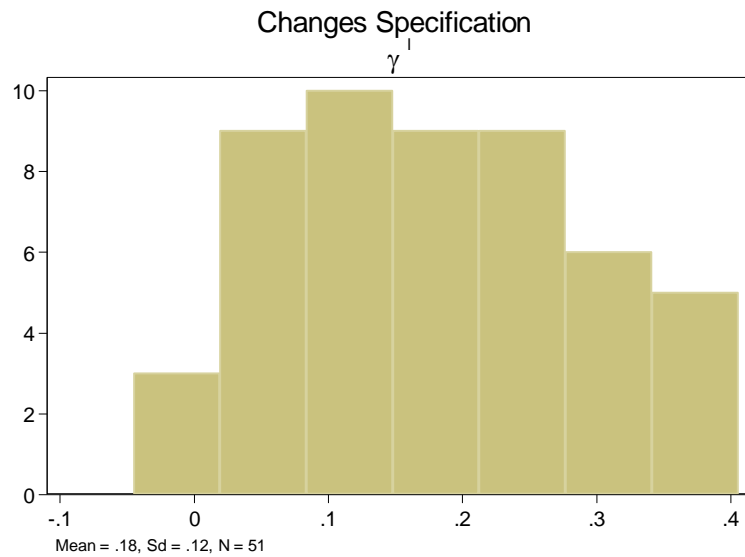
Distribution of Okun Coefficient and R^2 : Unemployment, changes equation



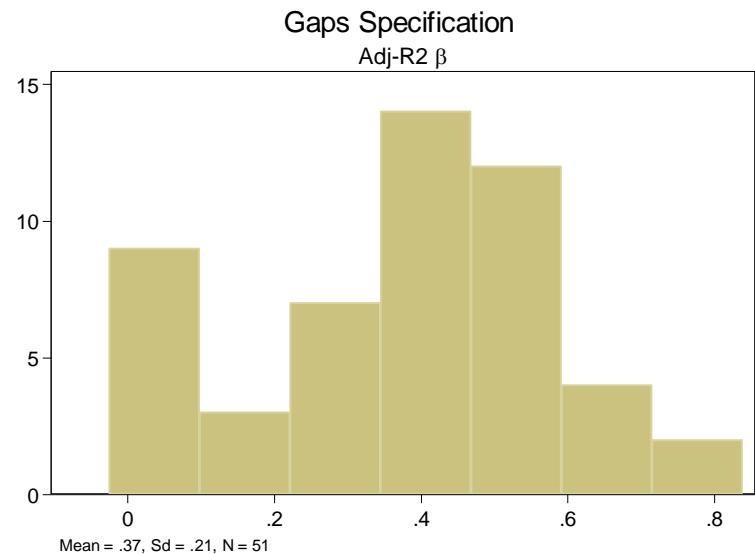
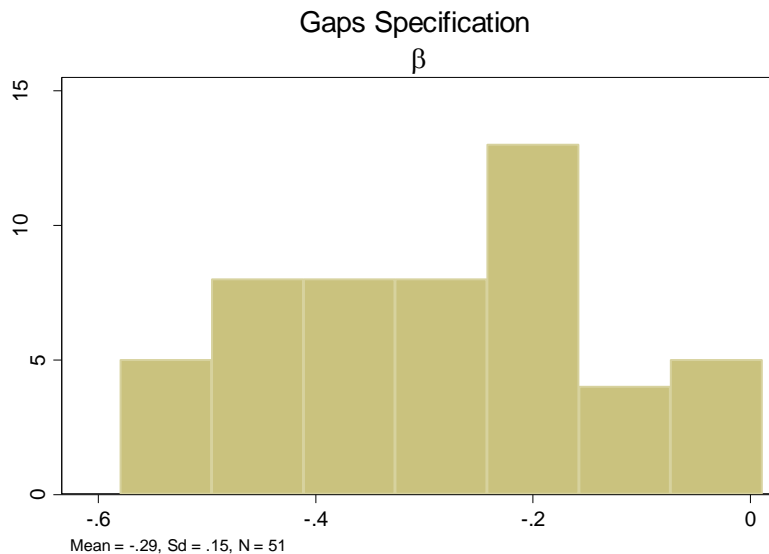
Distribution of Okun coefficient and R^2 : Employment, changes equation



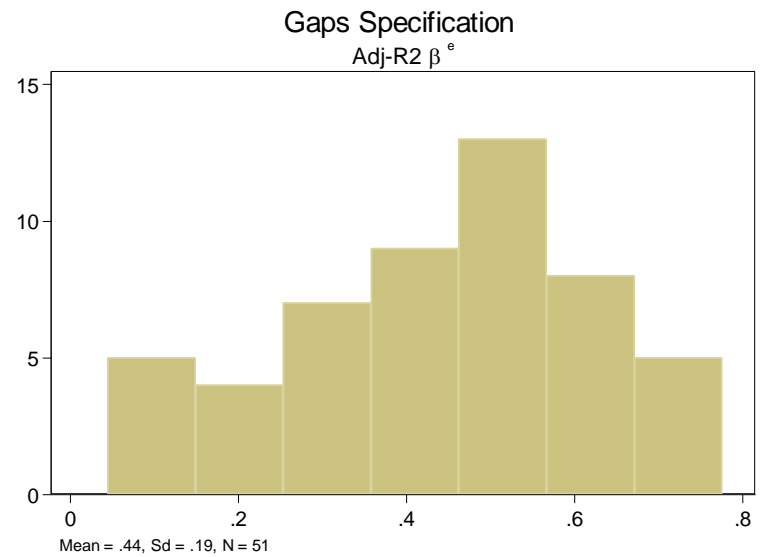
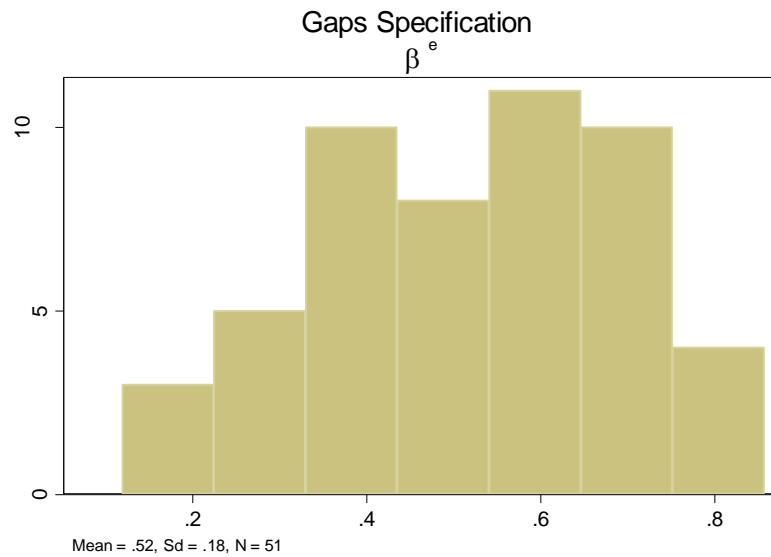
Distribution of Okun coefficient : Labor force, changes equation



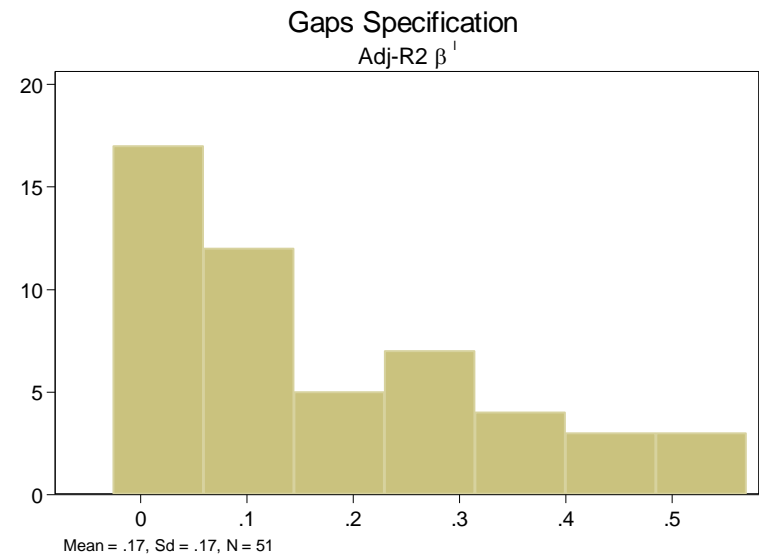
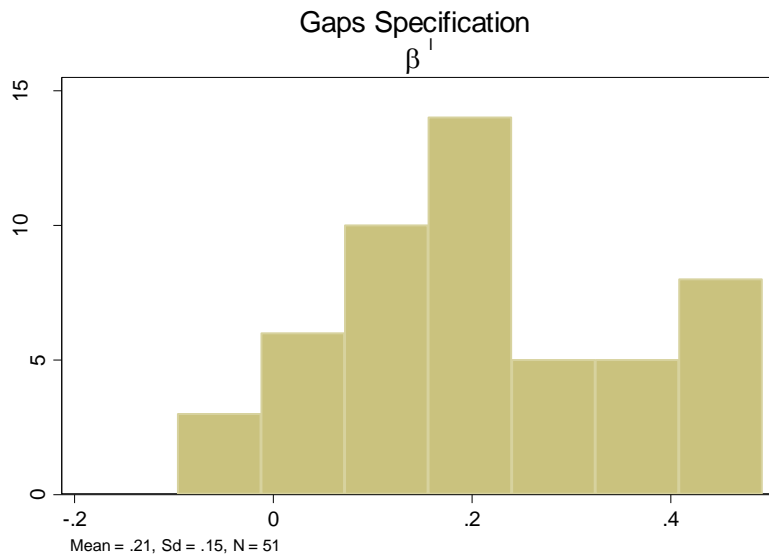
Distribution of Okun Coefficient and R^2 : Unemployment, gaps equation



Distribution of Okun coefficient and R^2 : Employment, gap equation



Distribution of Okun coefficient and R^2 : Labor force, gap equation



Correlation Matrix

	β	γ	β^e	γ^e	β^l
γ	0.9574*	1			
β^e	-0.6367*	-0.6060*	1		
γ^e	-0.7324*	-0.7446*	0.8852*	1	
β^l	0.3285*	0.3195*	0.5186*	0.2737	1
γ^l	0.0165	0.0458	0.6172*	0.6322*	0.7782*

Distribution matrix: Gaps

	Low R^2	High R^2
High β (in absolute value)	Mississippi	Alabama, California, Florida, Idaho, Illinois, Indiana, Kentucky, Michigan, Missouri, Nevada, North Carolina, Ohio, Oregon, Pennsylvania, Rhode Island, South Carolina, Tennessee, Utah, Washington, Wisconsin, New Jersey
Low β (in absolute value)	West Virginia, Alaska, Colorado, Delaware, District of Columbia, Georgia, Hawaii, Iowa, Kansas, Louisiana, Montana, Nebraska, New Mexico, New York, North Dakota, Oklahoma, South Dakota, Texas, Wyoming	Arizona, Massachusetts, Arkansas, Maine, Maryland, Connecticut, Minnesota, New Hampshire, Vermont, Virginia

Industrial Structure

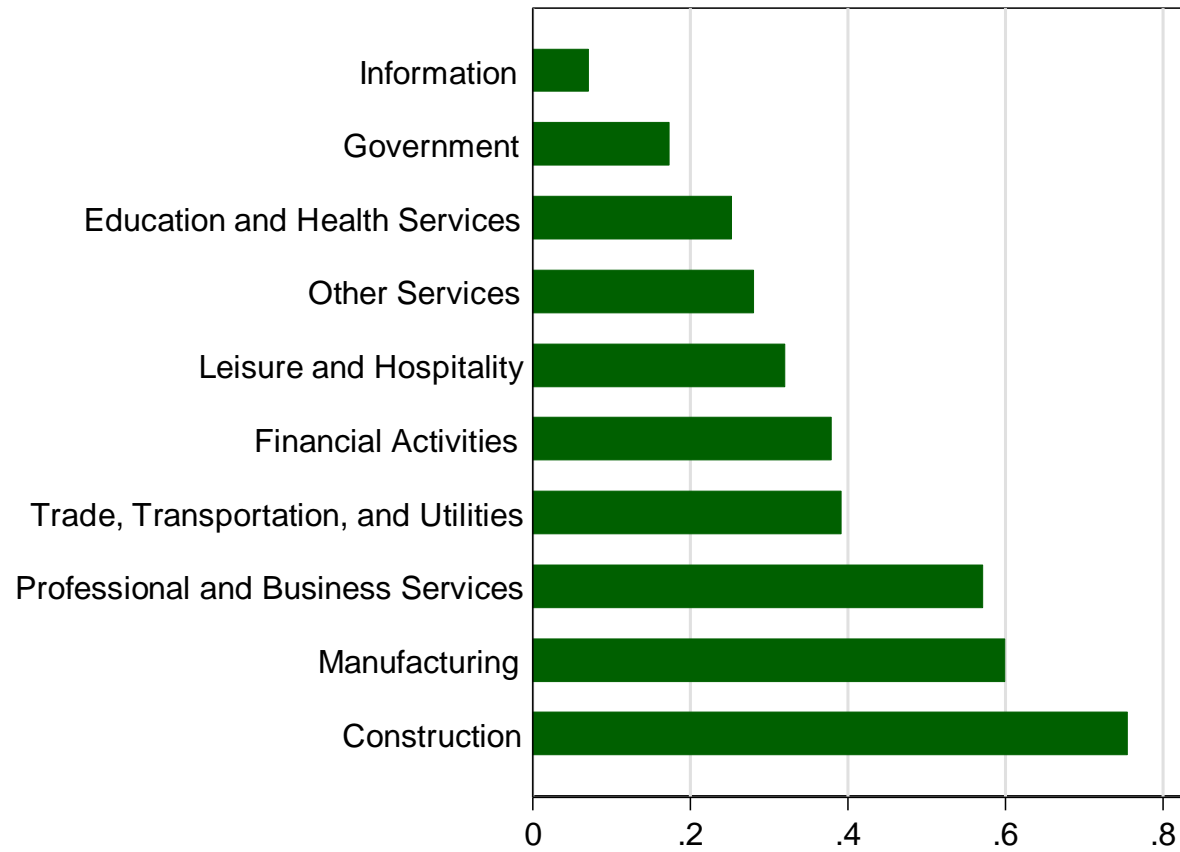
- Methodology
- Explaining the heterogeneity

Employment elasticity at the industry level

- How responsive is employment to the changes in value added at the industry level?
- National data on value added at the industry level - VA_I
- National data at the industry level - $Empl_I$

$$\Delta Empl_I = \omega_0 + \omega_1 \Delta VA_I$$

Elasticities by sector - ω_1



Industrial structure: State level

$$IndStruc_S = \sum_I \frac{Empl_{S,I}}{Total\ Empl_S} * \omega_1$$

- Once we have the elasticities (ω_1), we built an average at the state level, weighting for the share of employment of that industry in the states.
- Given that the estimated elasticities are between zero and one the industrial structure is also bounded between zero and one

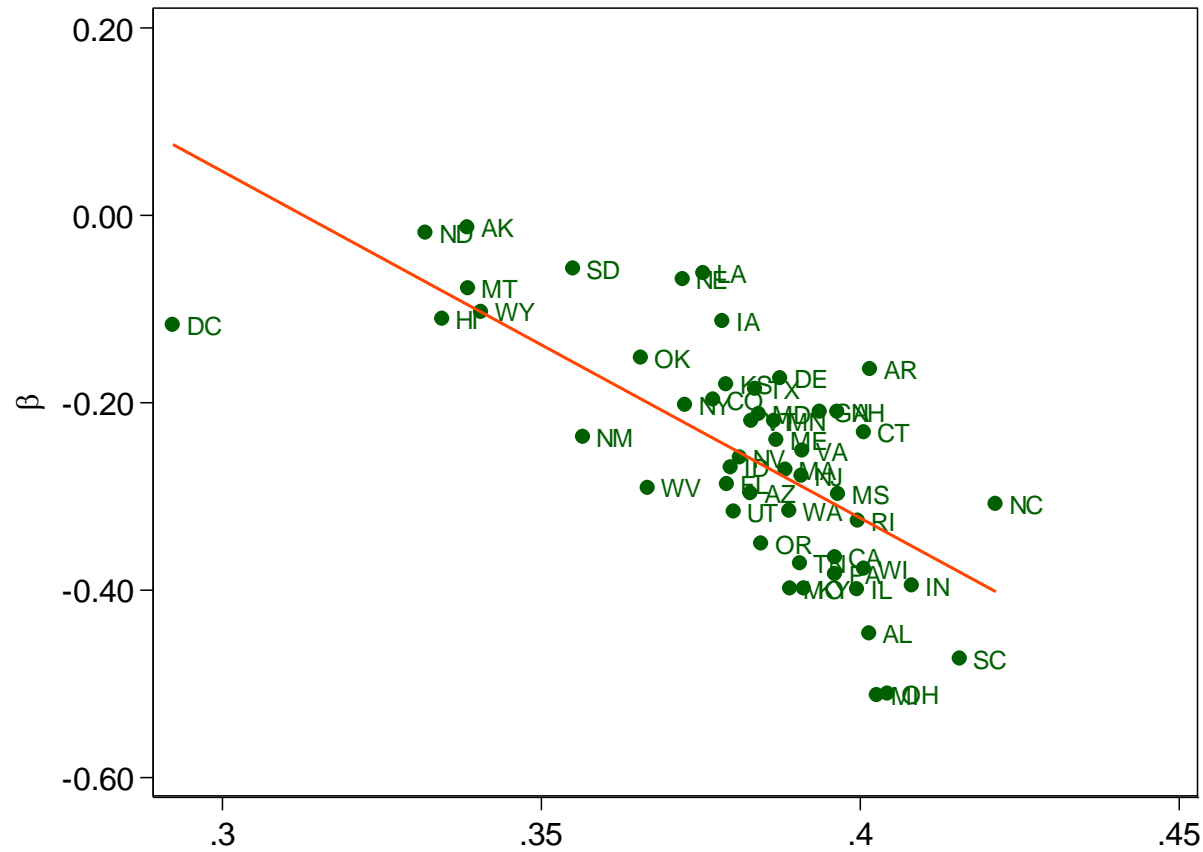
Determinants

Testing if industrial structure survives including other determinants

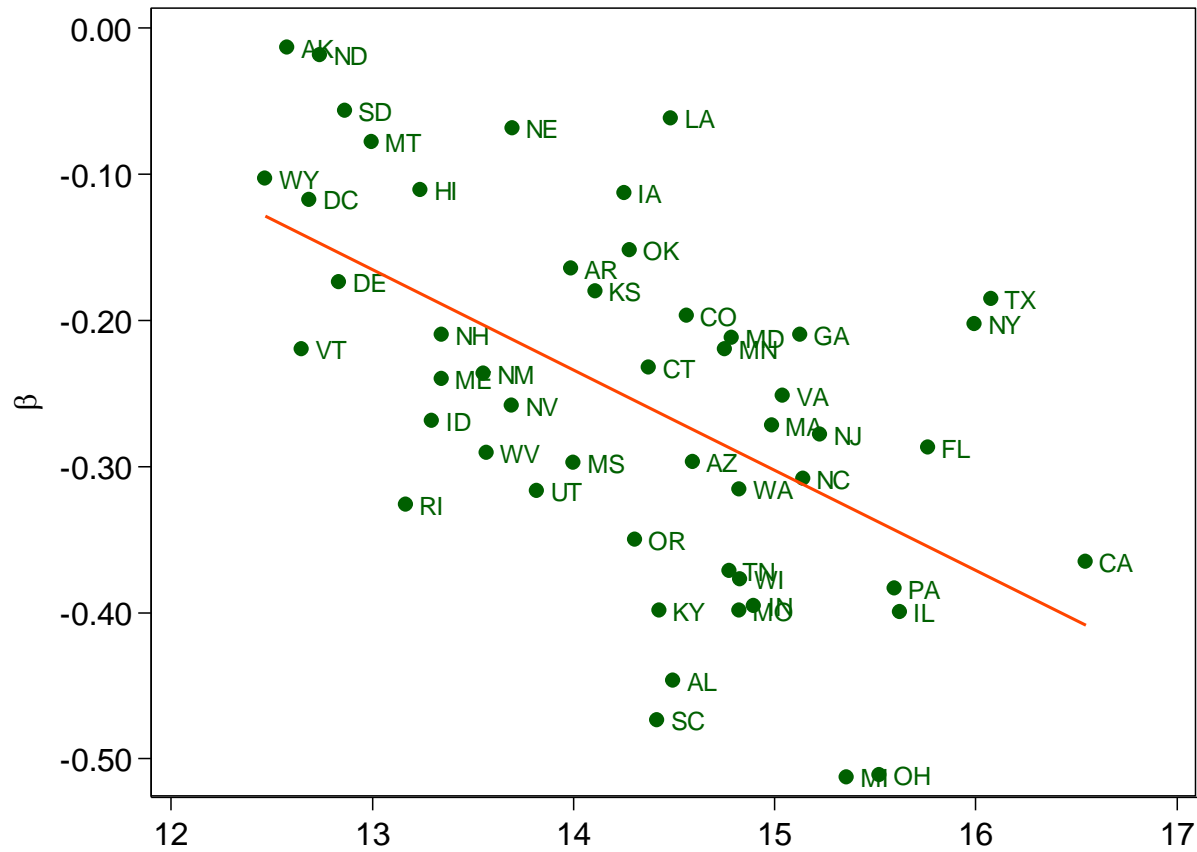
Descriptive Statistics

	Obs	Mean	Std. Dev.	Min	Max
Industrial Structure	51	0.38	0.02	0.29	0.42
Log-Labor Force	51	14.29	1.02	12.47	16.55
Entrepreneurial Index	51	0.00	0.00	0.00	0.01
Skill Mismatch Index	51	9.84	3.04	4.32	20.34

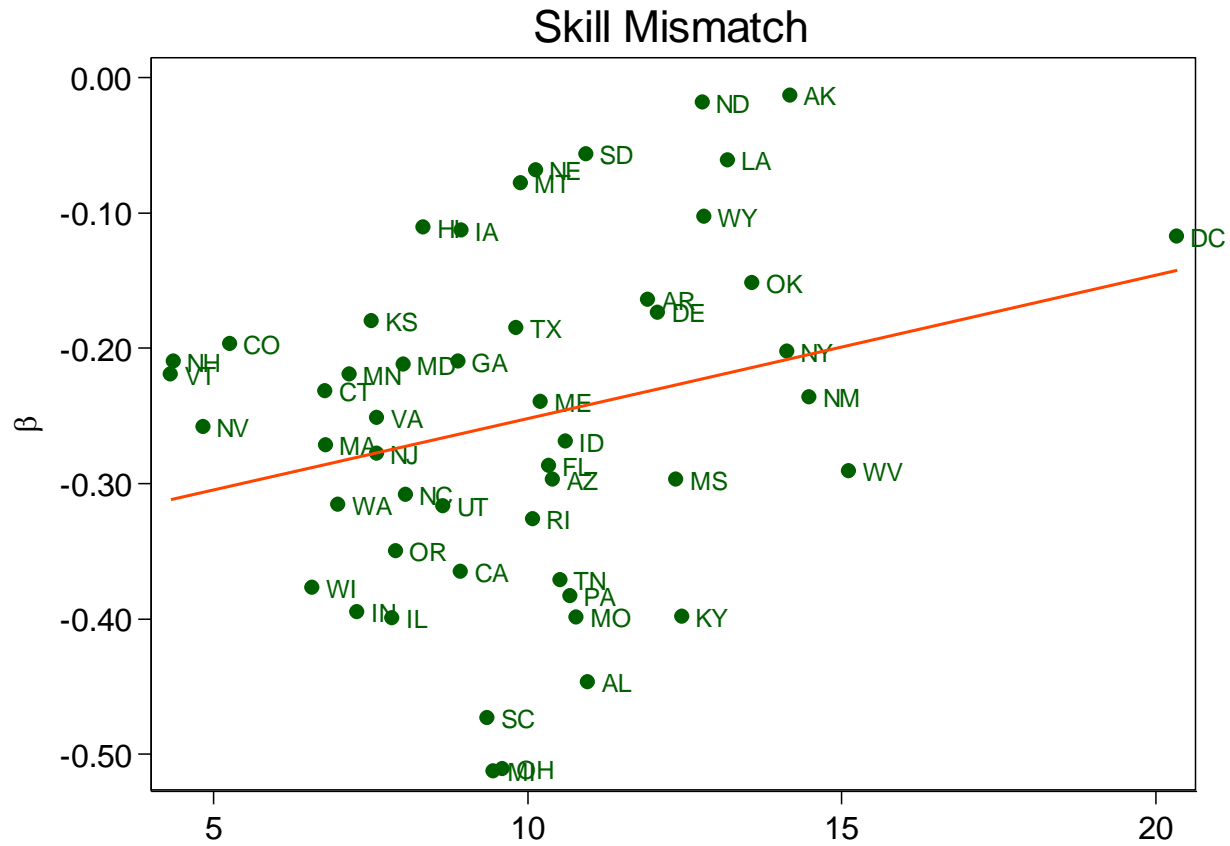
Okun coefficient and industrial structure



Okun coefficient and labor force



Okun coefficient and Skill Mismatch Index



SMI data comes from Estevão and Tsounta (2011). A Higher number indicates a higher mismatch

Multivariate regressions

	γ						γ^e					
Industrial Structure	-3.70*** (0.53)				-2.75*** (0.65)	-3.24*** (0.77)	3.28*** (0.95)				2.79** (1.22)	3.68** (1.45)
Log-Labor Force		-0.07*** (0.01)			-0.03* (0.01)	-0.02 (0.01)		0.05** (0.02)			0.01 (0.03)	0.01 (0.03)
Entrepreneurial Index			41.70*** (13.78)		18.68* (10.77)	16.18 (10.94)			-33.27 (20.67)		-12.94 (20.41)	-8.36 (20.74)
Skill Mismatch Index				0.01* (0.01)		-0.01 (0.00)				-0.01 (0.01)		0.01 (0.01)
Constant	1.16*** (0.20)	0.73*** (0.21)	-0.39*** (0.05)	-0.36*** (0.06)	1.10*** (0.23)	1.33*** (0.30)	-0.79** (0.36)	-0.30 (0.34)	0.56*** (0.07)	0.52*** (0.08)	-0.73 (0.44)	-1.15* (0.57)
Observations	51	51	51	51	51	51	51	51	51	51	51	51
R-squared	0.50	0.32	0.16	0.07	0.56	0.57	0.20	0.09	0.05	0.01	0.21	0.23
Adjusted R-squared	0.488	0.302	0.140	0.0477	0.531	0.535	0.180	0.0765	0.0308	-0.00840	0.156	0.161

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1