Democratic Consolidation, Unionization, and Growth-Enhancing Structural Change

Nam Seok Kim [1]

[1]Korea Institute for International Economic Policy (KIEP)
and Global Labor Organization (GLO)

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2. Related Literature
3. Democratization and Unionization in South Korea and Taiwan
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Research Question

- Re-allocation of labor from less productive sectors to more productive sectors is essential in attaining rapid and sustainable economic growth.
- Because only some developing countries achieve productive labor re-allocation, it is important to address the determinant of productive labor re-allocation.
- Based on this motivation, this paper focuses on how the institutional properties represented by unionization can be related to the productive re-allocation of labor.

Approach

- This paper studies how the increased bargaining power of labor union is related to the structural change of an economy.
- Structural change : change in employment share across different sectors within an economy.
- I follow the conceptual framework of Rodrik et al. (2017) in evaluating structural change and its growth implications.
- If a sector with higher productivity attracted a greater employment share, then we can say that the economy went through growth-enhancing structural change.

Approach

- First, I suggest aggregated sectoral pattern by estimating cross-country panel data of 31 countries. (I am skipping this part today.)
- After identifying the cross-country pattern, I focus on geographically disaggregated sectoral data of two East Asian new democracies, South Korea, and Taiwan. (Today's presentation.)
- I consider 7 sectors of 17 different regions in South Korea (1989-2019) and 10 sectors in 25 regions in Taiwan (1992-2018).
- To quantify the unionization, I construct the index for the degree of unionization for every sector-region pair of both countries using their annual government reports.

Findings

- South Korea and Taiwan experienced growth enhancing structural change according to geographically disaggregated sectoral analysis with Arellano-Bond dynamic panel data analysis.
- I find that, if a sector in a region had higher degree of unionization, the magnitude of growth enhancing structural change is decreased.
- In other words, if a sector has higher labor unionization, then the size of increase in employment share from productivity premium is lowered.

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Related Literature - Structural Change

- Rodrik and McMillan (2011), McMillan et al. (2014), Rodrik et al. (2017)
- A structural change is defined as a growth-enhancing (reducing) structural change if the relative productivity of sector is positively (negatively) correlated with the change in employment share.
- Vries et al. (2015), Ahsan and Mitra (2017), McCaig and Pavcnik (2017), Firpo and Pieri (2017), Mueller et al. (2019) Atta-Ankomah and Osei (2021)

Related Literature - Union and Rigidity

- Unionization affects labor rigidity through wage level and employment magnitude.
- Theoretical contributions : (1) Collective bargaining model on wage and employment (Nickell and Andrews (1983)), and (2) Insider-outsider approach on labor union (Lindbeck and Snower (1988)).
- Both groups of theoretical clarifications support that the wage is an increasing function of the bargaining power of union.

Related Literature - Union and Rigidity

- Empirical findings also support that unionized workers enjoy statistically significant wage premium. (Lewis (1963, 1986), Card (1996), Hirsch (2004), Sojourner et al. (2012))

- The relationship between the unionization and employment is mixed.

- Negative relationship between unionization and employment : Ashenfelter and Brown (1986), Card (1986, 1990), Abowd and Kramarz (1993), Kahn (2000), Sojourner et al. (2012), Frandsen (2012)
- Positive relationship between unionization and employement : Abowd (1989), Maloney (1994)
- No empirical pattern between unionization and employment : Nickell and Wadhwani (1990), Boal and Pencavel (1994), Dinardo and Lee (2004)

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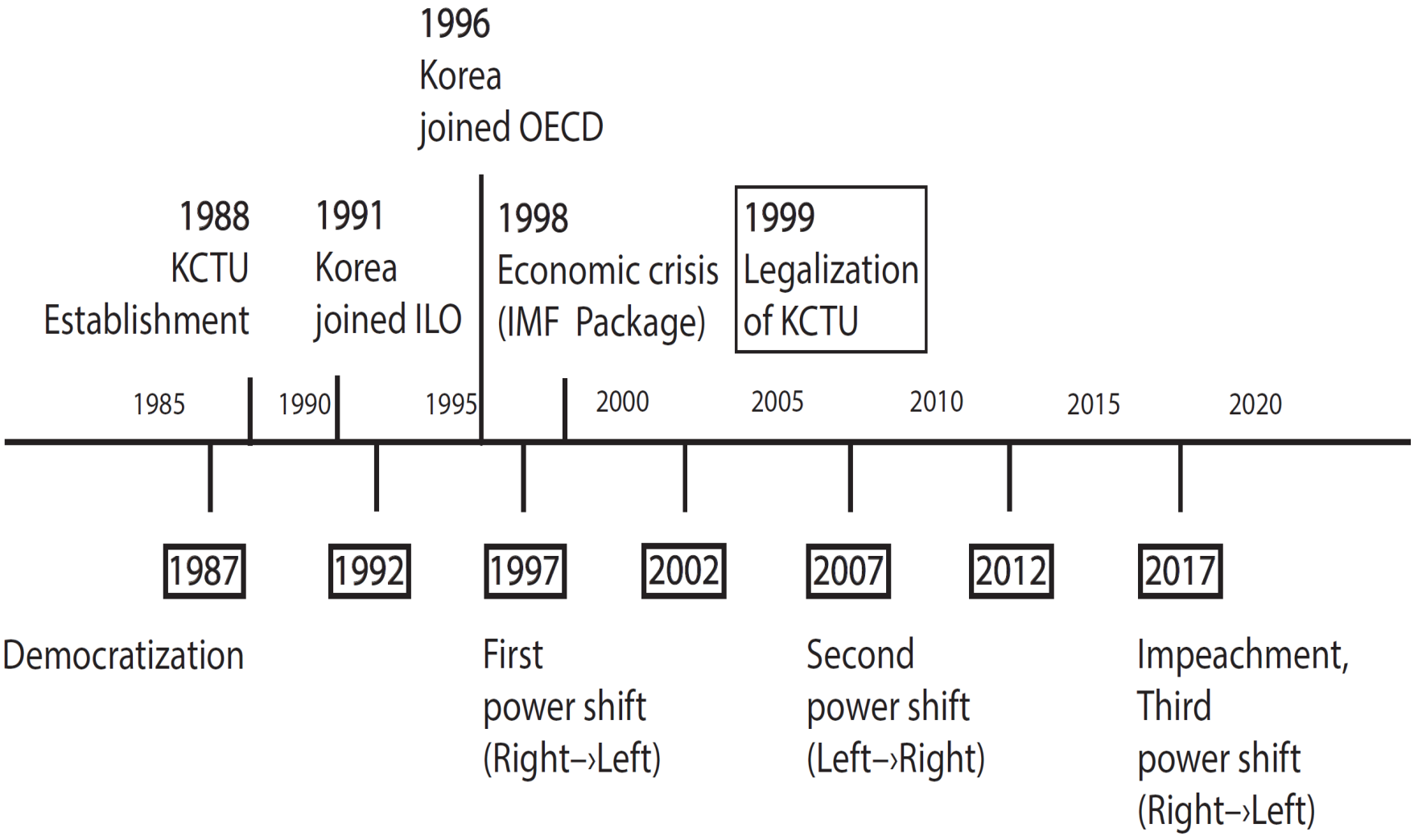
Why South Korea and Taiwan?

- For most countries, information on sector-specific rigidity, such as sector-level union density or collective bargaining coverage, is often not available.
- In addition, most measures are from recent periods for fully developed countries, and they have limited variation in union density and collective bargaining coverage across different periods and sectors.
- In South Korea and Taiwan, there has been fundamental increase in the bargaining power of labor union after the democratization which occurred in 1987 in Korea and 1991 in Taiwan.
- Their democratic labor union confederations are legalized in 1999 and 2000, respectively.

Democratization and Unionization in South Korea

- Democratization is attained in 1987
- KFTU : Federation of Korean Trade Unions since 1961
- KCTU (Democratic Labor Union Confederation) : Korean Confederation of Trade Unions since 1988
- KFTU was the sole official labor confederation in South Korea until the KCTU is legalized by the law in 1999.
- Labor-management dispute cases : Annual average of 1996 - 1998 is 97 while that of 1999 - 2001 is 227.

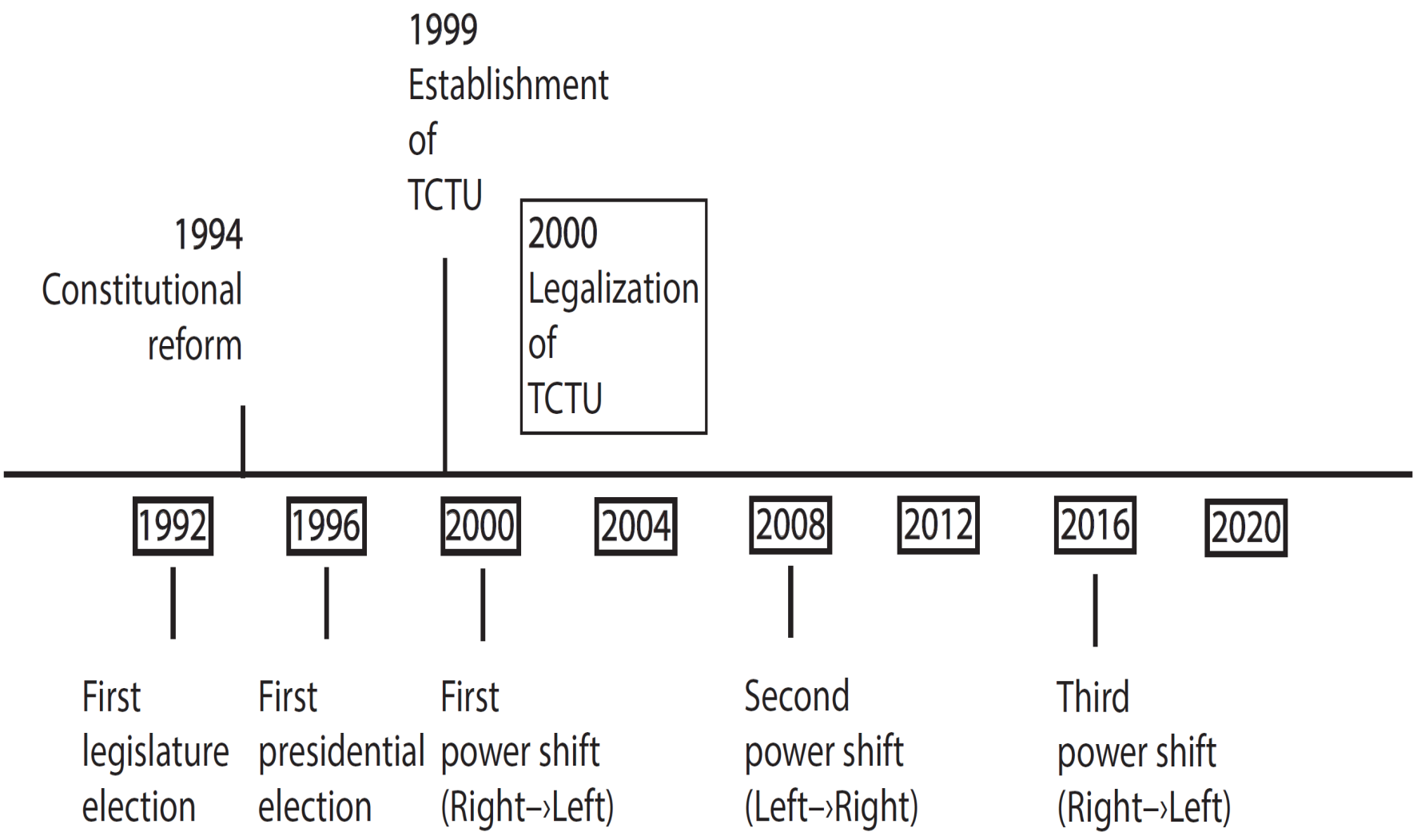
Korean Democratization



Taiwanese Democratization

- Democratization is attained gradually during 1991 - 1996.
- CFL : Chinese Federation of Labor since 1948
- TCTU (Democratic Labor Union Confederation) : Taiwan Confederation of Trade Unions since 1999
- CFL was the sole official labor confederation in Taiwan until the TCTU is legalized by the law in 2000.
- Labor-management dispute cases : Annual average of 1997 - 1999 is 4214 while that of 2000 - 2002 is 10999.

Taiwanese Democratization



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Data

- South Korea's sectoral labor union density and geographical distribution of sectoral union members : Ministry of Employment and Labor
- Taiwan's sectoral labor union density and geographical distribution of sectoral union members : Ministry of Labor, National statistics archive of Republic of China
- Sectoral value added and employment share of South Korea and Taiwan.
- I consider 7 sectors of 17 different regions in South Korea (1989-2019) and 10 sectors in 25 regions in Taiwan (1992-2018).

Data - Key Variables

- θ_{ijt} is the employment share of sector i of region j in year t.
- p_{ijt} is the yearly productivity measure of each sector-region pair ij. I simply quantify p_{ijt} by having $p_{ijt} = V_{ijt}/L_{ijt}$ where V_{ijt} stands for the value added.
- I construct relative productivity using the overall productivity of region j, P_{jt}. Symmetrically, it can be expressed as $P_{jt} = V_{jt}/L_{jt}$.
- The relative productivity of sector-region pair, p_{ijt}/P_{jt}, indicates how individual sector i in region j is relatively productive compared to the overall aggregated productivity of region j.

Data - Unionization Index for South Korea and Taiwan

$$Unionize_{ijt} = \left\{ \frac{L^u_{jt}}{L^u_t} \times L^u_{it} \right\} \Big/ L_{ijt} \tag{1}$$

- where L^u denotes the number of members of labor unions. L^u_{jt}/L^u_t quantifies region j's share of labor union members in the total for the country in year t. L^u_{it} is the sectoral number of labor union members (sector i, region j, year t.).

- By multiplying L^u_{jt}/L^u_t by L^u_{it}, $Unionize_{ijt}$ multiplies both sector-level variation and geographical variation in the degree of unionization.

- Dividing by L_{ijt}, the total number of employees in each sector of the region, leads us to get $Unionize_{ijt}$ which is a normalized proxy for the degree of unionization. Alternative Index

Data

Table: Sectors in South Korea and Taiwan

Sectors	Kor 1989-2019	Twn 1992-2003	Twn 2004-2012
Agriculture	AGR	AGR	AGR
Mining	MIN	MIN	MIN
Manufacturing	MAN	MAN	MAN
Trade Services	WRT	WRT	WRT
Construction	CON	CON	CON
Utilities	PTF	PU	PU
Transport services		TRA	TRA
Business services		FIRE	FIRE
Government services	PUBO	PUBO	PUB
Other services			OTH

Data

Table: Descriptive statistics

Variable	Mean	Std. Dev.	Min.	Max.	N
		South Korea			
θ_{ijt}	0.158	0.105	0	0.479	2640
$\Delta\theta_{ijt}$	3.44e-06	0.01	-0.047	0.055	2640
p_{ijt}/P_{jt}	1.233	1.167	0.042	11.636	2640
$Unionize_{ijt}$	0.079	0.16	0	2.411	2640
		Taiwan			
θ_{ijt}	0.109	0.11	0	0.551	2865
$\Delta\theta_{ijt}$	-0.0002014	0.009	-0.086	0.103	2865
p_{ijt}/P_{jt}	1.049	1.001	-1.53	18.952	2865
$Unionize_{ijt}$	0.444	1.129	0.001	19.915	2865

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Econometric Specification

- Focus 1 : Growth-enhancing structural change vs. Growth-reducing structural change.
- Focus 2 : Is the structural change's growth-enhancing effect heterogeneous across the degree of unionization?

Geographically Disaggregated Sectoral Analysis

$$\Delta\theta_{ijt} = \beta_0 + \sum_{a=1}^{d} \beta_{1a} \Delta\theta_{ijt-a} + \beta_2 \frac{p_{ijt-b}}{P_{jt-b}} + \beta_3 Unionize_{ijt}$$
$$+ \beta_4 \frac{p_{ijt-b}}{P_{jt-b}} \times Unionize_{ijt} + \mu_{ij} + \lambda_t + \nu_{ijt}$$

- where subscript i is sector, t is year. p_{ijt} is the geo-sectoral productivity while P_{jt} is the overall productivity of province j. $(3 \leq b \leq 5)$ $\Delta\theta_{ijt}$ is the first difference of the employment share measure.
- Samples from South Korea and Taiwan are estimated separately.
- This can be understood as the extension of Rodrik and McMillan (2017)'s definition on growth inducing/reducing structural change.
- The endogeneity of the lagged dependent variable is handled by the Arellano-Bond GMM estimator.

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Korean 7 sectors for 17 regions, 1989 - 2019

	(1) $\Delta\theta_{ijt}$	(2) $\Delta\theta_{ijt}$	(3) $\Delta\theta_{ijt}$
$\Delta\theta_{ijt-1}$	0.112***	0.121***	0.121***
	(0.0237)	(0.0253)	(0.0276)
p_{ijt-3}/P_{jt-3}	0.00236***		
	(0.000747)		
p_{ijt-4}/P_{jt-4}		0.00166***	
		(0.000521)	
p_{ijt-5}/P_{jt-5}			0.00130***
			(0.000410)
$Unionize_{ijt}$	0.00229	0.00348*	0.00239
	(0.00159)	(0.00196)	(0.00159)
$(p_{ijt-3}/P_{jt-3}) \times Unionize_{ijt}$	-0.00233***		
	(0.000813)		
$(p_{ijt-4}/P_{jt-4}) \times Unionize_{ijt}$		-0.00214**	
		(0.000874)	
$(p_{ijt-5}/P_{jt-5}) \times Unionize_{ijt}$			-0.00134***
			(0.000480)
Observations	2640	2528	2416
Fixed Effects	Yes	Yes	Yes
M.E of p/P	0.00217***	0.00149***	0.00119***
(Delta Method)	(0.00069)	(0.00047)	(0.00038)
M.E of $Unionize_{ijt}$	-0.00057	0.00083	0.00072
(Delta Method)	(0.00125)	(0.00143)	(0.00121)
AR(1) p-value	0.000	0.000	0.000
AR(2) p-value	0.189	0.646	0.913
Hansen's oid p-value	1.000	1.000	1.000

Standard errors in parentheses

Korea, Before and after the legalization of KCTU

	(1) $\Delta\theta_{ijt}$	(2) $\Delta\theta_{ijt}$	(3) $\Delta\theta_{ijt}$	(4) $\Delta\theta_{ijt}$	(5) $\Delta\theta_{ijt}$	(6) $\Delta\theta_{ijt}$
	1989 - 1999			2000 - 2019		
$\Delta\theta_{ijt-1}$	0.0483	0.0733	0.0615	0.0798**	0.0809**	0.0838**
	(0.0433)	(0.0522)	(0.0664)	(0.0324)	(0.0323)	(0.0330)
p_{ijt-3}/P_{jt-3}	0.00175			0.00198***		
	(0.00125)			(0.000686)		
p_{ijt-4}/P_{jt-4}		0.000815			0.00157***	
		(0.000628)			(0.000529)	
p_{ijt-5}/P_{jt-5}			0.00155*			0.00103***
			(0.000887)			(0.000378)
$Unionize_{ijt}$	-0.00119	0.00137	0.000887	0.00292	0.00269	0.00150
	(0.00286)	(0.00209)	(0.00181)	(0.00274)	(0.00220)	(0.00151)
$(p_{ijt-3}/P_{jt-3})\times Unionize_{ijt}$	-0.00145			-0.00254		
	(0.00114)			(0.00205)		
$(p_{ijt-4}/P_{jt-4})\times Unionize_{ijt}$		-0.00130			-0.00225*	
		(0.000889)			(0.00125)	
$(p_{ijt-5}/P_{jt-5})\times Unionize_{ijt}$			-0.00146*			-0.000987**
			(0.000848)			(0.000398)
Observations	682	580	481	1958	1948	1935
Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
M.E of p/P	0.00157	0.00066	0.00138*	0.00181***	0.00142***	0.00096***
(Delta Method)	(0.00113)	(0.00055)	(0.00080)	(0.00065)	(0.00048)	(0.00035)
M.E of $Unionize_{ijt}$	-0.00309	-0.00031	-0.00098	-0.00011	-0.00005	0.00028
(Delta Method)	(0.00265)	(0.00194)	(0.00189)	(0.00157)	(0.00148)	(0.00126)
AR(1) p-value	0.000	0.000	0.000	0.000	0.000	0.000
AR(2) p-value	0.015	0.161	0.606	0.651	0.733	0.790
Hansen's oid p-value	0.998	0.963	0.577	1.000	1.000	1.000

Taiwanese 10 sectors of 25 regions, 1992 - 2018

	(1) $\triangle\theta_{ijt}$	(2) $\triangle\theta_{ijt}$	(3) $\triangle\theta_{ijt}$
$\triangle\theta_{ijt-1}$	-0.143***	-0.141***	-0.152***
	(0.0179)	(0.0173)	(0.0185)
$\triangle\theta_{ijt-2}$	-0.174***	-0.168***	-0.169***
	(0.0290)	(0.0287)	(0.0292)
$\triangle\theta_{ijt-3}$	-0.120***	-0.116***	-0.117***
	(0.0149)	(0.0151)	(0.0158)
$\triangle\theta_{ijt-4}$	-0.0783***	-0.0773***	-0.0753***
	(0.0126)	(0.0121)	(0.0156)
p_{ijt-3}/P_{jt-3}	0.000207		
	(0.000142)		
p_{ijt-4}/P_{jt-4}		0.000374**	
		(0.000171)	
p_{ijt-5}/P_{jt-5}			0.000317
			(0.000205)
$Unionize_{ijt}$	-0.000668**	-0.000553**	-0.000689**
	(0.000300)	(0.000254)	(0.000326)
$(p_{ijt-3}/P_{jt-3}) \times Unionize_{ijt}$	-0.0000148		
	(0.000164)		
$(p_{ijt-4}/P_{jt-4}) \times Unionize_{ijt}$		-0.000177**	
		(0.0000896)	
$(p_{ijt-5}/P_{jt-5}) \times Unionize_{ijt}$			-0.000226*
			(0.000126)
Observations	2865	2850	2841
Fixed Effects	Yes	Yes	Yes
M.E of p/P	0.00020	0.00029*	0.00022
(Delta Method)	(0.00012)	(0.00015)	(0.00018)
M.E of $Unionize_{ijt}$	-0.00068***	-0.00075***	-0.00094***
(Delta Method)	(0.00022)	(0.00021)	(0.00023)
AR(1) p-value	0.000	0.000	0.000
AR(5) p-value	0.288	0.287	0.305
Hansen's oid p-value	1.000	1.000	1.000

Taiwan, Before and after the legalization of TCTU.

	(1) $\Delta\theta_{ijt}$	(2) $\Delta\theta_{ijt}$	(3) $\Delta\theta_{ijt}$	(4) $\Delta\theta_{ijt}$	(5) $\Delta\theta_{ijt}$	(6) $\Delta\theta_{ijt}$
	1992 - 2000			2001 - 2018		
$\Delta\theta_{ijt-1}$	-0.269***	-0.330***	-0.351***	-0.0903***	-0.0909***	-0.101***
	(0.0249)	(0.0267)	(0.0312)	(0.0157)	(0.0155)	(0.0170)
$\Delta\theta_{ijt-2}$				-0.101***	-0.101***	-0.110***
				(0.0119)	(0.0120)	(0.0139)
$\Delta\theta_{ijt-3}$				-0.0679***	-0.0680***	-0.0755***
				(0.0139)	(0.0146)	(0.0152)
$\Delta\theta_{ijt-4}$				-0.0138**	-0.0137**	-0.0597***
				(0.00582)	(0.00583)	(0.0166)
p_{ijt-3}/P_{jt-3}	0.00375*			0.000396***		
	(0.00227)			(0.000134)		
p_{ijt-4}/P_{jt-4}		0.00590			0.000433***	
		(0.00397)			(0.000152)	
p_{ijt-5}/P_{jt-5}			-0.00840**			0.000404**
			(0.00357)			(0.000197)
$Unionize_{ijt}$	-0.00240	-0.00245	-0.00397	-0.000199	-0.000194*	-0.000272**
	(0.00178)	(0.00178)	(0.00281)	(0.000128)	(0.000107)	(0.000131)
$(p_{ijt-3}/P_{jt-3})\times Unionize_{ijt}$	-0.000484			-0.000160**		
	(0.000869)			(0.0000656)		
$(p_{ijt-4}/P_{jt-4})\times Unionize_{ijt}$		-0.001000			-0.000207***	
		(0.00161)			(0.0000555)	
$(p_{ijt-5}/P_{jt-5})\times Unionize_{ijt}$			0.000714			-0.000253***
			(0.00152)			(0.0000941)
Observations	630	515	391	2548	2533	2522
Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
M.E of p/P	0.00353	0.00541	-0.00799**	0.00032***	0.00034	0.00030
(Delta Method)	(0.00226)	(0.00397)	(0.00342)	(0.00012)	(0.00310)	(0.01028)
M.E of $Unionize_{ijt}$	-0.00304*	-0.00380	-0.00299	-0.00037***	-0.00042	-0.00055
(Delta Method)	(0.00166)	(0.00268)	(0.00322)	(0.00011)	(0.00201)	(0.00790)
AR(1) p-value	0.000	0.000	0.000	0.000	0.000	0.000
AR(2) p-value	0.050	0.066	0.729			
AR(5) p-value				0.577	0.579	0.672
Hansen's oid p-value	0.001	0.000	0.000	1.000	1.000	0.000

Estimation Results

- Because the labor input will have higher rigidity after democratization due to the increased bargaining power of labor, an economy no longer enjoys quick and immediate re-allocation of labor according to productivity.
- This can be one of reasons for smaller share of structural growth in fully democratized economies.
- As labor's bargaining power increases along with democratic consolidation, new democracies can expect slower adjustment of labor allocation.

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Conclusion

- In South Korea and Taiwan, a sector in a region with higher degree of unionization had smaller growth-enhancing structural change.
- This heterogeneous size of growth enhancing structural change across unionization became more explicit after the liberalization of union.
- Cross-country aggregated extension with 31 countries provides similar intuition.
- As an extension, my paper also implements growth decomposition to see how the increased bargaining power of labor affected economic growth overall.

Thank you very much!

- Thank you very much!

Alternative Index

- $$Unionize^{*}_{ijt} = \left\{ \frac{L_{jt}}{L_t} \times L^{u}_{it} \right\} \Big/ L_{ijt} \tag{2}$$
- Implementing $\frac{L^{u}_{it}}{L_{it}}$ and $\frac{L^{u}_{jt}}{L_{jt}}$ linearly together.
- Arithmetic mean, geometric mean of $\frac{L^{u}_{it}}{L_{it}}$ and $\frac{L^{u}_{jt}}{L_{jt}}$.
- Mean of above arithmetic mean and geometric mean.

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