

# What Determines the Capital Share over the Long Run of History?

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# Background

Much talk today about factor shares

- "The falling wage share" (Autor, Van Reenen, Dorn, ...)
- "The rising capital share" (Piketty, ...)
- Several proposed drivers: Globalization, Market structure, Automation, Union influence, ...

But unanswered questions remain:

- What is the role of deep-rooted institutions?
- Are estimated links stable over long periods of time?
- What about causal impacts?

# This paper

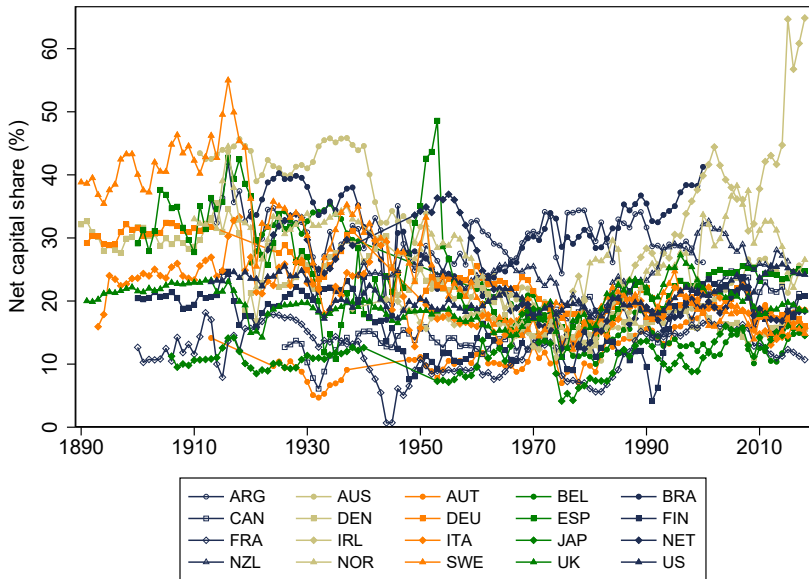
## Questions asked:

- How do institutions (ec., pol.) affect capital shares?
- Can we discriminate between *proximate* and *fundamental* factors (North and Thomas 1973; Acemoglu and Robinson 2000, 2005, 2015 (with Naidu, Restrepo))?

## What we do:

- New historical database (Bengtsson-Waldenström)
  - Capital/Wage share database, 20 countries, 1870-2015
  - Merge with other historical cross-country databases
- Event study approach
  - ① Universal suffrage
  - ② Close election wins of left-wing governments
  - ③ Decolonization
  - ④ Wars
- Panel regressions (OLS, IV)

# Net capital share, 1870-2015

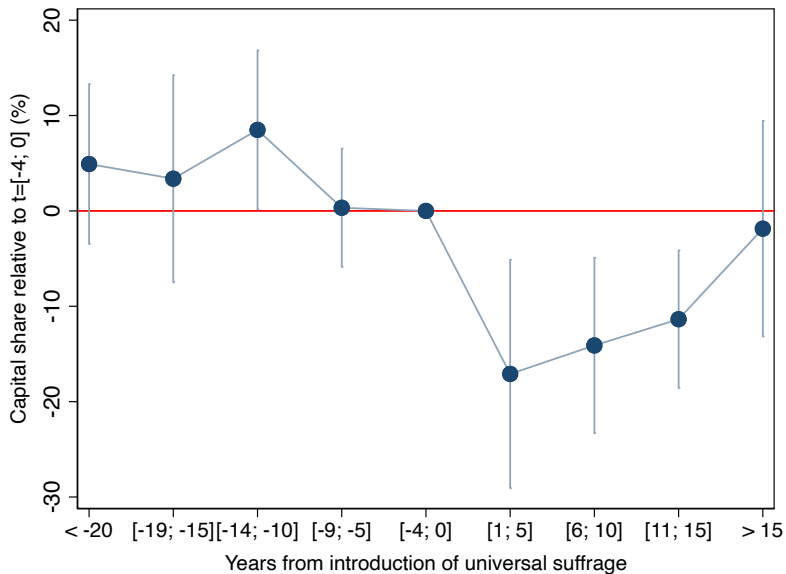


# Event #1: Extension of universal suffrage

- Literature on the role democracy:
  - *Economic development*: Acemoglu and Robinson (2000, 2006)
  - *Distribution*: Meltzer and Richard (1981), Boix (2003), Pittaluga et al. (2015), Acemoglu et al (2015), Scheve and Stasavage (2017)
- We study extension of universal suffrage events in 20th C
- Data on suffrage reforms from V-Dem ([www.v-dem.net](http://www.v-dem.net))
  - AR (1948); AU (1963); AT (1924); BE (1960); BR (1988); CA (1961); DK (1916); DE (1925); ES (1932); FI (1907); FR (1945); IT (1946); JP (1953); NO (1914); SE (1922); UK (1919)
- We run the following regression:

$$\log \text{CapitalShare}_{it} = \sum_{j \neq -1} \beta_j \cdot 1(t = t_j) + \gamma_i + \delta_t + \gamma_i \cdot t + u_{it}$$

## Universal suffrage and the capital share



# Universal suffrage and the capital share

- We find that democracy has large and lasting negative effects on the capital share
  - Pre-reform, no existing differences across countries.
  - Post-reform, the capital share drops instantaneously by 4-5 percentage points (ca 17 percent)
  - The effect lasts during the 10 years after democratization (still 3 percentage points, ca 12 percent)
- Still unclear about exact mechanisms (reallocation of funds, tax hikes?)

## Event #2: Close left-wing election wins

- How to identify the effect of redistributive policies?
- We study election wins of left-wing coalitions (*LeftGov*) with a vote share *just above* 50%  $\Rightarrow$  Regression Discontinuity
- Data on ideology of government party: Head of Government Dataset (Brambor et al., 2017)
- Vote share data: Polyarchy Dataset (Vanhanen, 2015)
- We run the following regression:

$$\log \text{CapitalShare}_{it} = \beta \cdot \text{LeftGov}_{it} + \gamma_i + \delta_t + \gamma_{it} + f(\text{LeftVote\%}_{it}) + u_{it}$$



# Close election wins of left-wing government

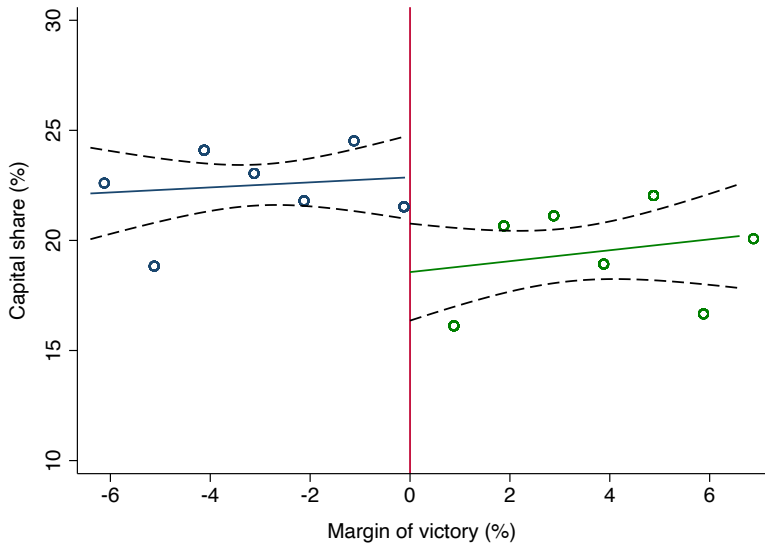


Table: Party ideology and the capital share

|                             | logCapitalShare  |                     |                     |                     |
|-----------------------------|------------------|---------------------|---------------------|---------------------|
|                             | OLS<br>(1)       | RD<br>(2)           | RD<br>(3)           | RD<br>(4)           |
| <i>LeftGov<sub>it</sub></i> | 0.003<br>(0.021) | -0.084**<br>(0.031) | -0.074**<br>(0.029) | -0.077**<br>(0.027) |
| Observations                | 1,963            | 416                 | 416                 | 416                 |
| Country FE                  | Yes              | Yes                 | Yes                 | Yes                 |
| Year FE                     | Yes              | Yes                 | Yes                 | Yes                 |
| Country-specific trends     | Yes              | Yes                 | Yes                 | Yes                 |
| Polynomial order            |                  | 1                   | 2                   | 3                   |
| Mean dependent (%)          | 21.8             | 21.0                | 21.0                | 21.0                |

Note: Imbens & Kalyanaraman (2012) on optimal bandwidth. SEs clustered by country.

# Left-wing government policy and the capital share

- We find that the capital share drops by on average 1.6 percentage points (7-8 percent) when a left-wing government barely won an election.
- Implication: for a given macroeconomic and social setting, when the political left narrowly gains the majority in parliament, they impose policies that lower the relative yields for capital compared to labor.

## Event #3: Decolonization

- Did capital owners in rich countries profit from the colonies?
  - Large literature on the profitability of colonies (Foreman-Peck, Offer, ...), but little on the specific gains to capital owners
  - Goldsmith (1965): 1/5 of assets in UK, FR, BE were colonial
  - Goetzmann and Ukhov (2006): Overseas investments had higher returns for given risk, offered diversification
- Decolonization history from ICOW Colonial History Dataset
  - Date of country's independence, name of colonizing country
  - Observe 50 independence events
- Potential endogeneity of decolonization: stacked event study
  - Construct separate datasets for each event
  - Compare capital shares in colonial powers with the other countries before and after the event.
- We run the following regression:

$$\log CapSh_{i,d,t} = \beta \cdot (Treat_{i,d} \cdot Post_{d,t}) + \gamma_{i,d} + \delta_{post,d} + \eta_{i,post} + u_{i,d,t}$$

# Impact of decolonization on the capital share

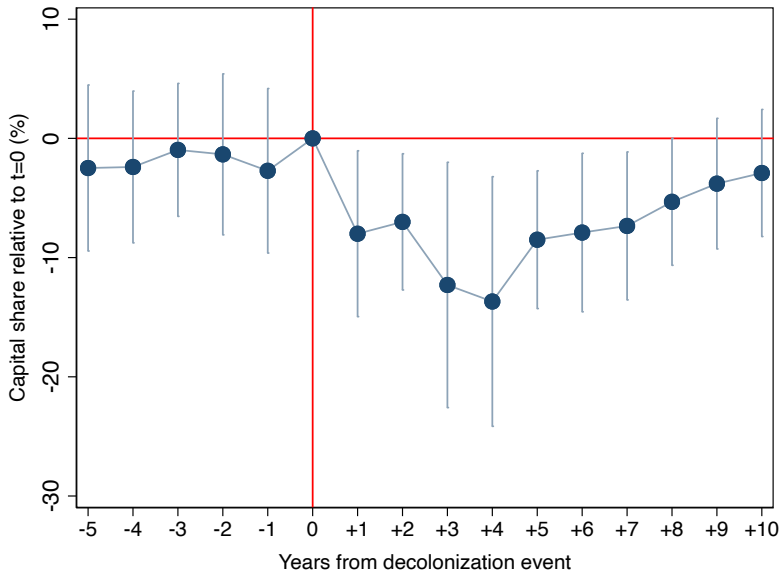


Table: Decolonization and the capital share

|   | <i>logCapitalShare</i> |                      |                       |                      |
|---|------------------------|----------------------|-----------------------|----------------------|
|   | Full period<br>(1)     | Without UK<br>(2)    | $\pm 10$ years<br>(3) | $\pm 5$ years<br>(4) |
| <i>Treated<sub>id</sub> × Post<sub>dt</sub></i> | -0.012***<br>(0.003)   | -0.018***<br>(0.005) | -0.025**<br>(0.013)   | -0.069***<br>(0.020) |
| Observations                                    | 104,200                | 97,800               | 19,087                | 9,982                |
| Post × Decolonization event                     | Yes                    | Yes                  | Yes                   | Yes                  |
| Country × Decolonization event                  | Yes                    | Yes                  | Yes                   | Yes                  |
| Country × Post                                  | Yes                    | Yes                  | Yes                   | Yes                  |
| Mean dependent (%)                              | 21.8                   | 21.9                 | 19.6                  | 19.3                 |

Note: This table presents the effects of decolonization on capital share of colonial powers. The sample is composed of 50 decolonization events. The empirical specification includes post × decolonization event, country × decolonization event, and country × post-decolonization period fixed effects. Standard errors clustered at country-year level in parenthesis.

# Decolonization and the capital share

- We find that decolonization decreased the capital share
  - Pre-event trends were parallel in decolonization and other countries
  - We estimate that losing a colony depressed the capital share by 6.9 percent over the first five years, and by 2.5 percent over the first ten years.
  - Leaving out the UK (largest colonizer) does not change results-

## Event #4: Wars

- Large literature on wars and distribution (Piketty 2014, Scheve and Stasavage 2016, Scheidel 2018)
- Direct impact (destruction), indirect impact (policies)
- Note that wars impact  $K$ ,  $Y$  and  $r$ 
  - $K = \text{Capital}$ ;  $K/Y = \text{Capital/Output}$ ;  $rK/Y = \text{CapitalShare}$
- We therefore run the following regressions:

$$\begin{aligned}\log \text{Capital}_{it} &= \beta \cdot (\text{War Participant} \times \text{War}) + \gamma_i + \gamma_i t + u_{it} \\ \log \text{Capital/Output}_{it} &= \beta \cdot (\text{War Participant} \times \text{War}) + \gamma_i + \gamma_i t + u_{it} \\ \log \text{CapitalShare}_{it} &= \beta \cdot (\text{War Participant} \times \text{War}) + \gamma_i + \gamma_i t + u_{it}\end{aligned}$$

- Data on wars since 1870 from Sarkees and Wayman (2010)
- Data on  $K$ ,  $K/Y$  collected from various sources



**Table:** Wars and capital stock, capital-output ratio and capital share

|                        | log <i>Capital</i> |         |           | log <i>Capital/Output</i> |         |          | log <i>CapitalShare</i> |          |         |
|------------------------|--------------------|---------|-----------|---------------------------|---------|----------|-------------------------|----------|---------|
|                        | (1)                | (2)     | (3)       | (4)                       | (5)     | (6)      | (7)                     | (8)      | (9)     |
| <i>War participant</i> |                    |         |           |                           |         |          |                         |          |         |
| × <i>All wars</i>      | -0.301**           |         |           | -0.270*                   |         |          | 0.077*                  |          |         |
|                        | (0.134)            |         |           | (0.131)                   |         |          | (0.040)                 |          |         |
| × <i>WWI</i>           |                    | 0.165   |           |                           | 0.011   |          |                         | 0.182*** |         |
|                        |                    | (0.150) |           |                           | (0.106) |          |                         | (0.042)  |         |
| × <i>WWII</i>          |                    |         | -0.649*** |                           |         | -0.506** |                         |          | 0.065   |
|                        |                    |         | (0.148)   |                           |         | (0.195)  |                         |          | (0.039) |
| Observations           | 1,159              | 1,159   | 1,159     | 1,159                     | 1,159   | 1,159    | 1,159                   | 1,159    | 1,159   |
| Country FE             | Yes                | Yes     | Yes       | Yes                       | Yes     | Yes      | Yes                     | Yes      | Yes     |
| Country-trends         | Yes                | Yes     | Yes       | Yes                       | Yes     | Yes      | Yes                     | Yes      | Yes     |

*Note:* Effect of wars on (log of) capital stock (cols 1-3), (log of) capital-output ratio (cols 4-6), and (log of) net capital share (cols 7-9). First all the wars episodes since 1870 (cols 1, 4 and 7), then specifically at WWI (cols 2, 5 and 8) and WWII (cols 3, 6 and 9). Regressions weighted by the intensity of wars, proxied by a function of the number of war deaths. Sample of 20 countries over the 1870-2015 period. SEs clustered at country level.

# Wars and the capital share

- We find that capital shares increased during wartime episodes in belligerent countries
  - The capital stock *decreases* during wars ( $-1/3$ ), especially WWII ( $-2/3$ )
  - The capital-output ratio *decreases* during wars ( $-1/4$ ), especially WWII ( $-1/2$ )
  - The capital share *increases* by ca 8 percent during wars, especially WWI ( $+1/5$ )
- We discuss the role of windfall gains and other reasons for higher capital returns during wars

# Panel regression analysis

- Panel regressions allow estimate the role of economic and political variables on full dataset
  - Government spending
  - Top marginal tax rate
  - Trade openness
  - GDP/capita
  - Patents
- First, we run the OLS regressions:

$$\log Capitalshare_{it} = \beta X_{it} + \gamma_i + \delta_t + \gamma_i t + u_{it}$$

- Thereafter, we estimate IV regressions
  - Marginal top tax instrument: Average tax in other countries
  - Government spending instrument: Extrapolation from the growth rate of national debt

Table: OLS regression results

|                      | <i>logCapitalshare</i> |                       |                      |                    |                     |                     |
|----------------------|------------------------|-----------------------|----------------------|--------------------|---------------------|---------------------|
|                      | Full period            |                       |                      |                    | Pre-WWII            | Post-WWII           |
|                      | (1)                    | (2)                   | (3)                  | (4)                | (5)                 | (6)                 |
| log Gov. spending    | -1.723***<br>(-0.413)  | -1.760***<br>(-0.423) | -1.066**<br>(-0.406) | -0.369<br>(-0.234) | -0.441**<br>(0.188) | -0.779<br>(0.508)   |
| Obs.                 | 1,825                  | 1,825                 | 1,825                | 1,825              | 548                 | 1,164               |
| log Top marginal tax | -1.008***<br>(-0.172)  | -0.922***<br>(-0.126) | -0.434<br>(-0.254)   | -0.179<br>(-0.195) | 0.172<br>(0.245)    | -0.643**<br>(0.267) |
| Obs.                 | 1,804                  | 1,804                 | 1,804                | 1,804              | 468                 | 1,175               |
| log Trade openness   | 0.039<br>(-0.031)      | 0.183<br>(-0.193)     | 0.176<br>(-0.220)    | -0.053<br>(-0.140) | 0.260<br>(0.300)    | -0.047<br>(0.340)   |
| Obs.                 | 1,818                  | 1,818                 | 1,818                | 1,818              | 548                 | 1,162               |
| log GDP/capita       | -0.141***<br>(-0.044)  | -0.126**<br>(-0.053)  | 0.183<br>(-0.174)    | 0.290<br>(-0.200)  | 0.484***<br>(0.130) | 0.298<br>(0.204)    |
| Obs.                 | 1,875                  | 1,875                 | 1,875                | 1,875              | 560                 | 1,171               |
| log Patents          | -0.059<br>(-0.038)     | -0.015<br>(-0.051)    | 0.130***<br>(-0.040) | 0.066<br>(-0.058)  | 0.166**<br>(0.057)  | -0.049<br>(0.057)   |
| Obs.                 | 1,471                  | 1,471                 | 1,471                | 1,471              | 450                 | 899                 |
| Country FE           | No                     | Yes                   | Yes                  | Yes                | Yes                 | Yes                 |
| Year FE              | No                     | No                    | Yes                  | Yes                | Yes                 | Yes                 |
| Country trends       | No                     | No                    | No                   | Yes                | Yes                 | Yes                 |

**Table:** Instrumented regressions: Government spending, Top tax rates

|                           | <i>logCapitalshare</i> |                     |                   |                     |
|---------------------------|------------------------|---------------------|-------------------|---------------------|
|                           | OLS<br>(1)             | 2SLS<br>(2)         | OLS<br>(3)        | 2SLS<br>(4)         |
| log Government spending   | -1.066**<br>(0.406)    | -1.151**<br>(0.421) |                   |                     |
| log Top marginal tax rate |                        |                     | -0.434<br>(0.254) | -0.837**<br>(0.318) |
| First stage t-stat        |                        | 20.87               |                   | 2.09                |
| Observations              | 1,823                  | 1,823               | 1,786             | 1,786               |
| Country FE                | Yes                    | Yes                 | Yes               | Yes                 |
| Year FE                   | Yes                    | Yes                 | Yes               | Yes                 |

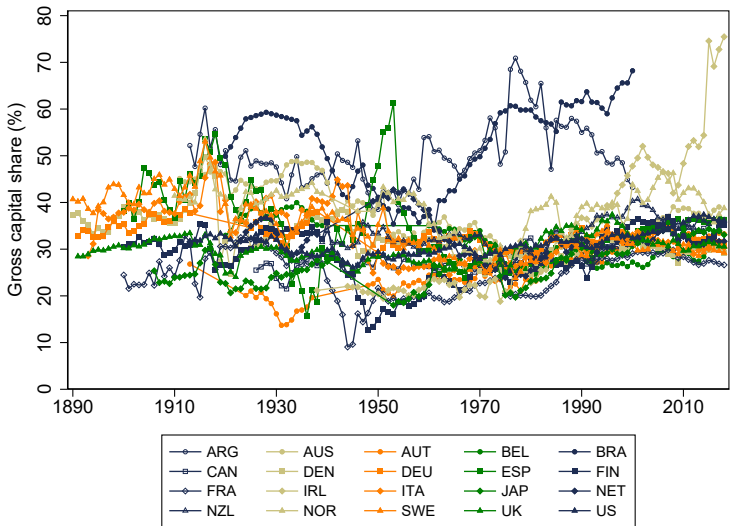
## Panel regression results

- Government redistribution (gov. spending, top tax rates) depresses the capital share
  - Negative estimates in both OLS and IV
- Other variables have no clear association after including all fixed effects
- Do effects vary over time? Patents and GDP positively associated in pre-WWII era, but not later

# Conclusions

- We use a new historical cross-country panel dataset to analyze how economic and political institutions affect the capital share of value added
- Our main findings are the following:
  - ① Democracy depresses the capital share (extension of universal suffrage)
  - ② Redistributive policies depress the capital share (close left-wing election wins; IV results for government spending and top marginal taxation)
  - ③ Decolonization depressed the capital share
  - ④ Wars boost the capital share (wartime windfall profits)

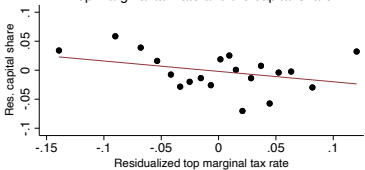
# Gross (of depreciation) capital share



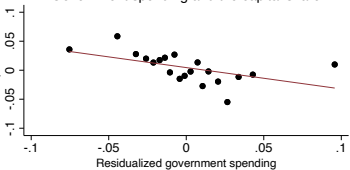


# Covariation of capital share with some outcomes

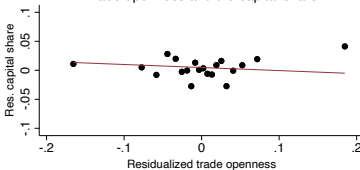
Top marginal tax rate and the capital share



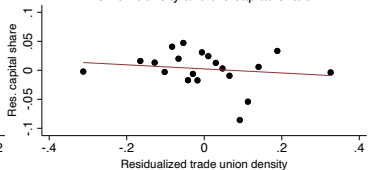
Government spending and the capital share



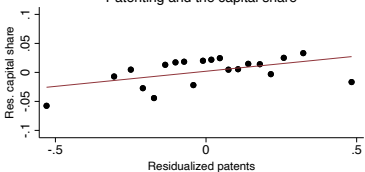
Trade openness and the capital share



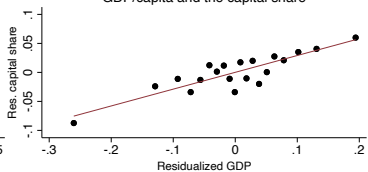
Union density and the capital share



Patenting and the capital share



GDP/capita and the capital share



# Sensitivity of bandwidth length in RD regressions

