Bureaucrats and the Korean Export Miracle

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Discussion focused on (a) economic mechanisms and (b) policy design

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Contribution to literature on bureaucratic capacity and development:

Does bureaucratic capacity matter for ...

... industrial policy?

... growth miracles?

South Korea, 1960 – 2000

- 1960: Poorer than most of Africa
  2023: Same per capita income as France

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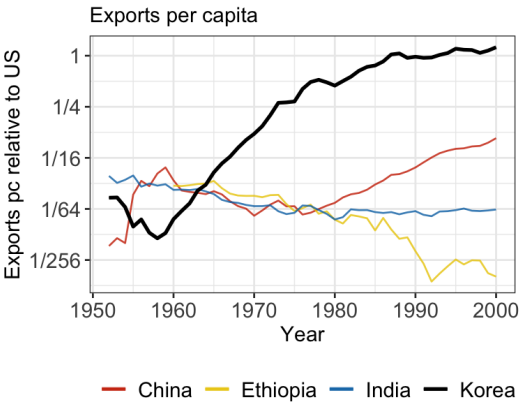

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- Exports grew particularly fast
- Gov. pursued industrial and export policies
- I study the people behind one such policy
  How much does the policy's effect depend on individual bureaucrats?
  (Abowd et al., 1999; Bertrand et al., 2003)

Roadmap

Setting to Identify how Implementing Capacity Changes a Policy's Effect

Results (and Identification)

- Large Differences in Exports Due to Bureaucrats
- Office Openings Increase Exports
- Bureaucrat Experience Shapes Their Effect

Conclusion

How Implementing Capacity Changes a Policy's Effect – Challenges

Challenge 1: Need variation in implementing capacity holding fixed policy

- Same policy implemented in many locations

Challenge 2: Need variation in implementing capacity holding fixed location

- Natural variation in capacity when bureaucrats move between locations

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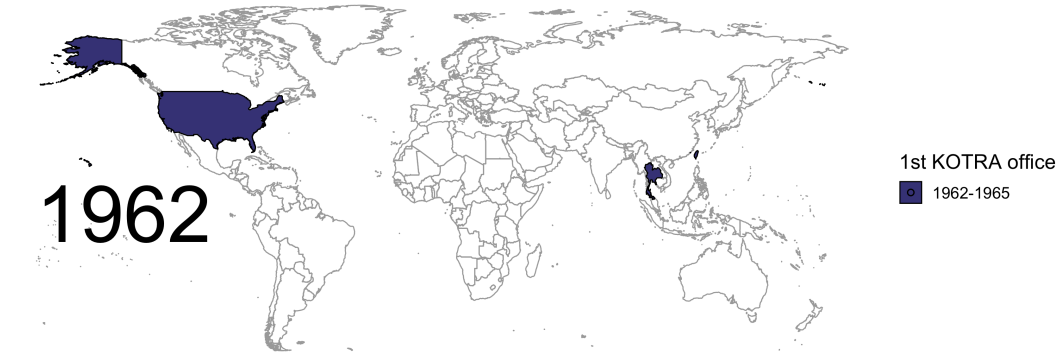
Ideally: Outcome closely linked to economic growth

Setting 1 – Policy Implemented in Many Locations



Overseas Offices of Korea Trade Promotion Agency (KOTRA)

- Single goal: “increases of exports”
- Office activities: Reports on demand Find new trade partners Trade fairs

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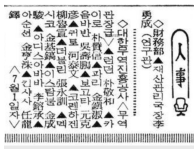

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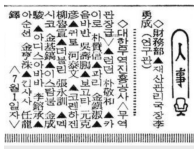
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座談 참석자

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London connected to other offices

B_1: Bangkok, Casablanca, Paris

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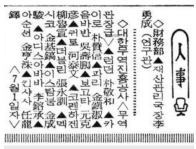

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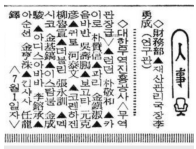

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London connected to other offices

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Preview – Industrial Policy Needs Good Bureaucrats

1. 1 SD increase in manager ability increases exports by 37%

   Using: Rotation of bureaucrats tasked with exports to each country

   Key assumption: Appointments quasi-random wrt export trends

2. Policy increases exports by 38%

   Using: Staggered roll-out of offices to countries.

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Preview – Effect Size

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- Policy ineffective if implemented by bureaucrat 1 SD below average
  ... despite large average effect
- Effects large ... but less so relative to Korean export growth
  - 37% annual growth of Korean exports (1962-1981)
  - 50-fold increase in exports per capita relative to U.S.
- AKM: Bureaucrats explain 1/7 as much variation as destination countries

Identification: How much do exports vary between bureaucrats?

$$y_{cpt} = \beta_{b(c,t)} + \gamma_c + \lambda_{pt} + \epsilon_{cpt}$$

$\beta_{b(c,t)}$ – FE for bureaucrat in country c in year t, λ_{pt} – product-year FE

Identification of $\beta_{b(c,t)}$ & γ_c only within largest connected set

Key assumption: $\beta_{b(c,t)} \perp$ trends in exports (ϵ_{cpt})

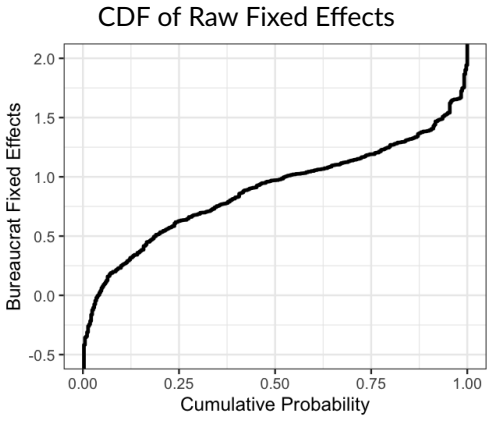
$\Rightarrow$ Allows rich patterns of sorting (Card et al., 2013, 2016, 2017), e.g.:
better bureaucrats to countries with higher fixed effects

Data:

- Sample: Country-years with bureaucrat 1965-2000
- Exports at 4-digit SITC–level (Feenstra and Romalis, 2014)
- $y_{cpt} = \text{asinh}^{-1}(exports_{cpt})$
  Robustness: (a) Extensive, (b) int. margin, (c) different weightings of margins

Main Finding – How Much Bureaucrats Matter for Exports

AKM: $y_{cpt} = \beta_{b(c,t)} + \gamma_c + \lambda_{pt} + \epsilon_{cpt}$



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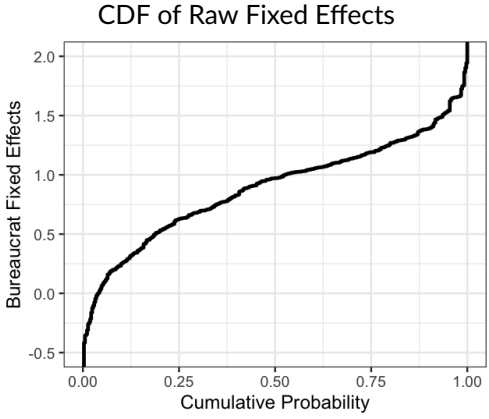

Concerns

- $\beta_{b(c,t)} \not\perp$ export trends $\Rightarrow$ Next slide!
- β_b estimated with error
  $\Rightarrow$ $Var(\hat{\beta}_b)$ overstates bureaucrat importance

Note

- Bias well-understood: inversely related to connectivity of country-bureaucrat graph

Solution

- Kline et al. (2020): $\widehat{Var(\beta_b)} = Var(\hat{\beta}_b)$ - $\widehat{\text{bias}}$

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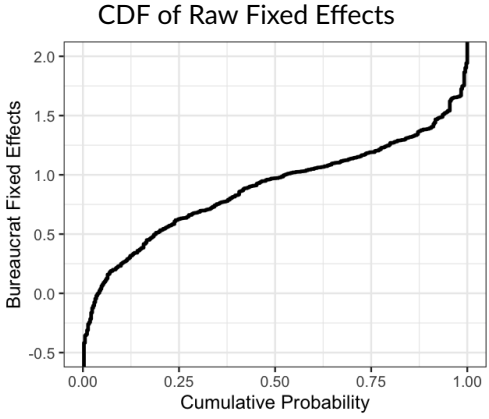

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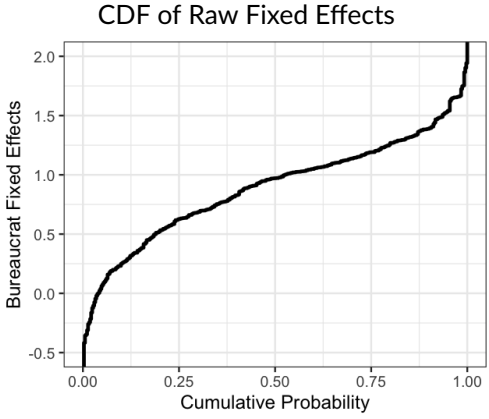

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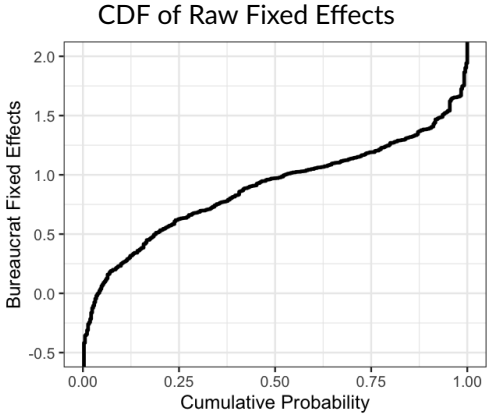

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- Alternative: shrinkage

▸ Full variance decomposition, incl. placebo

Appointments $\perp$ Trends – Three Main Reasons

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1. Cannot perfectly time appointments.
   If you tried: differential pre-trends

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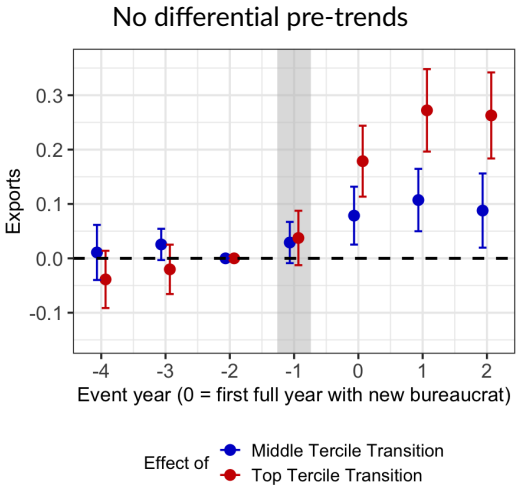

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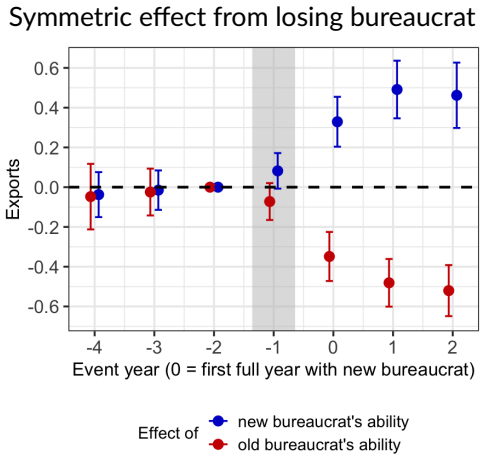

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   (a) Strategic: Send good bureaucrats to statically important countries

   (b) Qualitative interviews: language, desirability – other constraints

Appointments $\perp$ Trends – Three Main Reasons

Further checks:

1. b effects predictive out of sample
2. b FE or appointment FE?
3. No sign of misspecification
4. Effects on extensive and intensive margin
5. Consistent effects across quantiles of incoming and outgoing bureaucrat

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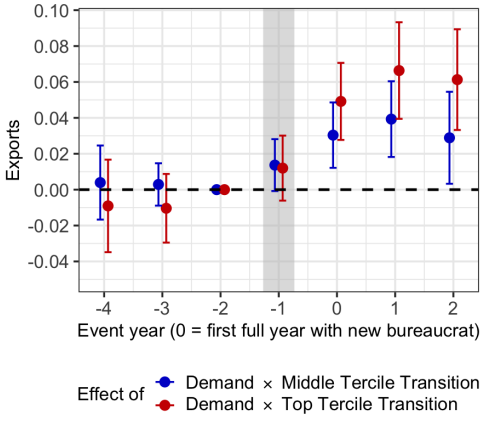

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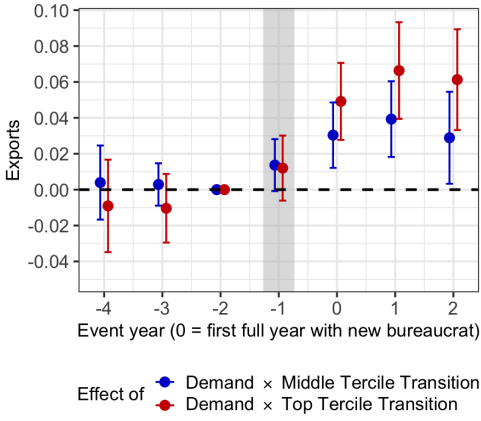

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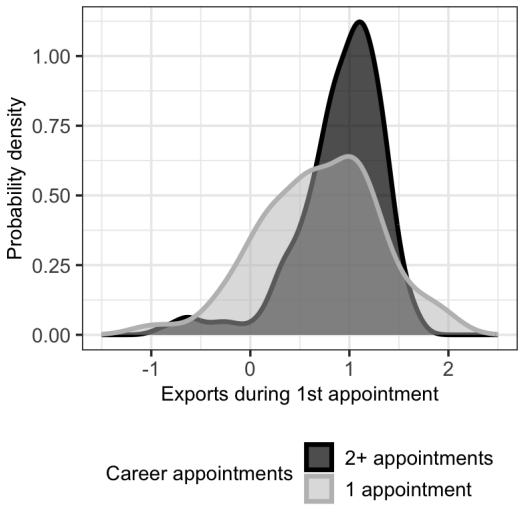
  - In year 0, exports jump in line with change in ability × demand
  - Top Tercile Transition: Reaction to demand up by 28%
- Interactions explain much of bureaucrat effect (but not all of it)

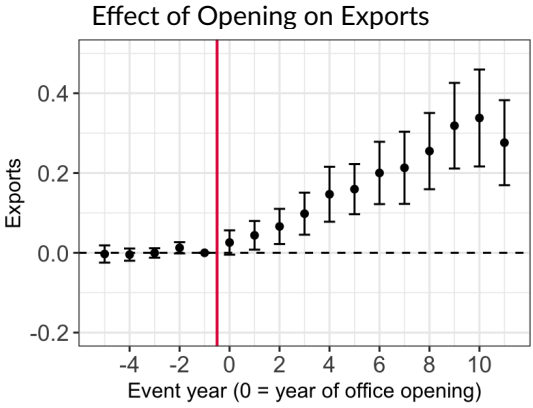
▸ Regression equation

Extension: Ineffective Bureaucrats Are Not Reappointed



- Bureaucrats in left tail during 1st appointment are not reappointed
- Effect of being above 25th percentile with "year of 1st appointment"-FE: 0.430 (0.109) additional appointments
- Potentially:
  - Optimal organizational response to high uncertainty about ability
    ... when maximizing LHS-variable
  - Optimal to run low-stakes projects to select out low performers

Finding 2 – Openings: 38% Increase in Korean Exports



Parallel pre-trends

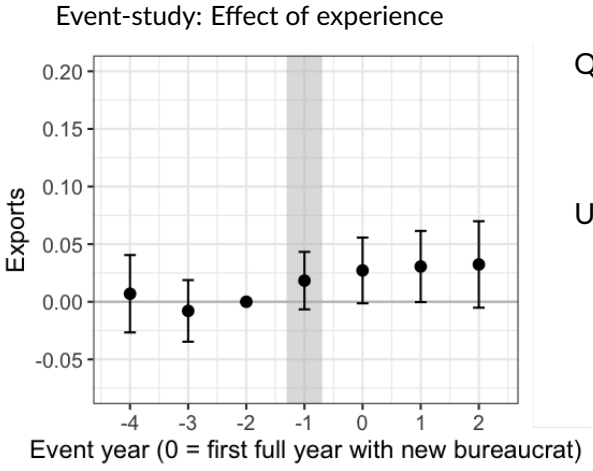
After opening: Exports grow by 38%

Concern: Targeting

- Openings don't target growing markets
- Openings target pre-determined gravity

  Europe: Pre-determined market size predicts roll-out

Finding 3 – Bureaucrat Experience Shapes Their Effect



Quasi-random component of experience:

- Change in import demand during bureaucrat's first appointment

Upon bureaucrat switch :

- Products with increase in experience: Exports increase by 3%
- Experience effects concentrated in products with demand growth

Conclusion: (Industrial) Policy's Effect Depends on Capacity

- Good & bad potential bureaucrats/managers exist everywhere

  Putting the good ones in key positions matters for economic growth

  In tasks with uncertainty: selecting out bad bureaucrats is key

- Exposure to opportunities and problems builds capacity (Hirschmann, 1958)
  - Potential path for building state capacity endogenously
  - Path dependence in
    - State capacity
    - Effect of Industrial Policy

- Central contribution: link state capacity and industrial policy

Thanks!

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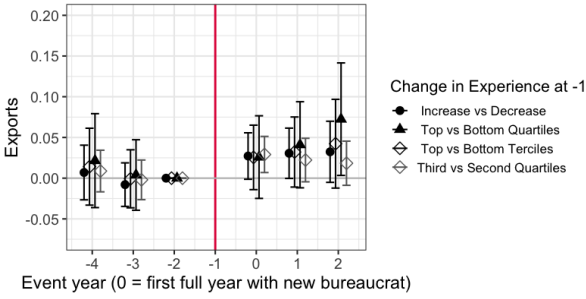
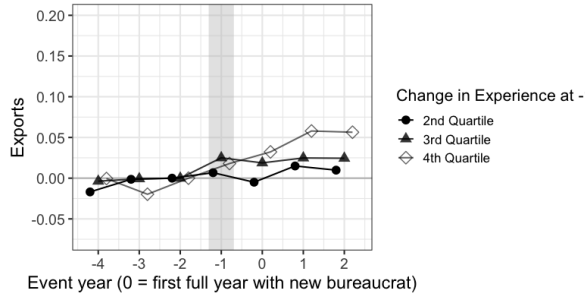
Appendix

Point 3: Alternative Experience Measures: Similar Estimates





▸ Back to Main Experience Measure

Instrument: Experience due to Import Demand Growth

b's 1st country: $C_1(b)$ b's 1st start year: $T_1(b)$

Sources of endogeneity:

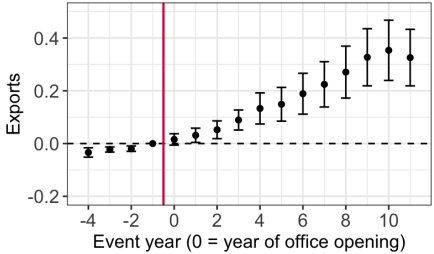
1. $C_1(b)$, $T_1(b)$ endogenous to existing $\text{exports}_{p,C_1(b),T_1(b)-k}$
2. Exports during 1st appointment endogenous to bureaucrat actions

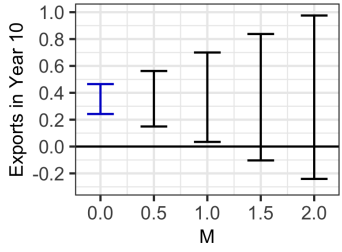
$$\text{instrument}_{b(c,t),pt} = \sum_{k=0}^{2} \widehat{\text{exports}}_{p,b(c,t),C_1(b),T_1(b)+k} - \sum_{k=-3}^{-1} \widehat{\text{exports}}_{p,b(c,t),C_1(b),T_1(b)+k}$$

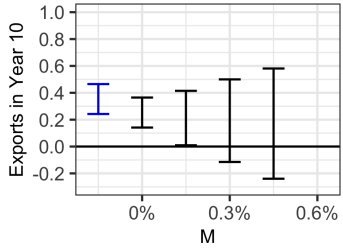
$$\widehat{\text{exports}}_{cpt} = \text{IHS}\left(\text{imports}cpt \frac{\text{exports}_{-c,pt}}{\text{imports}_{-c,pt}}\right)$$

▸ Back to identification idea

Point 1: Effect robust to not-yet-treated control group







- Allow for 1 year anticipation
- Back to identification
- Back to main result

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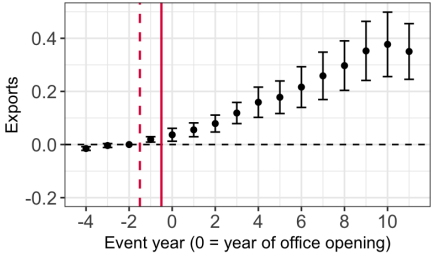
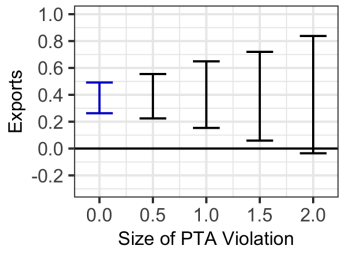
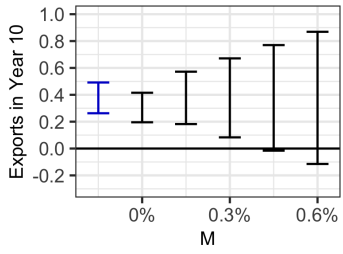
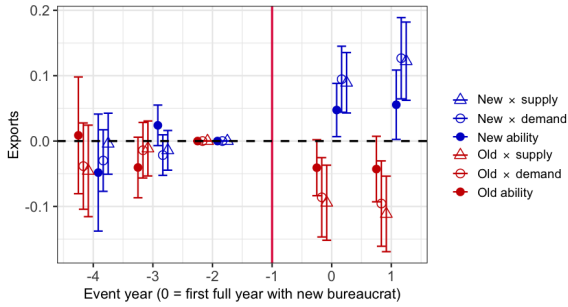






▸ Don't allow for 1 year anticipation ▸ Back to identification ▸ Back to main result

Point 2: Effect of market conditions on exports jumps upon appointment

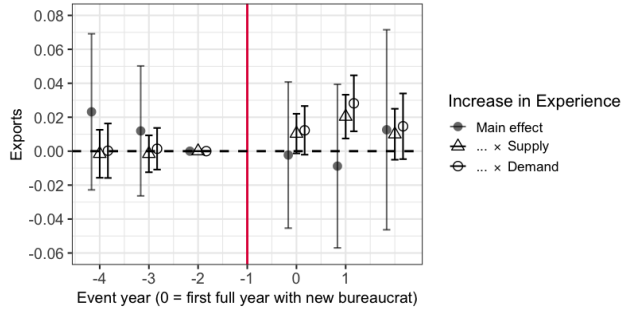


$$y_{ecpt} = \eta_{ep} + \lambda_{pt} + \psi_d^0 \text{demand}_{cpt} + \psi_{d,new}^0 \text{demand}_{cpt} \times \hat{\beta}_e^{new} + \psi_s^0 \text{supply}_{cpt} + \psi_{s,new}^0 \text{supply}_{cpt} \times \hat{\beta}_e^{new} +$$
$$\psi_{d,old}^0 \text{demand}_{cpt} \times \hat{\beta}_e^{old} + \psi_{s,old}^0 \text{supply}_{cpt} \times \hat{\beta}_e^{old} + \sum_{k \neq -2} \Big[\alpha_k + \psi_{dk} \text{demand}_{cpt} + \psi_{sk} \text{supply}_{cpt} +$$
$$\boldsymbol{\theta_k} \ \hat{\beta}_e^{new} + \boldsymbol{\theta_k^{demand}} \ \text{demand}_{cpt} \times \hat{\beta}_e^{new} + \boldsymbol{\theta_k^{supply}} \ \text{supply}_{cpt} \times \hat{\beta}_e^{new} +$$
$$\boldsymbol{\delta_k} \ \hat{\beta}_e^{old} + \boldsymbol{\delta_k^{demand}} \ \text{demand}_{cpt} \times \hat{\beta}_e^{old} + \boldsymbol{\delta_k^{supply}} \ \text{supply}_{cpt} \times \hat{\beta}_{ep}^{old} \Big] \ \mathbf{1}\{t = T + k\} + \epsilon_{ecpt}$$

▸ Mechanism without equation

Point 3: Mechanism: Transmit information about market conditions

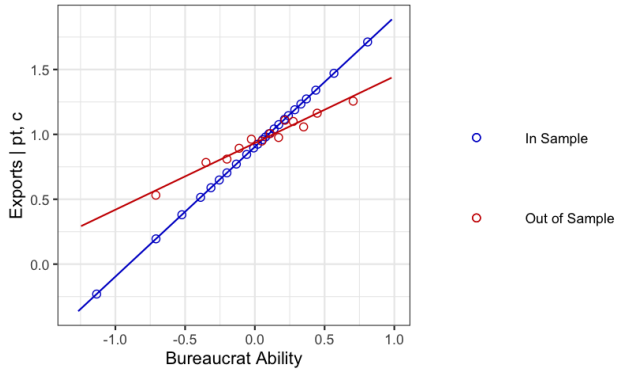
$$\text{exports}_{cpt,b(c,t)} = \eta_{ep} + \lambda_{T(e),pt} + \tau_{et} + \psi_d^0 \text{demand}_{cpt} + \psi_s^0 \text{supply}_{cpt} +$$
$$\psi_{d,\text{increase}}^0 \text{demand}_{cpt} \times \text{increase}_{ep} + \psi_{s,\text{increase}}^0 \text{supply}_{cpt} \times \text{increase}_{ep} +$$
$$\sum_{k \neq -2} \left[\boldsymbol{\theta_k} \text{ increase}_{ep} + \psi_{dk} \text{demand}_{cpt} + \boldsymbol{\theta_k^{demand}} \text{ demand}_{cpt} \times \text{increase}_{ep} + \right.$$
$$\left. \psi_{sk} \text{supply}_{cpt} + \boldsymbol{\theta_k^{supply}} \text{ supply}_{cpt} \times \text{increase}_{ep} \right] \mathbf{1}\{t = T + k\} + \epsilon_{ecpt}$$



▸ Back to main figure

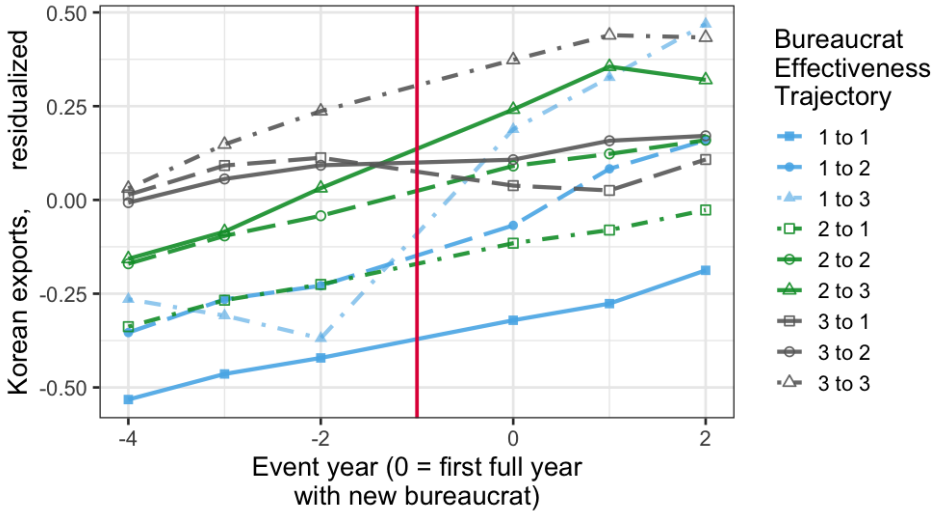
Point 2: Out-of-sample FE predictive of exports

- Out-of-sample FE estimated *only using other countries*
  Bureaucrat with n appointments: Out-of-sample FE estimated on $n - 1$
- TWFE: Out of sample FE has coefficient .52 (similar to Metcalfe et al., 2023)



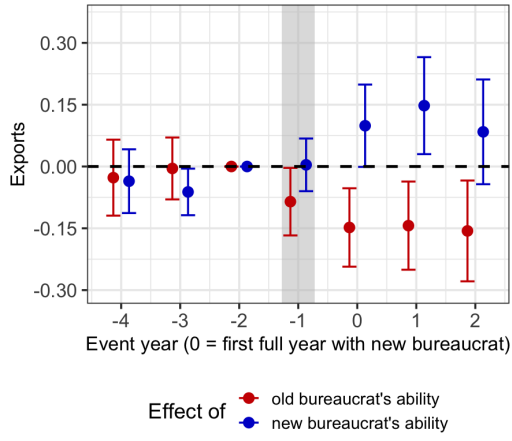
▸ Back to main diagnostics ▸ Out of sample event study

Point 2: Consistent effects from changes in bureaucrat effects



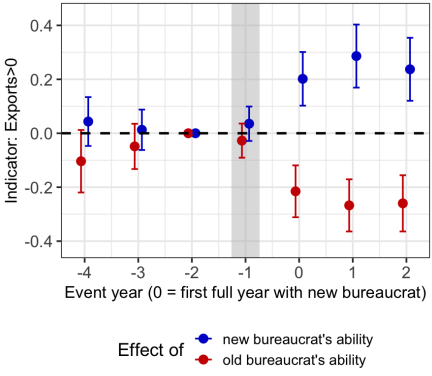
▸ Back to main diagnostics

Point 2: Out-of-sample FE predictive of exports

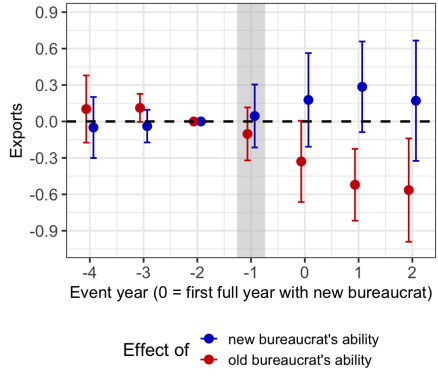


▸ Back to main diagnostics

Bureaucrat effects, extensive and intensive margin



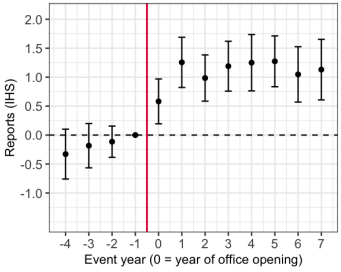
Products with extensive margin changes

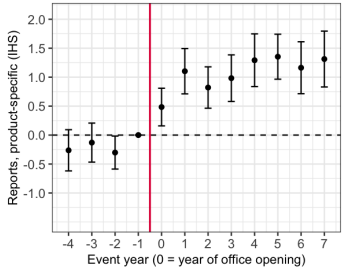


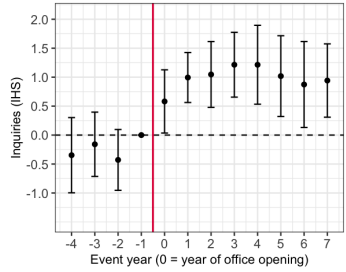
Products with exports>0 throughout

▸ Back to main diagnostics

Point 1: Office openings increase activity almost instantly





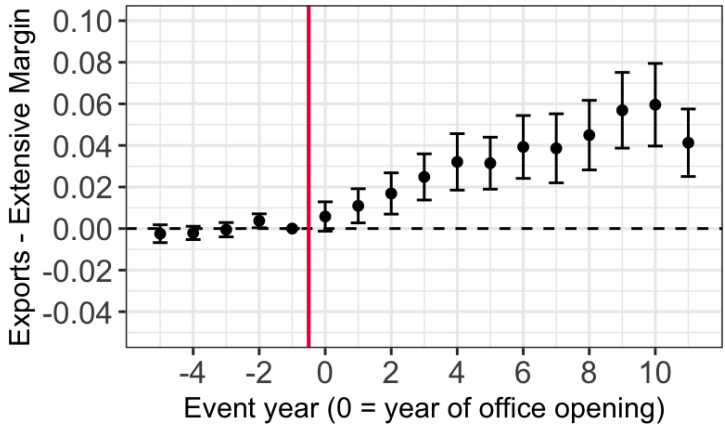


Average office opening: Multiply by 2.7 reports ($8 \rightarrow 21$) and inquiries ($26 \rightarrow 70$)

Data from “Market News”. Reports on weekdays 1965-2001. Inquiries: 1974-1997.

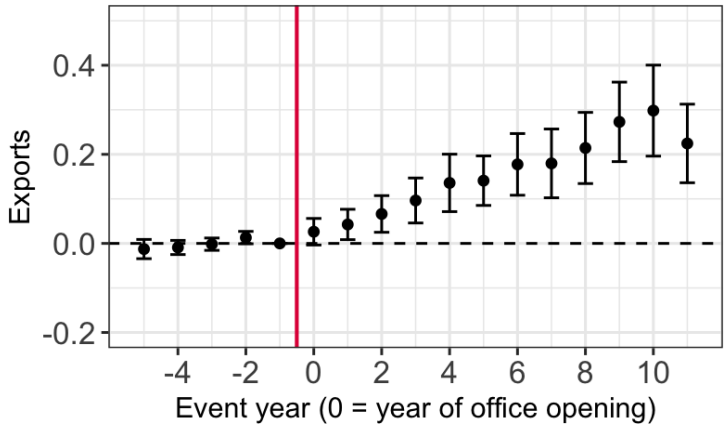
▸ Back to main result office opening

Openings, Extensive Margin: More Products with Positive Exports



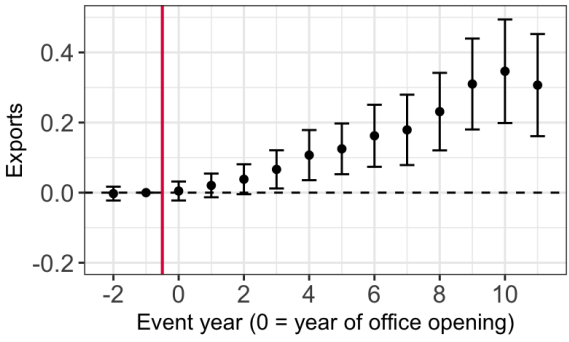
▸ Back to main result

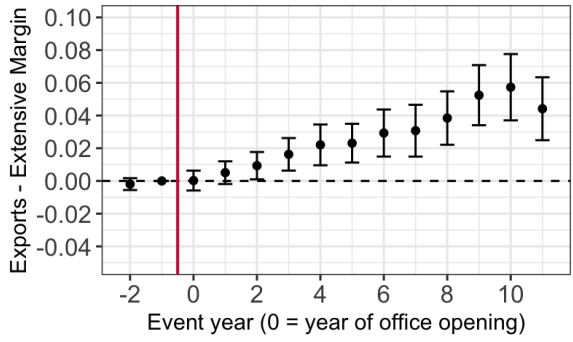
Openings, Control for Non-Korean Imports



▸ Back to main result

Include Openings from 1964





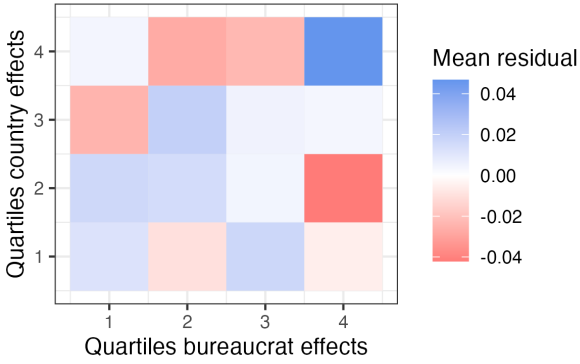
▸ Back to main result

Bureaucrat effects constant across appointments.

	Exports			
	(1)	(2)	(3)	(4)
Share of Variation explained by FE				
Adj. R^2	0.345	0.442	0.460	0.464
R^2	0.355	0.451	0.469	0.473
Year-product FE	Yes	Yes	Yes	Yes
Country FE		Yes	Yes	Yes
Bureaucrat FE			Yes	Yes
Bureaucrat-Country FE				Yes
Observations	1,772,452	1,772,452	1,772,452	1,772,452
Bureaucrats	397	397	397	397
Countries	87	87	87	87

‣ Back to point 2 - main

Checking Implicit Assumption: No Sign of Misspecification



Example of mispecification:

Bureaucrats only have effect in small countries

$\Rightarrow$ Bottom left quadrant: very negative

In each quadrant: mean residuals much smaller than SD(bureaucrats)

‣ Back to main diagnostics

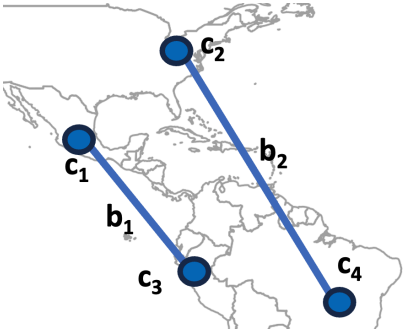
Point 2: bureaucrat FE explain $\approx 1/7$ as much as country FE

$$\text{Var}(y_{cpt}) = \text{Var}(\theta_{b(c,t)}) + \text{Var}(\gamma_c) + 2\text{Cov}(\theta_{b(c,t)}, \gamma_c) + \text{Var}(\epsilon_{cpt})$$

Bureaucrats	Actual data		Placebo
	All	≥ 2 app.	All
	(1)	(2)	(3)
Var(bureaucrat)	0.100	0.056	0.006
Var(country)	0.722	0.695	0.591
Cov(bureaucrat, country)	-0.088	-0.045	-0.005
Var(bureaucrat+country)	0.646	0.659	0.586
Var(exports$\|pt$), spell-level	0.732	0.737	0.737
Var(exports$\|pt$), raw	4.404	4.645	4.360
N (in mio)	1.70	1.22	1.76
Spells	676	480	
Bureaucrats	380	184	389.2
Countries	75	75	78.4

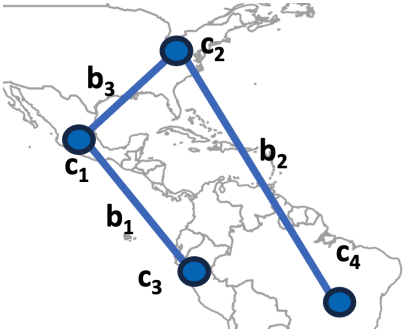
▸ Back to CDF

Identification of $\beta_{b(c,t)}$ & γ_c only within largest connected set



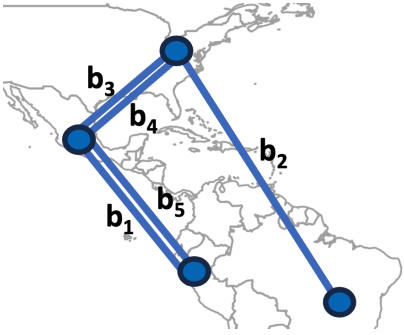
▸ Main Finding ▸ Identification

Identification of $\beta_{b(c,t)}$ & γ_c only within largest connected set



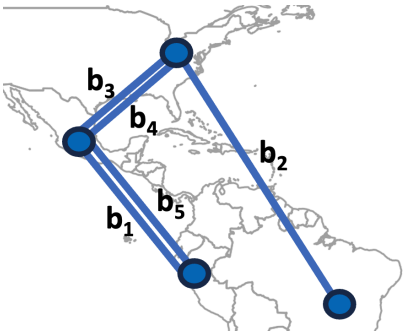
▸ Main Finding ▸ Identification

Identification of $\beta_{b(c,t)}$ & γ_c only within largest connected set



▸ Main Finding ▸ Identification

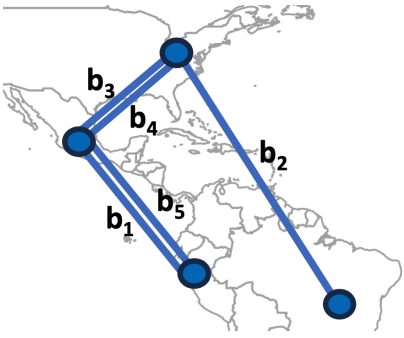
Identification of $\beta_{b(c,t)}$ & γ_c only within largest connected set



	Connected Set	Leave-1-Out
Managers	397	380
Appointments	728	676
Offices	86	75
Offices $>$ 1 manager	82	75

▸ Main Finding ▸ Identification

Identification of $\beta_{b(c,t)}$ & γ_c only within largest connected set



	Connected Set	Leave-1-Out
Managers	397	380
Appointments	728	676
Offices	86	75
Offices $>$ 1 manager	82	75
Offices $>$ 5 managers		61

▸ Main Finding ▸ Identification