Industrial Policy

EC502 Macroeconomics
Topic 4

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2026 Spring

What is Industrial Policy?

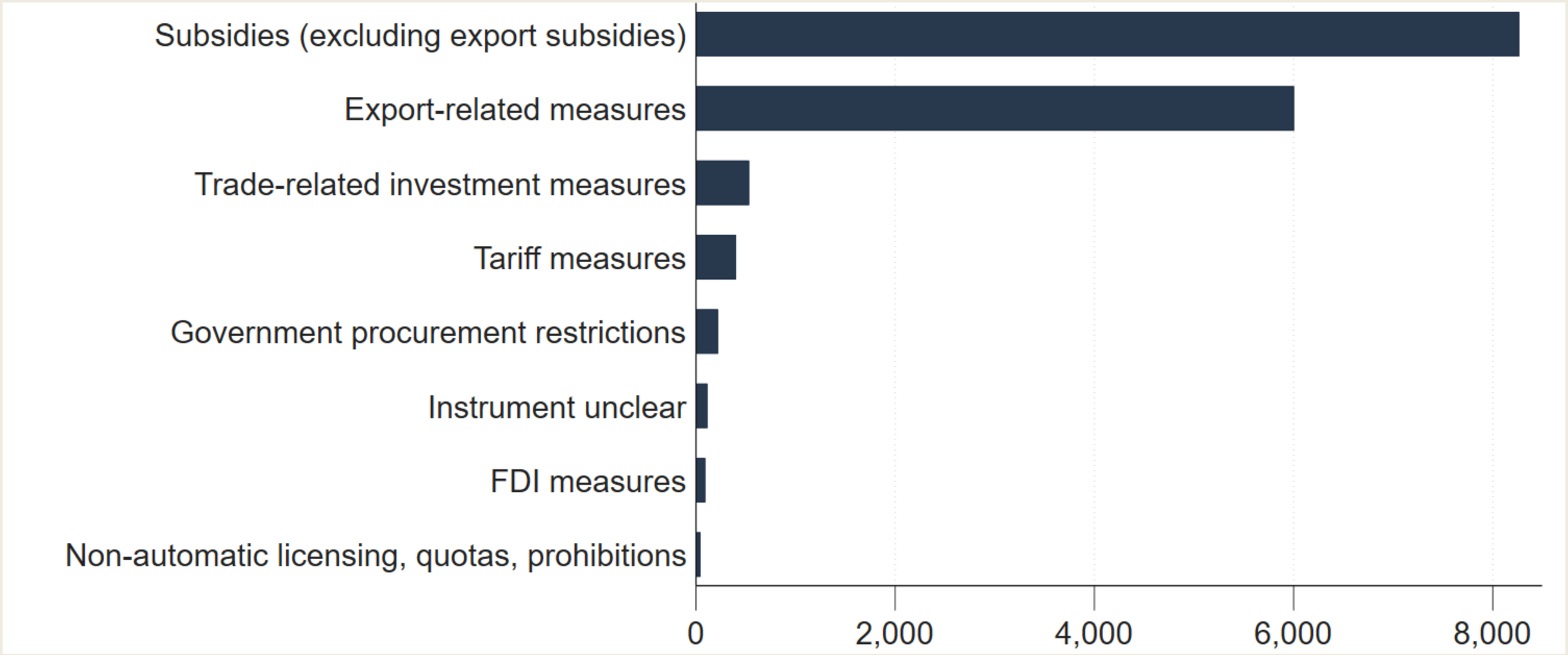
- Industrial policy:
  "targeted intervention to certain economic activity in pursuit of a public goal"
- In a nutshell, "we promote X but not Y"
- Examples:
  - South Korea in the 1970s: Heavy and Chemical Industry (HCI) drive
    - preferential tax and financing and low input tariffs for targeted sectors
  - Japan in the 50s-70s:
    - import controls, export promotion, R&D support for targeted sectors
  - Taiwan after 80s:
    - "Hsinchu Science Park": preferential taxes for targeted sectors (semiconductors)

More Recent Examples

	Policy Description	Targeted Activity	Policy Instrument
1	Brazil increased import tariffs for various IT and telecommunication goods *to stimulate innovation and strengthen the national IT sector.*	IT and telecommunications	Import tariff
2	The Ministry of Industry and Information Technology released a policy [...] *to boost growth in the Chinese battery industry*, particularly for automobiles.	Batteries	State Loan
3	[...] the Ministry of Information Industry (MII) of the People's Republic of China (PRC) issued a Planning Release [...] The release [...] seeks to provide guidance on *maintaining and strengthening the PRC's position in the global ship-building industry.*	Shipbuilding	State Loan
4	The Ecuadorian Executive adopted Decree 675, increasing the percentage of bioethanol in regular fuel [...] *aiming to boost biofuel consumption and production while supporting local agriculture*.	Biofuels, agriculture	Price stabilization
5	The government of Egypt increased for USD 1,000, its flight subsidies for international charter flights [...] [the] *core scope [of this program] was to boost Egyptian tourism overall.*	Tourism	Production subsidy

Source: Juhász, Lane, Oehlsen, Pérez (2026)

TheInstruments of Industrial Policy



Source: Juhász, Lane, Oehlsen, Pérez (2026)

Question

1. What are the economic rationales of industrial policy?

2. Does it work in practice?

1. What are the Economic Rationales of Industrial Policies?

Roadmap

1. Equilibrium without policies
2. Explore the role of policies
3. Explore the role of trade

1.1. Equilibrium without Policies

Environment

- Two periods, $t = 0,1$
- Two sectors: $s = m, a$ (say, manufacturing and agriculture)
- Aggregate consumption (which is also equal to GDP):

$$C_t = (c_{mt})^{\gamma}(c_{at})^{1-\gamma}$$

- A firm produces each good with

$$y_{mt} = A_{mt} \times l_{mt}, \qquad y_{at} = A_{at} \times l_{at}$$

- $\{A_{m0}, A_{a0}\}$ are exogenous, but $\{A_{m1}, A_{a1}\}$ are given by

$$A_{m1} = A_{m0} + \beta_m L_{m0}, \quad A_{a1} = A_{a0} + \beta_a L_{a0}, \quad \text{where} \quad \beta_a, \beta_m \geq 0$$

  - L_m, L_a: sector-level employment (i.e., $L_m = \sum_{i=1}^{N} l_{mi}$, $L_a = \sum_{i=1}^{N} l_{ai}$ with N large)
  - The more people work in a sector, the more ideas they create

Household Optimization

- Given prices (p_{at}, p_{mt}), households choose how much to consume each good:

$$\max_{c_{mt}, c_{at}} (c_{mt})^{\gamma}(c_{at})^{1-\gamma}$$

$$\text{s.t.} \quad p_{at}c_{at} + p_{mt}c_{mt} = w_t$$

- The Lagrangian is

$$\mathscr{L} = (c_{mt})^{\gamma}(c_{at})^{1-\gamma} + \lambda[w_t - p_{at}c_{at} - p_{mt}c_{mt}]$$

  - FOCs:

$$\gamma(c_{mt})^{\gamma-1}(c_{at})^{1-\gamma} = p_m\lambda_t, \quad (1-\gamma)(c_{mt})^{\gamma}(c_{at})^{-\gamma} = p_{at}\lambda_t$$

- Eliminating Lagrangian multipliers,

$$\frac{p_{mt}c_{mt}}{p_{at}c_{at}} = \frac{\gamma}{1-\gamma}$$

Firm's Optimization

- Each firm maximizes its profit:

$$\max_{l_{mt}} \; p_{mt} A_{mt} \times l_{mt} - w_t l_{mt}$$

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- Solution:

$$l_{mt} \begin{cases} = \infty & \text{if} \quad p_{mt}A_{mt} > w_t \\ \in [0,\infty] & \text{if} \quad p_{mt}A_{mt} = w_t \\ = 0 & \text{if} \quad p_{mt}A_{mt} < w_t \end{cases}$$

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- We cannot have $l_{mt} = \infty$ or $l_{mt} = 0$ (supply never equals demand)

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- We cannot have $l_{mt} = \infty$ or $l_{mt} = 0$ (supply never equals demand)
- Therefore, $p_{mt}A_{mt} = w_t$
- Likewise, we have $p_{at}A_{at} = w_t$

Equilibrium

- Equilibrium: $\{c_{mt}, c_{at}, L_{at}, L_{mt}, p_{at}, p_{mt}, w_t\}_{t=0,1}$ and $\{A_{m1}, A_{a1}\}$ such that

1. Household demand:

$$\frac{p_{mt}c_{mt}}{p_{at}c_{at}} = \frac{\gamma}{1-\gamma}$$

2. Supply:

$$p_{mt}A_{mt} = w_t, \quad p_{at}A_{at} = w_t$$

3. Market clears (supply equals demand):

$$A_{mt}L_{mt} = c_{mt}L_t, \quad A_{at}L_{at} = c_{at}L_t$$

$$L_m + L_a = L$$

4. Technology

$$A_{m1} = A_{m0} + \beta_m L_{m0}, \quad A_{a1} = A_{a0} + \beta_a L_{a0}$$

Equilibrium Outcomes

- Combining 1-3, we have

$$L_{mt} = \gamma L_t, \quad L_{at} = (1-\gamma)L_t$$

- We can recover GDP in each period from

$$Y_t = (A_{mt}L_{mt})^{\gamma}(A_{at}L_{at})^{1-\gamma}$$

with

$$L_{at} = L_t - L_{mt}$$

$$A_{m1} = A_{m0} + \beta_m L_{m0}, \quad A_{a1} = A_{a0} + \beta_a L_{a0}$$

1.2. The Role of Policies

Policy Impact Today on Current GDP

- Suppose the government can control (L_{m0}, L_{a0}) through policies
- How do they affect GDP today and in the future?
- Today's GDP (after substituting $L_{a0} = L_0 - L_{m0}$):

$$Y_0 = (A_{m0}L_{m0})^{\gamma}(A_{a0}(L_0 - L_{m0}))^{1-\gamma}$$

- The effect of increasing manufacturing employment is

$$\frac{dY_0}{dL_{m0}} = \gamma(A_{m0}L_{m0})^{\gamma-1}(A_{a0}(L_0 - L_{m0}))^{1-\gamma}A_{m0} - (1-\gamma)(A_{m0}L_{m0})^{\gamma}(A_{a0}(L_0 - L_{m0}))^{-\gamma}A_{a0}$$

$$= Y_0\left[\frac{\gamma}{L_{m0}} - \frac{1-\gamma}{L_0 - L_{m0}}\right]$$

- Recall in eqm, $L_{m0} = \gamma L_0$, so the gov. cannot increase today's GDP

Policy Impact Today on Future GDP

- What about future GDP?
- GDP at $t = 1$ (after imposing $L_{m1} = \gamma L_1$ and $L_{a1} = (1-\gamma)L_1$)

$$Y_1 = \Big(\gamma\left[A_{m0} + \beta_m L_{m0}\right]\Big)^{\gamma}\Big((1-\gamma)\left[A_{a0} + \beta_a(L_0 - L_{m0})\right]\Big)^{1-\gamma} L_1$$

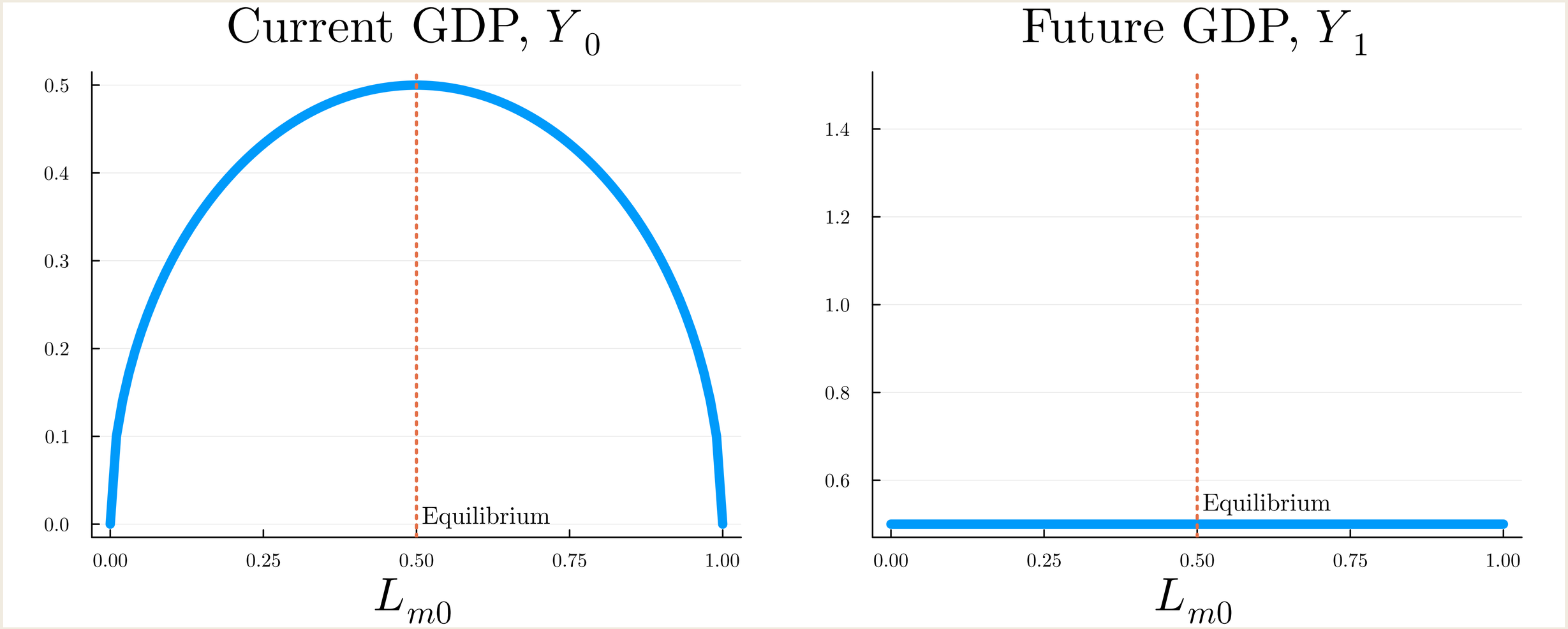
- The effect of increasing manufacturing employment at $t = 0$ is

$$\frac{dY_1}{dL_{m0}} = Y_1\left[\frac{\gamma\beta_m}{A_{m0} + \beta_m L_{m0}} - \frac{(1-\gamma)\beta_a}{A_{a0} + \beta_a(L_0 - L_{m0})}\right]$$

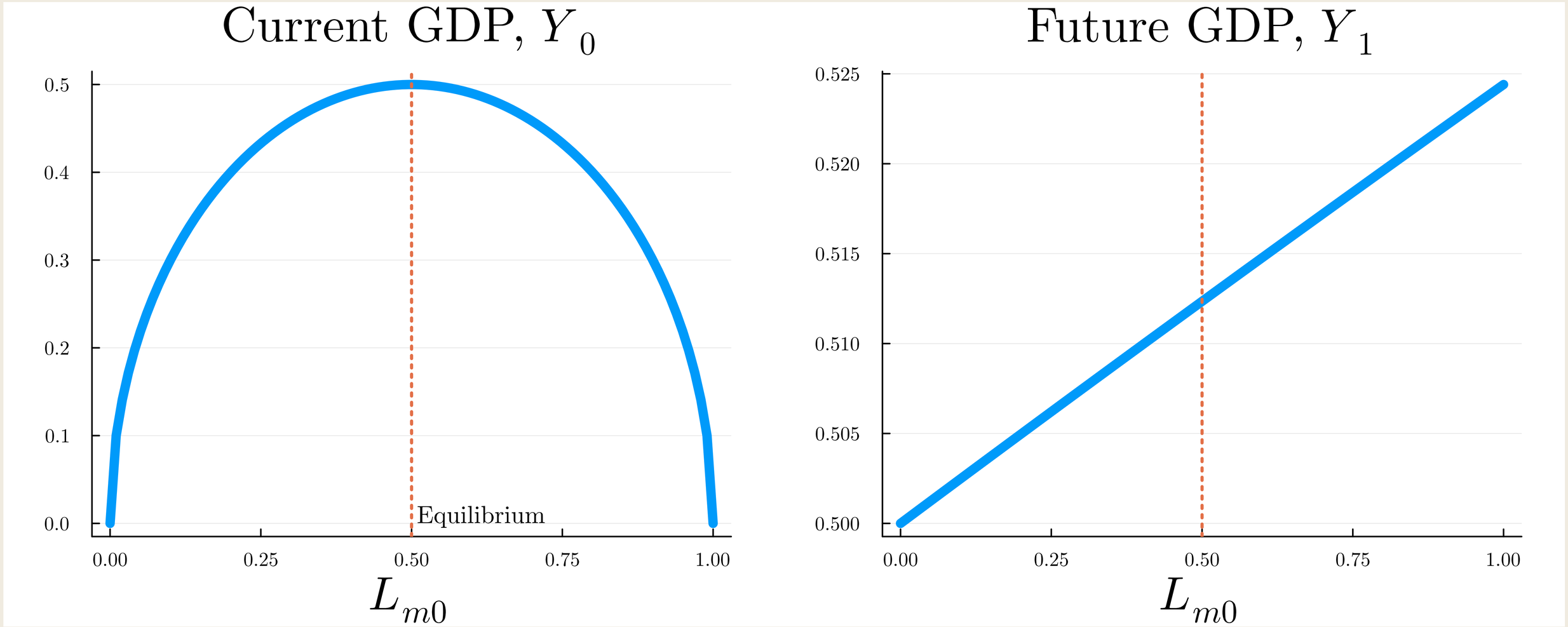
- Since $L_{m0} = \gamma L_0$, the gov. can increase future GDP by increasing L_{m0} if

$$\frac{\gamma\beta_m}{A_{m0} + \beta_m\gamma L_0} - \frac{(1-\gamma)\beta_a}{A_{a0} + \beta_a(1-\gamma)L_0} > 0$$

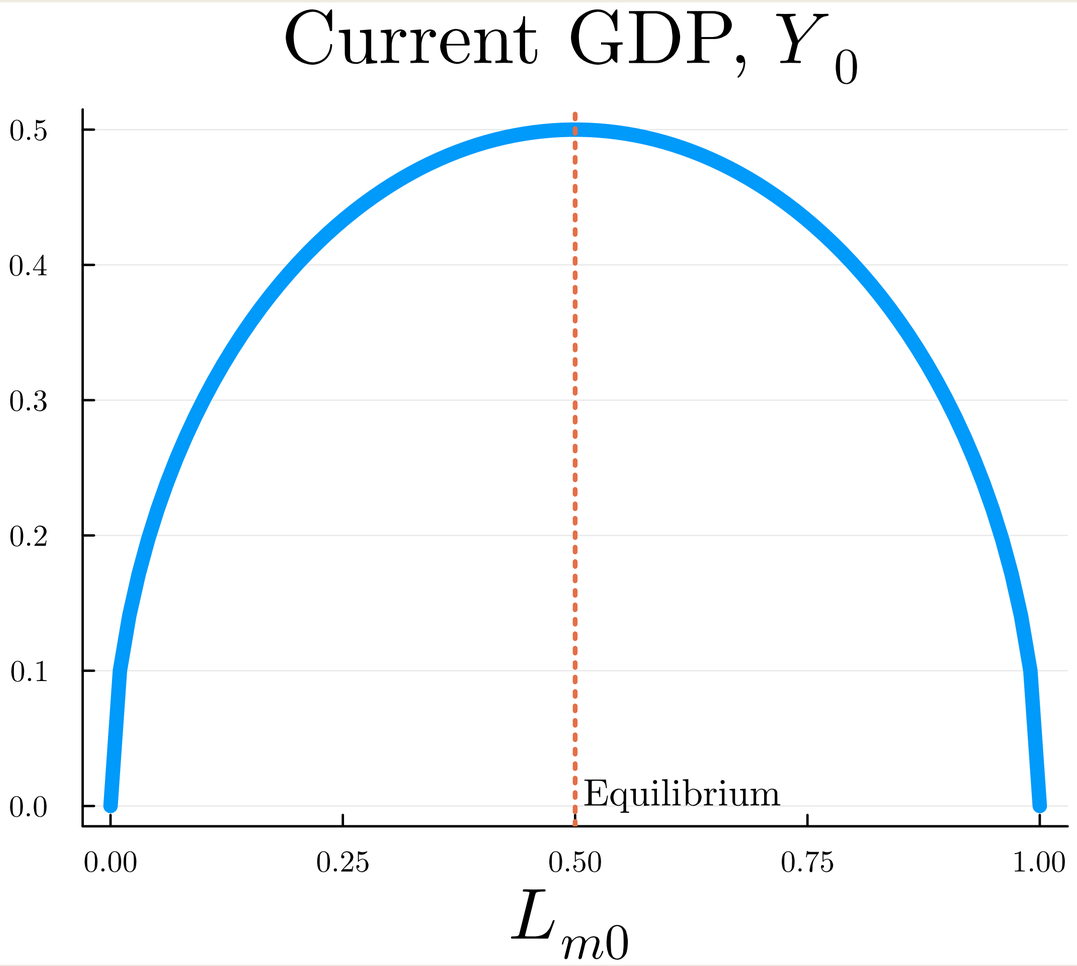
$\beta_m = \beta_a = 0$

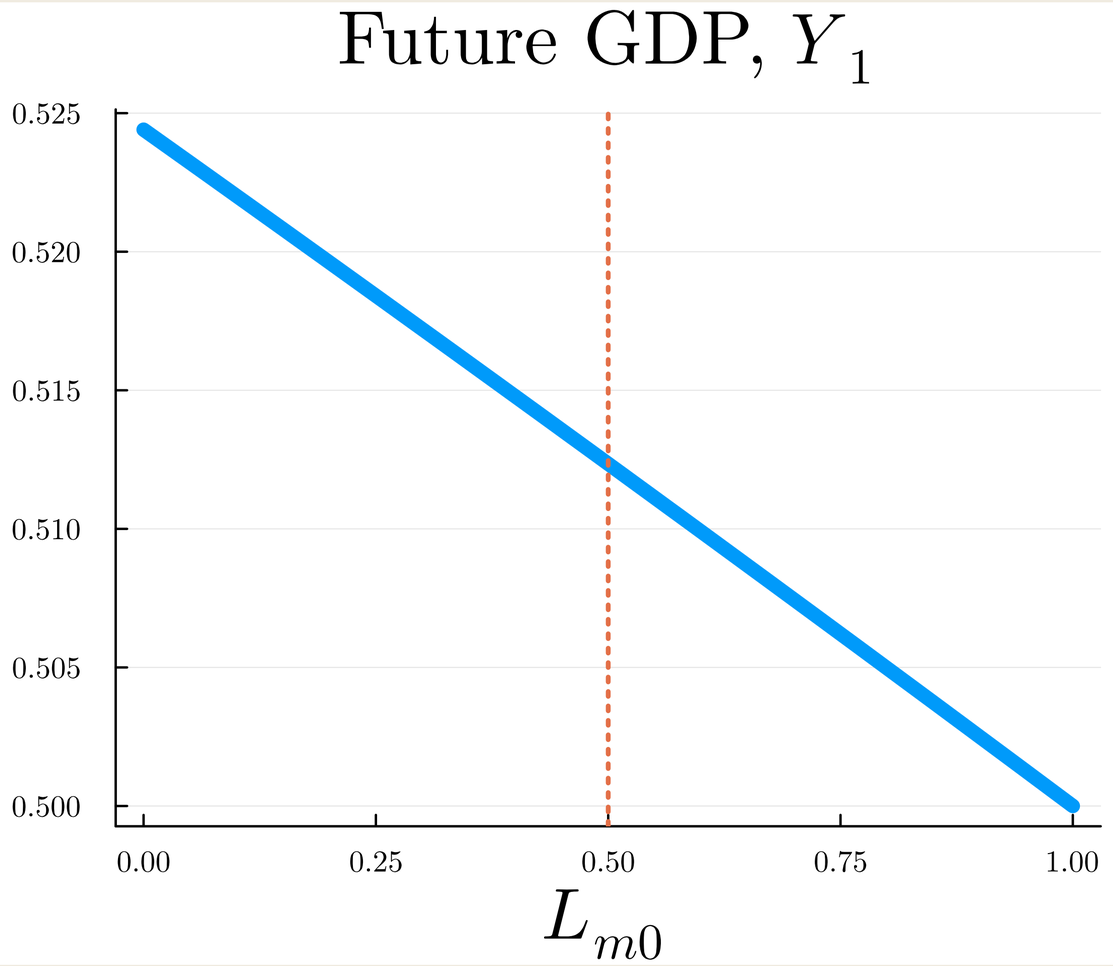


$\beta_m > \beta_a = 0$



$\beta_a > \beta_m = 0$





1.3. Is Protectionism Good?

Opening Up to Trade

- Now suppose a country can trade with foreign countries
- Assume that the trade takes place at exogenous world prices of $(\bar{p}_m, \bar{p}_a)$
- Households can buy goods at price $(\bar{p}_m, \bar{p}_a)$ and they solve

$$\max_{c_{mt}, c_{at}} (c_{mt})^{\gamma} (c_{at})^{1-\gamma}$$

$$\text{s.t.} \quad \bar{p}_{at} c_{at} + \bar{p}_{mt} c_{mt} = w_t$$

- This results in the similar condition as before:

$$\frac{\bar{p}_{mt} c_{mt}}{\bar{p}_{at} c_{at}} = \frac{\gamma}{1-\gamma}$$

Firm's Problem with Trade

- A firm in manufacturing solves

$$\max_{l_{mt}} \ \bar{p}_{mt} A_{mt} \times l_{mt} - w_t l_{mt}$$

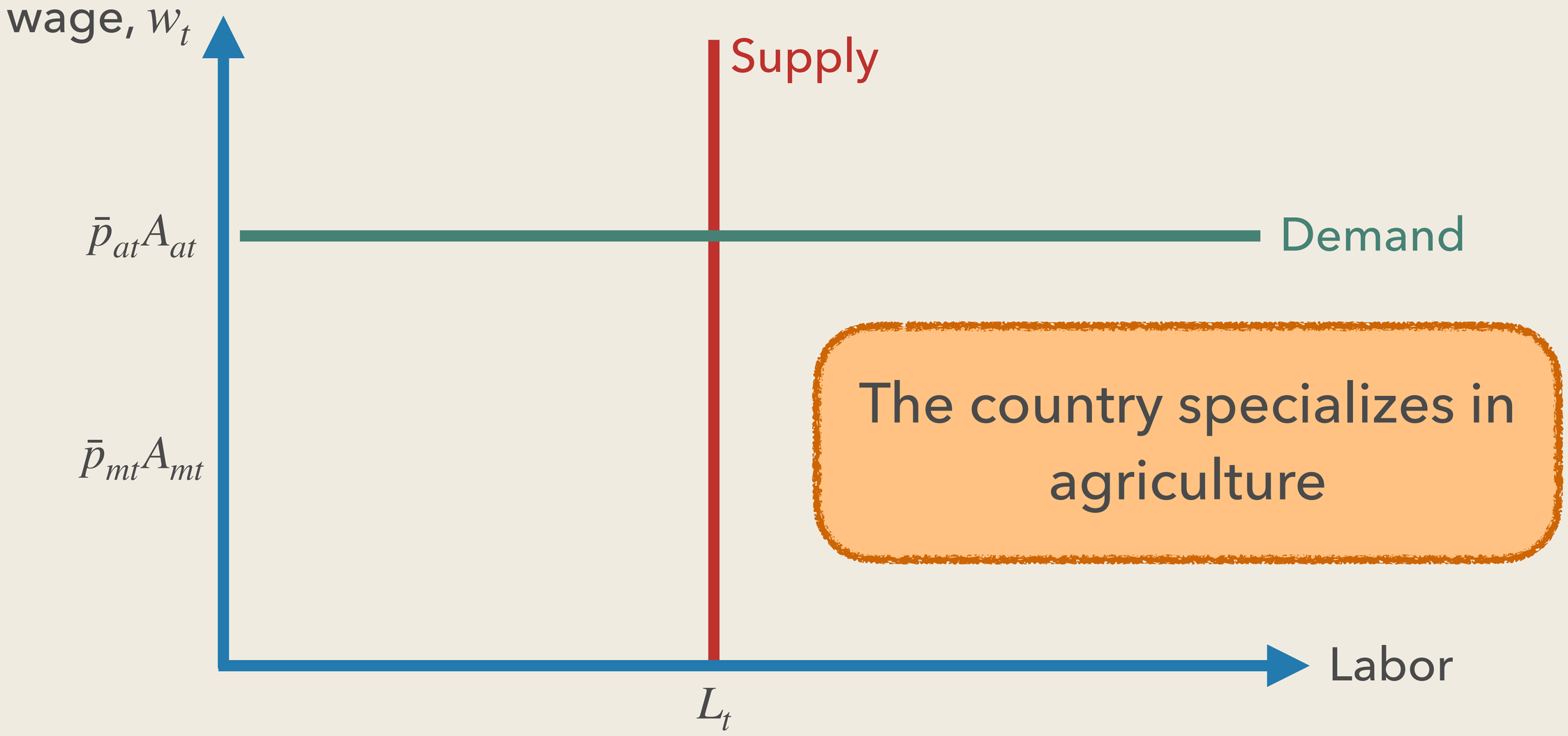
- The solution is

$$l_{mt} \begin{cases} = \infty & \text{if} \quad \bar{p}_{mt} A_{mt} > w_t \\ \in [0, \infty] & \text{if} \quad \bar{p}_{mt} A_{mt} = w_t \\ = 0 & \text{if} \quad \bar{p}_{mt} A_{mt} < w_t \end{cases}$$

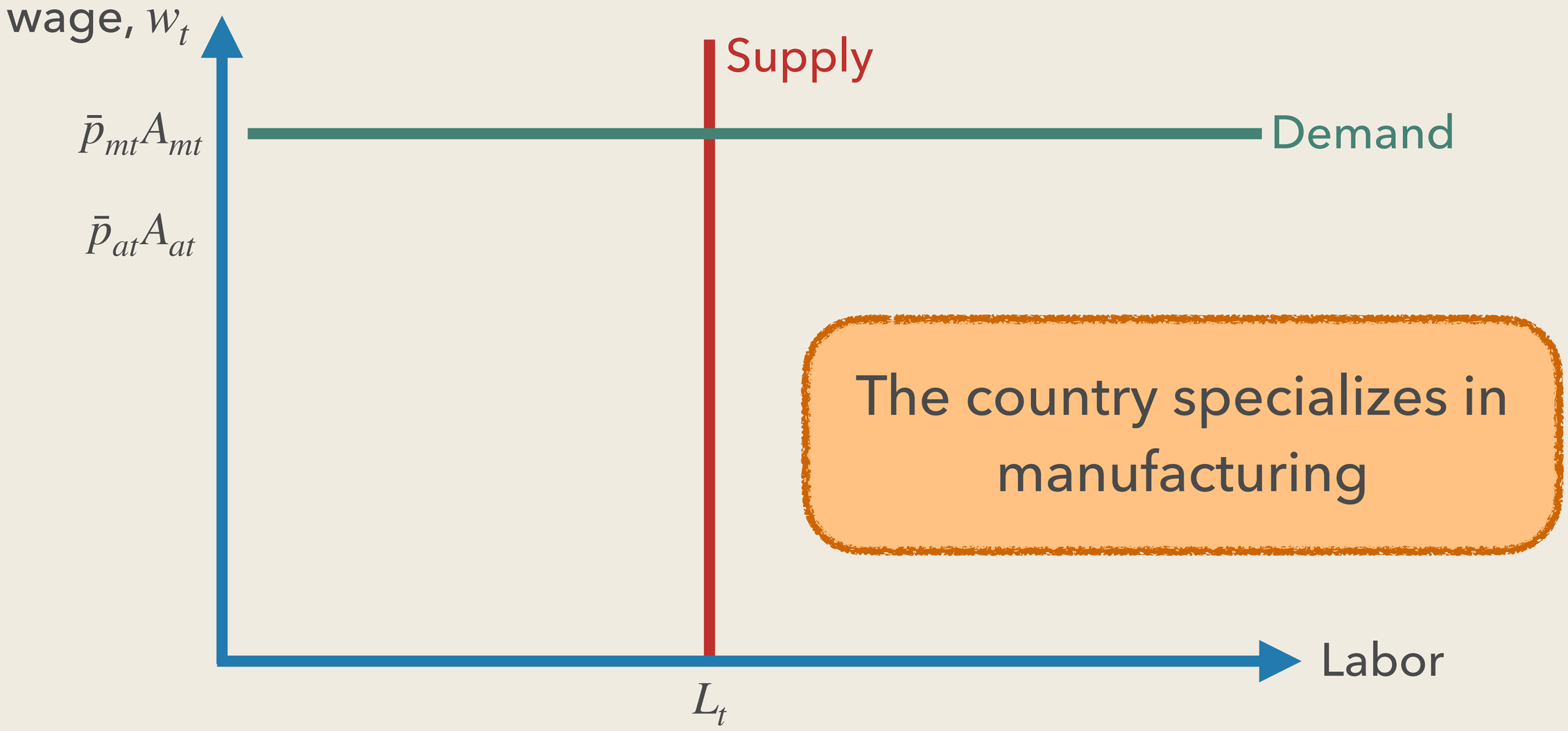
- Likewise,

$$l_{at} \begin{cases} = \infty & \text{if} \quad \bar{p}_{at} A_{at} > w_t \\ \in [0, \infty] & \text{if} \quad \bar{p}_{at} A_{at} = w_t \\ = 0 & \text{if} \quad \bar{p}_{at} A_{at} < w_t \end{cases}$$

Case with $\bar{p}_{at}A_{at} > \bar{p}_{mt}A_{mt}$



Case with $\bar{p}_{at}A_{at} < \bar{p}_{mt}A_{mt}$



Specialize in Agriculture Forever

- Let us consider a case with a country specializing in agriculture at $t = 0$:

$$L_{m0} = 0, \quad L_{a0} = L_0$$

  which holds as long as $\bar{p}_{m0} A_{m0} < \bar{p}_{a0} A_{a0}$

- In the next period,

$$A_{m1} = A_{m0}, \quad A_{a1} = A_{a0} + \beta_a L_0$$

- The country ends up specializing in agriculture again as long as

$$\bar{p}_{m1} A_{m1} < \bar{p}_{a1} A_{a1}$$

  so that

$$L_{m1} = 0, \quad L_{a1} = L_1$$

Temporary Trade Protection

- Can a country do better by shutting down trade at $t = 0$?
- Suppose the country shuts down at $t = 0$,

$$L_{m0} = \gamma L_0, \quad L_{a0} = (1 - \gamma) L_0$$

- Then at $t = 1$,

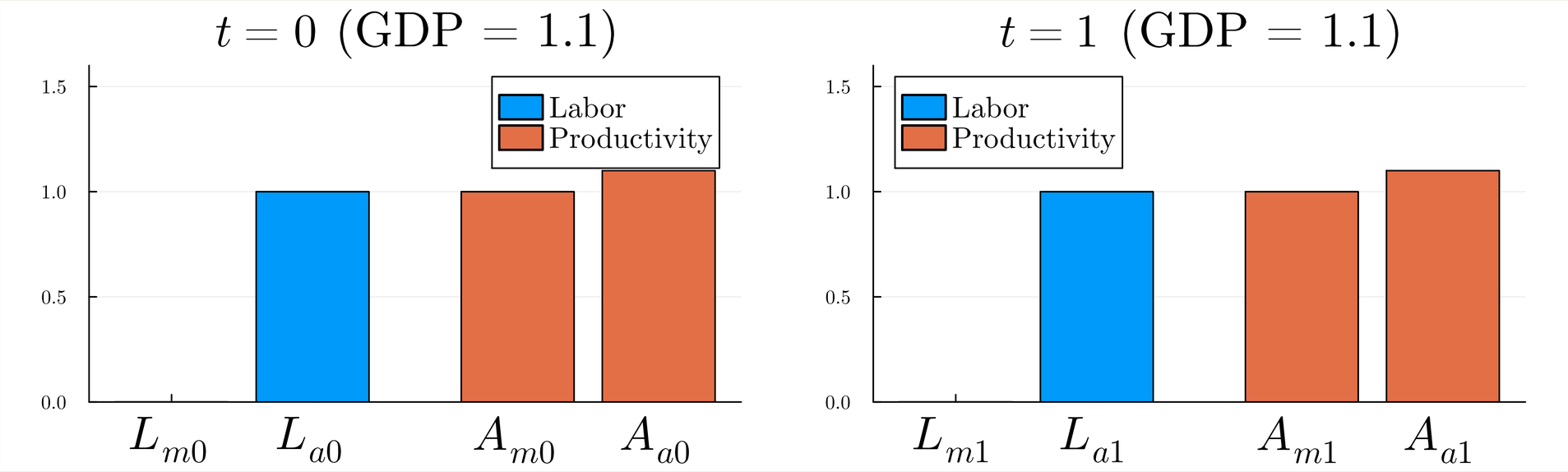
$$A_{m1} = A_{m0} + \beta_m \gamma L_0, \quad A_{a1} = A_{a0} + \beta_a (1 - \gamma) L_0$$

- If $\bar{p}_{m1} A_{m1} > \bar{p}_{a1} A_{a1}$, a country can now specialize in manufacturing!

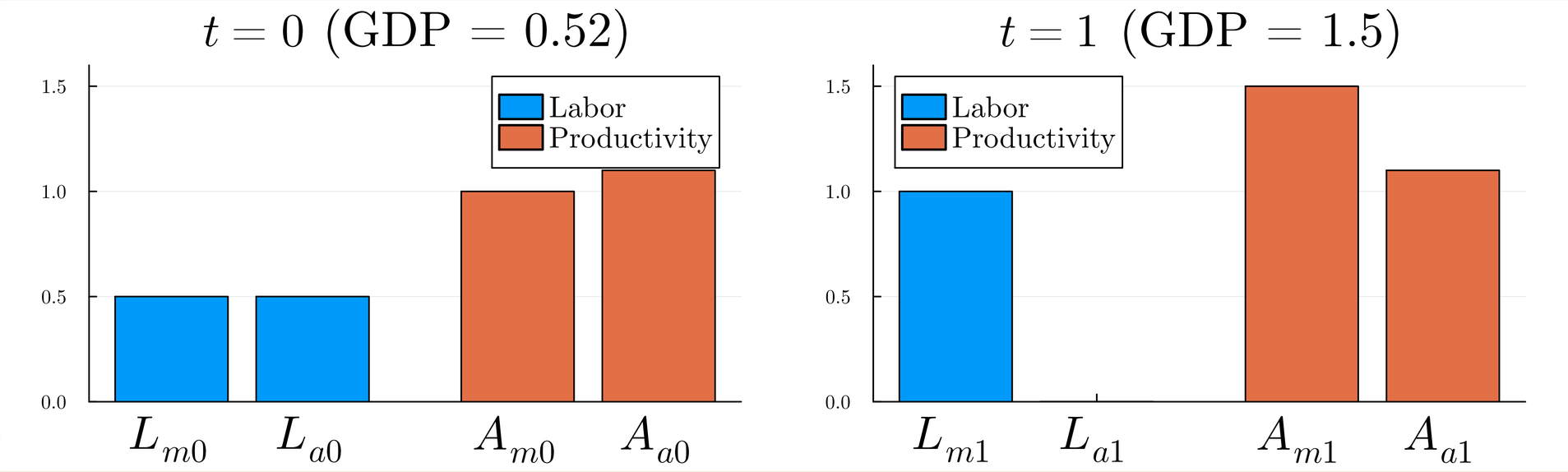
$$L_{m1} = L_1, \quad L_{a1} = 0$$

- Does this achieve a higher GDP at $t = 1$? Yes if $\beta_m \gg \beta_a$!
- This is called “infant industry mechanism”

Open to trade at $t = 0$



Open to trade at $t = 1$



Critiques

- The theoretical case for industrial policy is strong
- In practice, however, the effectiveness of industrial policy has been controversial
- Two issues:
  1. How does the government know (β_a, β_m)?
     - The success relies on targeting sectors with relatively higher β
  2. How can we make sure the government maximizes social welfare?
     - Targeting opens the door for self-interested lobbying and the political capture

2.1. Does Industrial Policy Work in Practice? Case of the Napoleonic Blockade – Juhász (2018)

Roadmap

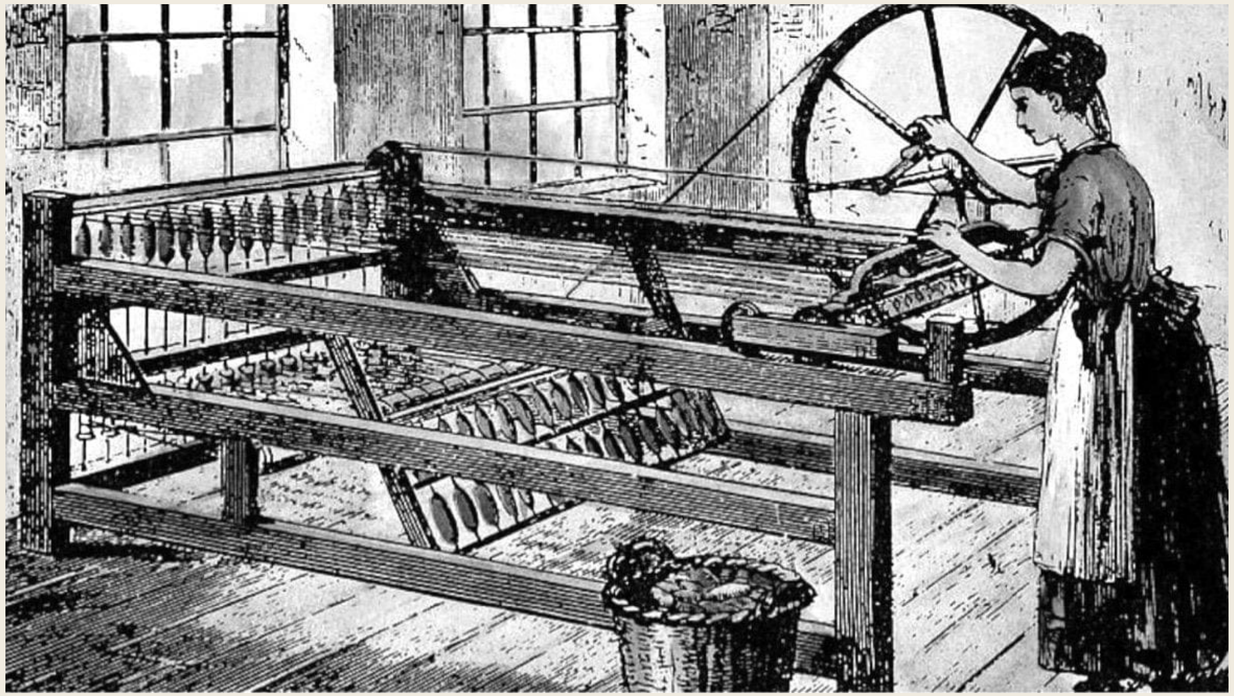
1. The Napoleon Blockade (France, 1803-1815)
2. South Korea’s HCI Drive (1972-1979)
3. Public R&D spending in the US
    1. World War II (1940-1945)
    2. Cold War (1960s)

Background on Industrial Revolution

- The Industrial Revolution (1760-1850) began in England
- The textile industry is one of the most impacted
- The invention of the Spinning Jenny moved the industry from home to factories
- The real price of yarn in Britain declined tenfold from 1785 to 1795
- France was lagging behind Britain
  - In 1790, France had 900 spinning jennies, while Britain had 18,000
- France lacked know-how, and the British competition prevented active adoption

Industrial Revolution

https://nazmiyalantiquerugs.com/blog/hand-spun-vs-machine-spun-wool-why-texture-tells-the-truth/



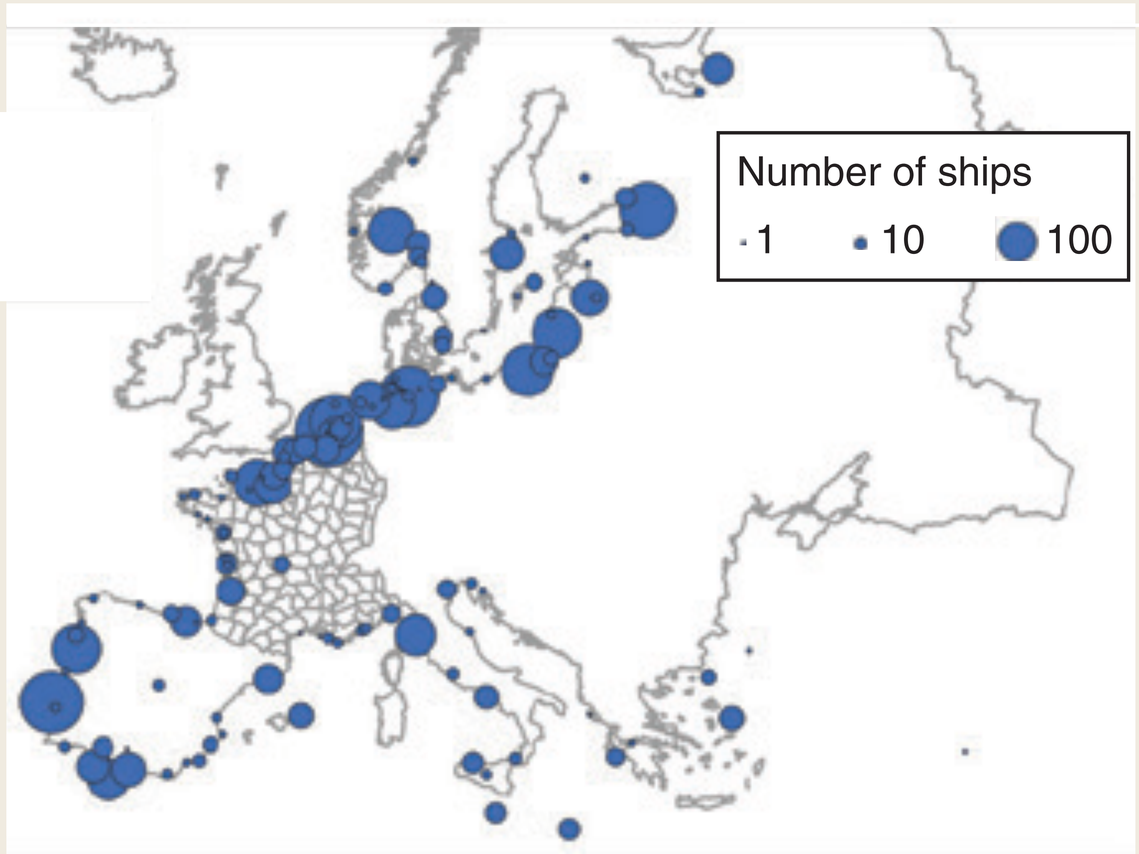
https://www.faribaultmill.com/pages/spinning-jenny

Napoleonic Blockade (1803-1815)

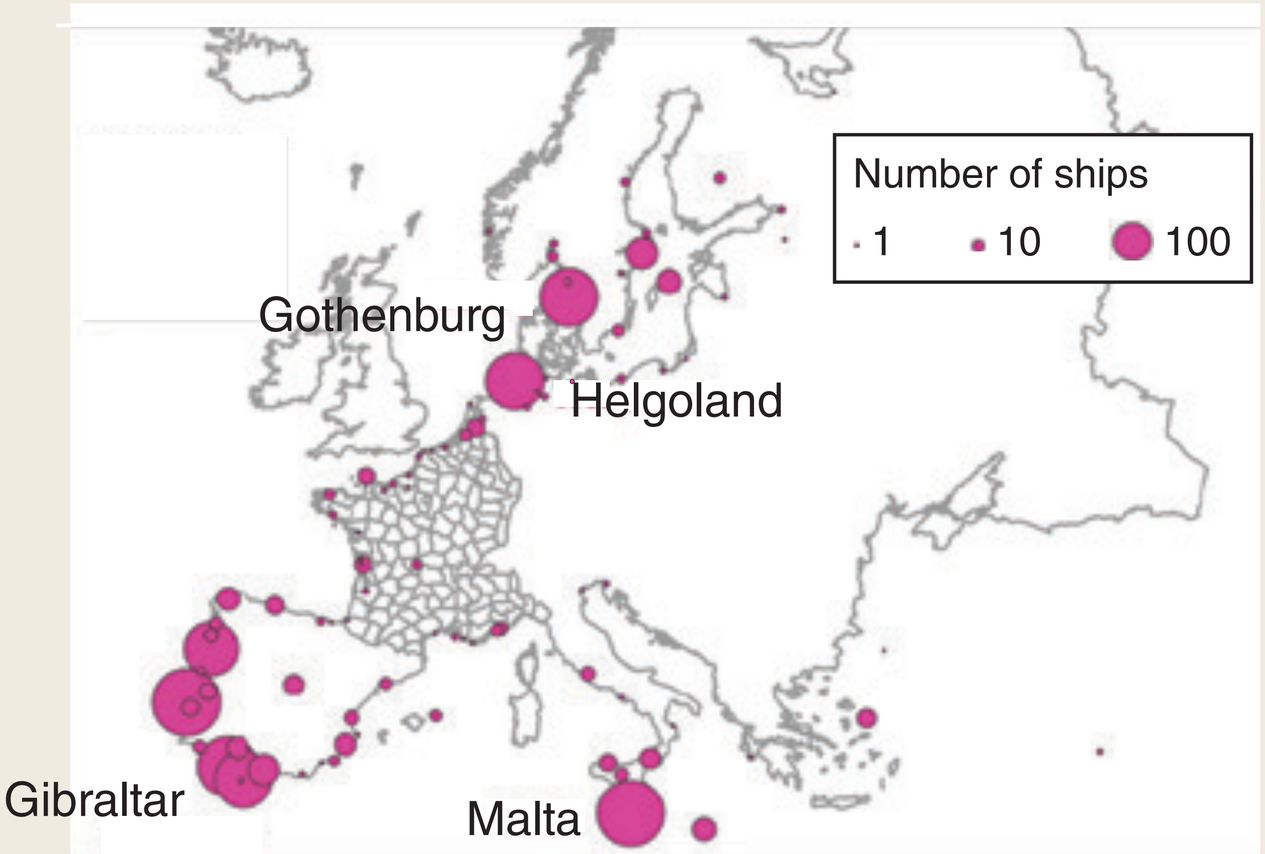
- During the Napoleonic Wars, in 1806, Napoleon implemented a blockade of Britain
  - In an attempt to stop British goods from entering Continental Europe
  - Ports were closed to ships carrying British goods
  - The military was active in patrolling the coastline
- However, the degree of enforcement differed across the continent
  - Near perfect enforcement in the territory of French empire
  - Northern Europe was under Napoleon's control, so well enforced
  - Southern Europe wasn't, so couldn't stop the inflow of British goods

Number of Ships Traveling to/from Britain

Panel A. 1802 (pre-blockade)

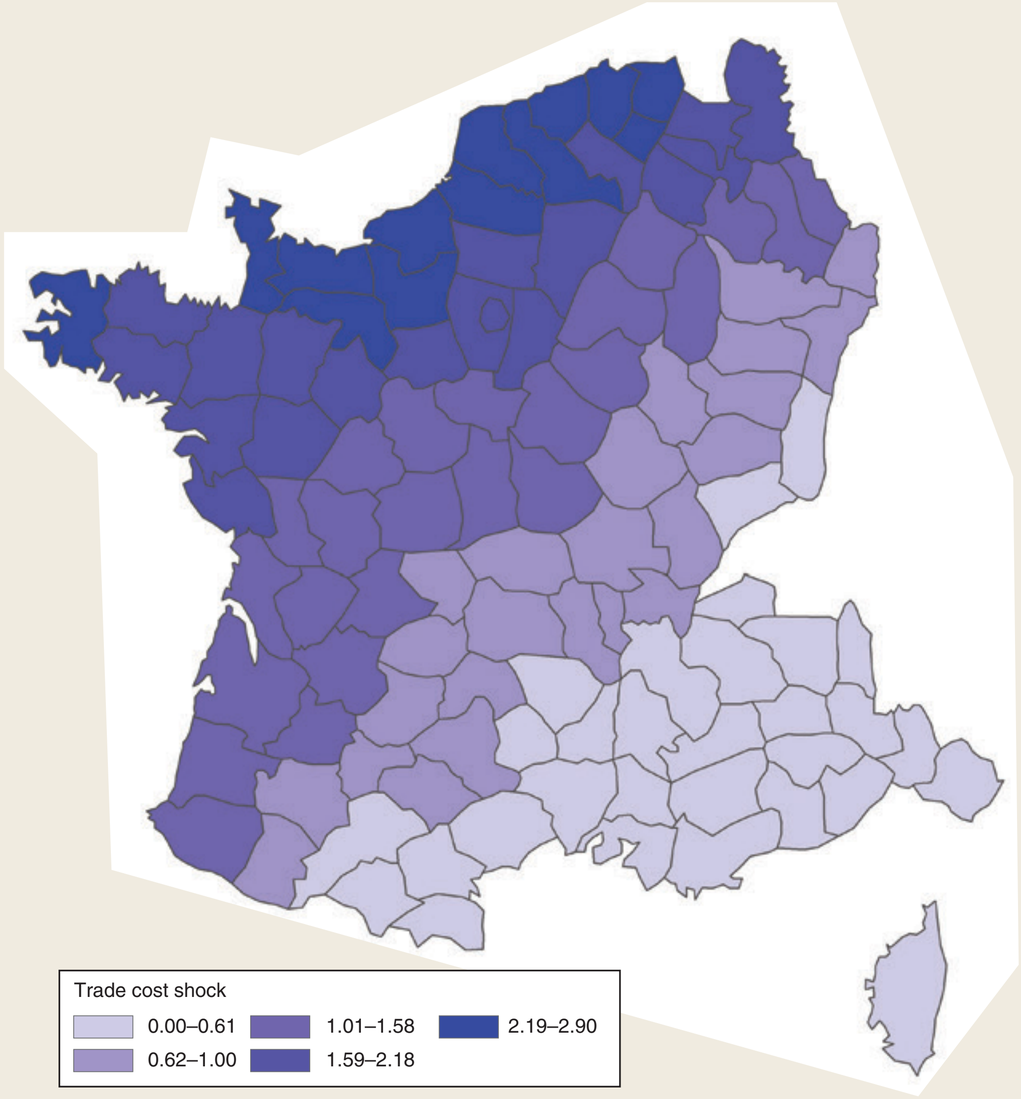


Panel B. 1809 (blockade)



Trade Cost Shock

- Define *trade cost shock* as log-changes in the shortest route to London
- Northern France experienced a larger shock
- Southern France not much

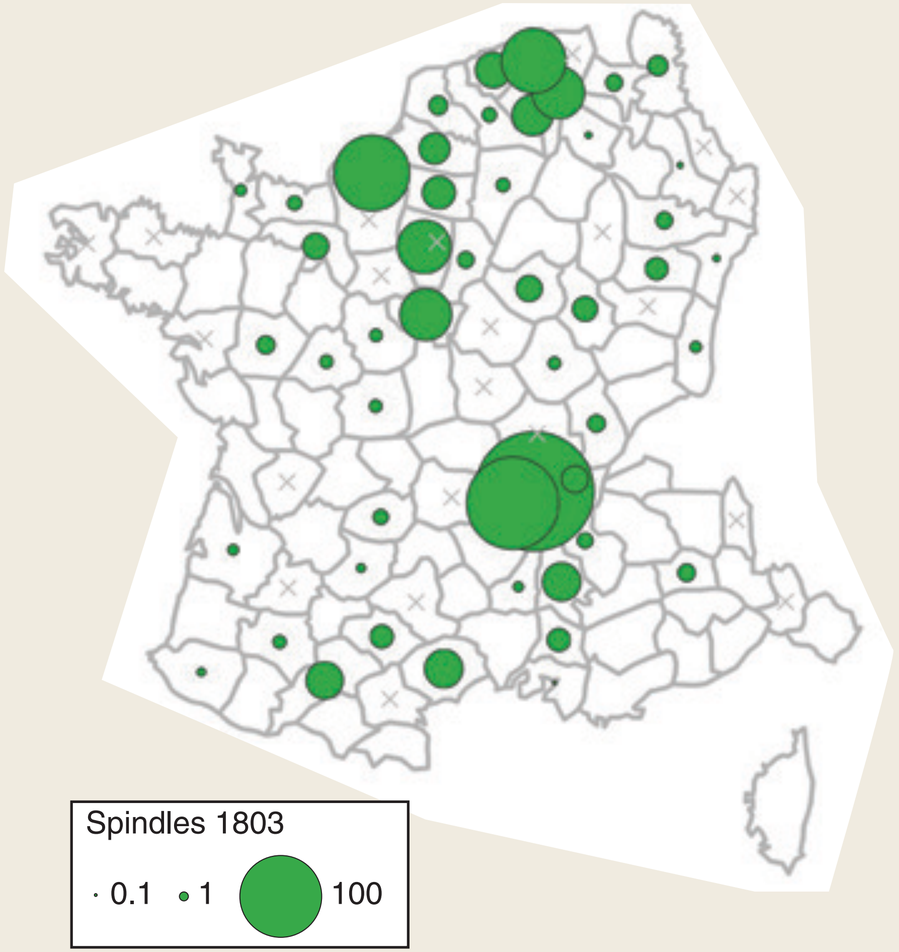


Questions

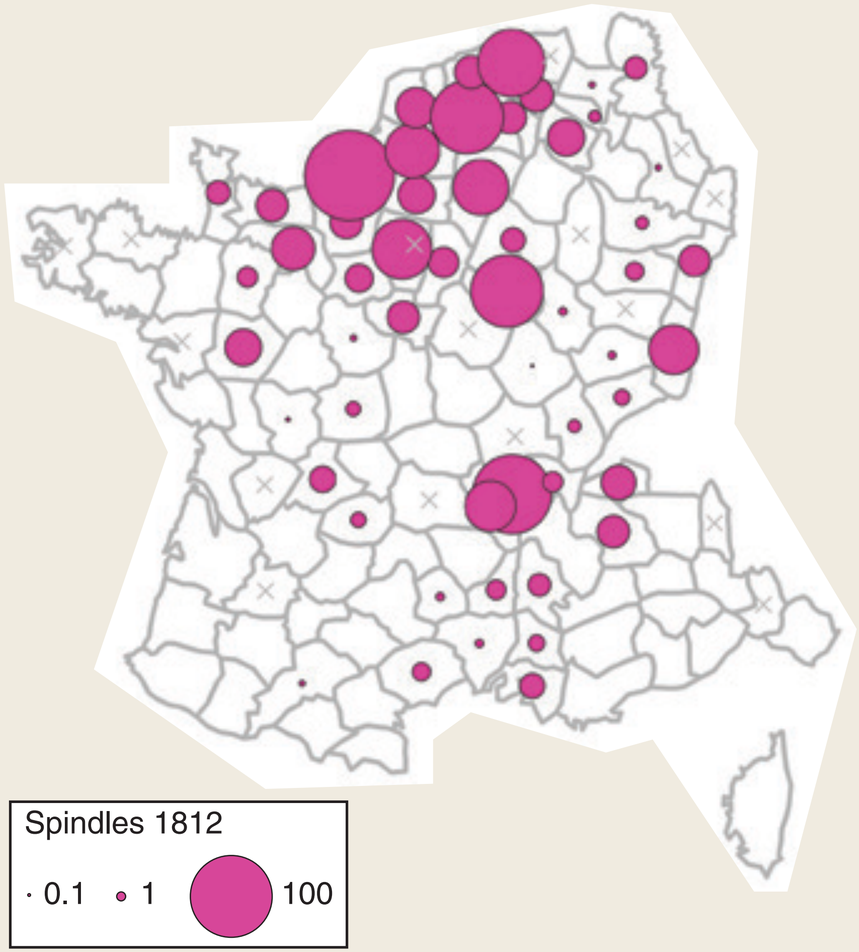
- Did the North develop Cotton spinning relative to the South?
- In the short run? In the long run?
- Did the North achieve higher economic development relative to the South?

Short-Run Impact

Panel A. Spindles per ’000 inhabitants, 1803



Panel B. Spindles per ’000 inhabitants, 1812



Short-Run Regression

$$S_{it} = \alpha_i + \delta_t + \gamma \ln D_{it} + \epsilon_{it}, \quad t \in \{1803,1812\}$$

	Spindles per thousand inhabitants						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Effective distance	33.47	33.48	34.78	24.73	32.96	42.18	38.82
	0.47	*0.47*	*0.49*	*0.35*	*0.46*	*0.52*	*0.48*
	(9.80)	(9.89)	(10.47)	(10.90)	(9.75)	(12.54)	(13.23)
	{10.00}	{10.06}	{10.58}	{11.07}	{10.01}	{13.50}	{13.46}
Streams × 1812		−0.14					−1.16
		(1.50)					(2.17)
Coal × 1812			−3.93				4.11
			(4.21)				(7.47)
Market potential × 1812				41.05			30.19
				(21.58)			(30.19)
Knowledge access × 1812					40.87		34.90
					(15.22)		(21.79)
Literacy × 1812						46.41	27.79
						(21.16)	(18.86)
Time fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Department fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	176	176	176	176	176	126	126
Adjusted R^2	0.34	0.33	0.34	0.36	0.37	0.42	0.45
Num. clusters (dept)	88	88	88	88	88	63	63
Num. clusters (gen)	40	40	40	40	40	30	30

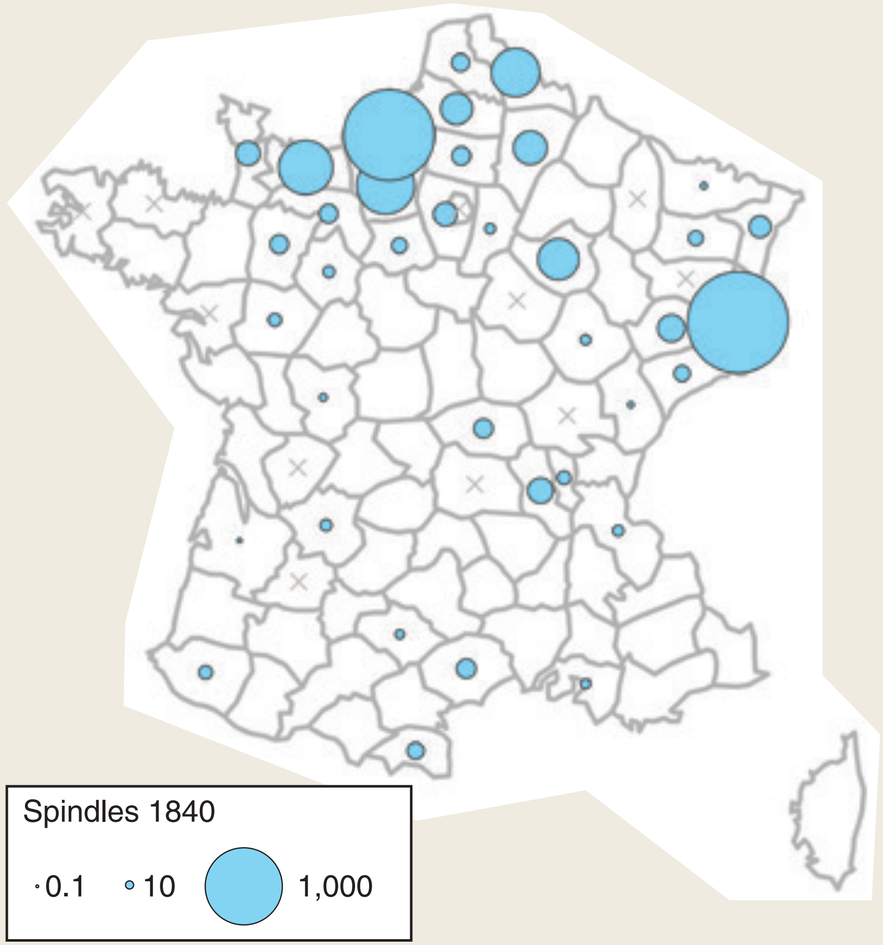
- Moving from 25th to 75th in D_{it} doubles S_{it}

Placebo

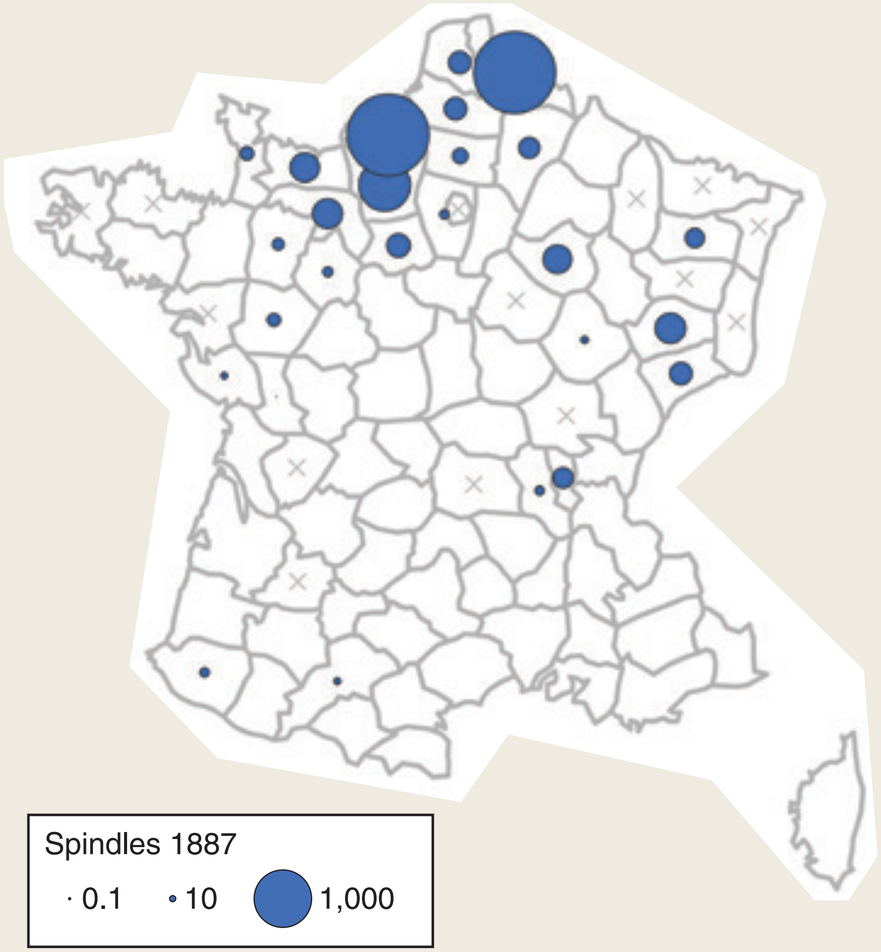
	Pre-treatment period: 1794–1803			Treatment period: 1803–1812			
	Spind. (1)	Spind. (2)	Spind. (3)	K/L (4)	Mach. (5)	Wool (6)	Leather (7)
Effective distance	5.89	3.32	2.08	−0.07	−0.02	−2.25	−0.02
	0.18	*0.10*	*0.06*	*−0.07*	*−0.06*	*−0.07*	*−0.13*
	(2.94)	(3.56)	(4.90)	(0.26)	(0.10)	(2.93)	(0.01)
	{3.22}	{4.01}	{5.69}			{3.11}	
Market potential × 1812		12.08	9.47				
		(5.85)	(8.93)				
Streams × 1812			−0.10				
			(0.53)				
Coal × 1812			2.53				
			(3.23)				
Knowledge access × 1812			4.93				
			(5.74)				
Literacy × 1812			0.44				
			(3.33)				
Time fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Department fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	176	176	126	78	74	138	116
Adjusted R^2	0.19	0.21	0.15	0.32	0.11	0.18	0.05
Num. clusters (dept)	88	88	63	39	37	69	58
Num. clusters (gen)	40	40	30	23	21	32	28

Long-Run Impact

Panel A. Spindles per ‘000 inhabitants, 1840



Panel B. Spindles per ‘000 inhabitants, 1887



Long-Run Regression

	Spindles per thousand inhabitants							
	OLS				2SLS			
Dep var measured in:	1840	1840	1887	1887	1840	1840	1887	1887
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Spindles, 1812	3.04	2.47	4.75	5.06	2.12	2.68	4.72	4.85
	(0.99)	(0.93)	(1.54)	(1.71)	(1.27)	(0.93)	(1.26)	(1.39)
	{0.99}	{0.93}	{1.57}		{1.27}	{0.94}	{1.29}	
Spindles, 1803	−2.95	−1.55	−4.69	−4.86	−1.61	−1.85	−4.64	−4.57
	(1.53)	(1.01)	(2.17)	(2.42)	(1.56)	(1.04)	(1.68)	(1.84)
Literacy		71.18		−16.63		60.98		−4.29
		(55.35)		(92.54)		(55.34)		(95.46)
Market potential		2.67		−33.57		−15.75		−16.38
		(109.61)		(132.55)		(104.61)		(129.33)
Knowledge access		−141.21		−159.55		−140.59		−159.00
		(83.05)		(108.88)		(78.31)		(101.80)
Coal		−27.19		12.23		−27.43		12.76
		(20.57)		(44.00)		(18.84)		(41.19)
Streams		−11.19		−16.85		−10.45		−17.54
		(5.80)		(10.08)		(4.86)		(8.34)
Observations	70	63	67	61	70	63	67	61
Adjusted R^2	0.39	0.61	0.61	0.61				
KP F-stat					12.78	10.35	15.21	10.15
Num. clusters (gen)	34	30	33	29	34	30	33	29

$$Y_{it} = \alpha_0 + \beta_{0t} S_{i(1812)} + \eta_{it}$$

$$S_{i(1982)} = \alpha_1 + \beta_1 \Delta \ln(D_i) + \omega_i$$

- Even temporary protection has a long-run impact

Long-Run Impact on GDP per Capita

	Natural logarithm of industrial value added per capita							
	OLS				2SLS			
Dep var measured in:	1860	1896	1930	2000	1860	1896	1930	2000
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Spindles, 1812	0.0037	0.0025	0.0040	0.0025	0.0075	0.0010	0.0016	0.0031
	0.3925	*0.2394*	*0.3965*	*0.2527*	*0.7987*	*0.0937*	*0.1590*	*0.3128*
	(0.0012)	(0.0012)	(0.0016)	(0.0012)	(0.0026)	(0.0026)	(0.0030)	(0.0026)
	{0.0013}	{0.0013}	{0.0016}	{0.0012}	{0.0021}	{0.0025}	{0.0028}	{0.0025}
Spindles, 1803	0.0035	0.0048	0.0046	0.0053	−0.0020	0.0070	0.0081	0.0044
	(0.0020)	(0.0019)	(0.0020)	(0.0017)	(0.0035)	(0.0036)	(0.0041)	(0.0032)
Observations	68	66	68	68	68	66	68	68
Adjusted R^2	0.2414	0.1369	0.2772	0.1718				
KP F-stat					12.60	15.25	12.60	12.60
Num. clusters (gen)	33	32	33	33	33	32	33	33

- Temporary protection on cotton spinning increased *aggregate* GDP in the long-run

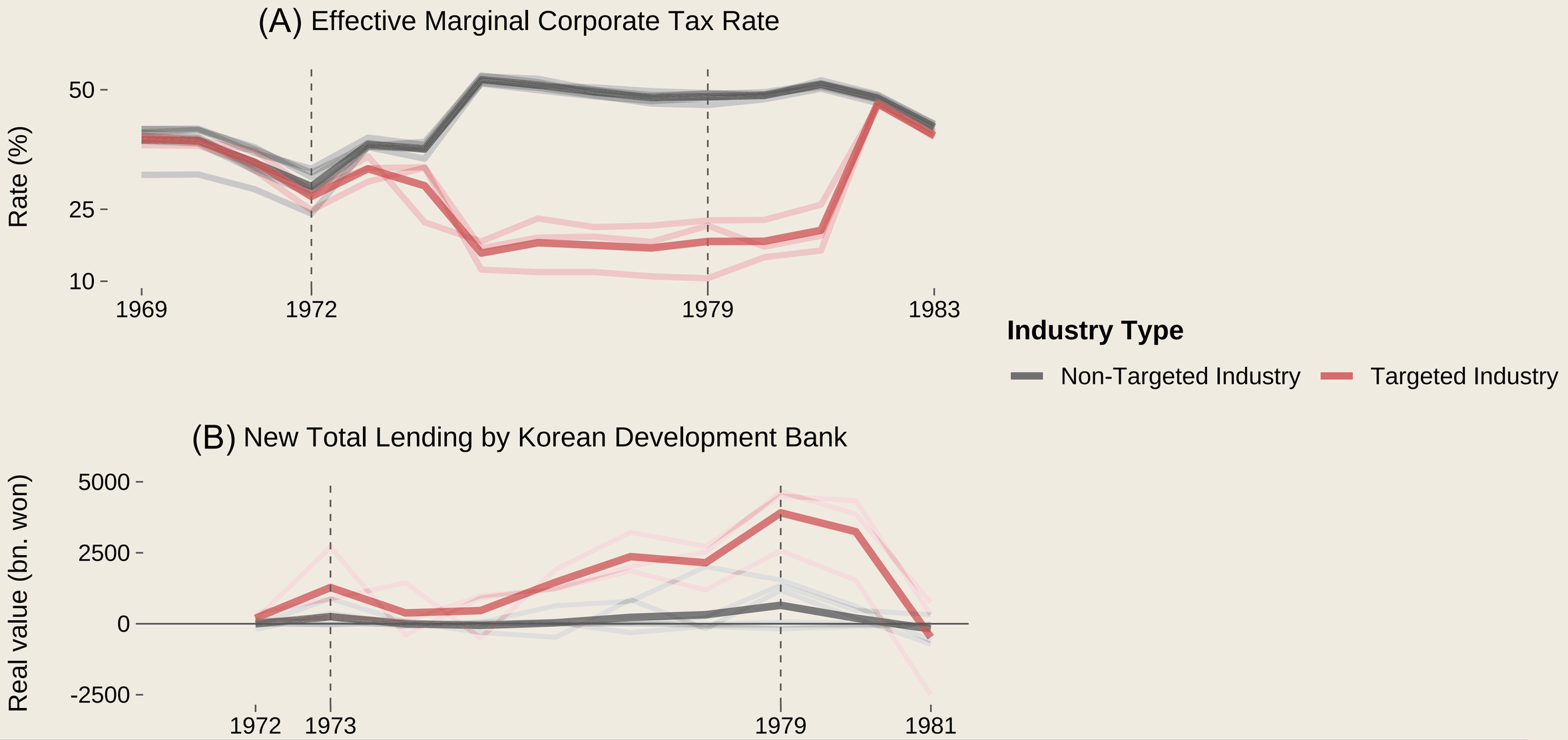
2.2. Does Industrial Policy Work in Practice? Case of South Korea's HCI Drive

— Lane (2025)

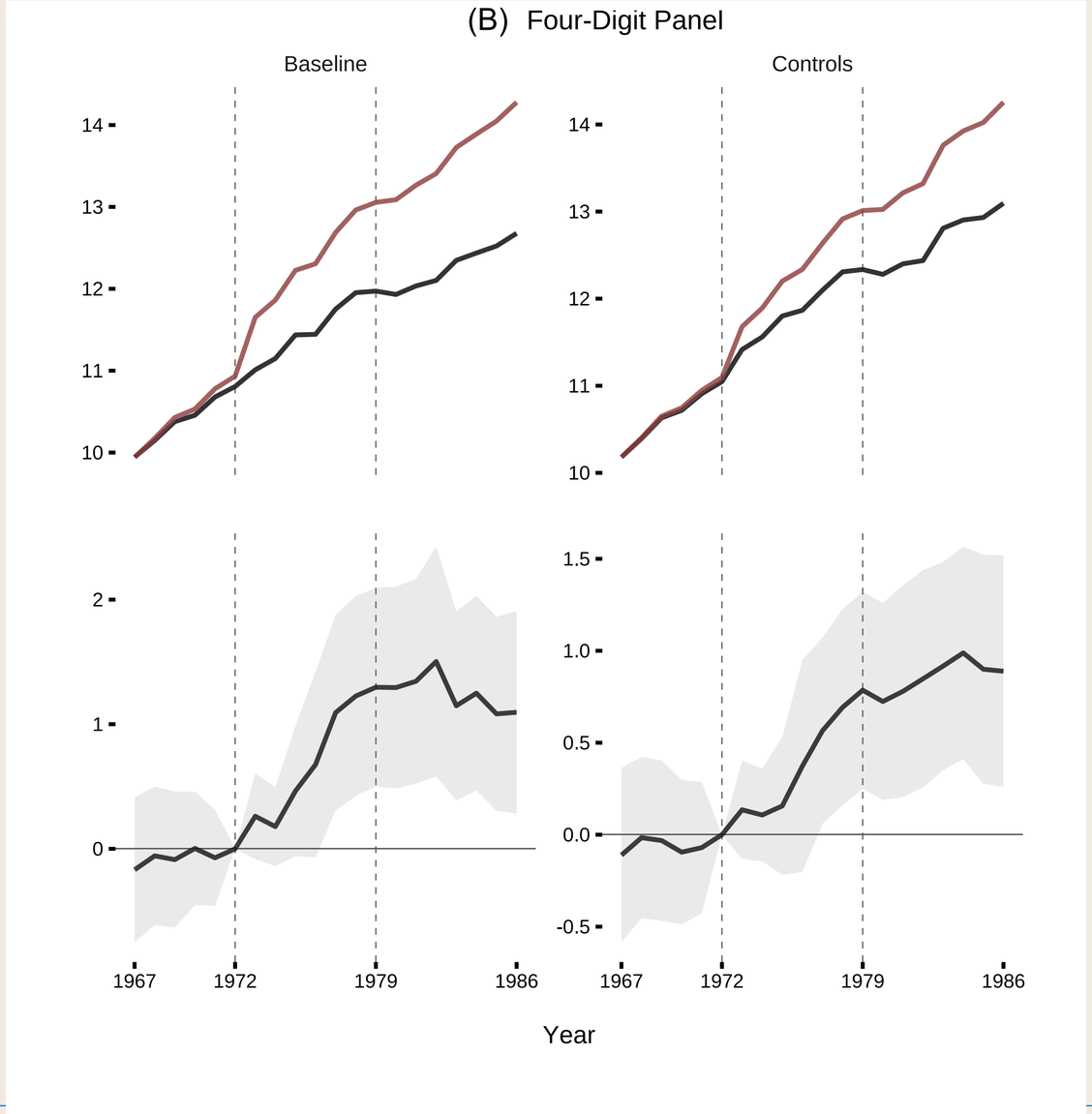
Background

- The HCI drive in 1973 in South Korea was fundamentally security-driven
- In 1969, Nixon declared the US would not provide military support to the Asia-Pacific
- South Korea believed it would need to defend against a communist-backed invasion
- The HCI targeted six sectors:
  steel, nonferrous metals, shipbuilding, machinery, electronics, and petrochem
- The choice was based on the need for military modernization
  - Not necessarily based on the growth potentials
  - In fact, many foreign lenders were skeptical of the choice

Policy Package



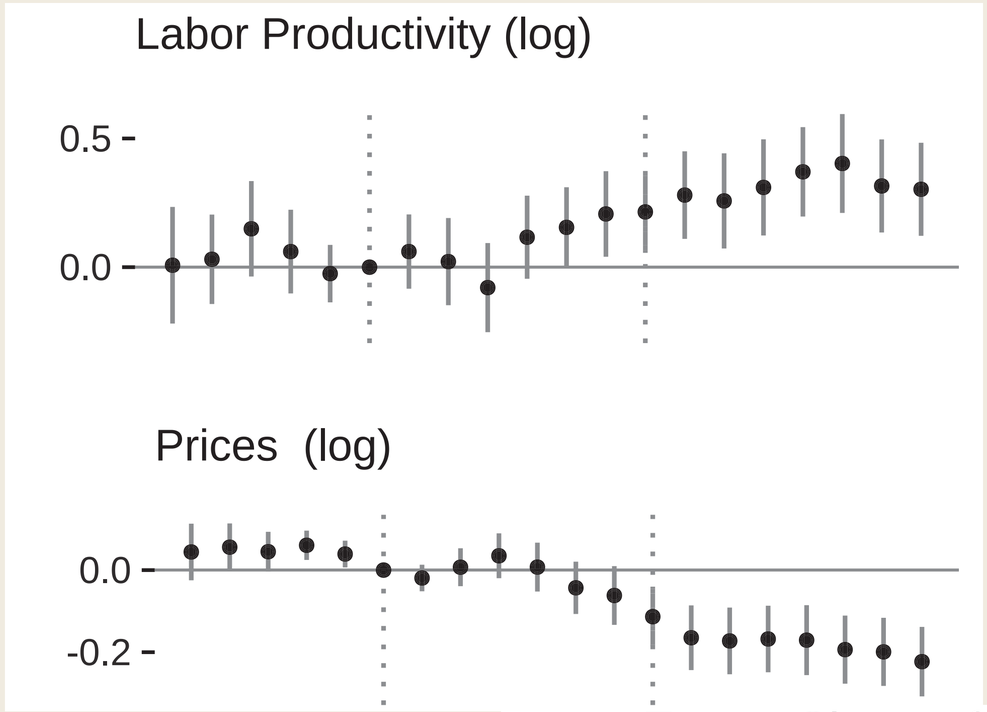
Industry Output

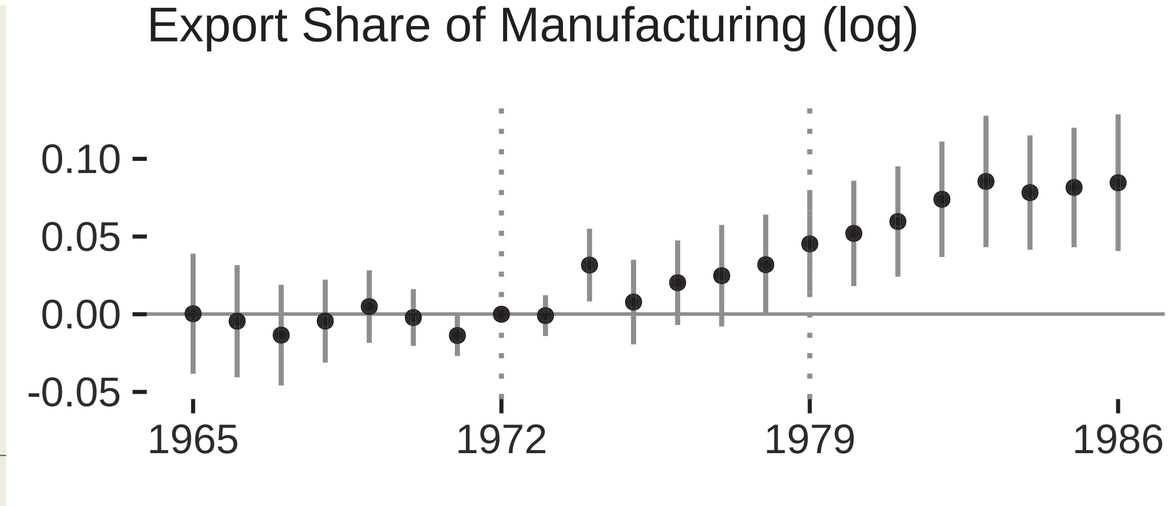


Legend for top row

- Non-Targeted Industries
- Targeted (HCI) Industries

Other Outcomes





2.2. Does Industrial Policy Work in Practice?

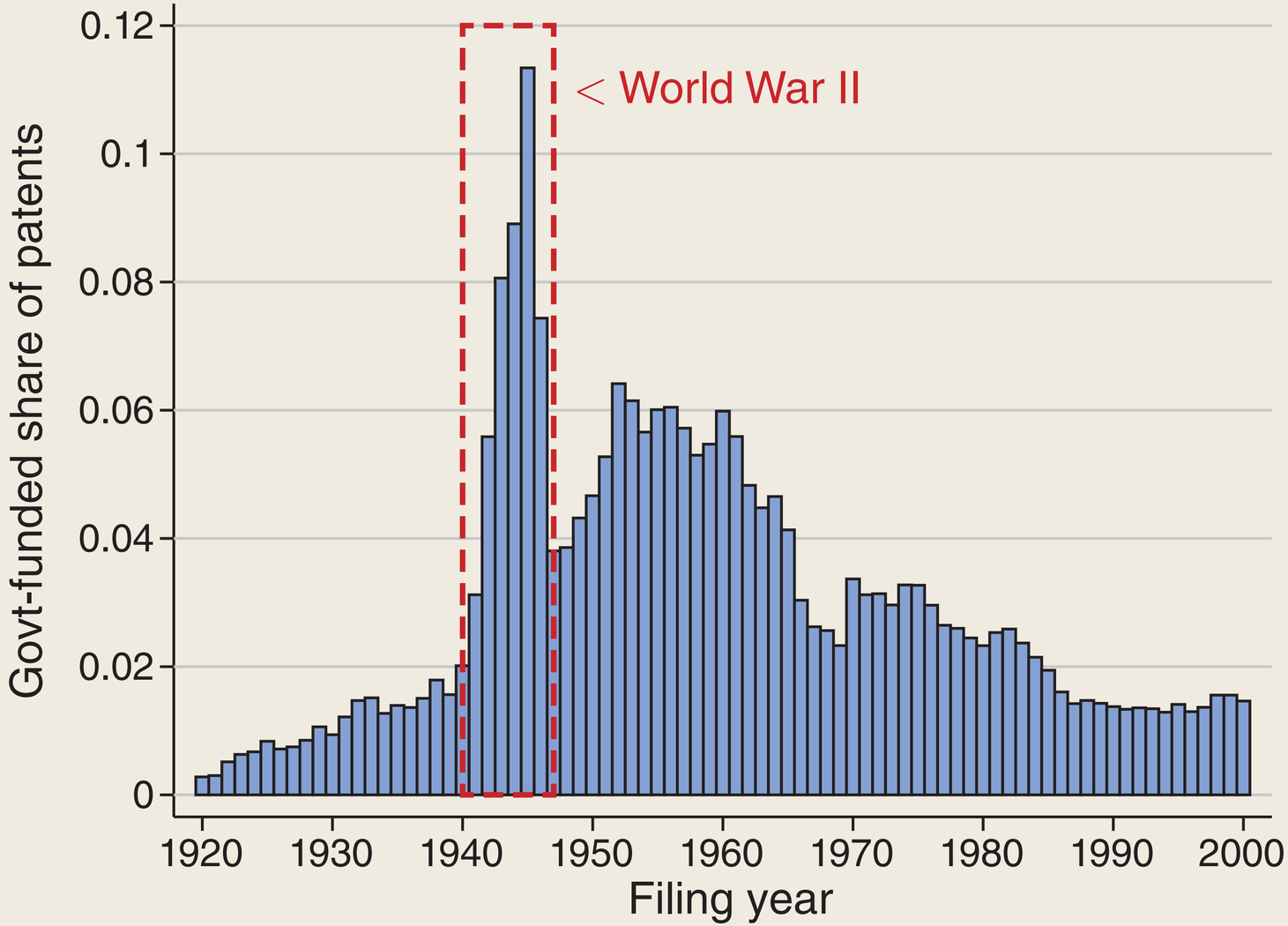
The Role of Public R&D

– Gross & Sampat (2025), Kantor & Whalley (2025)

Directly Acting on R&D

- We have seen that industrial policy “works” in practice
- Through the lens of the model, they suggest substantial knowledge spillover
- What if the government can directly act on knowledge creation?
- We will cover two large public R&D programs in the US:
  1. World War II (1940-1945)
  2. Cold-War-era space race (1960s)

1. World War II



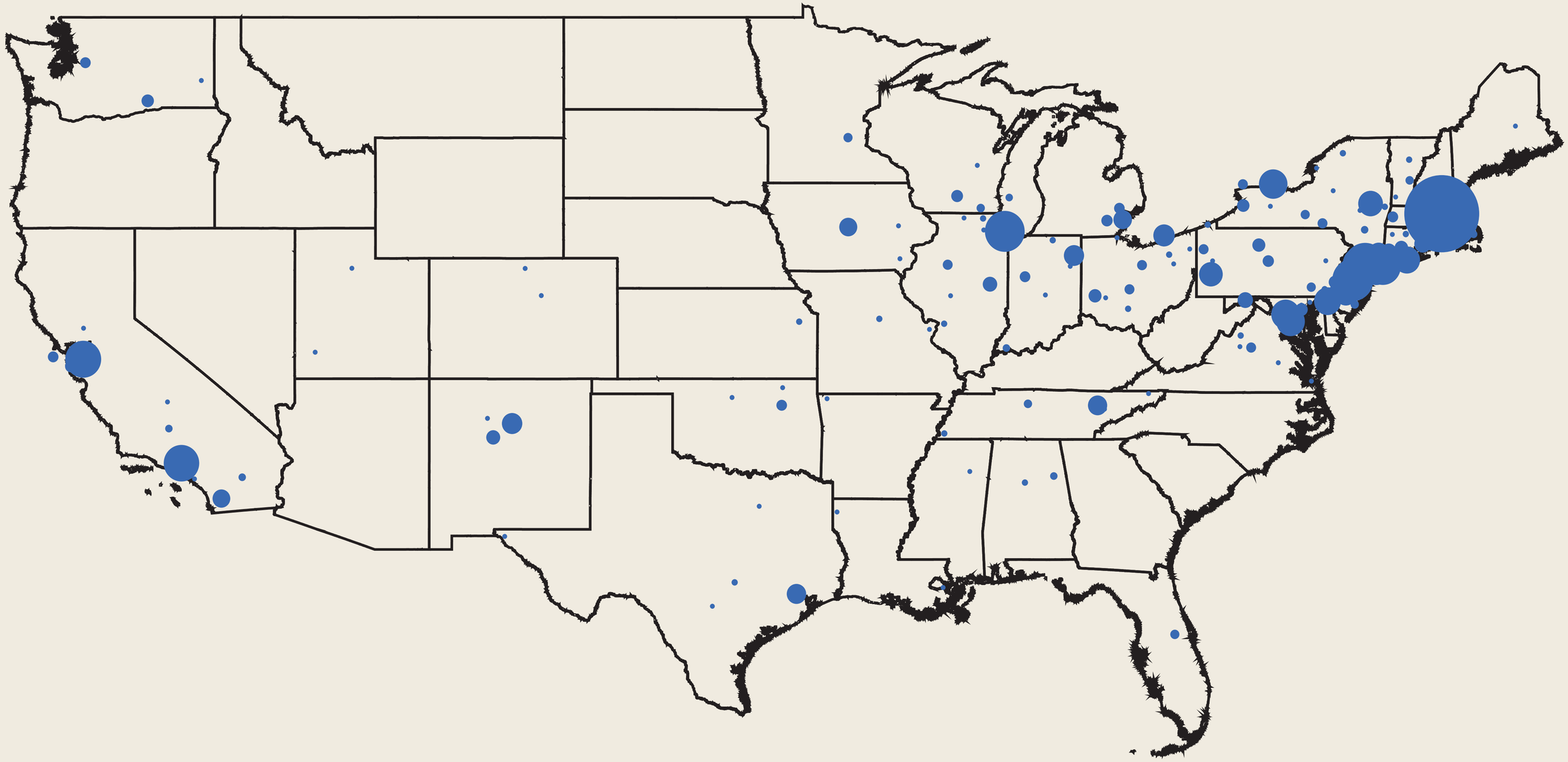
Background

- Before WWII, little federal funding of research outside of agriculture
- In 1940, an MIT scientist convinced Roosevelt to fund military research
- The Office of Scientific Research and Development (OSRD) led the funding
- From 1940-1945, the OSRD engaged in 2200 R&D contracts at over 9 billion USD
- The funding priority was based on short-run military need
  - Not the long-run commercial promise
- Examples:
  1. nuclear reactions (new)
  2. microwave radar (pushing the existing problem)

Top 10 Technology Class of OSRD Patents

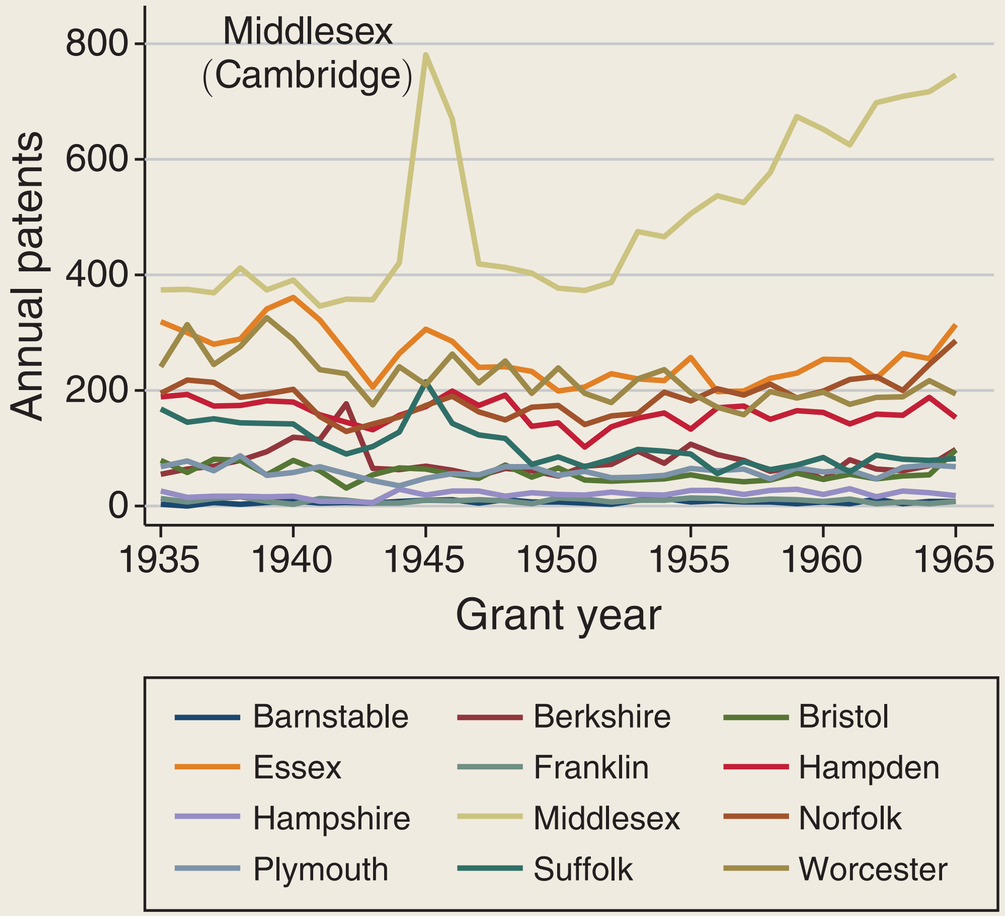
USPC	Description	OSRD patents		1933–1940 patents	
		Percent	Rank	Percent	Rank
342	Directive radio wave systems/devices (radar)	6.6	1	0.2	167
102	Ammunition and explosives	5.8	2	0.2	170
315	Electric lamp and discharge devices: Systems	4.8	3	0.6	302
250	Nuclear energy	4.0	4	0.1	117
333	Wave transmission lines and networks	3.6	5	0.2	164
343	Radio wave antennas	3.4	6	0.2	141
423	Inorganic chemistry	3.2	7	0.7	309
367	Acoustic wave systems/devices	3.1	8	0.1	79
324	Electricity: Measuring and testing	3.0	9	0.5	284
327	Misc. electrical devices, circuits, and systems	2.9	10	0.1	85

Geography of OSRD-Funded Invention

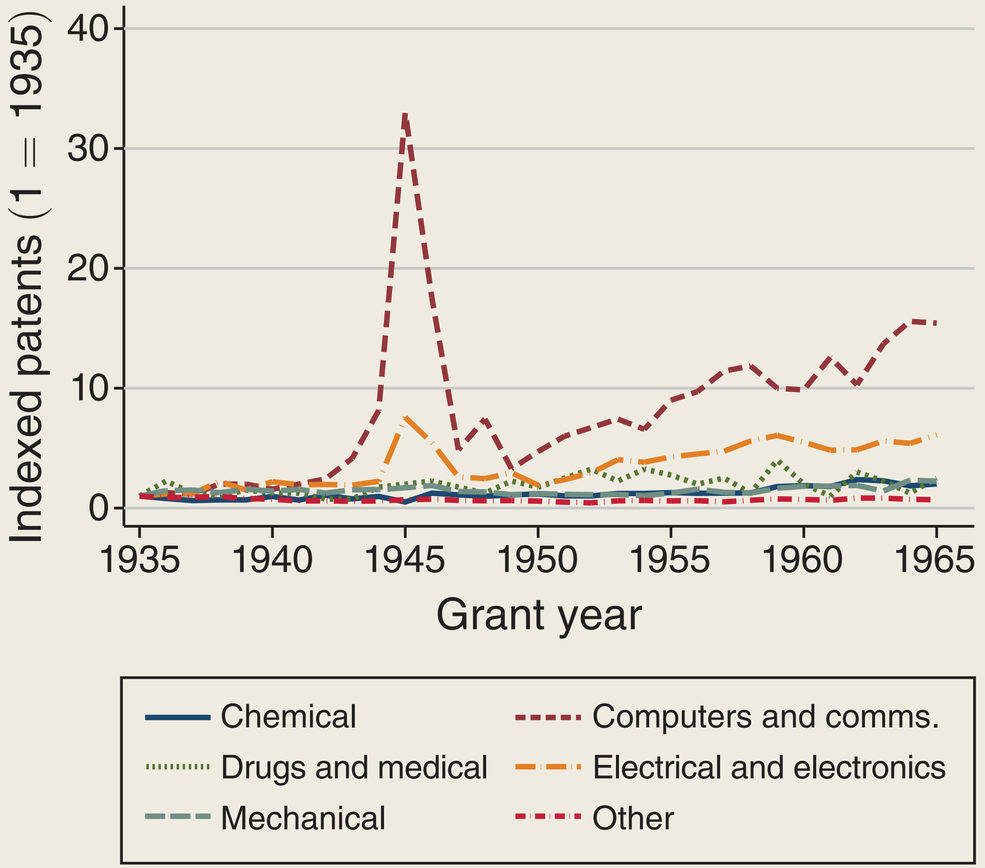


Exposure Spikes in 1945

Panel A. 12 largest MA counties (all technology areas)

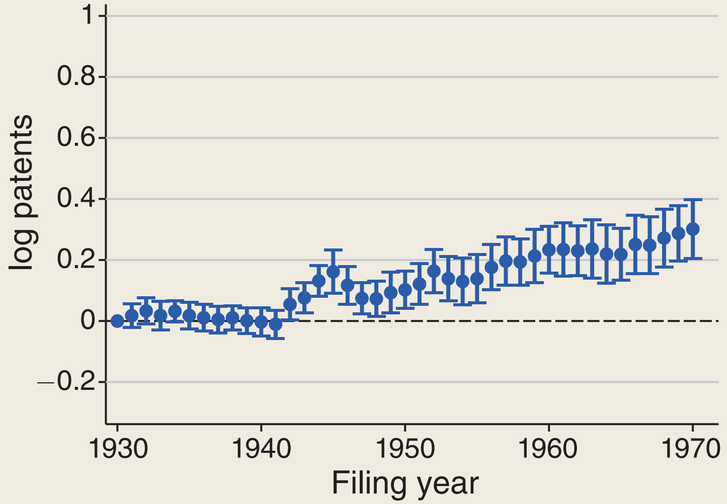


Panel B. Middlesex, MA (by technology area, indexed)



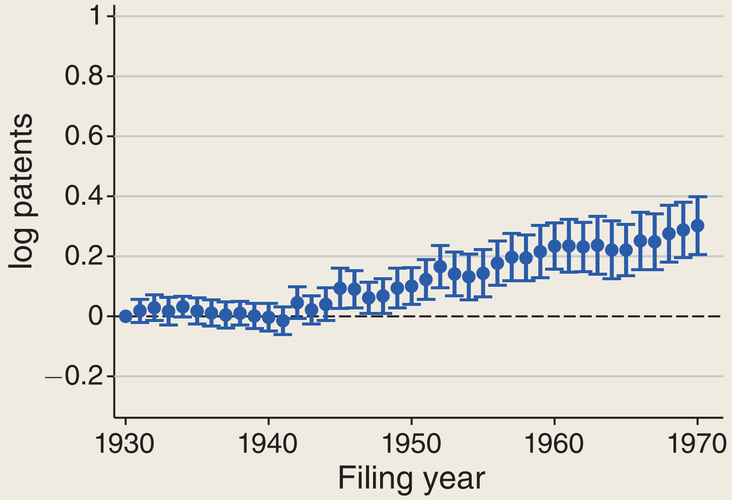
Impact on Patenting

Panel A. All patents

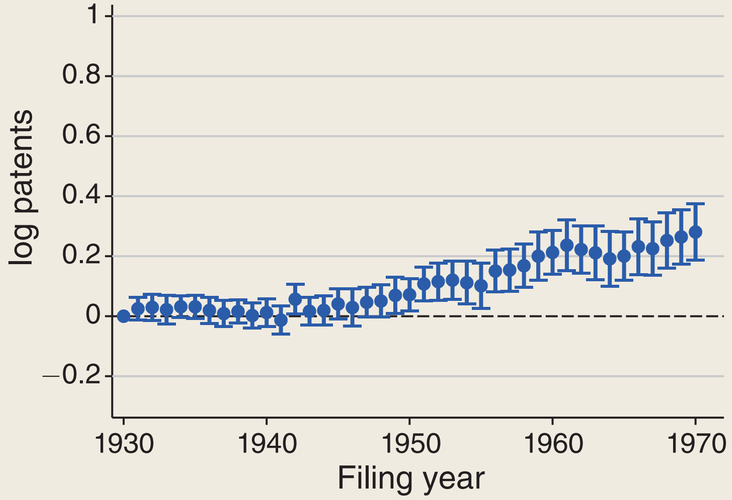


$$\ln(Patents)_{ict} = \sum_{t=1931}^{1970} \beta_t \cdot \ln(OSRD\ rate)_{ic} \cdot Year_t + \alpha_{ic} + \delta_t + \varepsilon_{ict},$$

Panel B. Non-OSRD patents



Panel C. Nongovernment interest patents



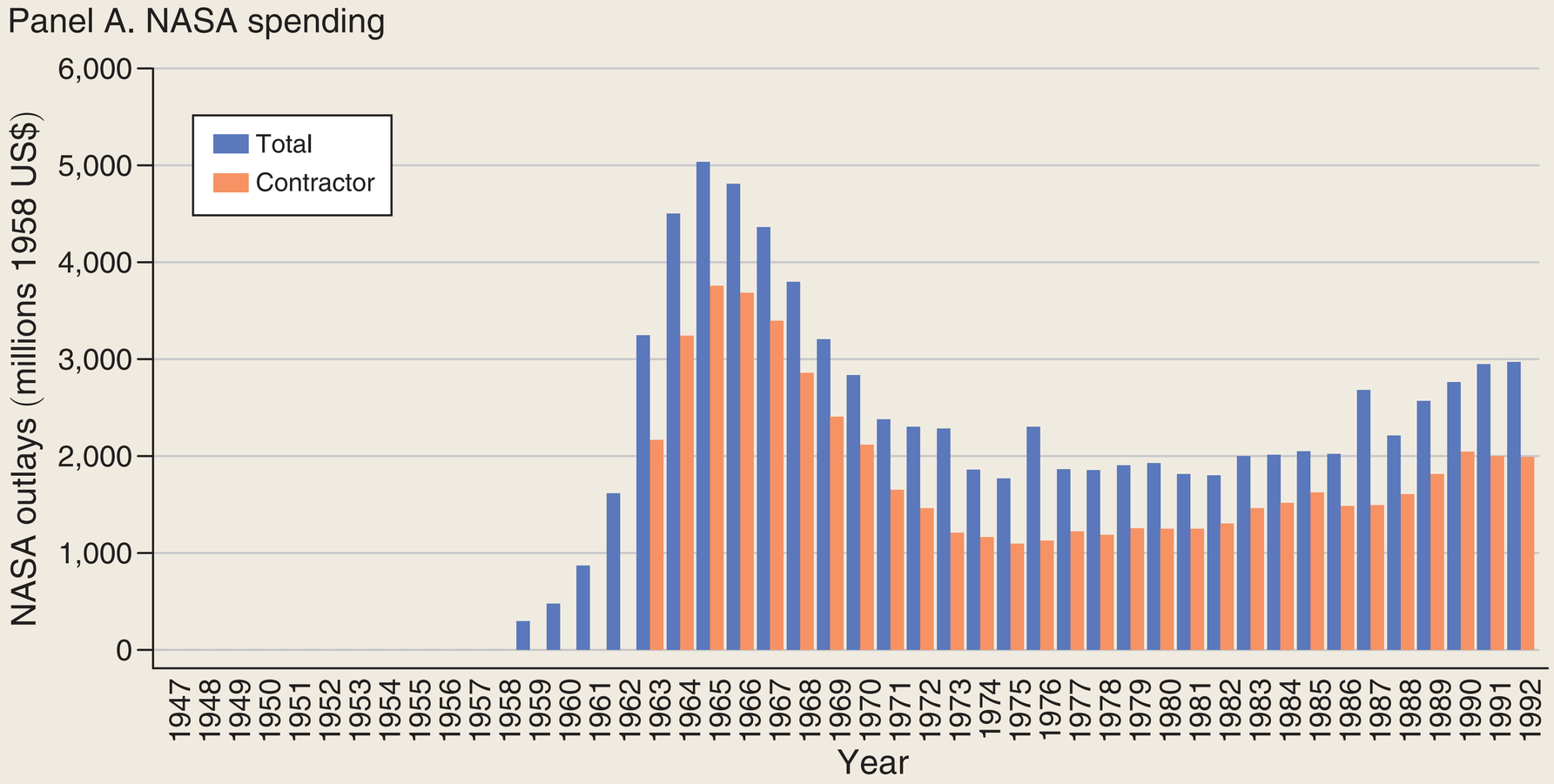
Employment Effect in 1980

$$\text{IHS}\left(Employment\right)_{id} = \beta \cdot OSRDTreatment_{id} + \alpha_i + \gamma_d + \mathbf{X}_{id}\phi + \varepsilon_{id},$$

TABLE 7—EFFECTS ON 1980 COUNTY EMPLOYMENT IN HIGH-TECH MANUFACTURING INDUSTRIES

	Extensive			Intensive		
	(1)	(2)	(3)	(4)	(5)	(6)
1{*Any OSRD patents*}	0.898	0.914	0.922			
	(0.226)	(0.166)	(0.166)			
IHS(*OSRD rate*)				1.712	1.137	1.175
				(0.868)	(0.614)	(0.614)
Observations	3,770	3,770	3,770	2,022	2,022	2,022
R^2	0.54	0.77	0.77	0.62	0.86	0.86
Y mean	4.37	4.37	4.37	4.08	4.08	4.08
County FEs	X	X	X	X	X	X
Industry FEs	X	X	X	X	X	X
IHS mfg. empl.		X	X		X	X
IHS all empl.			X			X

2. Space Race



- The race to beat the Soviet Union to the moon during the 1960s

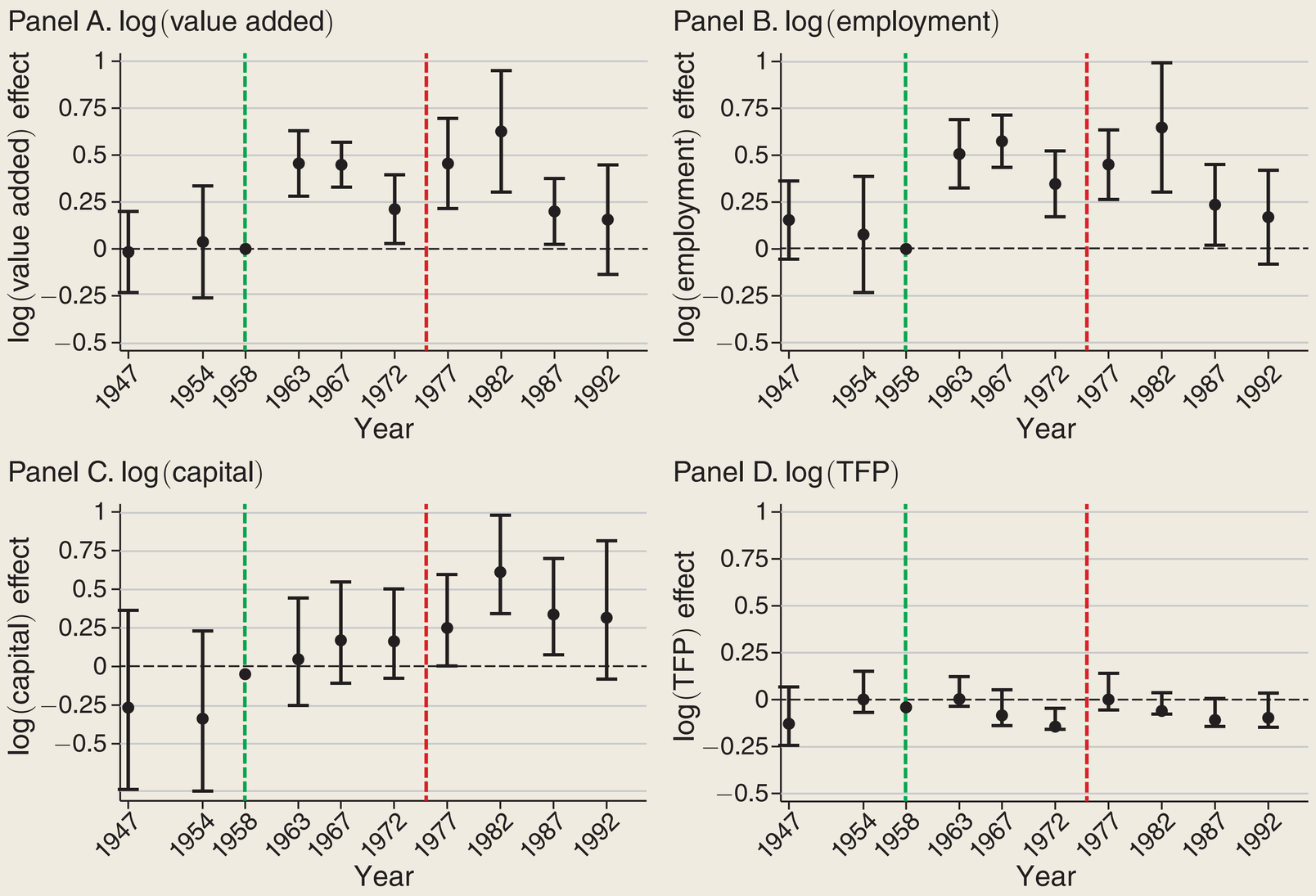
  ⇒ a surge in funding for NASA

Research Design

- Compare industry-location pairs with different exposures to the space race
- Exposed if the industry-location filed a space-related patent before the space race
  - Match texts between patents and the CIA document
- Call this “Space Capability”
- Estimate:

$$\ln Y_{ijt} = \sum_t \beta_t \times \text{High Space Capability}_{ij,t<1958} \times \mathbb{I}[\text{Year} = t] + \delta_i + \theta_j + \gamma_t + \nu_{ijt}$$

Main Result


Panel A. log(value added)
log(value added) effect
Panel B. log(employment)
log(employment) effect
Panel C. log(capital)
log(capital) effect
Panel D. log(TFP)
log(TFP) effect
1
0.75
0.5
0.25
0
−0.25
−0.5
1947
1954
1958
1963
1967
1972
1977
1982
1987
1992
Year