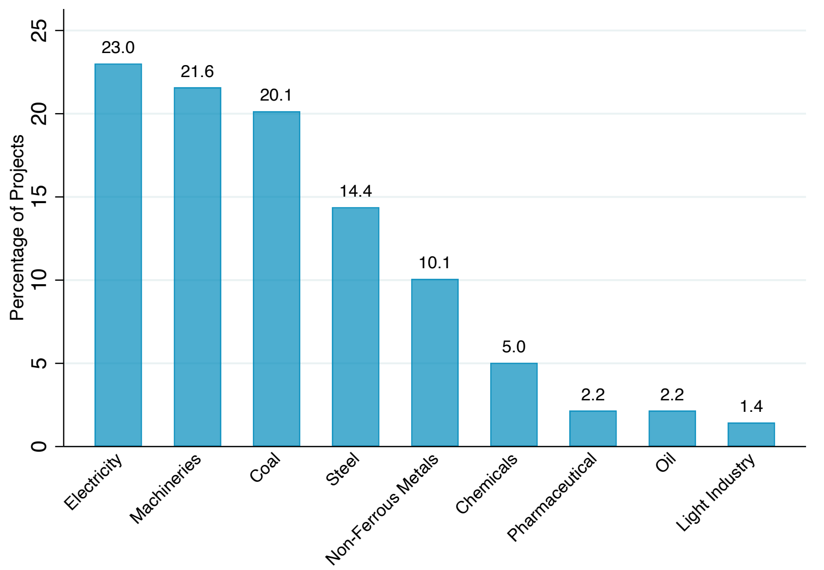
Online Appendix — Not for Publication

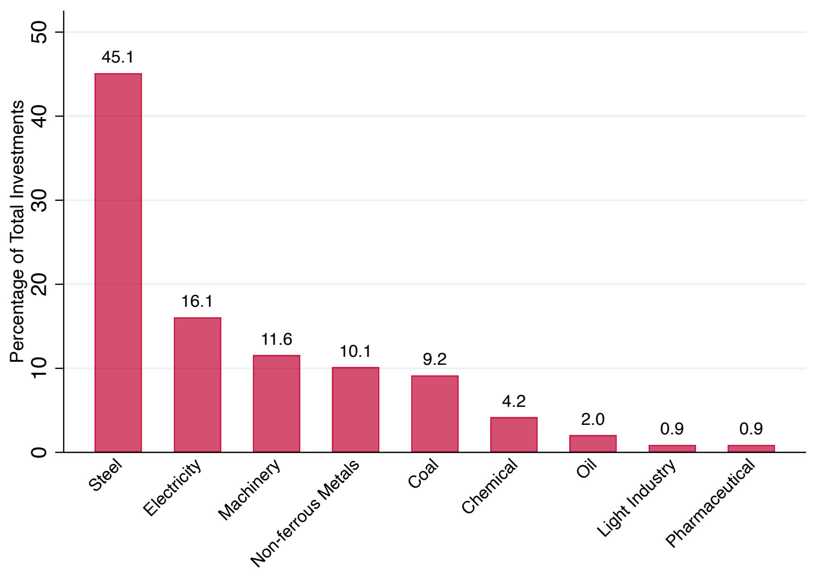
Additional Figures and Tables

Figure A.1: The 156 Projects by Industry

Panel A: Share of Industrial Clusters by Industry

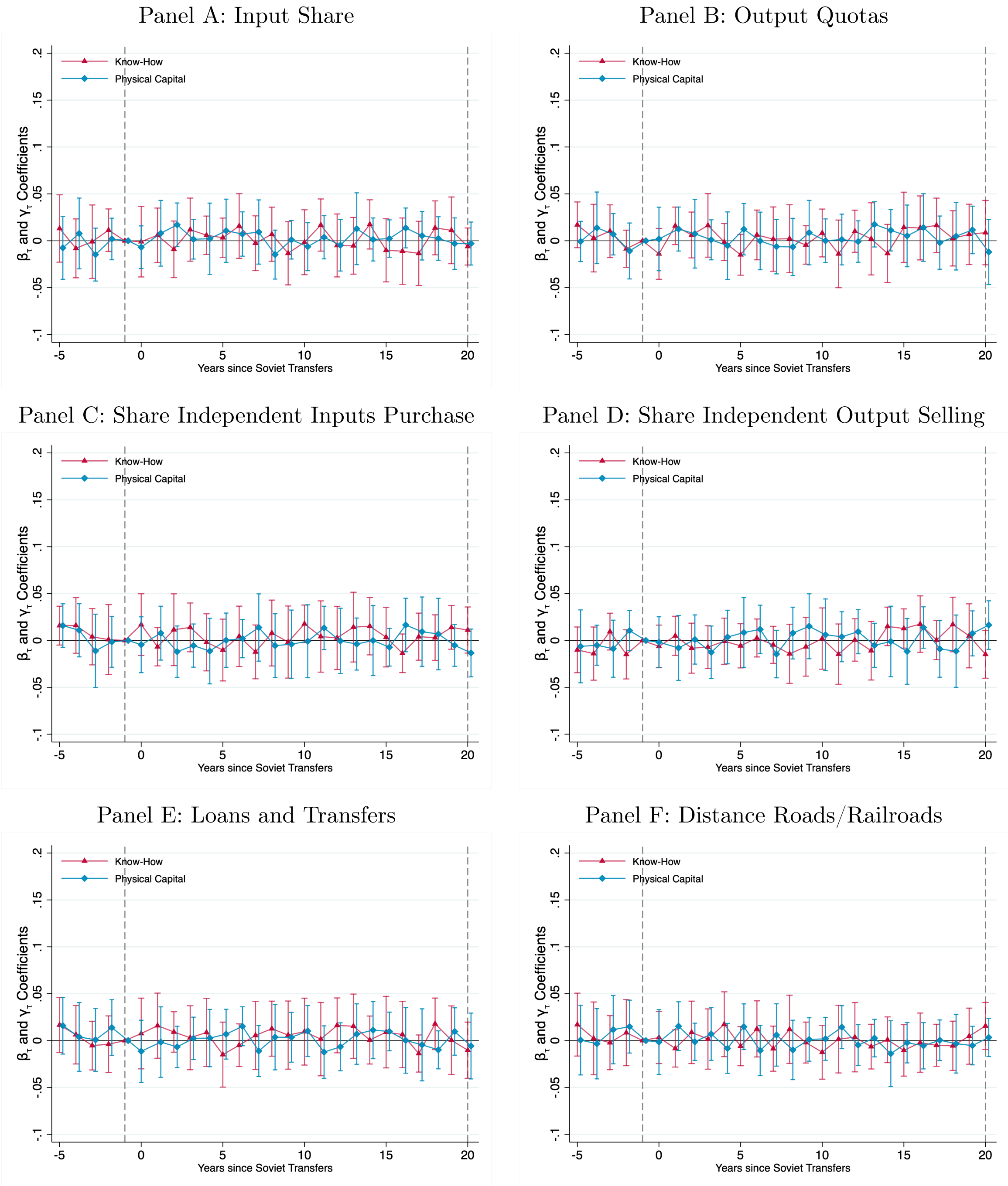


Panel B: Percentage of Total Investments per Industry



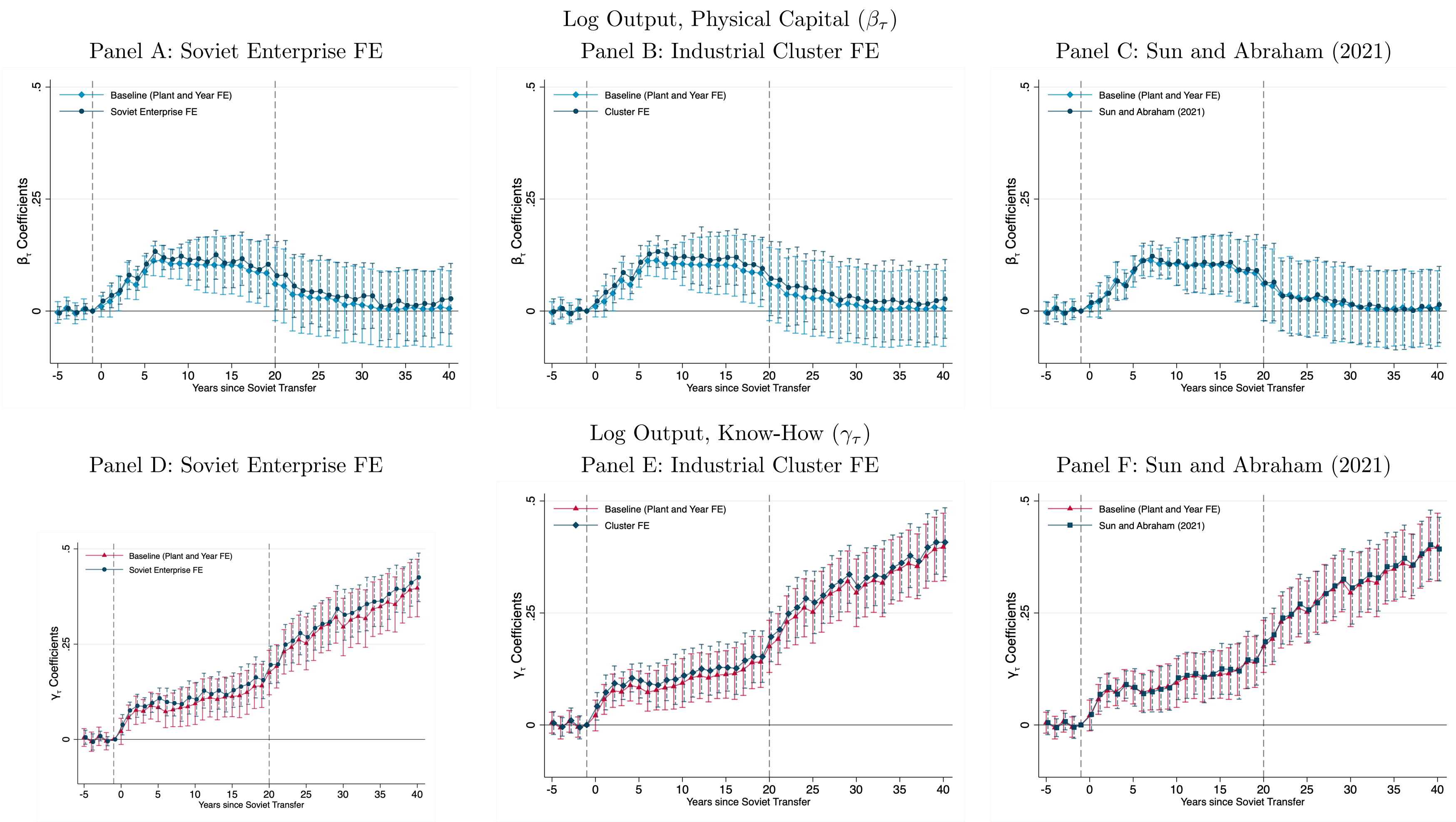
Notes. Distribution of the 139 civilian industrial clusters, known as the 156 Projects. Panel A reports the share of projects by industry. Panel B reports the percentage of total investments by industry. Data are provided at the project level from the National Archives Administration of China.

Figure A.2: Independent Decision-Making and Government Support in the 304 Plants



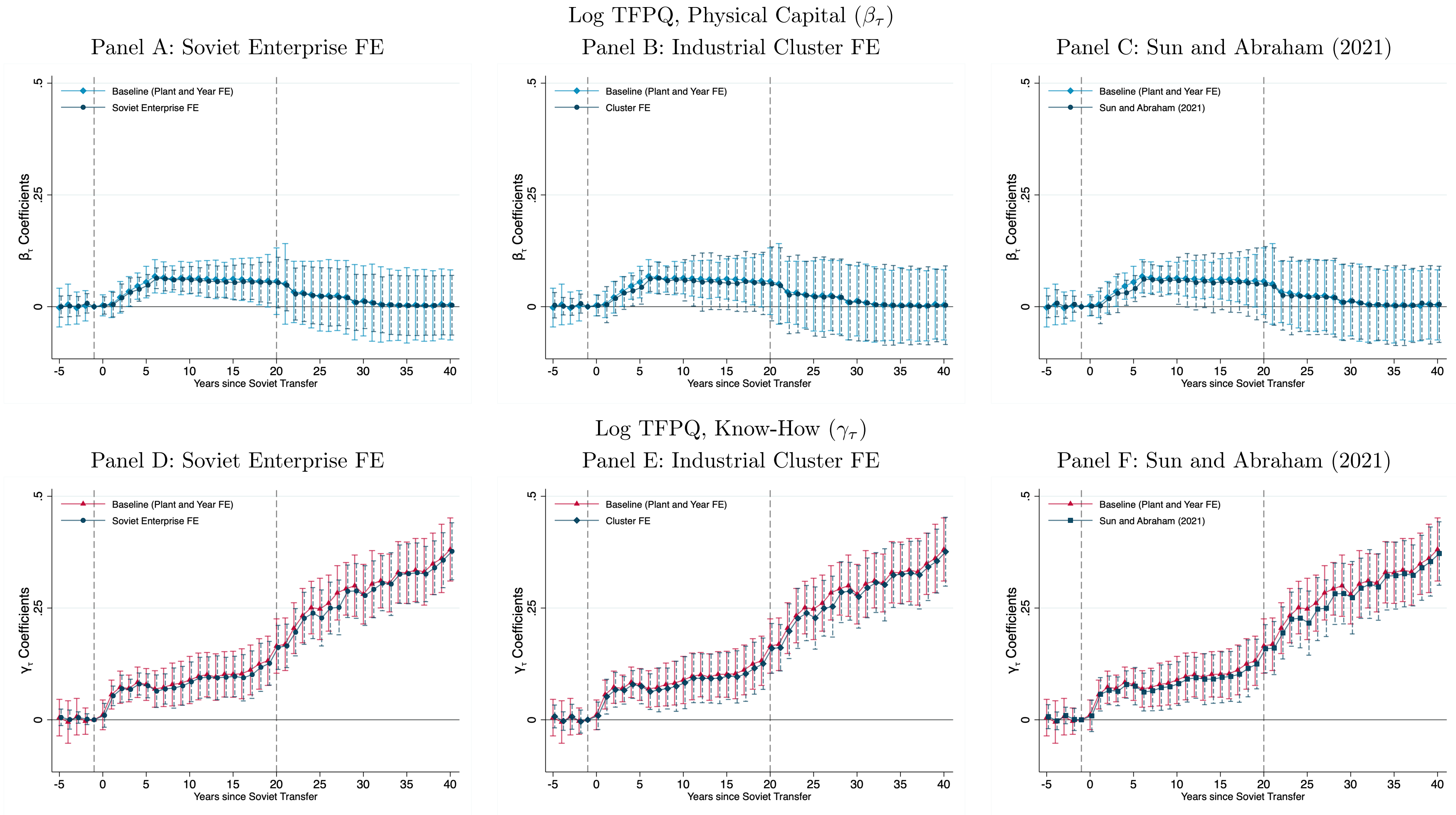
Notes. Annual β_τ and γ_τ coefficients estimated from Equation 1 for the 304 steel plants belonging to the 156 Projects, where *Physical Capital* is an indicator for plants that received Soviet physical capital. *Know-How* is an indicator for plants that also received Soviet know-how. The omitted period is $t = -1$, the year before receiving the Soviet transfer. Data are provided at the plant level from the Steel Association Reports from 1949 to 2000. *Input Share* is the ratio between inputs allocated to a plant and the total amount of planned output. *Output Quotas* is the production quotas assigned to the firm. *Share of Independent Inputs Purchase* is the share of inputs plants could independently buy. *Share of Independent Output Selling* is the share of outputs plants could independently sell. *Loans and Transfers* is logged sum of loans and transfers that the government granted to the 304 steel plants and are measured in 2020 US$ millions, reevaluated at 1 RMB in 1955=3.9605 USD in 2020. Standard errors are block-bootstrapped at the industrial cluster level with 1,000 replications. *** p $<$ 0.01, ** p $<$ 0.05, * p $<$ 0.1.

Figure A.3: Robustness Check on the Effects of Soviet Transfers on the 304 Steel Plants' Production – Alternative Fixed Effects, Output



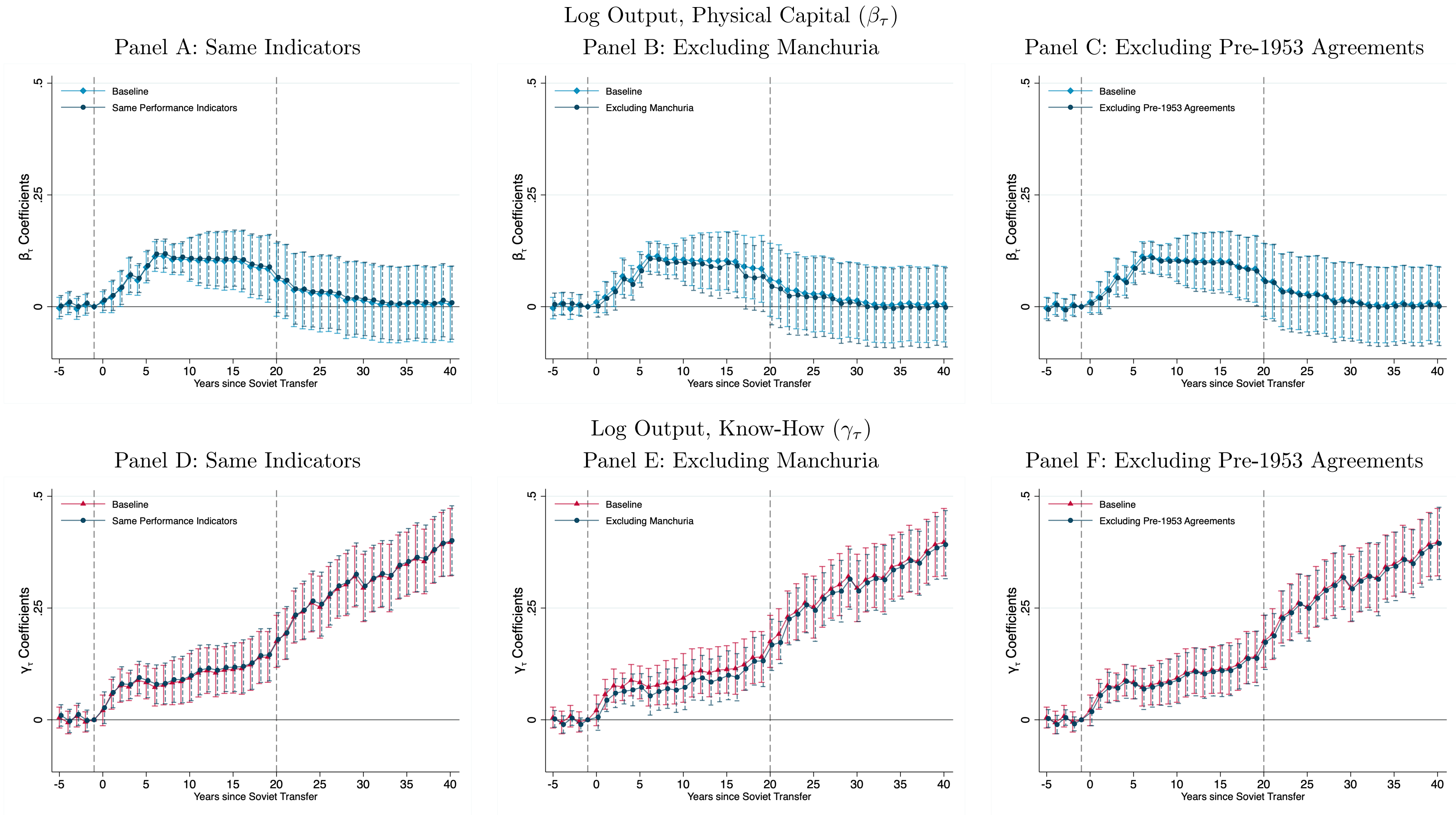
Notes. Annual β_τ coefficients (Panels A–C) and γ_τ coefficients (Panels D–F) from Equation 1 for the 304 steel plants belonging to the 156 Projects, controlling for Soviet enterprises that Chinese plants were supposed to duplicate fixed effects (Panels A and D), industrial cluster fixed effects (Panels B and E), and estimating weights underlying two-way fixed effects regressions based on Sun and Abraham (2021)'s method, using the Stata command `eventstudyweights`. Each panel also reports the baseline specification from Equation 1, which includes plant and year fixed effects. The omitted period is $t = -1$, the year before receiving the Soviet transfer. Data are provided at the plant level from the Steel Association Reports from 1949 to 2000. *Log Output* is logged quantities (in million tons) of steel. The first vertical line identifies the beginning of the Soviet transfer. The second vertical line identifies China's opening to international trade. Standard errors are block-bootstrapped at the industrial cluster level with 1,000 replications.

Figure A.4: Robustness Check on the Effects of Soviet Transfers on the 304 Steel Plants' Productivity – Alternative Fixed Effects, TFP



Notes. Annual β_τ coefficients (Panels A—C) and γ_τ coefficients (Panels D–F) from Equation 1 for the 304 steel plants belonging to the 156 Projects, controlling for Soviet enterprises that Chinese plants were supposed to duplicate fixed effects (Panels A and D), industrial cluster fixed effects (Panels B and E), and estimating weights underlying two-way fixed effects regressions based on Sun and Abraham (2021)'s method, using the Stata command `eventstudyweights`. Each also panel reports the baseline specification from Equation 1, which includes plant and year fixed effects. The omitted period is $t = -1$, the year before receiving the Soviet transfer. Data are provided at the plant level from the Steel Association Reports from 1949 to 2000. *Log TFPQ* is logged total factory productivity quantity, computed as the residuals of OLS regression of plant logged physical output on logged workers, capital stock and inputs, and plant and year fixed effects. The first vertical line identifies the beginning of the Soviet transfer. The second vertical line identifies China's opening to international trade. Standard errors are block-bootstrapped at the industrial cluster level with 1,000 replications.

Figure A.5: Robustness Check: Robustness Check on the Effects of Soviet Transfers on the 304 Steel Plants' Production – Performance Indicators and Japanese Occupation, Output

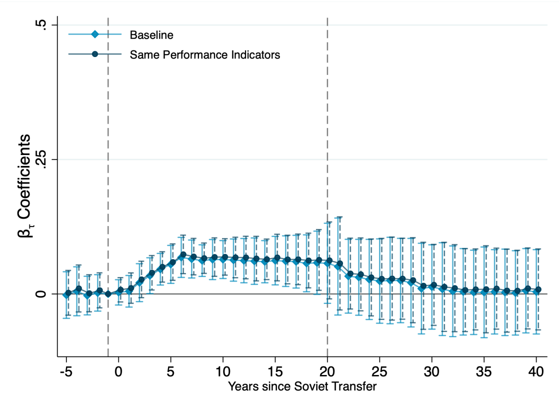


Notes. Annual β_τ coefficients (Panels A—C) and γ_τ coefficients (Panels D–F) from Equation 1 for the 304 steel plants belonging to the 156 Projects, including only plants that maximized the same set of indicators (profits, product quality, cost reduction, total wage bill, development of new products and projects) between 1952 and 1978 (Panels A and D), excluding the entire region of Manchuria (Panels B and E) and excluding agreements signed until 1953 (Panels C and F). The omitted period is $t = -1$, the year before receiving the Soviet transfer. Data are provided at the plant level from the Steel Association Reports from 1949 to 2000. *Log Output* is logged quantities (in million tons) of steel. The first vertical line identifies the beginning of the Soviet transfer. The second vertical line identifies China's opening to international trade. Standard errors are block-bootstrapped at the industrial cluster level with 1,000 replications.

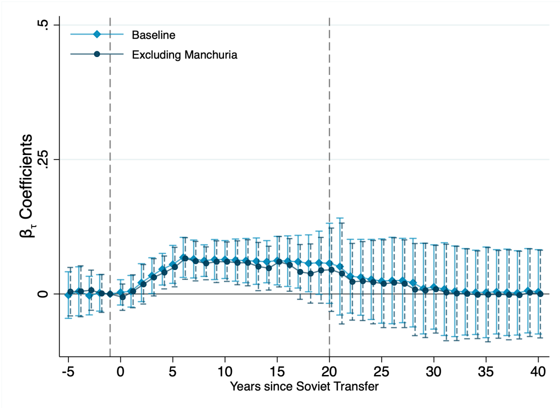
Figure A.6: Robustness Check: Robustness Check on the Effects of Soviet Transfers on the 304 Steel Plants' Production – Performance Indicators and Japanese Occupation, –TFP

Log TFPQ, Physical Capital (β_τ)

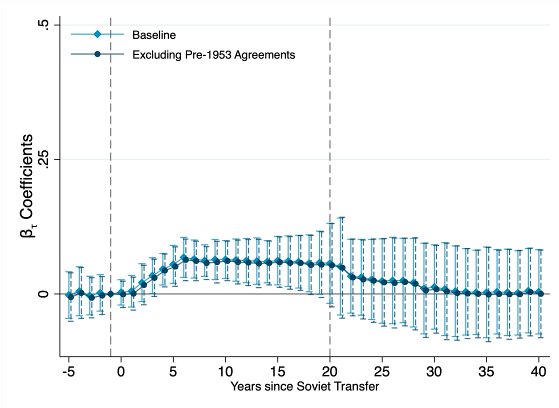
Panel A: Same Indicators



Panel B: Excluding Manchuria

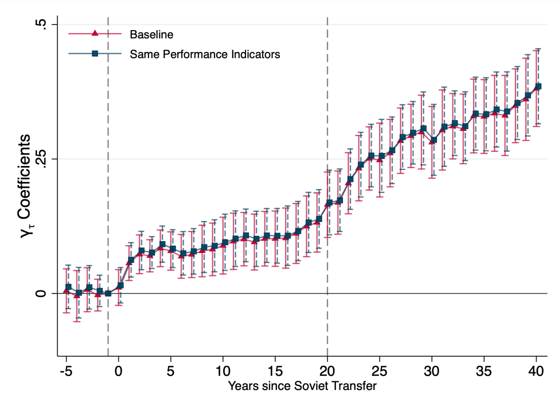


Panel C: Excluding Pre-1953 Agreements

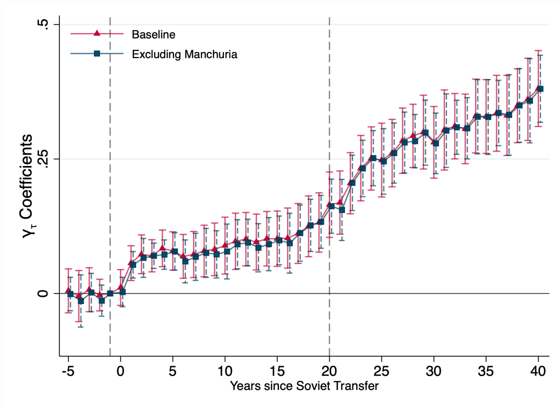


Log TFPQ, Know-How (γ_τ)

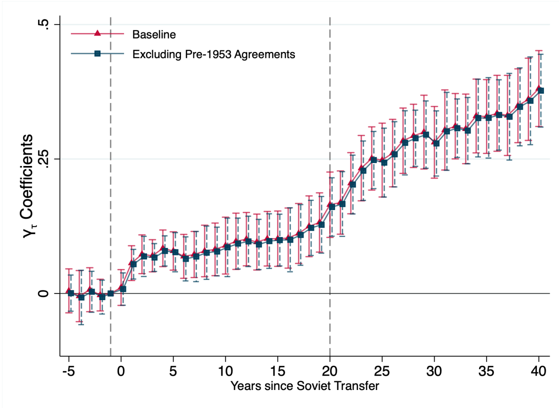
Panel D: Same Indicators



Panel E: Excluding Manchuria



Panel F: Excluding Pre-1953 Agreements

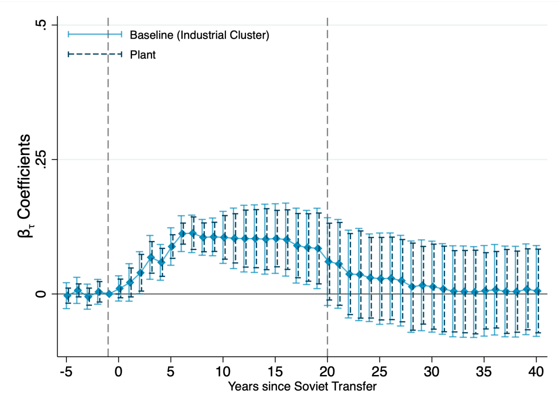


Notes. Annual β_τ coefficients (Panels A—C) and γ_τ coefficients (Panels D–F) from Equation 1 for the 304 steel plants belonging to the 156 Projects, including only plants that maximized the same set of indicators (profits, product quality, cost reduction, total wage bill, development of new products and projects) between 1952 and 1978 (Panels A and D), excluding the entire region of Manchuria (Panels B and E) and excluding agreements signed until 1953 (Panels C and F). The omitted period is $t = -1$, the year before receiving the Soviet transfer. Data are provided at the plant level from the Steel Association Reports from 1949 to 2000. *Log TFPQ* is logged total factory productivity quantity, computed as the residuals of OLS regression of plant logged physical output on logged workers, capital stock and inputs, and plant and year fixed effects. The first vertical line identifies the beginning of the Soviet transfer. The second vertical line identifies China's opening to international trade. Standard errors are block-bootstrapped at the industrial cluster level with 1,000 replications.

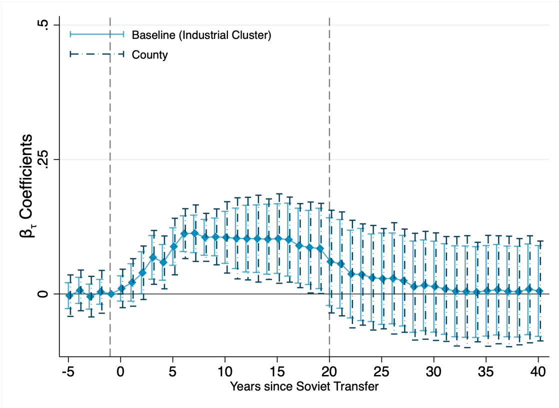
Figure A.7: Robustness Check on the Effects of Soviet Transfers on the 304 Steel Plants' Production – Alternative Clustering Level, Output

Log Output, Physical Capital (β_τ)

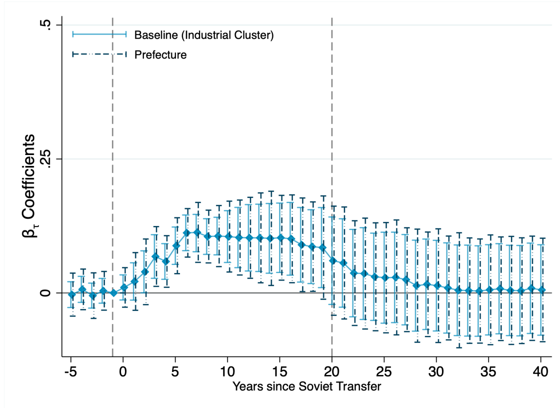
Panel A: Plant Level



Panel B: County Level

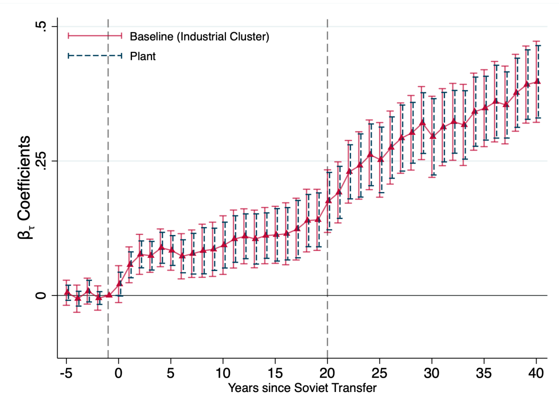


Panel C: Prefecture Level

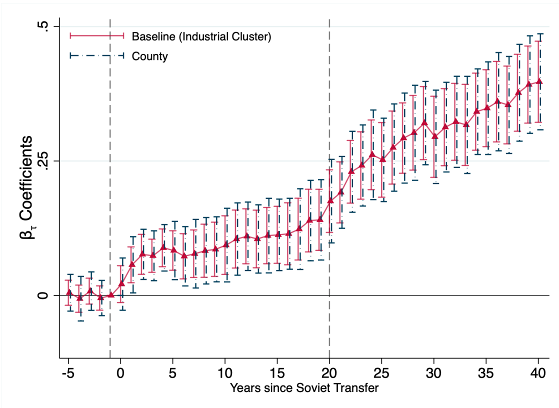


Log Output, Know-How (γ_τ)

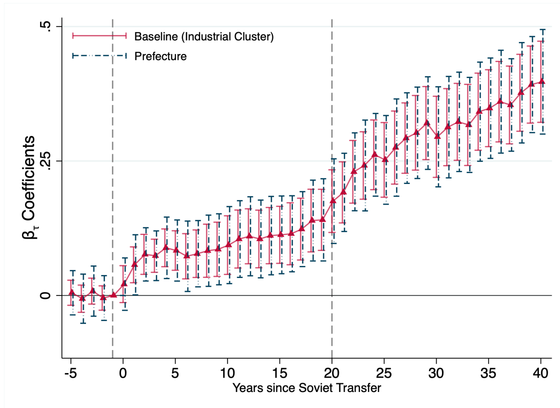
Panel D: Plant Level



Panel E: County Level

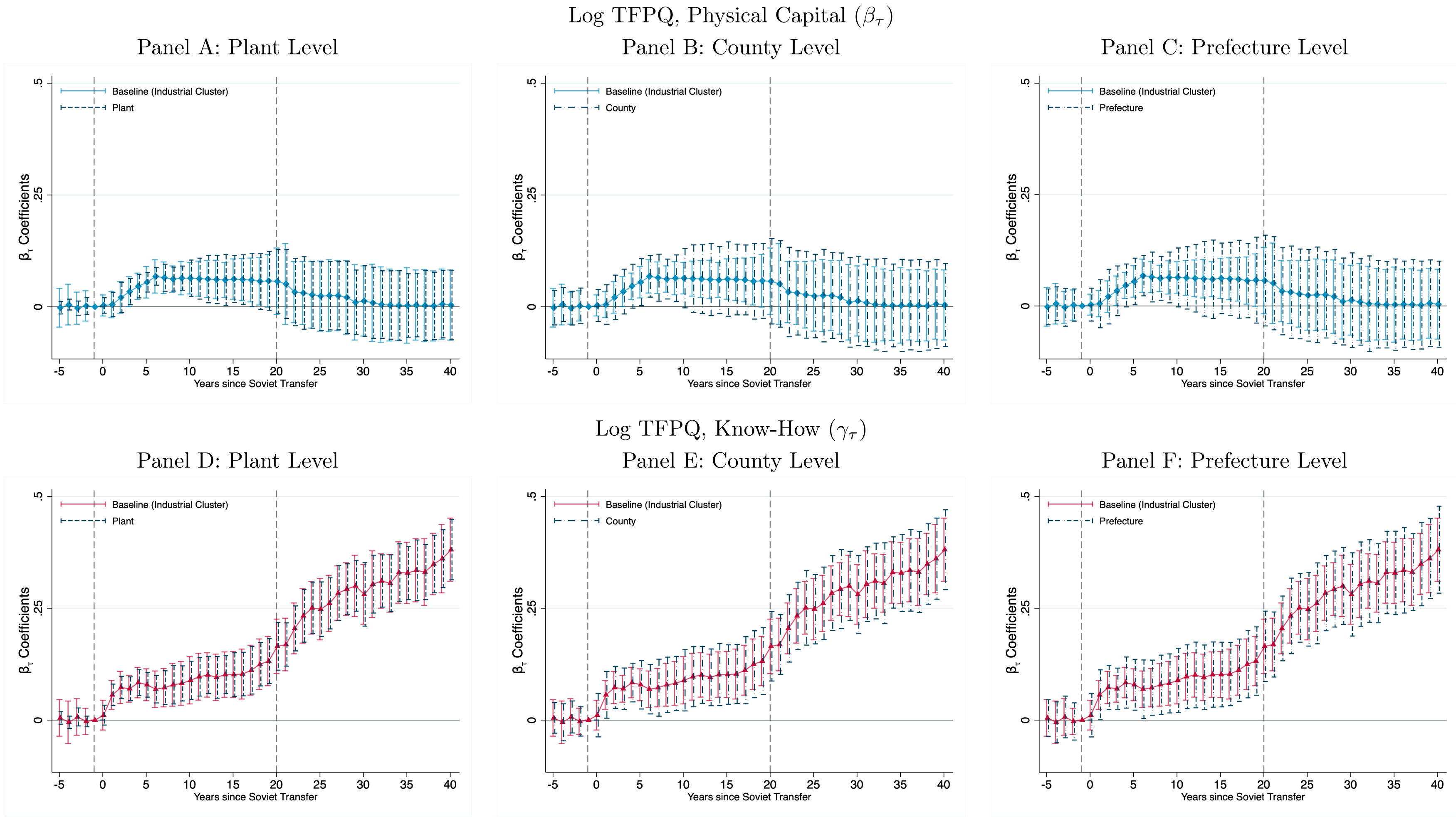


Panel F: Prefecture Level



Notes. Annual β_τ coefficients and γ_τ coefficients from Equation 1 for the 304 steel plants belonging to the 156 Projects, with standard errors clustered at the plant level (Panels A and D), the county level (Panels B and E) and the prefecture level (Panels C and F). Each also panel reports the baseline specification from Equation 1, with standard errors block-bootstrapped at the industrial cluster level with 1,000 replications. The omitted period is $t = -1$, the year before receiving the Soviet transfer. Data are provided at the plant level from the Steel Association Reports from 1949 to 2000. *Log Output* is logged quantities (in million tons) of steel.

Figure A.8: Robustness Check on the Effects of Soviet Transfers on 304 Steel Plants' Productivity – Alternative Clustering Level, TFP



Notes. Annual β_τ coefficients and γ_τ coefficients from Equation 1 for the 304 steel plants belonging to the 156 Projects, with standard errors clustered at the plant level (Panels A and D), the county level (Panels B and E) and the prefecture level (Panels C and F). Each panel also reports the baseline specification from Equation 1, with standard errors block-bootstrapped at the industrial cluster level with 1,000 replications. The omitted period is $t = -1$, the year before receiving the Soviet transfer. Data are provided at the plant level from the Steel Association Reports from 1949 to 2000. *Log TFPQ* is logged total factory productivity quantity, computed as the residuals of OLS regression of plant logged physical output on logged workers, capital stock and inputs, and plant and year fixed effects.

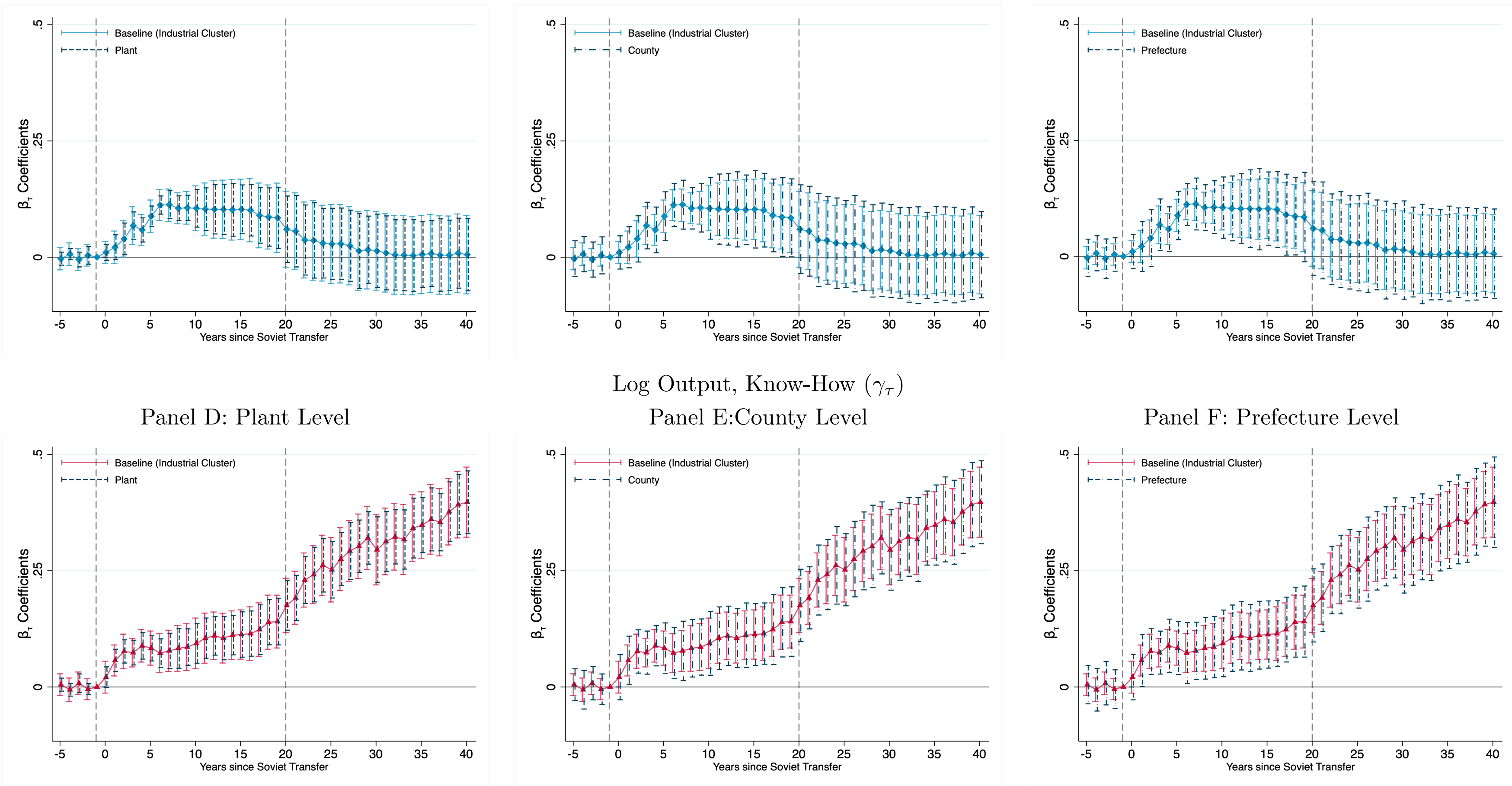
Figure A.9: Robustness Check on the Effects of Soviet Transfers on the 304 Steel Plants' Production – Alternative Clustering Level, Output

Log Output, Physical Capital (β_τ)

Panel A: Plant Level | Panel B: County Level | Panel C: Prefecture Level

Log Output, Know-How (γ_τ)

Panel D: Plant Level | Panel E:County Level | Panel F: Prefecture Level

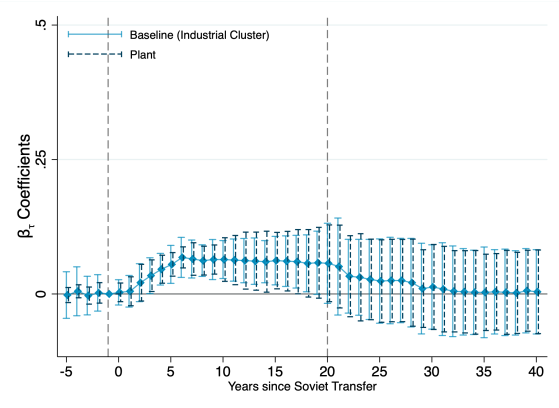


Notes. Annual β_τ coefficients and γ_τ coefficients from Equation 1 for the 304 steel plants belonging to the 156 Projects, with standard errors clustered at the plant level (Panels A and D), the county level (Panels B and E) and the prefecture level (Panels C and F). Each also panel reports the baseline specification from Equation 1, with standard errors block-bootstrapped at the industrial cluster level with 1,000 replications. The omitted period is $t = -1$, the year before receiving the Soviet transfer. Data are provided at the plant level from the Steel Association Reports from 1949 to 2000. *Log Output* is logged quantities (in million tons) of steel.

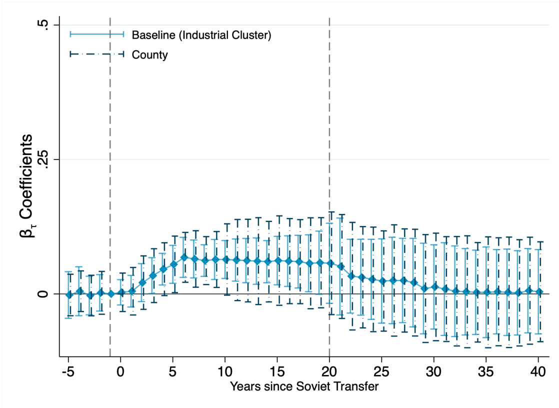
Figure A.10: Robustness Check on the Effects of Soviet Transfers on 304 Steel Plants' Productivity – Alternative Clustering Level, TFP

Log TFPQ, Physical Capital (β_τ)

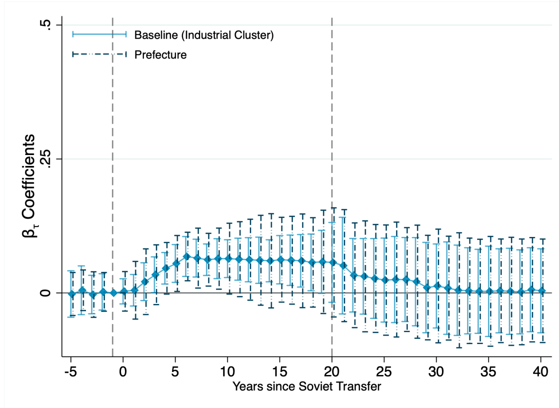
Panel A: Plant Level



Panel B: County Level

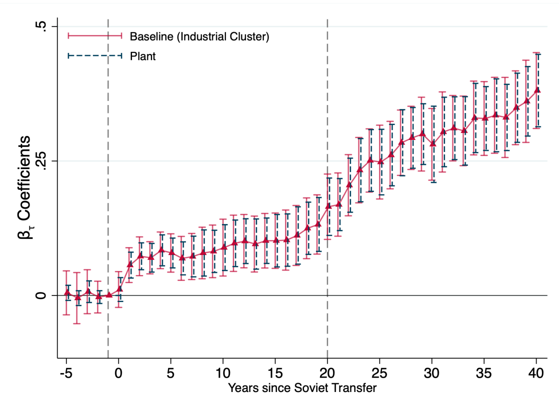


Panel C: Prefecture Level

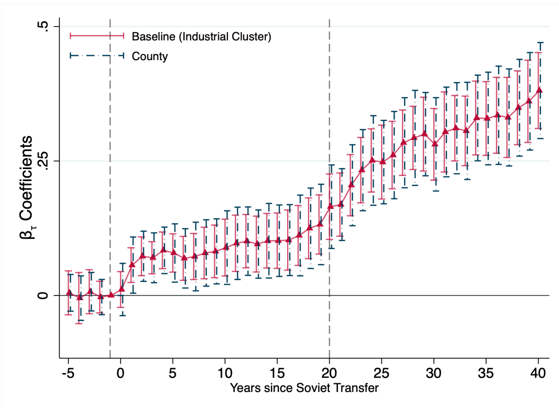


Log TFPQ, Know-How (γ_τ)

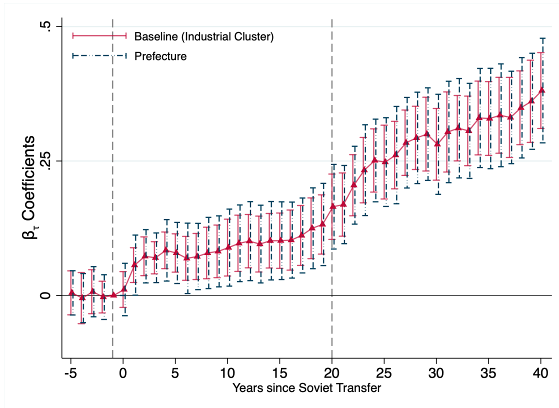
Panel D: Plant Level



Panel E:County Level



Panel F: Prefecture Level



Notes. Annual β_τ coefficients and γ_τ coefficients from Equation 1 for the 304 steel plants belonging to the 156 Projects, with standard errors clustered at the plant level (Panels A and D), the county level (Panels B and E) and the prefecture level (Panels C and F). Each panel also reports the baseline specification from Equation 1, with standard errors block-bootstrapped at the industrial cluster level with 1,000 replications. The omitted period is $t = -1$, the year before receiving the Soviet transfer. Data are provided at the plant level from the Steel Association Reports from 1949 to 2000. *Log TFPQ* is logged total factory productivity quantity, computed as the residuals of OLS regression of plant logged physical output on logged workers, capital stock and inputs, and plant and year fixed effects.

Table A.1: Comparison in Profit Retention and Independent Decision-Making between the 304 Plants and the Other Steel Plants

	Profit Retention (%)			Share Inputs Purchase (%)			Share Outputs Selling (%)		
	304 Plants (1)	Other Plants (2)	p-value (3)	304 Plants (4)	Other Plants (5)	p-value (6)	304 Plants (7)	Other Plants (8)	p-value (9)
Years									
1952-1957	10.12	3.64	0.000	15.32	5.78	0.000	6.78	2.51	0.000
1958-1962	13.53	6.91	0.000	21.40	7.81	0.000	8.92	3.78	0.000
1962-1966	7.56	3.78	0.000	16.71	6.04	0.000	7.55	2.65	0.000
1966-1978	6.71	2.55	0.000	17.29	6.33	0.000	9.23	4.49	0.000
1978-1983	15.88	7.78	0.000	25.78	8.92	0.000	15.69	7.18	0.000
Obs.	304	1,106	1,410	304	1,106	1,410	304	1,106	1,410

Notes. *Profit Retention* is the share of profits plants could retain upon fulfilling key performance indicators; *Share Inputs Purchase* is the share of inputs plants could independently buy; *Share of Output Selling* is the share of outputs plants could independently sell. The year brackets refer to different regulations in profit retention, that correspond correspond broadly to major historical events, such as the First Five-Year Plan (1953-1957), the Great Leap Forward (1958-1962), 1962-1966, the Cultural Revolution (1966-1976), and China's initial opening to international trade (1978-1983). Columns 1-2, 4-5, and 7-8 report the mean of these variables for the 304 steel plants and the other 1,106 steel plants covered by the Steel Association Reports. Columns 3, 6 and 9 report the p-value of testing mean equality between columns 1 and 2, 4 and 5, 7 and 8 respectively.

Table A.2: Distance of the 304 Steel Plants from Borders and Infrastructure

	Mean			Tests for Mean Equality		
	Know-How	Capital	No Transfer	p-values		
				1–2	2–3	All
	(1)	(2)	(3)	(4)	(5)	(6)
Distance Border (km)	231.60	230.44	229.45	0.510	0.616	0.552
	(61.34)	(62.15)	(65.74)			
Distance Province (km)	67.32	68.25	68.18	0.526	0.488	0.582
	(17.89)	(16.58)	(18.01)			
Distance Coast (km)	515.64	517.76	514.28	0.683	0.537	0.562
	(54.39)	(58.71)	(56.32)			
Distance Treated Ports (km)	581.30	582.83	580.93	0.706	0.762	0.609
	(41.32)	(43.98)	(42.72)			
Distance Highway (km)	38.11	37.65	38.42	0.526	0.711	0.654
	(12.43)	(11.57)	(13.42)			
Distance Railway (km)	63.49	62.55	62.31	0.572	0.521	0.522
	(21.19)	(22.40)	(19.87)			
Observations	98	91	115	189	206	304

Notes. Balancing tests on geographical characteristics of the 304 steel plants in the 20 steel industrial clusters. Data are provided at plant level from the Steel Association Reports. Columns 1–3 report mean and standard deviation (in parentheses), separately for 98 plants that received both know-how and physical capital transfers from the Soviet Union (column 1), 91 plants that received only a physical capital transfer from the Soviet Union (column 2), and 115 plants that eventually received no Soviet transfers (column 3). Columns 4 and 5 report the p-value of testing mean equality between columns 1 and 2 and columns 2 and 3, respectively. Column 6 reports the p-value of testing jointly the mean equality of columns 1, 2 and 3. *Distance Border, Province, Coast, Treated Ports, Highway,* and *Railways* are the plant distance in km from the national border, province border, coast, Treated Ports, highway, and railway in 1952.

Table A.3: Differences in the Industrial Clusters Hosting the 304 Steel Plants

	Physical Capital	Know-How	*p*-value
	(1)	(2)	(3)
Approval Year	0.012	-0.008	0.608
	(0.010)	(0.011)	
Start Year	-0.015	0.003	0.767
	(0.018)	(0.006)	
Expected Length	0.003	0.002	0.538
	(0.004)	(0.005)	
Expected Physical Capital Delivery Year	0.005	-0.004	0.426
	(0.007)	(0.006)	
Expected Soviet Experts Arrival Year	-0.007	0.003	0.552
	(0.010)	(0.005)	
Planned Investment (m)	-0.019	0.011	0.861
	(0.023)	(0.015)	
Actual Investment (m)	0.011	-0.005	0.619
	(0.013)	(0.007)	
Expected Equipment Value (m)	0.013	-0.006	0.561
	(0.016)	(0.009)	
Number of Workers (k)	-0.009	0.010	0.667
	(0.010)	(0.012)	
Number of Plants	-0.008	0.005	0.522
	(0.010)	(0.007)	
Observations	304	304	304

Notes. Coefficients from regressing project characteristics each plant belonged to on an indicator for plants that received the Soviet physical capital transfer and an indicator for plants that also received the Soviet know-how transfer. Data are provided at the project level from the National Archives Administration of China. Column 3 reports the *p*-value of testing jointly equality of the coefficients to zero. *Approval* and *Start Year* are the approval and start year of each project; *Expected Length* is the expected years to complete project construction; *Expected Physical Capital Delivery Year* is the project average expected year of Soviet physical capital delivery; *Expected Soviet Experts Arrival Year* is the project average expected year of Soviet experts arrival; *Planned*, *Actual Investment,* and *Expected Equipment Value* are, respectively, the investment planned at the approval time, the investment eventually realized, and the value of the equipment a project was expecting to receive from Soviet Union, measured in 2020 US$ millions, reevaluated at 1 RMB in 1955=3.9605 USD in 2020; *Number of Workers* is number of employees per project, in thousands; *Number of Plants* is the number of plants per project. Standard errors are block-bootstrapped at the industrial cluster level with 1,000 replications. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table A.4: Differences in Counties Hosting the 304 Steel Plants in 1953

	Physical Capital	Know-How	*p*-value
	(1)	(2)	(3)
Log Total Firms	0.018	-0.013	0.556
	(0.013)	(0.011)	
Log Population	-0.015	0.012	0.743
	(0.016)	(0.013)	
Employment Share	0.006	0.003	0.691
	(0.014)	(0.006)	
Log Gvt. Funds	0.004	0.007	0.701
	(0.011)	(0.012)	
Observations	304	304	304

Notes. Coefficient from regressing characteristics of the county each plant belonged to on an indicator for plants that received the Soviet physical capital transfer and an indicator for plants that also received the Soviet know-how transfer. Data are provided at county level from the People's Republic of China Population Digest in 1953. Column 3 reports the *p*-value of testing jointly equality of the coefficients to zero. *Log Total Firms* is logged total number of firms per county; *Log Population* is logged total population of a county; *Employment Share* is the fraction of employed population over total population; *Log Gvt. Funds* is logged free transfers that the government granted to a county, measured in 2020 US$ millions, reevaluated at 1 RMB in 1955=3.9605 USD in 2020. Standard errors are clustered at the county level. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table A.5: Effects of Soviet Transfers on the 304 Steel Plants' Production and Productivity

	Log Output	Log TFPQ		Log Output	Log TFPQ
	(1)	(2)		(3)	(4)
Phys. Cap. * Year -5	-0.003	-0.002	Phys. Cap. * Year 19	0.085**	0.058*
	(0.012)	(0.022)		(0.038)	(0.030)
Phys. Cap. * Year -4	0.007	0.005	Phys. Cap. * Year 20	0.060	0.057
	(0.013)	(0.023)		(0.042)	(0.038)
Phys. Cap. * Year -3	-0.005	-0.003	Phys. Cap. * Year 21	0.056	0.051
	(0.011)	(0.018)		(0.041)	(0.046)
Phys. Cap. * Year -2	0.004	0.002	Phys. Cap. * Year 22	0.037	0.033
	(0.012)	(0.017)		(0.042)	(0.035)
Phys. Cap. * Year 0	0.010	0.003	Phys. Cap. * Year 23	0.036	0.031
	(0.011)	(0.012)		(0.044)	(0.036)
Phys. Cap. * Year 1	0.021	0.005	Phys. Cap. * Year 24	0.030	0.027
	(0.018)	(0.015)		(0.042)	(0.038)
Phys. Cap. * Year 2	0.039*	0.021	Phys. Cap. * Year 25	0.028	0.024
	(0.020)	(0.018)		(0.043)	(0.040)
Phys. Cap. * Year 3	0.068***	0.034**	Phys. Cap. * Year 26	0.029	0.025
	(0.021)	(0.017)		(0.043)	(0.041)
Phys. Cap. * Year 4	0.059***	0.046***	Phys. Cap. * Year 27	0.025	0.025
	(0.017)	(0.015)		(0.040)	(0.040)
Phys. Cap. * Year 5	0.088***	0.055***	Phys. Cap. * Year 28	0.014	0.021
	(0.018)	(0.018)		(0.041)	(0.042)
Phys. Cap. * Year 6	0.112***	0.068***	Phys. Cap. * Year 29	0.016	0.010
	(0.017)	(0.019)		(0.042)	(0.043)
Phys. Cap. * Year 7	0.113***	0.065***	Phys. Cap. * Year 30	0.014	0.013
	(0.018)	(0.018)		(0.041)	(0.040)
Phys. Cap. * Year 8	0.105***	0.062***	Phys. Cap. * Year 31	0.009	0.009
	(0.017)	(0.015)		(0.040)	(0.044)
Phys. Cap. * Year 9	0.106***	0.064***	Phys. Cap. * Year 32	0.005	0.005
	(0.016)	(0.019)		(0.041)	(0.043)
Phys. Cap. * Year 10	0.105***	0.064***	Phys. Cap. * Year 33	0.004	0.004
	(0.025)	(0.018)		(0.042)	(0.041)
Phys. Cap. * Year 11	0.103***	0.063***	Phys. Cap. * Year 34	0.004	0.003
	(0.029)	(0.020)		(0.041)	(0.040)
Phys. Cap. * Year 12	0.102***	0.062***	Phys. Cap. * Year 35	0.006	0.003
	(0.032)	(0.021)		(0.040)	(0.043)
Phys. Cap. * Year 13	0.103***	0.061***	Phys. Cap. * Year 36	0.008	0.004
	(0.033)	(0.022)		(0.042)	(0.040)
Phys. Cap. * Year 14	0.103***	0.060***	Phys. Cap. * Year 37	0.005	0.003
	(0.032)	(0.020)		(0.040)	(0.041)
Phys. Cap. * Year 15	0.103***	0.062***	Phys. Cap. * Year 38	0.004	0.002
	(0.033)	(0.023)		(0.041)	(0.040)
Phys. Cap. * Year 16	0.101***	0.061***	Phys. Cap. * Year 39	0.009	0.006
	(0.025)	(0.024)		(0.041)	(0.040)
Phys. Cap. * Year 17	0.090**	0.060**	Phys. Cap. * Year 40	0.006	0.004
	(0.036)	(0.025)		(0.040)	(0.040)
Phys. Cap. * Year 18	0.086**	0.057**			
	(0.035)	(0.027)			
Observations	13,984	13,984		13,984	13,984

(continues)

Table A.5: Effects of Soviet Transfers on the 304 Steel Plants' Production and Productivity – Continued

	Log Output	Log TFPQ		Log Output	Log TFPQ
	(1)	(2)		(3)	(4)
Know-How * Year -5	0.005	0.005	Know-How * Year 19	0.141***	0.132***
	(0.012)	(0.021)		(0.029)	(0.028)
Know-How * Year -4	-0.006	-0.005	Know-How * Year 20	0.175***	0.165***
	(0.013)	(0.024)		(0.030)	(0.031)
Know-How * Year -3	0.008	0.007	Know-How * Year 21	0.192***	0.169***
	(0.012)	(0.021)		(0.029)	(0.030)
Know-How * Year -2	-0.004	-0.003	Know-How * Year 22	0.230***	0.205***
	(0.012)	(0.015)		(0.030)	(0.029)
Know-How * Year 0	0.021	0.011	Know-How * Year 23	0.242***	0.233***
	(0.018)	(0.017)		(0.032)	(0.031)
Know-How * Year 1	0.057***	0.056***	Know-How * Year 24	0.262***	0.251***
	(0.017)	(0.016)		(0.033)	(0.030)
Know-How * Year 2	0.076***	0.073***	Know-How * Year 25	0.251***	0.248***
	(0.019)	(0.018)		(0.035)	(0.035)
Know-How * Year 3	0.074***	0.070***	Know-How * Year 26	0.275***	0.261***
	(0.016)	(0.015)		(0.035)	(0.032)
Know-How * Year 4	0.089***	0.079***	Know-How * Year 27	0.293***	0.284***
	(0.018)	(0.017)		(0.033)	(0.031)
Know-How * Year 5	0.084***	0.078***	Know-How * Year 28	0.302***	0.293***
	(0.019)	(0.018)		(0.035)	(0.030)
Know-How * Year 6	0.073***	0.069***	Know-How * Year 29	0.321***	0.300***
	(0.021)	(0.021)		(0.036)	(0.035)
Know-How * Year 7	0.078***	0.072***	Know-How * Year 30	0.295***	0.281***
	(0.023)	(0.022)		(0.038)	(0.034)
Know-How * Year 8	0.083***	0.079***	Know-How * Year 31	0.313***	0.304***
	(0.025)	(0.024)		(0.037)	(0.038)
Know-How * Year 9	0.086***	0.082***	Know-How * Year 32	0.323***	0.311***
	(0.026)	(0.025)		(0.036)	(0.031)
Know-How * Year 10	0.094***	0.089***	Know-How * Year 33	0.317***	0.306***
	(0.028)	(0.027)		(0.038)	(0.033)
Know-How * Year 11	0.105***	0.097***	Know-How * Year 34	0.342***	0.330***
	(0.028)	(0.027)		(0.037)	(0.035)
Know-How * Year 12	0.110***	0.101***	Know-How * Year 35	0.348***	0.329***
	(0.026)	(0.025)		(0.036)	(0.035)
Know-How * Year 13	0.105***	0.096***	Know-How * Year 36	0.360***	0.335***
	(0.027)	(0.027)		(0.038)	(0.036)
Know-How * Year 14	0.111***	0.102***	Know-How * Year 37	0.354***	0.331***
	(0.027)	(0.026)		(0.037)	(0.038)
Know-How * Year 15	0.113***	0.102***	Know-How * Year 38	0.377***	0.349***
	(0.027)	(0.026)		(0.036)	(0.035)
Know-How * Year 16	0.115***	0.103***	Know-How * Year 39	0.392***	0.361***
	(0.029)	(0.029)		(0.037)	(0.039)
Know-How * Year 17	0.123***	0.112***	Know-How * Year 40	0.397***	0.381***
	(0.029)	(0.028)		(0.038)	(0.036)
Know-How * Year 18	0.139***	0.125***			
	(0.030)	(0.029)			
Observations	13,984	13,984		13,984	13,984

Notes. Annual β_τ and γ_τ coefficients from Equation 1 for the 304 steel plants belonging to the 156 Projects. *Physical Capital* is an indicator for plants that received Soviet physical capital. *Know-How* is an indicator for plants that also received Soviet know-how. Data are provided at the plant level from the Steel Association Reports from 1949 to 2000. *Log Output* is logged quantities (in million tons) of steel. *Log TFPQ* is logged total factory productivity quantity, computed as the residuals of OLS regression of plant logged physical output on logged workers, capital stock and inputs, and plant and year fixed effects. Standard errors are block-bootstrapped at the industrial cluster level with 1,000 replications *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table A.6: Effects of the Soviet Intervention on Number of Workers and Inputs in the 304 Steel Plants

	Log Workers (1)	Log Coke (2)	Log Iron (3)	Log Capital (4)
Physical Capital * Year 1	-0.009	0.005	-0.008	0.151***
	(0.008)	(0.007)	(0.012)	(0.039)
Physical Capital * Year 5	0.005	0.004	-0.002	0.152***
	(0.006)	(0.006)	(0.005)	(0.036)
Physical Capital * Year 10	-0.003	0.003	0.004	0.109***
	(0.004)	(0.007)	(0.006)	(0.028)
Physical Capital * Year 20	-0.008	0.006	-0.005	0.033**
	(0.010)	(0.005)	(0.009)	(0.016)
Physical Capital * Year 30	0.004	0.007	0.009	0.021
	(0.007)	(0.007)	(0.011)	(0.018)
Physical Capital * Year 40	0.005	-0.005	0.003	0.005
	(0.007)	(0.006)	(0.004)	(0.007)
Know-How * Year 1	-0.006	-0.003	-0.002	-0.002
	(0.008)	(0.005)	(0.003)	(0.010)
Know-How * Year 5	0.002	-0.002	-0.003	0.005
	(0.003)	(0.004)	(0.007)	(0.006)
Know-How * Year 10	-0.001	0.004	-0.005	0.020**
	(0.003)	(0.006)	(0.008)	(0.010)
Know-How * Year 20	-0.008	-0.002	0.007	0.075***
	(0.011)	(0.011)	(0.012)	(0.025)
Know-How * Year 30	0.005	0.003	-0.002	0.092***
	(0.007)	(0.004)	(0.003)	(0.028)
Know-How * Year 40	0.008	0.006	-0.004	0.112***
	(0.010)	(0.009)	(0.005)	(0.031)
Plant FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Observations	13,984	13,984	13,984	13,984

Notes. Selected annual β_τ and γ_τ coefficients estimated from Equation 1 for the 304 steel plants belonging to the 156 Projects. *Physical Capital* is an indicator for plants that received Soviet physical capital. *Know-How* is an indicator for plants that also received Soviet know-how. Data are provided at the plant level from the Steel Association Reports from 1949 to 2000. *Log Workers* is logged thousands of employees per plant; *Log Coke* and *Log Iron* are logged quantities (in million tons) of coke and iron. *Log Capital* is logged capital stock, calculated using the perpetual inventory method (PIM, see Table B.1). Standard errors are block-bootstrapped at the industrial cluster level with 1,000 replications. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table A.7: County-Level Government Investments

	Log Investment			Log Infrastructure
	All	Steel Industries	Other Industries	
	(1)	(2)	(3)	(4)
Physical Capital * Post	0.004	-0.011	0.015	0.015
	(0.005)	(0.044)	(0.028)	(0.038)
Know-How * Post	-0.006	0.013	-0.007	-0.009
	(0.010)	(0.003)	(0.010)	(0.020)
Year FE	Yes	Yes	Yes	Yes
Observations	3,240	3,240	3,240	3,240

Notes. *Physical Capital* is an indicator for counties where plants that received the Soviet physical capital transfer were located. *Know-How* is an indicator for counties where plants that also received the Soviet know-how transfer were located. *Log Investment* is logged government investment in all industries, in steel industries, and in other industries. *Log Infrastructure* is logged government investment in infrastructure. Data are provided at the county level from the Statistical Yearbooks between 1949 and 2008. *Post* is an indicator for years after 1952, when the Sino-Soviet Alliance started. Standard errors are clustered at the county level. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table A.8: Correlation Between Plants That Received No Soviet Transfers and Other Steel Plants

	Log Output	Log TFPQ	Log Workers	Prob. Ox.	Prob. Cast.
	(1)	(2)	(3)	(4)	(5)
Sino-Soviet Plants * Year 1	0.022	0.011	0.010	0.011	0.012
	(0.015)	(0.010)	(0.008)	(0.010)	(0.012)
Sino-Soviet Plants * Year 5	0.029***	0.012***	0.015***	0.007	0.009
	(0.010)	(0.004)	(0.005)	(0.009)	(0.011)
Sino-Soviet Plants * Year 10	0.033***	0.014***	0.020***	0.009	0.006
	(0.011)	(0.005)	(0.006)	(0.011)	(0.008)
Sino-Soviet Plants * Year 20	0.035***	0.015***	0.022***	0.005	0.012
	(0.007)	(0.005)	(0.007)	(0.008)	(0.015)
Sino-Soviet Plants * Year 30	0.039***	0.014***	0.023***	0.006	0.008
	(0.010)	(0.004)	(0.006)	(0.007)	(0.010)
Sino-Soviet Plants * Year 40	0.035***	0.010***	0.020***	0.006	0.004
	(0.007)	(0.003)	(0.005)	(0.008)	(0.007)
Plant FE	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes
Observations	36,220	36,220	36,220	36,220	36,220

Notes. The sample includes plants that were part of the 156 Projects but eventually received no transfers from Soviet Union and steel plants built by the Chinese government under other industrial projects started after the Sino-Soviet Split. *Sino-Soviet Plants* is an indicator for plants built as part of the 156 Projects. *Log Output* is logged quantities (in tons) of steel. *Log TFPQ* is logged total factory productivity quantity, computed as the residuals of OLS regression of plant logged physical output on logged workers, capital stock and inputs, and plant and year fixed effects. *Log Workers* is logged number of workers. *Prob. Ox* and *Prob. Cast.* are indicators for plants using the basic oxygen converters and the continuous casting furnaces. Data are provided at the plant level from the Steel Association Reports between 1949 and 2000. Standard errors are block-bootstrapped at the industrial cluster level with 1,000 replications. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table A.9: Political Connections

	Secretaries (1–4)				Mayors (5–6)			
	Rotations	Term length	Education	Experience	Rotations	Term length	Education	Experience
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Physical Capital * Year 1	0.006	0.002	-0.004	-0.006	-0.003	-0.004	-0.008	-0.007
	(0.008)	(0.004)	(0.008)	(0.008)	(0.005)	(0.006)	(0.009)	(0.011)
Physical Capital * Year 5	-0.004	0.001	-0.001	-0.004	-0.002	0.001	-0.010	-0.002
	(0.005)	(0.003)	(0.003)	(0.004)	(0.003)	(0.003)	(0.011)	(0.006)
Physical Capital * Year 10	-0.006	-0.004	-0.005	-0.005	-0.005	0.002	-0.006	-0.004
	(0.010)	(0.005)	(0.008)	(0.007)	(0.007)	(0.004)	(0.007)	(0.005)
Physical Capital * Year 20	0.001	-0.002	-0.004	0.001	-0.003	0.003	-0.008	0.003
	(0.005)	(0.005)	(0.006)	(0.005)	(0.006)	(0.005)	(0.011)	(0.008)
Physical Capital * Year 30	-0.001	-0.002	-0.008	0.003	-0.005	0.004	-0.010	0.001
	(0.004)	(0.003)	(0.012)	(0.006)	(0.007)	(0.006)	(0.010)	(0.003)
Physical Capital * Year 40	0.002	0.004	-0.005	0.003	-0.002	-0.001	-0.008	-0.005
	(0.007)	(0.006)	(0.006)	(0.003)	(0.006)	(0.004)	(0.011)	(0.010)
Know-How * Year 1	-0.005	0.001	-0.003	0.002	0.001	-0.003	-0.009	-0.004
	(0.005)	(0.003)	(0.005)	(0.004)	(0.005)	(0.005)	(0.010)	(0.006)
Know-How * Year 5	-0.001	-0.002	-0.002	-0.003	0.003	0.002	-0.008	-0.010
	(0.006)	(0.002)	(0.006)	(0.005)	(0.004)	(0.004)	(0.011)	(0.011)
Know-How * Year 10	0.003	0.003	-0.002	0.003	-0.005	0.001	-0.011	-0.007
	(0.005)	(0.004)	(0.003)	(0.005)	(0.009)	(0.002)	(0.014)	(0.012)
Know-How * Year 20	0.001	0.001	-0.002	0.004	0.003	0.003	-0.009	-0.007
	(0.003)	(0.005)	(0.002)	(0.006)	(0.003)	(0.005)	(0.008)	(0.010)
Know-How * Year 30	-0.004	-0.002	-0.005	0.002	-0.002	0.003	-0.007	-0.005
	(0.008)	(0.004)	(0.006)	(0.006)	(0.004)	(0.004)	(0.009)	(0.006)
Know-How * Year 40	-0.002	0.003	-0.007	-0.007	0.004	0.001	-0.011	-0.008
	(0.007)	(0.007)	(0.008)	(0.010)	(0.007)	(0.003)	(0.013)	(0.010)
Plant FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	13,984	13,984	13,984	13,984	13,984	13,984	13,984	13,984

Notes. Selected annual β_τ and γ_τ coefficients from Equation 1 for the 304 steel plants belonging to the 156 Projects. *Physical Capital* is an indicator for plants that received Soviet physical capital. *Know-How* is an indicator for plants that also received Soviet know-how. *Rotations* is logged number of rotations at the prefecture level. *Term Length* is logged average length of politicians' terms before being rotated. *Education* and *Experience* are, respectively, logged number of years of education and of experience in previous appointments. Data are provided at the prefecture-city level from the *People's Daily Online* database between 1949 and 2013. Standard errors are block-bootstrapped at the industrial cluster level with 1,000 replications. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table A.10: Role of Major Concurrent Historical Events

	Great Famine Deaths	Investments During TF Years
	(1)	(2)
Physical Capital	-0.019	-0.011
	(0.025)	(0.044)
Know-How	-0.022	0.009
	(0.023)	(0.003)
Observations	81	81

Notes. *Physical Capital* is an indicator for counties where plants that received the Soviet physical capital transfer were located. *Know-How* is an indicator for counties where plants that also received the Soviet know-how transfer were located. *Great Famine Deaths* is the estimated number of deaths caused by the Great Famine (1958–1961), estimated though cohort loss from the 2000 census. *Investments During TF Years* is the county-level investments during the years of the Third Front Movements construction (1964–1980), collected from Chen (2014). Robust standard errors are in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table A.11: Effects of Soviet Transfers in All 156 Projects, 1985 and 1998–2013

	Log Value Added		Log TFPQ		Log Employees	
	1985	1998-2013	1985	1998-2013	1985	1998-2013
	(1)	(2)	(3)	(4)	(5)	(6)
Physical Capital	0.047	0.008	0.038	0.006	0.006	0.008
	(0.043)	(0.010)	(0.023)	(0.011)	(0.008)	(0.016)
Know-How	0.347***	0.419***	0.325***	0.394***	0.003	0.009
	(0.053)	(0.069)	(0.042)	(0.055)	(0.005)	(0.010)
Sector-Province FE	Yes	No	Yes	No	Yes	No
Sector-Province-Year FE	No	Yes	No	Yes	No	Yes
Observations	139	2,085	139	2,085	139	2,085

Notes. β and γ coefficients estimated from Equation 2. *Physical Capital* is an indicator for plants that received Soviet physical capital. *Know-How* is an indicator for plants that also received Soviet know-how. Data are provided at the plant level from the Second Annual Survey in 1985 (columns 1, 3, and 5) and from the China Industrial Plants database between 1998 and 2013 (columns 2, 4, and 6). *Log Value Added* is measured in 2020 US$ millions, reevaluated at 1 RMB in 1955=3.9605 USD in 2020; *Log TFPQ* is logged total factory productivity quantity, computed as the residuals of OLS regression of plant logged physical output on logged workers, capital stock and inputs, and plant and year fixed effects and product type indicators; *Log Employees* is logged thousands of employees per plant. Standard errors are block-bootstrapped at the industrial cluster level with 1,000 replications. ***$p<0.01$, **$p<0.05$, *$p<0.1$.

Table A.12: Spillover Effects, 1998–2013

	Log Value Added		Log TFPR		Log Exports	
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Related Firms						
Physical Capital	0.013	0.010	-0.005	-0.003	-0.012	-0.010
	(0.025)	(0.020)	(0.018)	(0.009)	(0.015)	(0.012)
Know-How	0.011	-0.009	0.003	0.004	0.008	-0.015
	(0.020)	(0.012)	(0.008)	(0.004)	(0.007)	(0.018)
Physical Capital * Private	0.022	0.020	0.025	0.021	0.008	0.004
	(0.031)	(0.029)	(0.028)	(0.0283)	(0.013)	(0.003)
Know-How * Private	0.215***	0.206***	0.209***	0.200***	0.134***	0.124***
	(0.031)	(0.044)	(0.045)	(0.041)	(0.033)	(0.028)
Physical Capital * Private * New	0.015	0.011	0.019	0.021	0.023	0.016
	(0.018)	(0.017)	(0.026)	(0.024)	(0.022)	(0.021)
Know-How * Private * New	0.033***	0.030***	0.031***	0.025***	0.050***	0.044***
	(0.011)	(0.009)	(0.006)	(0.005)	(0.012)	(0.010)
Sector-Province-Year FE	Yes	No	Yes	No	Yes	No
Sector-Prefecture-Year FE	No	Yes	No	Yes	No	Yes
Observations	160,123	160,123	160,123	160,123	160,123	160,123
Panel B: Not Related Firms						
Physical Capital	0.012	-0.004	-0.003	-0.015	-0.005	-0.004
	(0.015)	(0.011)	(0.018)	(0.016)	(0.012)	(0.009)
Know-How	0.004	-0.003	0.004	0.003	0.003	-0.002
	(0.006)	(0.006)	(0.008)	(0.007)	(0.005)	(0.004)
Physical Capital * Private	0.005	-0.004	-0.004	0.008	-0.005	-0.003
	(0.005)	(0.012)	(0.007)	(0.011)	(0.008)	(0.005)
Know-How * Private	0.002	0.005	0.003	-0.004	0.001	0.007
	(0.006)	(0.010)	(0.004)	(0.005)	(0.002)	(0.008)
Physical Capital * Private * New	0.002	0.005	-0.002	-0.003	0.003	0.001
	(0.006)	(0.008)	(0.005)	(0.009)	(0.005)	(0.003)
Know-How * Private * New	-0.008	-0.003	0.005	-0.006	0.006	0.003
	(0.010)	(0.004)	(0.005)	(0.009)	(0.009)	(0.038)
Sector-Province-Year FE	Yes	No	Yes	No	Yes	No
Sector-Prefecture-Year FE	No	Yes	No	Yes	No	Yes
Observations	124,762	124,762	124,762	124,762	124,762	124,762

Notes. *Physical Capital* is an indicator for firms related to plants that received Soviet physical capital. *Know-How* is an indicator for firms related to plants that also received Soviet know-how. *Private* is an indicator for non-state-owned firms. *New* is an indicator for firms that entered the market between 1998 and 2013. *Log Value Added* and *Exports* are measured in 2020 US$ millions, reevaluated at 1 RMB in 1955=3.9605 USD in 2020*;* *Log TFPR* is logged total factor productivity revenue, computed as the residuals of OLS regression of plant logged value added on logged workers, capital stock and inputs, and plant and year fixed effects. Data are provided at the firm level from the China Industrial Plants database between 1998 and 2013. Standard errors are block-bootstrapped at the industrial cluster level with 1,000 replications. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table A.13: County-Level Output Production by Privatized Plants, 1998–2013

	Share Privately Owned Firms			Share Private Output		
	All	Related	Unrelated	All	Related	Unrelated
	(1)	(2)	(3)	(4)	(5)	(6)
Physical Capital	0.015	0.012	0.018	0.016	0.012	0.004
	(0.021)	(0.027)	(0.009)	(0.014)	(0.018)	(0.006)
Know-How	0.166***	0.161***	0.005	0.252***	0.242***	0.011
	(0.020)	(0.015)	(0.005)	(0.044)	(0.049)	(0.013)
Prefecture-Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,296	1,296	1,296	1,296	1,296	1,296

Notes. *Physical Capital* is an indicator for counties where plants that received Soviet physical capital were located. *Know-How* is an indicator for counties where plants that also received Soviet know-how were located. *Share Privately Owned Firms* is the per county share of firms that became private between 1998 and 2013. *Share Private Output* is the per county share of output produced by privately owned firms. *Related* includes firms in the same, upstream, or downstream industry of the 304 steel plants; *Unrelated* includes firms not in the same, upstream, or downstream industry of the 304 plants. Data are provided at the county level from the Statistical Yearbooks from 1998 to 2013. Standard errors are clustered at the county level. ***p<0.01, **p<0.05, *p<0.1.

Table A.14: Channels of Persistence of the Soviet Technology Transfer

	STEM Universities	Technical Schools	College Graduates	High-Skilled Workers
	(1)	(2)	(3)	(4)
Physical Capital	0.009	-0.010	0.015	0.007
	(0.013)	(0.012)	(0.021)	(0.011)
Know-How	0.104***	0.156***	0.133***	0.162***
	(0.034)	(0.041)	(0.030)	(0.035)
Prefecture-Year FE	Yes	Yes	Yes	Yes
Observations	1,296	1,296	1,296	1,296

Notes. *Physical Capital* is an indicator for counties where plants that received Soviet physical capital were located. *Know-How* is an indicator for counties where plants that also received Soviet know-how were located. *STEM Universities* is the share of universities per county offering a STEM degree. *Technical schools* is the number of technical schools per inhabitant county. *College Graduates* and *High-Skilled Workers* are the logged number of college graduates and high-skilled technicians per capita per county. Data are provided at the county level from the China Education Yearbooks from 1998 to 2013. Standard errors are clustered at the county-level. ***p<0.01, **p<0.05, *p<0.1.

Appendix B: Data Appendix

In this appendix, we provide a detailed description of our primary data sources and how we assembled the dataset. In Table B.1 we report the definition of the key variables used in our analysis.

B1. The 156 Projects

The first step of our data collection aimed to retrieve the list of the 156 Projects approved under the Sino-Soviet Alliance. To do so, we relied on the official signed agreements between the Soviet Union and China signed between 1950 and 1957, collected from the National Archives Administration of China, whose access is restricted and was occasionally granted for this paper. For each project, we recorded information on name, location, industry, total investments, capacity, number of workers, and name and number of plants. For each plant, we retrieved records indicating whether the Soviet transfers were eventually received. The National Archives also contains agreements for additional 105 projects to be implemented during the Second Five Year Plan (1958-1962). 26 of them were canceled before the Sino-Soviet Split and 73 due to the Sino-Soviet Split. Notably, 12 of these additional 105 projects were in the steel industry. Approved between 1958 (3) and 1959 (9), they were all canceled in 1960 due to the Split. These projects are not included in our analysis.

To make sure we collected the official agreements for all the approved projects, we also gathered data from the *Selected Archival Materials on the PRC's Economy*, a collection of documents on the PRC's economic development between 1949 and 1957, which includes detailed summaries of the 156 Projects. A comparison of these summaries with the official agreements reveals that the former contain no additional projects or information beyond that found in the latter. We also compared our digitized list of projects against two historical studies in Chinese on the Sino-Soviet technology transfer program that independently collected the 156 technology transfer projects from the National Archives Administration of China (Zhang et al., 2003; Dong and Wu, 2004a). Specifically, we checked for any differences or additional information on project name, start and completion years, and location, as well as project industry, size, and capacity. Neither Zhang et al. (2003) nor Dong and Wu (2004a) provide any additional information than our data.

We next collected data on both the accidents suffered by the Soviet physical capital planned to be delivered to Chinese steel plants and the delays experienced by Soviet experts traveling to China from the Russian State Archive of the Economy (Rossiiskii Gosudarstvennyi Arkhiv Ekonomiki, Moscow). In an attempt to closely monitor physical capital and experts for China, the Soviet Union kept precise records on the reasons for the accidents and the delays and information on the Chinese plants to which physical capital was planned to be delivered and that Soviet experts were supposed to visit. We then match accidents and delays on the Soviet side to the 304 steel plants. Physical capital may have suffered the following accidents: fires and floods in Soviet factories that completely destroyed machinery and equipment destined for Chinese plants, and train derailments during the transportation to China that caused similar damages. Given that the average time to rebuild steel machinery and equipment spanned from two to three years, such accidents represented a major obstacle to completing the 156 Projects (Filatov, 1980).

Moreover, only one railway connected the Soviet Union to China in the 1950s, making it impossible to use alternative routes after trains derailed, which further delayed machinery delivery and experts' visits. There were 115 accidents: 48 were fires (41.7%), 30 were floods (26.1%), and 37 were train derailments (32.8%).

Soviet experts' trips to China could be delayed for three reasons. First, if machinery they had to learn to use got destroyed, they needed to wait for it to be rebuilt before learning how to use it. Second, these experts could have been retained to deal with unexpected breakdowns or machinery repairs in their own factories. Third, translators assigned to their trips often needed more time to learn Chinese. Of the 109 planned Soviet experts' trips to China, 87% were delayed: 40 (42.1%) due to physical capital accidents, 37 due to urgent matters in Soviet factories (38.9%), and 18 due to translators' issues (19.0%).

B2. Plant-Level and Firm-Level Data

We then constructed a panel dataset of plant performance, gathering data from several archives.

Steel Association Reports (1949–2000). These reports, compiled yearly from 1949 to 2000, contain restricted data on all 94 Chinese firms in the steel industry, for a total of 1,410 plants. They contain detailed information on plant quantity and type of steel products, input utilization, the specific machinery in use, capital, fixed investment, profits, and number and types of workers (unskilled workers, high-skilled workers, and engineers), all of which we manually collected and digitized in different rounds between August 2020 and December 2021. Using the plant name, location, county, and province, we manually and uniquely matched the 304 plants belonging to the 20 steel industrial clusters to their performance data.

Second Industrial Survey (1985). In the early 1980s, the Chinese government began implementing several reforms on market liberalization. Until then, stretching back to the PRC's founding in 1949, there had been a lack of systematic data on firm and industry structure. This survey, conducted by Statistics China in 1985, was therefore undertaken for policy makers to learn about the structure of the industries and enterprises, the products, the state of technology and equipment, the economic value of enterprises, and the quality of their workforce. This information constituted a guide for subsequent policies and reforms. As such, the survey covered more than 40 industries within the secondary sector. It is considered the most comprehensive dataset on industrial enterprises from the founding of the PRC through the early 1990s.[1] The firm-level-data portion of the survey, though still confidential today, has been declassified for this project; it covers the 7,592 largest firms operating in China in 1985.[2] For each of them, the Survey gathered data on output, sales, profits, fixed assets, raw materials, total wages, number of employees, finished product inventory, main products, production equipment, and year of establishment, which we manually collected and digitized. We have also manually collected and digitized the county-level and prefecture-level industrial production data reported in the survey (which is stored internally at Statistics China, in Beijing).

China Industrial Enterprises Database (1998–2013). This database, compiled by Statistics China yearly between 1998 and 2013 to compute GDP, covers more than 1 million publicly listed and private industrial enterprises whose asset value exceeded 5 million yuan prior to 2011, and 20 million yuan after 2011. All industrial firms in the database are required to file an annual report of their production activities, as well as their accounting and financial information. Statistics China implemented strict double-checking standards for verifying the accuracy of firm-reported information. For each firm, the database contains data on output, number of employees, profits, ownership structure, and capital investment.

We complement this data with province-level data from all the published statistical yearbooks compiled by Statistics China between 1949 and 2000. This dataset contains province-level information on GDP, population, capital, investment, and number of workers.

Data Digitization. Between August 2019 and December 2021, we employed four research assistants (undergraduate students at Tsinghua University and Peking University) to digitize the newly collected data. On top of manually performing the data entry, the research assistants were asked to cross-check their work to ensure that all the data were correctly digitized.

Geolocation of the 304 Plants. The Second Industrial Survey records each firm's address in 1984. To geolocalize the firms, we searched the 1984 address of each firm on Gaode Map, an online GPS browser that provides a high-quality map of China. If we could find the 1984 address in Gaode Map, we use Gaode Map's geocoding API to transfer the 1984 address to the geographic location, based on latitude and longitude. For 3,426 of the 7,592 firms covered by the Second Industrial Survey (45%), their 1984 addresses cannot be found, because the name of streets, villages, or towns changed. We therefore manually searched these 1984 addresses on the websites of local governments that keep track of name changes, and we found how the addresses changed from 1984 and the corresponding current addresses. In this way, we were able to obtain the geographic locations of all the firms based on the current addresses.[3]

Between 1998 and 2013, the China Industrial Enterprises database records the firm name only. We searched firms by their name in Tianyancha, a comprehensive database on all registered Chinese firms, which provides the firms' current address. We obtained all firms' addresses and used Gaode Map's geocoding API

[1] The First Industrial Survey was conducted in 1950, right after the PRC was founded. Its goal was estimating the "lay of the land" regarding the national industrial and mining enterprises, a basis for the recovery from the Civil War and subsequent development. However, this survey contains no firm-level data, and it predates the construction of treated and comparison plants. For this reason, we cannot employ it in our paper.

[2] The Second Industrial Survey reported that in 1985 there were 437,200 firms operating in China and that it collected firm-level data for the 7,592 largest ones, but the official survey guidelines do not provide a formal size threshold for inclusion in the survey itself. We computed that the surveyed companies comprised only 1.74% of total Chinese firms but produced 62.46% of the industrial output in 1985.

[3] From 1990 to 2013, Chinese prefecture cities were subject to some jurisdictional changes. However, because we retrieve firm latitude and longitude, these changes do not affect firm geolocalization.

to transfer the addresses to geographic locations, based on latitudes and longitudes.

Identification of Firms Economically Related to the 304 Plants. We reconstructed the backward and forward linkages between the 304 steel plants and the 684 other complementary plants not eligible to receive the Soviet transfers, as follows. First, we retrieved each firm's three-digit industry code from the Steel Association Reports, as we observe the firm products. We then use the input-output tables of the closest available year to assess whether firm products were upstream or downstream, relative to the products of the 304 steel plants. If products were neither upstream nor downstream, we consider these firms not economically related to the 304 plants. The National Bureau of Statistics of China (NBS) began compiling its input-output tables in 1987, and did so every five years (in the years ending with 2 and 7).

B3. Checking the Accuracy of Plant-Level Data

While dealing with plant-level data, one always has to consider the possibility that the outcomes provided by the plants may not be accurate. This issue is even more salient in command-driven economies, where the risk of data manipulation is higher. First, until the 1990s, Chinese statistical institutes were highly decentralized, with consequent variation in the quality and methodologies employed to compute the official statistics, which undermines their internal validity of such data (Koch-Weser, 2013). Second, authoritarian regimes usually provide little transparency on how key economic outcomes are computed, and systematic misreporting or data falsification are employed, especially in periods of economic instability or to hide government policy failures (Koch-Weser, 2013). Third, focusing specifically on the 304 steel plants, their managers may have had incentives to report better-than-actual outcomes, for example in an attempt to meet the production goals set by the central government.

While not completely exempt by these potential issues, the Steel Association Reports offer advantages relative to official statistics. First, these reports were used internally and not to compile official statistics. Therefore, they were highly monitored and checked by industry peers, which strongly limited the possibility of manipulation. Moreover, the fact that they reported quantities of steel produced further reduced the risk of manipulation, since these products were sold to other state-owned firms, which could cross check their production information. Conversely, the aggregate production data were complied by Statistics China, a different and independent source. Manipulations were more likely to occur in the latter than in the former reports since those were the officially released data.

Chinese economic historians have acknowledged the much higher quality and reliability of data for internal use relative to those of data for public release (Zeitz, 2011; Zhang, 2015; Hirata, 2018; Wu and Yi, 2022), also underscoring how the former have a much wider, more comprehensive coverage than the latter. Moreover, data for internal use appear to be consistent with major historical trends. For instance, the construction of the 156 Projects implied a massive reallocation of labor from the agricultural to the heavy industrial sector, amounting to 40% of Chinese employment in the industrial sector in 1952. Consistently, the Steel Association Reports indicate a 45% jump of employment in the steel industry in the 1950s. Conversely, the publicly released compendium does not show any major changes in employment levels in the same years. Similar conclusions during the years of the Great Leap Forward were also reached by Zeitz (2011).

Also, after the Sino-Soviet Split, the Chinese government wanted to tie up loose ends with the Soviet Union as quickly as possible. As such, data manipulation should have lowered performance of Soviet-treated plants, which would go against us finding a positive effect of the Soviet transfer. This is especially true during the Great Leap Forward, when the Chinese government wanted to show the efficacy of labor-intensive methods of industrialization, which would emphasize manpower rather than machines and capital expenditure, in stark contrast with the goals of the Soviet transfer (Clark, 1973; Lardy, 1995).

Beyond these considerations, we compared the Steel Association Reports with plant internal digests, used to describe daily factory operations; these were even less subject to the direct government control. We were able to retrieve such information from the company historical archives for 98 of the 304 steel plants. The digests report quantity of steel production, including crude steel and pig iron, allowing us to compare the same quality of products. The comparison of the production volumes across the two data sources reveals that they are remarkably similar, with minor discrepancies that appear due to rounding or typos. Such discrepancies are never larger than 1%.

Next, we compared our data with the data collected by Clark (1995). As one of the leading experts on the economics of steel production in command economies, Clark visited and collected data on Chinese steel plants with a capacity of at least 100,000 tons in multiple trips between 1952 and 1993. Specifically, for each visited plant, he estimated the minimum and maximum yearly steel output based on the capital in use, concluding that the data from the Steel Association annual reports, our main source, appear credible. While Clark collected his data independently, he was certainly able to visit these plants thanks to the help of the Chinese government, which very likely monitored his publication. Moreover, during his plant visits, Clark had access to plant production data, likely to be used to compile the Steel Association reports. These caveats limit the use of Clark (1995)'s data as an alternative data source. However, his work contains qualitative descriptions of the production process at the plant level, consistent with data on firm technological upgrade that we collected from Chinese Ministry of Commerce and the Ministry of Industry and Information Technology historical archives, that to the best of our knowledge were not available to Clark when he visited China.

Table B.1: List of Variables, With Their Definitions and Sources

Variable	Definition
A. Plant-Year Level (1949–2000), *source*: Steel Association Reports	
Log Steel	Logged million tons of steel produced
Log Coke/Iron/Pig Iron	Logged million tons of coke/ iron/ pig iron
Log TFPQ	Total Factor Productivity Quantity, see Appendix
Log Converters	Indicator for plants using the basic oxygen converter
Log Casting	Indicator for plants using the continuous casting method
Log Exports	Logged values of exports to Western world countries
Log International Standard	Logged million tons of steel above international standards
% Engineers	Share of engineers out of total employment
% Technicians	Share of high-skilled technicians out of total employment
% Unskilled	Share of unskilled workers out of total employment
Log Workers	Total number of workers
Log Fixed Assets	Logged value of land, buildings, and machines
Log Capital Stock	See table notes
Log Substitute Capital	Logged values of imported substitute capital (1970-2000)
Log Complementary Equipment	Logged values of imported complementary equipment (1970-2000)
Log Scrapped Output	Logged steel scrapped due to low quality
Log Quality Defect Index	Faction of output rejected downstream due to low quality
Coke Ratio	Coke usage/total tons of hot metal production
Maintenance	Planned maintenance interventions/total maintenance interventions
Down-Turn Time	Unexpected machine downtime hours/total available operational hours
Inventory	Logged tons of steel in plant inventory
B. Firm-Year Level (1998–2013), *source*: China Industrial Enterprises	
Log Value Added	Difference between firm gross income and intermediate inputs
Log TFPR	Total Factor Productivity Revenue
Log Revenues	Operating revenues
C. Province-Year Level (1949–2013), *source*: Statistical Yearbook	
Log Industrial Output	Logged value of industrial production
Log Industrial Employment	Logged number of workers in industrial sector
Log GDP Capita	Logged GDP per capita
Log Investment	Logged value of government investments
D. County-Year Level (1998–2013), *source*: China Education Yearbooks	
STEM Universities	Share of universities offering a STEM degree per county
Technical School	Number of technical schools per inhabitant per county
Log College Graduates	Logged number of college graduates over population
Log High-Skilled Workers	Logged number of high-skilled workers over population

Notes. To obtain a measure of firm capital stock from the fixed gross assets (*fga*), we use the Perpetual Inventory Method (PIM). First, we compute investment I as the difference between the deflated current and the lagged *fga*, and we use the PIM formula $P_{t+1}K_{t+1} = P_{t+1}(1-\delta)P_tK_t + P_{t+1}I_{t+1}$, where K is the quantity of capital, P is its price (set equal to one percent, the interest rate to be paid back to the Soviet Union for the loan granted to China for the technology transfer program), I is investment, and δ is the depreciation rate (set equal to 3.5%, according to the average estimated life of machine of 20 years (Lardy, 1995). However, this procedure is valid only if the base-year capital stock (the first year in the data for a given firm) can be written as P_0K_0 , which is not the case here because *fga* is reported at its historic cost. To estimate its value at replacement cost, we use the R^G factor suggested by Balakrishnan et al. (2000), $R^G = \frac{[(1+g)^{\tau+1}-1](1+\pi)^{\tau}[(1+g)(1+\pi)-1]}{g\{[(1+g)(1+\pi)]^{\tau+1}-1\}}$, where τ is the average life of machines (assumed to be 20 years, according to Lardy, 1995), π is the average capital price $\frac{P_t}{P_{t-1}}$ equal to 1%, and g is the (assumed constant) real investment growth rate $\frac{I_t}{I_{t-1}}$ from 1949 to 1978 (equal to 1.07821, as from Statistics China). We multiply *fga* in the base year 1949 by R^G to convert capital to replacement costs at current prices, which we then deflate using the price index for machinery and machine tools to express it in real terms. Finally, we apply the PIM formula.

Appendix C: Sensitivity Checks

C1. Definition of the Know-How Indicator

In equation 1, the indicator Know-How equals one for plants that received the Soviet know-how transfer; and to zero for plants that were supposed to receive it but eventually did not due to the Split. However, at the time of the Split, among the 98 plants that eventually got the know-how transfer, 89 had already received the whole Soviet training, while 9 were still receiving it. Even if the Soviet experts were suddenly withdrawn by Soviet Union, leaving these 9 plants with an incomplete transfer, they had already completed between 32 and 35 months of training, relative to a planned duration of 36. We therefore code the Know-How indicator as one also for such plants. While their small number prevents us from estimating the effects of know-how transfer based on its completion level, our results are robust to the exclusion of such firms (Figure C.1).

C2. IV Results

Since the probability of receiving the Soviet transfers before the Split depended on delays on the Soviet side, we also propose an instrumental variable (IV) approach, leveraging on the causes of such delays. Specifically, we instrument the probability of receiving Soviet physical capital with an indicator that equals one if capital to be delivered to a specific Chinese plant suffered any accident; the probability of receiving Soviet know-how with an indicator that equals one if experts supposed to visit a specific Chinese plant experienced any delay. The exclusion restriction implies that such delays affected plant outcomes only through the transfers eventually received by the plant. While the exclusion restriction cannot be tested directly, we show that the two types of delays are not predicted by plant characteristics (Table C.1, columns 1 and 2). However, they strongly predict whether a plant received any Soviet transfer. Accidents to physical capital that a plant was supposed to receive lower its probability of receiving the physical capital transfer before 1960 by 16.8% (Table C.1, column 3). Similarly, delays to the Soviet experts a plant was supposed to host reduce its probability of receiving a know-how transfer before the Split by 18.1%, (Table C.1, column 5).

Repeating our analysis with the IV specification largely confirms our findings and leads to point estimates very close to the OLS ones. The effects of receiving Soviet physical capital increased output and TFPQ by 11.0% and 10.4%, respectively, ten years after the intervention relative to plants that did not receive any Soviet transfers (Figure C.2, Panels A and C). The effects then constantly decreased over time and were no longer significant 20 years after the Soviet intervention. The impact of also receiving a know-how transfer is associated with an 18.4% increase in output and a 17.8% increase in TFPQ 20 years after the intervention, with these numbers jumping to 47.3% and 46.3% after 40 years, relative to plants that received only the physical capital transfer (Figure C.2, Panels B and D). The similar magnitude of the estimates between OLS and IV specifications confirms that variations in the transfers eventually received by each plant largely depended on the accidents the Soviet machinery suffered or on experts' delays.

C2. TFP Estimation and Robustness Checks[4]

In our main specification, we estimate total factor productivity quantity (TFPQ) as the residuals of an OLS regression of plant-level logged physical output, measured in million tons of steel, on logged workers, capital stock and quantities of inputs (coke and iron) employed in the production process, and plant and year fixed effects. A potential problem with this approach is that OLS could be biased due to the endogenous choice of inputs by the plants. However, this concern is attenuated in our context, since workers and inputs usage don't differentially change across the 304 plants, as shown in Table A.7. In other words, the estimated increase in TFPQ appears driven by higher output rather than a different input usage.

Observing gross output in an industry that produces relatively homogenous goods represents an advantage relative to the value-added TFP approaches, as explained by Gandhi et al. (2020). However, a potential concern with the OLS estimates is that using quantities of output and input may hide the fact that plants that received the Soviet transfers produced more high-quality steel relative to plants that did not receive any transfers (as shown in Table 3) or that they may have used the same quantity of better-quality inputs.

[4] We would like to thank our discussant, Dimitrije Ruzic, Nick Bloom and Martin Rotemberg for insightful comments and suggestions on TFP estimation in a command economy.

To address this issue, we first compute plant value added and input costs, using product and input prices collected from the Steel Association Reports. Notably, these prices, although set by the government, did reflect quality differences. In 1985, for instance, Statistics China set the high-quality crude steel price at 320RMB (US$199.22 in 2020 figures) per ton, compared to 249RMB (US$154.95 in 2020 figures) per ton of lower-quality pig iron. All the nominal variables are deflated using the year-product-specific deflator provided by Statistics China, with 1980 as the base year. While using the same deflator for all the firms cannot control for plant-specific price shocks (as explained by Loecker and Warzynski, 2012), this is not an issue in our context. In fact, Chinese firms faced the same price for a given product in a given year. As a result, our estimates suffer no bias due to plant-specific variation in output or input prices. Second, we compute total factor productivity revenue (TFPR) by estimating the same regression as in our main specification, but replacing physical output with value added and input quantities with their costs. These productivity estimates are slightly larger than the baseline ones, indicating that neglecting to control for output composition downward-biases our results but does not change the overall interpretation of our findings (Table C.2, row 2, Panels A and B).

We next check the robustness of our TFPQ and TFPR measures to alternative estimation methods. First, instead of an OLS regression, we use factor shares. From Chinese national accounting, we retrieve a labor share of 0.60 and a capital share of 0.40, but we also use a labor share of 0.66 and a capital share of 0.33 (which are the values usually used by the literature, Bloom et al., 2013a), as well as 0.50 and 0.50 for robustness. We then compute TFPR using these values and retrieved TFPQ via the formula $\log$ TFPQ=logTFPR-log $\widetilde{p}$, where $\widetilde{p}$ is the value-added weighted average of each plant product price. These productivity estimates are comparable to the OLS ones (Table C.2, rows 3-5, Panels A and B).

The use of prices in a command economy may generate the so-called quality bias (de Roux et al., 2020): the Chinese government may have set prices that were not reliable indicators of underlying input quality. We already noted that the Chinese government set higher prices for high-quality steel. Nevertheless, these prices may not fully reflect quality differences. Therefore, we test for the possibility of quality bias as follows. We impose to output and inputs the average annual U.S. prices reported by the American Iron and Steel Institute at the four-digit level, and we compute TFPR and TFPQ with these values, as described above. The estimates using U.S. prices are larger but comparable to those using Chinese prices (Table C.2, row 6, Panels A and B), confirming that also the latter incorporated at least to some extent quality differences.

In the last few decades a growing body of research has proposed different methods to address the potential endogeneity of TFP estimation (for instance, Olley and Pakes, 1996,OP; Levinsohn and Petrin, 2003, LP; and Gandhi et al., 2020, GNR). These methods are based on a control-function approach that employs a "proxy variable," for instance an input, to learn about TFP variations. In particular, Gandhi et al. (2020) developed a nonparametric identification and estimation of gross-output production function, using as inputs as the proxy variable. The fact that in our setting inputs appear uncorrelated with TFP variation limits the use of these methods, as we may incur in a weak instrument issue. Not surprisingly, these TFP estimation methods lead to results virtually identical to the factor-share ones (Table C.2, rows 7-9, Panels A and B).

Finally, we test robustness our baseline TFP measure to product quality. More specifically, we re-estimate TFP replacing physical output with either physical output net of scrapped output or physical output net of steel declared unusable by downstream firms. The results are larger than our baseline estimations, corroborating the evidence that firms which got Soviet know-how produced higher quality products relative to firms which did not (Table C.2, rows 10-11, Panels A and B).

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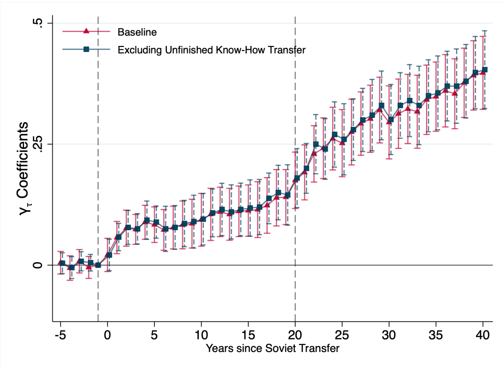
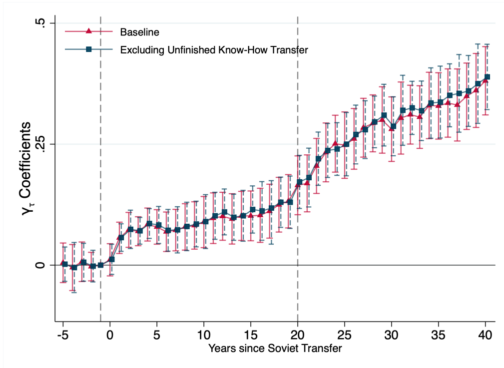
Figure C.1: Effects of Soviet Physical and Know-How Transfers on Production and Productivity – Excluding Plants that Were Receiving the Know-How Transfer at the time of the Sino-Soviet Split

Panel A: Log Output



Panel B: Log TFPQ

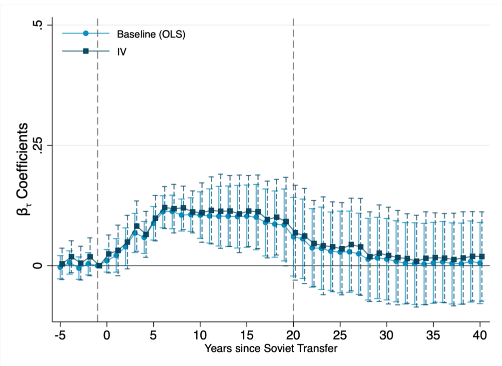


Notes. Annual γ_τ coefficients from Equation 1 for the 304 steel plants belonging to the 156 Projects, excluding 9 steel plants that were receiving the Soviet know-transfer at the time of the Split. The omitted period is $t = -1$, the year before receiving the Soviet transfer. Data are provided at the plant level from the Steel Association Reports from 1949 to 2000. *Log Output* is logged quantities (in million tons) of steel. *Log TFPQ* is logged total factory productivity quantity, computed as the residuals of OLS regression of plant logged physical output on logged workers, capital stock and inputs, and plant and year fixed effects. Standard errors are block-bootstrapped at the industrial cluster level with 1,000 replications *** p < 0.01, ** p < 0.05, * p < 0.1.

Figure C.2: Effects of Soviet Physical and Know-How Transfers on Plant Production and Productivity, OLS and IV Estimates

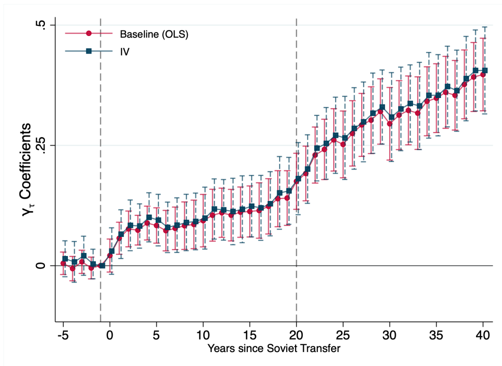
Physical capital (β_τ)

Panel A: Log Output

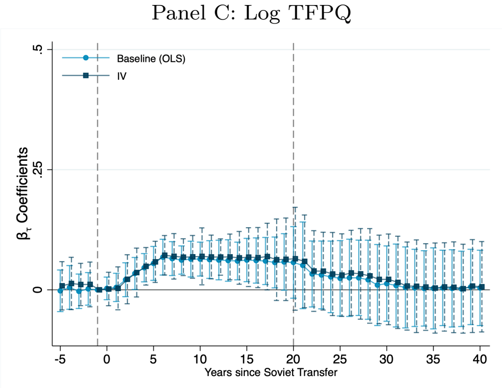


Know-How (γ_τ)

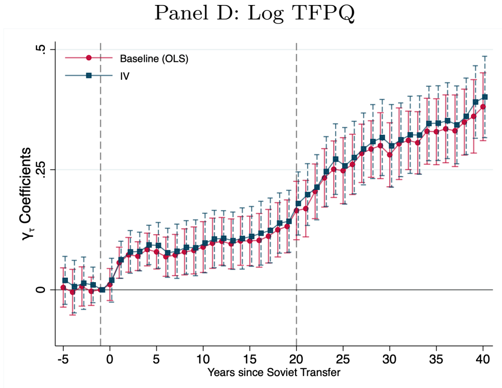
Panel B: Log Output



Panel C: Log TFPQ



Panel D: Log TFPQ



Notes. IV estimates of Equation 1 on the 304 steel plants belonging to the 156 Projects using accidents to Soviet machinery as an instrument for receiving Soviet physical capital transfer and accidents to Soviet experts as an instrument for receiving know-how transfer. Each panel also reports the baseline OLS specification. Data are provided at the plant level from the Steel Association Reports from 1949 to 2000. *Log Output* is logged quantities (in million tons) of steel. *Log TFPQ* is logged total factor productivity quantity, computed as the residuals of OLS regression of logged physical output on logged workers, capital stock and inputs, and plant and year fixed effects. Standard errors are block-bootstrapped at the industrial-cluster level with 1,000 replications.

Table C.1: Plant Characteristics, Soviet Accidents and Delays, and Probability of Receiving Soviet Transfers

	Pr Accident Physical Capital	Pr Experts Delays	Physical Capital		Know-How	
	(1)	(2)	(3)	(4)	(5)	(6)
Physical Capital Accidents			-0.168***	-0.196***		
			(0.020)	(0.023)		
Soviet Experts Delays					-0.181***	-0.212***
					(0.053)	(0.046)
Steel Production (m tons)	-0.003	0.006	0.003	0.005	0.005	0.006
	(0.003)	(0.007)	(0.005)	(0.011)	(0.006)	(0.009)
Crude Steel Production (m tons)	-0.001	-0.005	-0.004	0.002	0.004	-0.005
	(0.003)	(0.006)	(0.009)	(0.003)	(0.005)	(0.006)
Pig Iron Production (m tons)	0.004	-0.004	-0.004	-0.008	0.002	0.008
	(0.005)	(0.008)	(0.005)	(0.009)	(0.004)	(0.010)
Value Added (m)	-0.003	0.004	0.008	0.005	0.011	0.010
	(0.008)	(0.004)	(0.009)	(0.007)	(0.011)	(0.015)
Productivity (log TFPQ)	-0.004	-0.008	-0.004	0.006	-0.002	-0.005
	(0.008)	(0.009)	(0.008)	(0.006)	(0.004)	(0.006)
Employees per Plant (k)	0.002	-0.004	0.005	0.006	0.002	0.005
	(0.004)	(0.006)	(0.006)	(0.007)	(0.004)	(0.006)
Engineers (k)	0.003	0.003	0.005	0.008	0.005	0.010
	(0.004)	(0.005)	(0.006)	(0.009)	(0.008)	(0.009)
High-Skilled Technicians (k)	-0.002	-0.005	0.008	0.011	0.004	0.005
	(0.006)	(0.004)	(0.010)	(0.012)	(0.004)	(0.008)
Unskilled Workers (k)	0.003	0.005	-0.005	-0.009	0.005	0.007
	(0.004)	(0.008)	(0.008)	(0.010)	(0.008)	(0.009)
Loans	-0.006	-0.005	-0.004	-0.006	0.011	0.010
	(0.008)	(0.006)	(0.006)	(0.008)	(0.012)	(0.011)
Transfers	-0.004	0.006	0.010	0.011	-0.006	-0.007
	(0.009)	(0.009)	(0.011)	(0.015)	(0.008)	(0.009)
Distance Cole Deposits (km)	0.001	-0.006	0.004	0.003	0.004	0.005
	(0.005)	(0.009)	(0.005)	(0.005)	(0.008)	(0.007)
Distance Coke Deposits (km)	-0.005	-0.003	0.005	0.005	0.004	0.006
	(0.007)	(0.005)	(0.007)	(0.008)	(0.005)	(0.009)
Observations	304	304	304	304	304	304
Model	OLS	OLS	OLS	Probit	OLS	Probit

Notes. Correlation between plant characteristics and probability of machinery and experts Accidents (columns 1 and 2); and linear probability model (columns 3 and 5) and marginal effects from a Probit model (columns 4 and 6) for the probability of receiving Soviet transfers. *Pr Accident Physical Capital* is an indicator for plants whose Soviet physical capital suffered an accident. *Pr Experts Delays* is an indicator for plants whose Soviet experts' trips were delayed from the Soviet side. *Physical Capital* is an indicator for plants that received Soviet physical capital. *Know-How* is an indicator for plants that also received know-how transfer. Data are provided at plant level from the Steel Association Reports. Steel, Crude Steel, and Pig Iron Production are in million tons. Value Added is in 2020 US$ millions, reevaluated at 1 RMB in 1955 = 3.9605 USD in 2020; *Productivity (logged TFPQ)* is logged total factor productivity quantity (TFPQ), computed as OLS residuals of regressing plant-level logged physical output, in million tons of steel, on logged workers, capital stock, and quantities of inputs (coke and iron) employed in the production process, and plant and year fixed effects; Employees, Engineers, High-Skilled Technicians, and Unskilled Workers are, respectively, thousands of employees, engineers, high-skilled technicians, and unskilled workers; *Loans* and *Transfers* are, respectively, loans and free transfers that the government granted to each plant, measured in 2020 US$ millions, reevaluated at 1 RMB in 1955 = 3.9605 USD in 2020. Distance Coal and Coke Deposits are the plant distance in km from and coal and coke deposits. Standard errors are block-bootstrapped at the industrial cluster level with 1,000 replications. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table C.2: Robustness of TFP Estimations

	Year 1	Year 5	Year 10	Year 20	Year 30	Year 40
Panel A: Physical Capital (β_τ)						
TFPQ, OLS Baseline	0.005	0.055***	0.064***	0.057	0.013	0.004
	(0.015)	(0.018)	(0.018)	(0.038)	(0.041)	(0.040)
TFPR, OLS	0.004	0.062***	0.070***	0.063	0.016	0.006
	(0.020)	(0.016)	(0.025)	(0.050)	(0.040)	(0.039)
FS: LS = 0.60, CS = 0.40	0.003	0.065***	0.071***	0.065	0.018	0.005
	(0.021)	(0.018)	(0.026)	(0.055)	(0.039)	(0.041)
FS: LS = 0.66, CS = 0.33	0.003	0.069***	0.072***	0.066	0.017	0.005
	(0.020)	(0.020)	(0.025)	(0.052)	(0.042)	(0.039)
FS: LS = 0.50, CS = 0.50	0.003	0.068***	0.075***	0.068	0.019	0.004
	(0.019)	(0.019)	(0.026)	(0.055)	(0.040)	(0.041)
Using US Prices	0.002	0.067***	0.078***	0.065	0.019	0.005
	(0.020)	(0.021)	(0.025)	(0.056)	(0.041)	(0.039)
OP	0.004	0.054***	0.064***	0.056	0.015	0.005
	(0.018)	(0.020)	(0.024)	(0.051)	(0.038)	(0.040)
LP	0.004	0.055***	0.063***	0.058	0.017	0.006
	(0.019)	(0.021)	(0.025)	(0.052)	(0.040)	(0.041)
GNR	0.004	0.054***	0.064***	0.057	0.015	0.005
	(0.019)	(0.020)	(0.025)	(0.051)	(0.049)	(0.040)
Excluding Scrapped Output	0.005	0.055***	0.064***	0.057	0.013	0.004
	(0.015)	(0.018)	(0.018)	(0.038)	(0.041)	(0.040)
Excluding Output Not Usable Downstream	0.005	0.055***	0.064***	0.057	0.013	0.004
	(0.015)	(0.018)	(0.018)	(0.038)	(0.041)	(0.040)
Panel B: Know-How (γ_τ)						
TFPQ, OLS Baseline	0.056***	0.078***	0.089***	0.165***	0.281***	0.381***
	(0.016)	(0.018)	(0.027)	(0.029)	(0.037)	(0.037)
TFPR, OLS	0.060***	0.088***	0.096***	0.169***	0.301***	0.407***
	(0.018)	(0.022)	(0.028)	(0.034)	(0.040)	(0.045)
FS: LS = 0.60, CS = 0.40	0.061***	0.087***	0.098***	0.170***	0.298***	0.405***
	(0.020)	(0.021)	(0.030)	(0.032)	(0.041)	(0.047)
FS: LS = 0.66, CS = 0.33	0.059***	0.087***	0.097***	0.178***	0.299***	0.406***
	(0.019)	(0.025)	(0.031)	(0.031)	(0.039)	(0.046)
FS: LS = 0.50, CS = 0.50	0.058***	0.090***	0.095***	0.177***	0.300***	0.404***
	(0.020)	(0.022)	(0.029)	(0.035)	(0.042)	(0.048)
Using US Prices	0.064***	0.095***	0.108***	0.201***	0.312***	0.420***
	(0.019)	(0.021)	(0.030)	(0.032)	(0.045)	(0.046)
OP	0.061***	0.090***	0.096***	0.165***	0.282***	0.380***
	(0.019)	(0.022)	(0.029)	(0.033)	(0.041)	(0.044)
LP	0.062***	0.086***	0.095***	0.166***	0.281***	0.381***
	(0.019)	(0.021)	(0.028)	(0.034)	(0.040)	(0.044)
GNR	0.061***	0.087***	0.096***	0.164***	0.381***	0.379***
	(0.018)	(0.023)	(0.027)	(0.035)	(0.041)	(0.046)
Excluding Scrapped Output	0.062***	0.088***	0.097***	0.179***	0.299***	0.401***
	(0.016)	(0.020)	(0.025)	(0.026)	(0.041)	(0.047)
Excluding Output Not Usable Downstream	0.065***	0.087***	0.098***	0.175***	0.295***	0.403***
	(0.014)	(0.019)	(0.024)	(0.028)	(0.044)	(0.049)
Observations	13,984	13,984	13,984	13,984	13,984	13,984

Notes. Selected annual β_t (Panel A) and γ_t (Panel B) coefficients from Equation 1 estimated on the 304 steel plants belonging to the 156 Projects. Data are provided at the plant level from the Steel Association Reports from 1949 to 2000. *TFP* is estimated as total factor productivity quantity (TFPQ), computed as OLS residuals of regressing plant-level logged physical output, in million tons of steel, on logged workers, capital stock, and quantities of inputs (coke and iron) employed in the production process, and plant and year fixed effects (row 1), and as total factor productivity revenue (TFPR), substituting physical output with value added and quantities of inputs with their costs (row 2), using factor shares (FS) with a labor share (LS) of 0.60 and capital share (CS) of 0.40 (row 4); a labor share of 0.66 and a capital share of 0.33 (row 5); a labor share of 0.50 and a capital share of 0.50 (row 6); using U.S. instead of Chinese prices for steel products; using Olley and Pakes (1996)'s method (row 7); using Levinsohn and Petrin (2003)'s method (row 8); using Gandhi et al. (2020)'s method (row 9); using physical output net of output scrapped due to low quality (row 10); and using physical output net of output declared not usable by downstream companies (row 11). Standard errors are block-bootstrapped at the industrial-cluster level with 1,000 replications *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

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