Online Appendix

Inventors and Firm Innovation: Evidence from the U.S. World War I Draft

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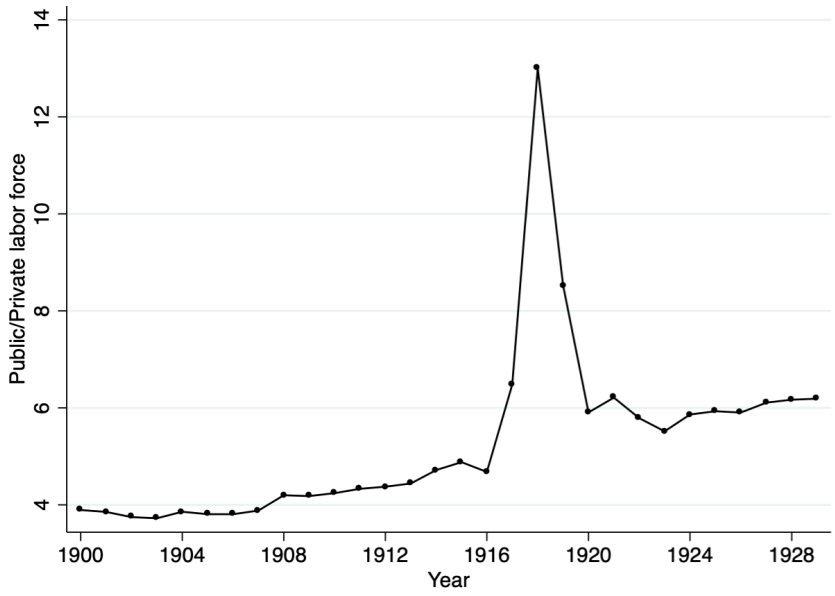
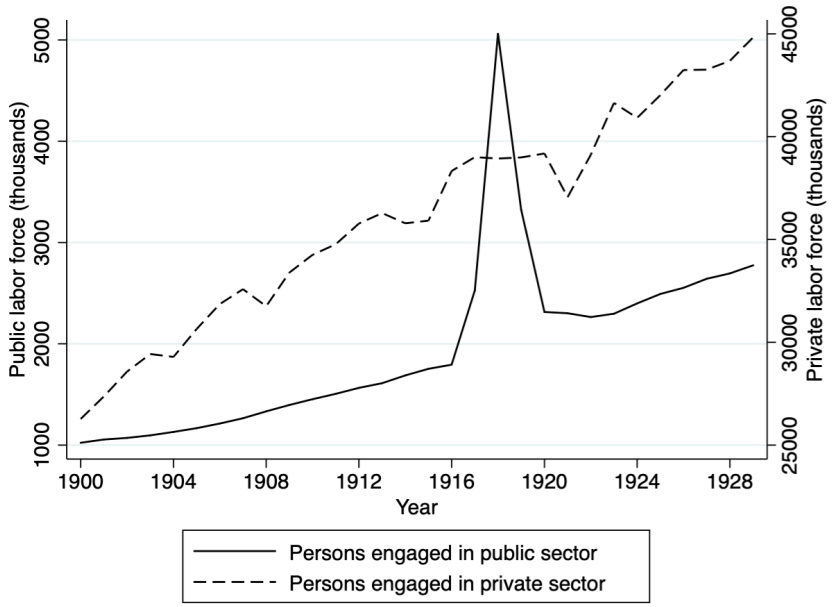
Online Appendix Figure B and Table B

Figure B.1: LABOR FORCE IN PUBLIC/PRIVATE SECTOR



(a) Persons engaged in public/private sector (ratio)

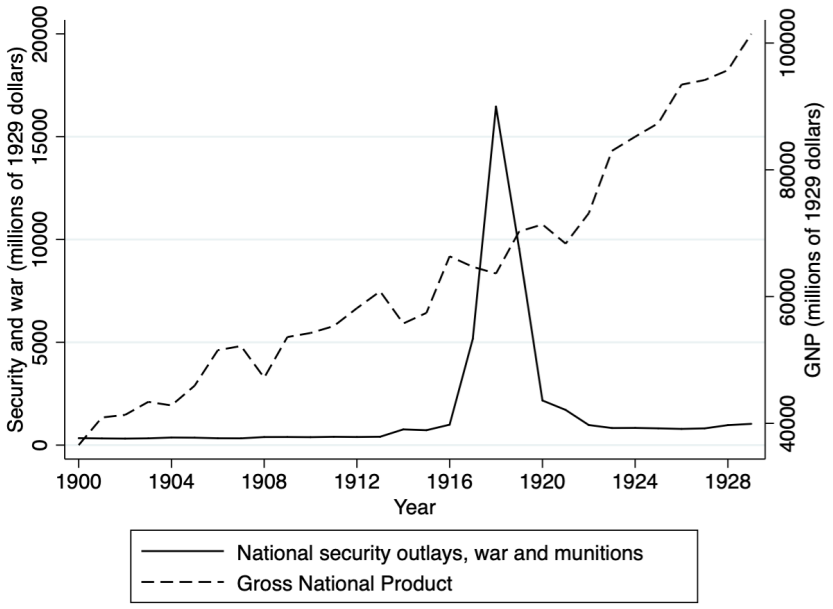


(b) Persons engaged in public/private sector (thousands)

Notes: The figures show persons engaged in public/private sector across the years from administrative data (Kendrick, 1961).

Figure B.2: MILITARY EXPENDITURE

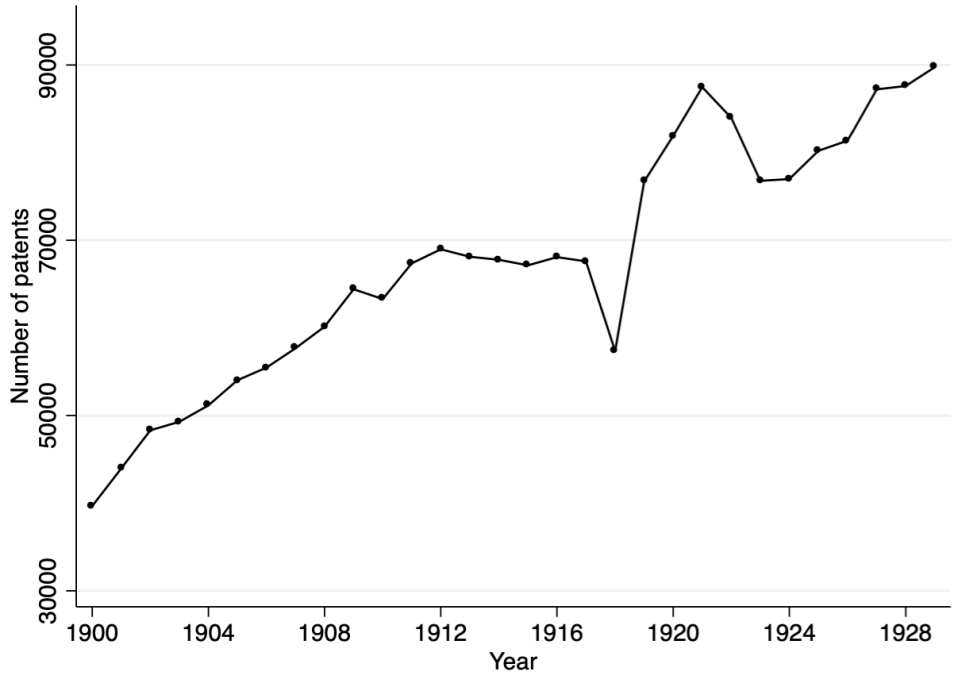
(a) Military expenditure, percentage of GNP



(b) Military expenditure and GNP (millions of 1929 dollars)

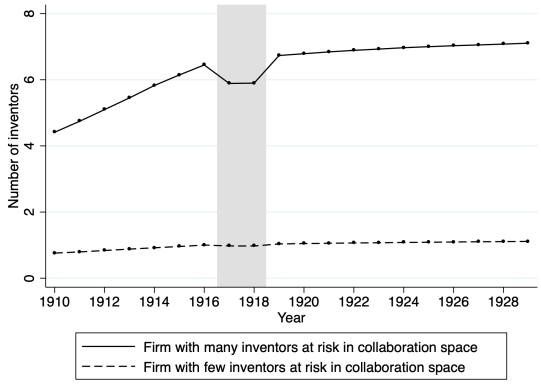
Notes: The figures show persons military expenditure across the years from administrative data (Kendrick, 1961).

Figure B.3: PATENT APPLICATIONS PER YEAR

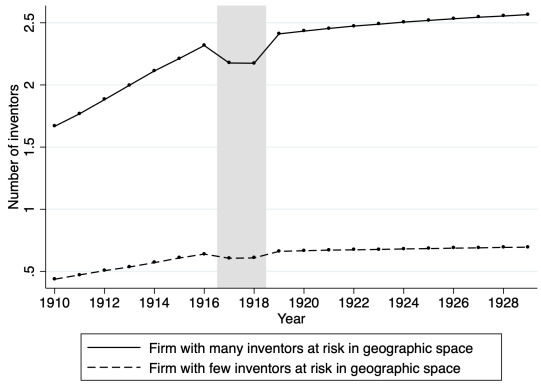


Notes: The figure shows the total number of patent applications to the U.S. Patent and Trademark Office (Marco et al., 2015).

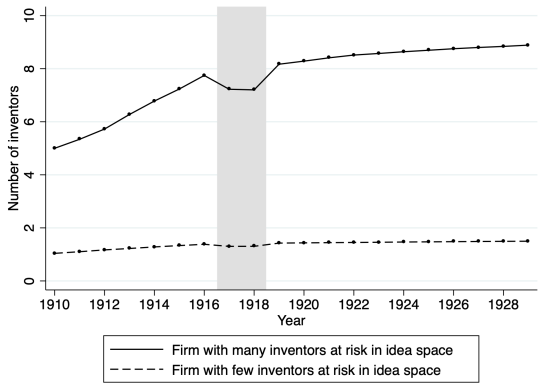
Figure B.4: IMPACT OF SUPPLY SHOCK ON THE POOL OF INVENTORS



(a) Collaboration space



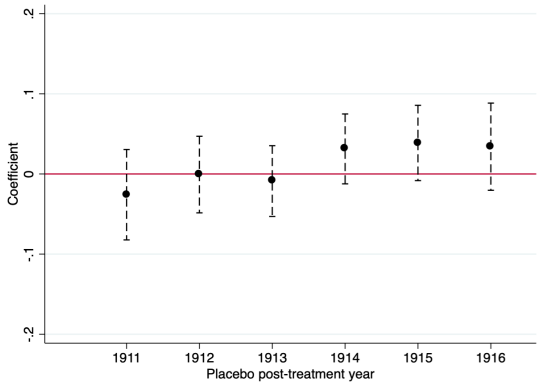
(b) Geographic space



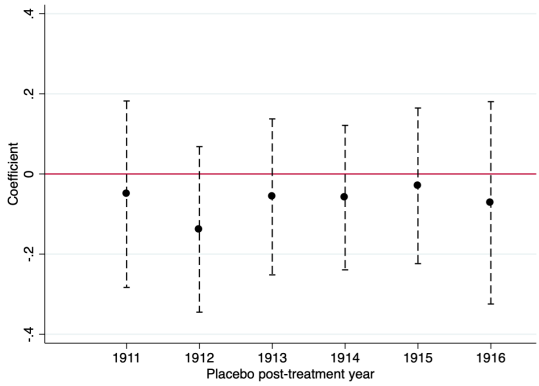
(c) Idea space

Notes: The figures show the pool of inventors for treated firms and control firms in each supply shock. New inventors who file a patent application for the first time are added to the pool of inventors every year. Inventors who serve in the military are excluded from the pool between the years 1917 to 1918.

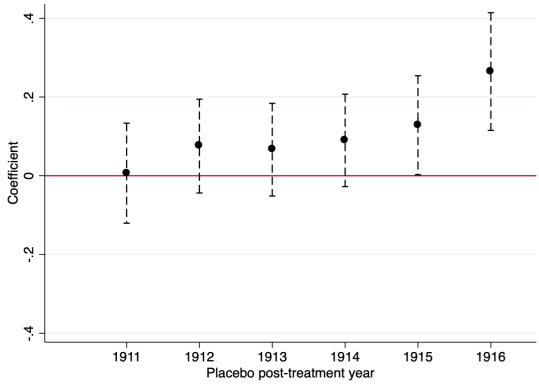
Figure B.5: IMPACT OF SUPPLY SHOCK ON INNOVATION RATES, PLACEBO WWI DRAFT YEARS



(a) Collaboration space



(b) Geographic space



(c) Idea space

Notes: The figures show each of coefficients corresponding to each placebo year.

Table B.1: PATENT CLASSIFICATION

NACE Rev.2	Description	Percent (%)
10	Manufacture of Food Products	0.47
10.5	Manufacture of Dairy Products	0.08
11	Manufacture of Beverages	0.03
12	Manufacture of Tobacco Products	0.11
13	Manufacture of Textiles	0.62
14	Manufacture of Wearing Apparel	0.21
15	Manufacture of Leather and Related Products	0.36
16	Manufacture of Wood and of Products of Wood and Cork; Manufacture of Articles of Straw and Plaiting Materials	0.11
17	Manufacture of Paper and Paper Products	0.57
18.1	Printing and Service Activities Related to Printing	0.12
19	Manufacture of Coke and Refined Petroleum Products	0.82
20.1	Manufacture of Basic Chemicals, Fertilisers and Nitrogen Compounds, Plastics and Synthetic Rubber in Primary Forms	7.85
20.2	Manufacture of pesticides and other agrochemical products	0.14
20.3	Manufacture of Paints, Varnishes and Similar Coatings, Printing Ink and Mastics	0.38
20.4	Manufacture of Soap and Detergents, Cleaning and Polishing Preparations, Perfumes and Toilet Preparations	0.28
20.42	Manufacture of Perfumes and Toilet Preparations	0.01
20.5	Manufacture of Other Chemical Products	0.63
20.51	Manufacture of Explosives	0.42
20.6	Manufacture of Man-Made Fibres	0.12
21	Manufacture of Basic Pharmaceutical Products and Pharmaceutical Preparations	0.94
22	Manufacture of Rubber and Plastic Products	1.53
22.1	Manufacture of Rubber Products	0.08
22.2	Manufacture of Plastics Products	0.08
23	Manufacture of Other Non-Metallic Mineral Products	0.07
23.1	Manufacture of Glass and Glass Products	1.05
23.3	Manufacture of Clay Building Materials	0.25
23.42	Manufacture of Ceramic Sanitary Fixtures	0.04
23.5	Manufacture of Cement, Lime and Plaster	0.28
24	Manufacture of Basic Metals	1.73
24.46	Processing of Nuclear Fuel	0.00
25.1	Manufacture of Structural Metal Products	0.40
25.2	Manufacture of Tanks, Reservoirs and Containers of Metal	0.47
25.3	Manufacture of Steam Generators, Except Central Heating Hot Water Boilers	0.00
25.4	Manufacture of Weapons and Ammunition	0.61
25.5	Forging, Pressing, Stamping and Roll-Forming of Metal; Powder Metallurgy	0.05
25.6	Treatment and Coating of Metals; Machining	0.21
25.7	Manufacture of Cutlery, Tools and General Hardware	1.01
25.9	Manufacture of Other Fabricated Metal Products	0.29
25.94	Manufacture of Fasteners and Screw Machine Products	0.15
26.1	Manufacture of Electronic Components and Boards	3.22
26.11	Manufacture of Electronic Components	0.00
26.2	Manufacture of computers and peripheral equipment	0.21
26.3	Manufacture of Communication Equipment	5.36
26.4	Manufacture of Consumer Electronics	0.59
26.5	Manufacture of Instruments and Appliances for Measuring, Testing and Navigation; Watches and Clocks	2.82
26.51	Manufacture of Instruments and Appliances for Measuring, Testing and Navigation	0.73
26.52	Manufacture of Watches and Clocks	0.39
26.6	Manufacture of irradiation, electromedical and electrotherapeutic equipment	0.11
26.7	Manufacture of Optical Instruments and Photographic Equipment	1.41
26.8	Manufacture of Magnetic and Optical Media	0.53
27.1	Manufacture of Electric Motors, Generators, Transformers and Electricity Distribution and Control Apparatus	1.93
27.12	Manufacture of Electricity Distribution and Control Apparatus	0.51
27.2	Manufacture of Batteries and Accumulators	0.37
27.3	Manufacture of Wiring and Wiring Devices	0.61
27.33	Manufacture of Wiring Devices	3.47
27.4	Manufacture of Electric Lighting Equipment	0.76
27.5	Manufacture of Domestic Appliances	3.12
27.9	Manufacture of Other Electrical Equipment	2.77
28.1	Manufacture of General-Purpose Machinery	5.46
28.11	Manufacture of Engines and Turbines, Except Aircraft, Vehicle and Cycle Engines	0.46
28.14	Manufacture of Other Taps and Valves	0.08
28.21	Manufacture of Ovens, Furnaces and Furnace Burners	0.18
28.22	Manufacture of Lifting and Handling Equipment	0.68
28.23	Manufacture of Office Machinery and Equipment (Except Computers and Peripheral Equipment)	1.50
28.25	Manufacture of Non-Domestic Cooling and Ventilation Equipment	0.48
28.29	Manufacture of Other General-Purpose Machinery N.E.C.	3.95
28.3	Manufacture of Agricultural and Forestry Machinery	1.51
28.4	Manufacture of Metal Forming Machinery and Machine Tools	6.11
28.9	Manufacture of Other Special-Purpose Machinery	9.17
28.92	Manufacture of Machinery for Mining, Quarrying and Construction	0.34
28.94	Manufacture of Machinery for Textile, Apparel and Leather Production	3.68
28.95	Manufacture of Machinery for Paper and Paperboard Production	0.10
28.99	Manufacture of Other Special-Purpose Machinery N.E.C.	0.75
29.1	Manufacture of Motor Vehicles	5.40
29.3	Manufacture of Parts and Accessories for Motor Vehicles	0.00
30	Manufacture of Other Transport Equipment	3.35
31	Manufacture of Furniture	0.69
32	Other Manufacturing	1.61
32.5	Manufacture of medical and dental instruments and supplies	0.62
32.9	Manufacturing N.E.C.	1.73
42.2	Construction of Utility Projects	0.07
42.91	Construction of Water Projects	0.04
43	Specialised Construction Activities	0.57
62	Computer Programming, Consultancy and Related Activities	0.00

Notes: Four-digit International Patent Classification (IPC) classes are assigned to the standard industrial classification system in the European Union (two-digit NACE Rev. 2) in the PATSTAT database. A percentage of patents in each industry is reported.

Table B.2: LONG-RUN IMPACT OF SUPPLY SHOCK ON INNOVATION RATES, REDUCED FORM, MORE INNOVATIVE FIRM

	Specification			
	(1)	(2)	(3)	(4)
Dependent variable: Patent applications per year				
A. Year: 1910-1929, Post-treatment years: 1917-1929				
Supply shock in Collaboration space	-0.0414*** (0.0154)	–	–	-0.0398*** (0.0154)
Geographic space	–	-0.1124 (0.1153)	–	-0.1167 (0.1153)
Idea space	–	–	0.1257*** (0.0460)	0.1212*** (0.0459)
Dependent variable mean	0.3481			
Number of observations	181,860			
Number of firms	9,093			
B. Year: 1910-1950, Post-treatment years: 1917-1950				
Supply shock in Collaboration space	-0.0445*** (0.0146)	–	–	-0.0455*** (0.0146)
Geographic space	–	-0.1570 (0.1135)	–	-0.1619 (0.1135)
Idea space	–	–	-0.0444 (0.0351)	-0.0496 (0.0351)
Dependent variable mean	0.3481			
Number of observations	372,813			
Number of firms	9,093			
C. Year: 1900-1950, Post-treatment years: 1917-1950				
Supply shock in Collaboration space	-0.0322*** (0.0093)	–	–	-0.0325*** (0.0093)
Geographic space	–	-0.0687 (0.0715)	–	-0.0721 (0.0717)
Idea space	–	–	-0.0118 (0.0228)	-0.0153 (0.0227)
Dependent variable mean	0.3056			
Number of observations	463,743			
Number of firms	9,093			

Notes: The sample consists of firms which had at least one patent application prior to the WWI draft and had no patent application relevant for the arms industry such as weapons, ammunition, and explosives. The outcome variable is the number of patent applications per year not relevant for the arms industry. The number of patent applications is winsorized at 10. Standard errors are clustered by firms.

Table B.3: LONG-RUN IMPACT OF SUPPLY SHOCK ON INNOVATION RATES, REDUCED FORM, LESS INNOVATIVE FIRM

	Specification			
	(1)	(2)	(3)	(4)
Dependent variable: Patent applications per year				
A. Year: 1910-1929, Post-treatment years: 1917-1929				
Supply shock in Collaboration space	-0.0021 (0.0015)	–	–	-0.0022 (0.0015)
Geographic space	–	-0.0273*** (0.0104)	–	-0.0269*** (0.0104)
Idea space	–	–	-0.0389*** (0.0057)	-0.0390*** (0.0057)
Dependent variable mean	0.0768			
Number of observations	398,760			
Number of firms	19,938			
B. Year: 1910-1950, Post-treatment years: 1917-1950				
Supply shock in Collaboration space	-0.0054*** (0.0015)	–	–	-0.0057*** (0.0015)
Geographic space	–	-0.0225** (0.0111)	–	-0.0217* (0.0111)
Idea space	–	–	-0.0636*** (0.0053)	-0.0639*** (0.0053)
Dependent variable mean	0.0768			
Number of observations	817,458			
Number of firms	19,938			
C. Year: 1900-1950, Post-treatment years: 1917-1950				
Supply shock in Collaboration space	-0.0042*** (0.0009)	–	–	-0.0044*** (0.0009)
Geographic space	–	-0.0184*** (0.0067)	–	-0.0178*** (0.0067)
Idea space	–	–	-0.0346*** (0.0029)	-0.0348*** (0.0029)
Dependent variable mean	0.0710			
Number of observations	1,016,838			
Number of firms	19,938			

Notes: The sample consists of firms which had at least one patent application prior to the WWI draft and had no patent application relevant for the arms industry such as weapons, ammunition, and explosives. The outcome variable is the number of patent applications per year not relevant for the arms industry. The number of patent applications is winsorized at 10. Standard errors are clustered by firms.

Table B.4: LONG-RUN IMPACT OF SUPPLY SHOCK ON INNOVATION RATES, REDUCED FORM, HIGHLY INNOVATIVE FIRM

	Specification			
	(1)	(2)	(3)	(4)
Dependent variable: Patent applications per year				
A. Year: 1910-1929, Post-treatment years: 1917-1929				
Supply shock in Collaboration space	-0.6037*** (0.1155)	–	–	-0.5406*** (0.1135)
Geographic space	–	-0.6589 (0.9828)	–	-0.9558 (0.9503)
Idea space	–	–	2.5571*** (0.2635)	2.5080*** (0.2636)
Dependent variable mean	1.2970			
Number of observations	58,660			
Number of firms	2,933			
B. Year: 1910-1950, Post-treatment years: 1917-1950				
Supply shock in Collaboration space	-0.6380*** (0.1249)	–	–	-0.5911*** (0.1240)
Geographic space	–	-1.0400 (0.9958)	–	-1.2396 (0.9724)
Idea space	–	–	1.9617*** (0.2558)	1.9109*** (0.2555)
Dependent variable mean	1.2970			
Number of observations	120,253			
Number of firms	2,933			
C. Year: 1900-1950, Post-treatment years: 1917-1950				
Supply shock in Collaboration space	-0.2837*** (0.1042)	–	–	-0.2426** (0.1031)
Geographic space	–	-0.4538 (0.8517)	–	-0.6881 (0.8308)
Idea space	–	–	1.7479*** (0.2479)	1.7297*** (0.2475)
Dependent variable mean	1.0379			
Number of observations	149,583			
Number of firms	2,933			

Notes: The sample consists of firms which had at least one patent application prior to the WWI draft and had no patent application relevant for the arms industry such as weapons, ammunition, and explosives. Highly innovative firms are those with pre-WWI patents in the top 10 percentile. The outcome variable is the number of patent applications per year not relevant for the arms industry. The number of patent applications is winsorized at 10. Standard errors are clustered by firms.

Table B.5: CORRELATIONS BETWEEN POSSIBLE SUPPLY SHOCK AND ACTUAL SUPPLY SHOCK

	Actual supply shock of served inventors		
	Collaborator (1)	Geographic (2)	Idea (3)
A. Supply shock of more likely draftable inventors (age 21-30)			
Collaborator	0.2585	0.0110	-0.0156
Geographic	0.0075	0.9581	0.0022
Idea	0.0186	0.0041	0.9499
B. Supply shock of less likely draftable inventors (age 31-45)			
Collaborator	0.0356	0.0214	0.0022
Geographic	0.0267	0.0363	-0.0021
Idea	-0.0002	0.0031	0.0790
C. Supply shock of not draftable inventors (age 46 or above)			
Collaborator	0.0104	0.0199	-0.0124
Geographic	0.0129	0.0166	-0.0050
Idea	0.0037	-0.0003	0.0736

Notes: This table reports correlation between each of possible supply shocks captured by draftable inventors and each of actual supply shocks captured by served inventors. In panel A, supply shocks of more likely draftable inventors are the instruments for supply shocks of served inventors. Panel B and C show correlation between placebo supply shocks and supply shocks of served inventors. The sample consists of firms which had at least one patent application prior to the WWI draft. Standard errors are clustered by firms.

Table B.6: FIRST-STAGE REGRESSIONS, PLACEBO AGE GROUPS

	Dependent variable					
Instrument	Collaborator (1)	Geographic (2)	Idea (3)	Collaborator (4)	Geographic (5)	Idea (6)
A. Supply shock of less likely draftable inventors (age 31-45)						
Collaborator (S^*_{iC})	0.0389***	–	–	0.0376***	0.0039***	0.0070**
	(0.0077)			(0.0077)	(0.0009)	(0.0031)
Geographic (S^*_{iG})	–	0.0100**	–	-0.0026	0.0097**	0.0373***
		(0.0044)		(0.0044)	(0.0044)	(0.0099)
Idea (S^*_{iF})	–	–	0.0238***	-0.0007	0.0002	0.0237***
			(0.0015)	(0.0020)	(0.0004)	(0.0015)
F-test of excluded instruments	25.53	5.17	249.74	13.30	8.40	85.96
B. Supply shock of not draftable inventors (age 46 or above)						
Collaborator (S^*_{iC})	0.0111*	–	–	0.0103*	0.0036***	-0.0007
	(0.0058)			(0.0058)	(0.0008)	(0.0025)
Geographic (S^*_{iG})	–	0.0043	–	-0.0015	0.0040	0.0175**
		(0.0033)		(0.0041)	(0.0033)	(0.0084)
Idea (S^*_{iF})	–	–	0.0191***	0.0009	-0.0004	0.0191***
			(0.0012)	(0.0018)	(0.0003)	(0.0013)
F-test of excluded instruments	3.68	1.70	232.52	2.60	7.97	77.86

Notes: This table reports first-stage regressions for placebo supply shocks measured by unlikely draftable inventors. The sample consists of firms which had at least one patent application prior to the WWI draft. Standard errors are clustered by firms.

Table B.7: IMPACT OF SUPPLY SHOCK ON INNOVATION RATES, IV COEFFICIENTS, PLACEBO AGE GROUPS OF INVENTOR

	Specification			
	(1)	(2)	(3)	(4)
Dependent variable: Patent applications per year				
A. Supply shock of less likely draftable inventors (age 31-45)				
Supply shock in Collaboration space	-0.0544 (0.1010)	–	–	-0.0573 (0.1094)
Geographic space	–	-6.0505 (15.5370)	–	-5.0650 (13.2236)
Idea space	–	–	-0.0377 (0.0533)	-0.0371 (0.0542)
B. Supply shock of not draftable inventors (age 46 or above)				
Supply shock in Collaboration space	0.4979 (0.5490)	–	–	0.3389 (0.5237)
Geographic space	–	-1.3442 (1.2974)	–	-1.1873 (1.3282)
Idea space	–	–	-0.0380 (0.0531)	-0.0500 (0.0566)
Dependent variable mean	0.1618			
Number of observations	261,279			
Number of firms	29,031			

Notes: The sample consists of firms which had at least one patent application prior to the WWI draft and had no patent application relevant for the arms industry such as weapons, ammunition, and explosives. The outcome variable is the number of patent applications per year not relevant for the arms industry. The number of patent applications is winsorized at 10. Standard errors are clustered by firms. State-year fixed effects are included.

Table B.8: IMPACT OF SUPPLY SHOCK ON INNOVATION RATES, REDUCED FORM, ALL FIRM

	Specification			
	(1)	(2)	(3)	(4)
Dependent variable: Patent applications per year				
A. All firms				
Supply shock in Collaboration space	-0.0215***	–	–	-0.0208***
	(0.0080)			(0.0080)
Geographic space	–	0.0475	–	0.0481
		(0.0498)		(0.0497)
Idea space	–	–	0.0927**	0.0915**
			(0.0362)	(0.0362)
Dependent variable mean	0.1664			
Number of observations	265,536			
Number of firms	29,504			
B. More innovative firms (Patents before WWI above the median)				
Supply shock in Collaboration space	-0.0368*	–	–	-0.0332
	(0.0223)			(0.0223)
Geographic space	–	0.2575	–	0.2527
		(0.1675)		(0.1674)
Idea space	–	–	0.2240***	0.2211***
			(0.0844)	(0.0844)
Dependent variable mean	0.3572			
Number of observations	84,537			
Number of firms	9,393			
C. Less innovative firms (Patents before WWI below the median)				
Supply shock in Collaboration space	-0.0016	–	–	-0.0018
	(0.0030)			(0.0030)
Geographic space	–	-0.0229	–	-0.0233
		(0.0212)		(0.0212)
Idea space	–	–	-0.0512***	-0.0513***
			(0.0125)	(0.0125)
Dependent variable mean	0.0772			
Number of observations	180,999			
Number of firms	20,111			

Notes: The sample consists of firms which had at least one patent application prior to the WWI draft. More innovative firms had pre-WWI patents above the median and less innovative firms had pre-WWI patents equal to or below the median. The outcome variable is the number of patent applications per year. The number of patent applications is winsorized at 10. Standard errors are clustered by firms. State-year fixed effects are included.

Table B.9: IMPACT OF SUPPLY SHOCK ON INNOVATION RATES, INTERACTION TERMS FOR MORE OR LESS INNOVATIVE FIRMS

	Specification			
	(1)	(2)	(3)	(4)
Dependent variable: Patent applications per year				
More innovative firms				
Supply shock in Collaboration space	-0.0344 (0.0211)	–	–	-0.0311 (0.0211)
Geographic space	–	0.1370 (0.1517)	–	0.1298 (0.1520)
Idea space	–	–	0.2419*** (0.0834)	0.2389*** (0.0834)
Less innovative firms				
Supply shock in Collaboration space	-0.0016 (0.0019)	–	–	-0.0016 (0.0019)
Geographic space	–	-0.0076 (0.0137)	–	-0.0075 (0.0137)
Idea space	–	–	-0.0159* (0.0085)	-0.0160* (0.0085)
Dependent variable mean	0.1664			
Number of observations	265,536			
Number of firms	29,504			

Notes: The sample consists of firms which had at least one patent application prior to the WWI draft. More innovative firms are those with pre-WWI patents above the median and less innovative firms are those with pre-WWI patents below the median. The outcome variable is the number of patent applications per year. The number of patent applications is winsorized at 10. Standard errors are clustered by firms.

Table B.10: IMPACT OF SUPPLY SHOCK ON INNOVATION RATES, REDUCED FORM (DIFFERENT WEIGHT)

	Specification			
	(1)	(2)	(3)	(4)
Dependent variable: Patent applications per year				
A. Firms				
Supply shock in Collaboration space	-0.0251***	–	–	-0.0246***
	(0.0083)			(0.0083)
Geographic space	–	0.0366	–	0.0363
		(0.0481)		(0.0480)
Idea space	–	–	0.0806**	0.0795**
			(0.0390)	(0.0390)
Dependent variable mean	0.1618			
Number of observations	261,279			
Number of firms	29,031			
B. More innovative firms				
Supply shock in Collaboration space	-0.0490**	–	–	-0.0455*
	(0.0234)			(0.0234)
Geographic space	–	0.2322	–	0.2286
		(0.1627)		(0.1623)
Idea space	–	–	0.1827**	0.1783**
			(0.0901)	(0.0900)
Dependent variable mean	0.3481			
Number of observations	81,837			
Number of firms	9,093			
C. Less innovative firms				
Supply shock in Collaboration space	-0.0018	–	–	-0.0018
	(0.0033)			(0.0033)
Geographic space	–	-0.0254	–	-0.0252
		(0.0212)		(0.0212)
Idea space	–	–	-0.0432***	-0.0432***
			(0.0144)	(0.0144)
Dependent variable mean	0.0768			
Number of observations	179,442			
Number of firms	19,938			

Notes: The sample consists of firms which had at least one patent application prior to the WWI draft and had no patent application relevant for the arms industry such as weapons, ammunition, and explosives. More innovative firms are those with pre-WWI patents above the median and less innovative firms are those with pre-WWI patents below the median. The outcome variable is the number of patent applications per year not relevant for the arms industry. The number of patent applications is winsorized at 10. Standard errors are clustered by firms. State-year fixed effects are included.

Table B.11: IMPACT OF SUPPLY SHOCK ON INNOVATION RATES, REDUCED FORM (OUTSIDE THE FIRM)

	Specification			
	(1)	(2)	(3)	(4)
Dependent variable: Patent applications per year				
A. Firms				
Supply shock in Collaboration space	-0.0213*** (0.0077)	–	–	-0.0208*** (0.0077)
Geographic space	–	0.0522 (0.0479)	–	0.0521 (0.0479)
Idea space	–	–	0.0813** (0.0390)	0.0800** (0.0391)
Dependent variable mean	0.1618			
Number of observations	261,279			
Number of firms	29,031			
B. More innovative firms				
Supply shock in Collaboration space	-0.0370* (0.0217)	–	–	-0.0338 (0.0217)
Geographic space	–	0.2840* (0.1688)	–	0.2807* (0.1687)
Idea space	–	–	0.1842** (0.0905)	0.1809** (0.0905)
Dependent variable mean	0.3481			
Number of observations	81,837			
Number of firms	9,093			
C. Less innovative firms				
Supply shock in Collaboration space	-0.0019 (0.0030)	–	–	-0.0021 (0.0030)
Geographic space	–	-0.0254 (0.0212)	–	-0.0252 (0.0212)
Idea space	–	–	-0.0432*** (0.0144)	-0.0433*** (0.0144)
Dependent variable mean	0.0768			
Number of observations	179,442			
Number of firms	19,938			

Notes: The sample consists of firms which had at least one patent application prior to the WWI draft and had no patent application relevant for the arms industry such as weapons, ammunition, and explosives. More innovative firms had pre-WWI patents above the median and less innovative firms had pre-WWI patents equal to or below the median. The outcome variable is the number of patent applications per year not relevant for the arms industry. The number of patent applications is winsorized at 10. Standard errors are clustered by firms. State-year fixed effects are included.

Table B.12: CORRELATIONS BETWEEN SUPPLY SHOCK OF ALL MEN AND SUPPLY SHOCK OF INVENTORS

	Actual supply shock of served inventors		
	Collaborator (1)	Geographic (2)	Idea (3)
A. Supply shock of more likely draftable men in geographic space			
Collaborator	0.2585	0.0110	-0.0156
Geographic	0.0069	0.1787	0.0167
Idea	0.0186	0.0041	0.9499
B. Supply shock of less likely draftable men in geographic space			
Collaborator	0.2585	0.0110	-0.0156
Geographic	-0.0065	-0.1118	0.0016
Idea	0.0186	0.0041	0.9499
C. Supply shock of not draftable men in geographic space			
Collaborator	0.2585	0.0110	-0.0156
Geographic	-0.0035	-0.1459	-0.0259
Idea	0.2585	0.0110	-0.0156

Notes: This table reports correlation between each of supply shocks captured by all men in 1910 Census and each of actual supply shocks captured by served inventors. The supply shock in geographic space measured by inventors is replaced with each of supply shocks in geographic space measured by all men in 1910 Census, while supply shocks in collaboration space and idea space remain the same. The sample consists of firms which had at least one patent application prior to the WWI draft. Standard errors are clustered by firms.

Table B.13: FIRST-STAGE REGRESSIONS, SUPPLY SHOCK OF ALL MEN IN GEOGRAPHIC SPACE

	Dependent variable					
Instrument	Collaborator (1)	Geographic (2)	Idea (3)	Collaborator (4)	Geographic (5)	Idea (6)
A. Supply shock of more likely draftable men in geographic space from 1910 Census						
Collaborator (S^*_{iC})	0.1081***	–	–	0.1093***	0.0001	-0.0001
	(0.0051)			(0.0055)	(0.0006)	(0.0004)
Geographic (S^*_{iG})	–	0.0675***	–	-0.0060**	0.0676***	-0.0033
		(0.0021)		(0.0024)	(0.0021)	(0.0117)
Idea (S^*_{iF})	–	–	0.6649***	0.0293***	-0.0015	0.6671***
			(0.0076)	(0.0090)	(0.0009)	(0.0081)
F-test of excluded instruments	453.85	1,027.98	7,607.89	2,326.87	352.51	132.84
B. Supply shock of less likely draftable men in geographic space from 1910 Census						
Collaborator (S^*_{iC})	0.1081***	–	–	0.1093***	0.0003	-0.0001
	(0.0051)			(0.0055)	(0.0006)	(0.0004)
Geographic (S^*_{iG})	–	-0.0605***	–	0.0092***	-0.0605***	-0.0005
		(0.0034)		(0.0035)	(0.0034)	(0.0167)
Idea (S^*_{iF})	–	–	0.6649***	0.0293***	-0.0007	0.6671***
			(0.0076)	(0.0090)	(0.0009)	(0.0081)
F-test of excluded instruments	453.85	316.49	7,607.89	133.13	106.90	2,314.91
C. Supply shock of not draftable men in geographic space from 1910 Census						
Collaborator (S^*_{iC})	0.1081***	–	–	0.1093***	0.0003	-0.0001
	(0.0051)			(0.0055)	(0.0006)	(0.0004)
Geographic (S^*_{iG})	–	-0.0801***	–	0.0031	-0.0801***	0.0074
		(0.0035)		(0.0029)	(0.0035)	(0.0177)
Idea (S^*_{iF})	–	–	0.6649***	0.0293***	-0.0014	0.6671***
			(0.0076)	(0.0090)	(0.0009)	(0.0081)
F-test of excluded instruments	453.85	526.69	7,607.89	133.14	180.94	2,354.57

Notes: The supply shock in geographic space measured by inventors is replaced with each of possible supply shocks in geographic space measured by all men in 1910 Census, while supply shocks in collaboration space and idea space remain the same. The sample consists of firms which had at least one patent application prior to the WWI draft. Standard errors are clustered by firms.

Table B.14: IMPACT OF SUPPLY SHOCK ON INNOVATION RATES, SUPPLY SHOCK OF ALL MEN IN GEOGRAPHIC SPACE

	Specification			
	(1)	(2)	(3)	(4)
Dependent variable: Patent applications per year				
A. Supply shock of more likely draftable men in geographic space from 1910 Census				
Supply shock in Collaboration space	-0.0217***	–	–	-0.0204**
	(0.0070)			(0.0080)
Geographic space	–	-0.0425	–	-0.0431
		(0.0360)		(0.0359)
Idea space	–	–	0.0832**	0.0886**
			(0.0326)	(0.0361)
B. Supply shock of less likely draftable men in geographic space from 1910 Census				
Supply shock in Collaboration space	-0.0217***	–	–	-0.0204**
	(0.0070)			(0.0080)
Geographic space	–	0.0748	–	0.0733
		(0.0487)		(0.0487)
Idea space	–	–	0.0832**	0.0882**
			(0.0326)	(0.0362)
C. Supply shock of not draftable men in geographic space from 1910 Census				
Supply shock in Collaboration space	-0.0217***	–	–	-0.0206***
	(0.0070)			(0.0080)
Geographic space	–	0.0126	–	0.0153
		(0.0534)		(0.0533)
Idea space	–	–	0.0832**	0.0881**
			(0.0326)	(0.0361)
Dependent variable mean	0.1664			
Number of observations	265,536			
Number of firms	29,504			
Number of counties	1,361			

Notes: The supply shock in geographic space measured by inventors is replaced with each of possible supply shocks in geographic space measured by all men in 1910 Census, while supply shocks in collaboration space and idea space remain the same. The sample consists of firms which had at least one patent application prior to the WWI draft. The outcome variable is the number of patent applications per year. The number of patent applications is winsorized at 10. Standard errors are clustered by firms.

Table B.15: IMPACT OF SUPPLY SHOCK ON INNOVATION RATES, REDUCED FORM (NOT WORKING WITH ANY FIRM)

	Specification			
	(1)	(2)	(3)	(4)
Dependent variable: Patent applications per year				
A. Firms				
Supply shock in Collaboration space	-0.0213***	–	–	-0.0208***
	(0.0077)			(0.0077)
Geographic space	–	0.0411	–	0.0412
		(0.0397)		(0.0396)
Idea space	–	–	0.0519*	0.0510*
			(0.0269)	(0.0269)
Dependent variable mean	0.1618			
Number of observations	222,795			
Number of firms	29,031			
B. More innovative firms				
Supply shock in Collaboration space	-0.0370*	–	–	-0.0341
	(0.0217)			(0.0217)
Geographic space	–	0.2330	–	0.2306
		(0.1434)		(0.1433)
Idea space	–	–	0.1185*	0.1162*
			(0.0631)	(0.0631)
Dependent variable mean	0.3481			
Number of observations	76,338			
Number of firms	9,093			
C. Less innovative firms				
Supply shock in Collaboration space	-0.0019	–	–	-0.0021
	(0.0030)			(0.0030)
Geographic space	–	-0.0216	–	-0.0215
		(0.0178)		(0.0178)
Idea space	–	–	-0.0297***	-0.0297***
			(0.0103)	(0.0103)
Dependent variable mean	0.0768			
Number of observations	146,457			
Number of firms	19,938			

Notes: The sample consists of firms which had at least one patent application prior to the WWI draft and had no patent application relevant for the arms industry such as weapons, ammunition, and explosives. More innovative firms had pre-WWI patents above the median and less innovative firms had pre-WWI patents equal to or below the median. The outcome variable is the number of patent applications per year not relevant for the arms industry. The number of patent applications is winsorized at 10. Standard errors are clustered by firms. State-year fixed effects are included.

Table B.16: IMPACT OF SUPPLY SHOCK ON INNOVATION RATES, IV COEFFICIENTS (NOT WORKING WITH ANY FIRM)

	Specification			
	(1)	(2)	(3)	(4)
Dependent variable: Patent applications per year				
A. Firms				
Supply shock in Collaboration space	-0.2000***	–	–	-0.1952***
	(0.0685)			(0.0683)
Geographic space	–	0.0652	–	0.0661
		(0.0593)		(0.0589)
Idea space	–	–	0.0787**	0.0830**
			(0.0385)	(0.0386)
Dependent variable mean	0.1618			
Number of observations	222,795			
Number of firms	29,031			
B. More innovative firms				
Supply shock in Collaboration space	-0.3596*	–	–	-0.3348*
	(0.2008)			(0.1997)
Geographic space	–	0.3657*	–	0.3707*
		(0.2106)		(0.2105)
Idea space	–	–	0.1741**	0.1799**
			(0.0876)	(0.0876)
Dependent variable mean	0.3481			
Number of observations	76,338			
Number of firms	9,093			
C. Less innovative firms				
Supply shock in Collaboration space	-0.0175	–	–	-0.0191
	(0.0260)			(0.0259)
Geographic space	–	-0.0344	–	-0.0344
		(0.0268)		(0.0267)
Idea space	–	–	-0.0460***	-0.0455***
			(0.0150)	(0.0150)
Dependent variable mean	0.0768			
Number of observations	146,457			
Number of firms	19,938			

Notes: The sample consists of firms which had at least one patent application prior to the WWI draft and had no patent application relevant for the arms industry such as weapons, ammunition, and explosives. More innovative firms had pre-WWI patents above the median and less innovative firms had pre-WWI patents equal to or below the median. The outcome variable is the number of patent applications per year not relevant for the arms industry. The number of patent applications is winsorized at 10. Standard errors are clustered by firms. State-year fixed effects are included.

Table B.17: SUMMARY STATISTICS, INDIVIDUAL

	Served inventors	Non-served inventors		
		Total	Registered	Not registered
	(1)	(2)	(3)	(4)
Patent applications per year (SD)				
1910-1916	0.3778	0.1539	0.1684	0.1356
	(1.0016)	(0.5429)	(0.5521)	(0.5306)
1917-1918	0.2600	0.0683	0.0724	0.0630
	(0.9195)	(0.4196)	(0.4286)	(0.4074)
Median age				
	28	40	33	51
Number of inventors				
	1,783	119,244	67,342	51,902

Notes: The sample consists of inventors who had at least one patent application prior to the WWI draft. The number of patents is winsorized at 10.

Table B.18: IMPACT OF SUPPLY SHOCK ON INNOVATION RATES, OLS COEFFICIENTS, INDIVIDUAL

	Specification			
	(1)	(2)	(3)	(4)
Dependent variable: Number of patent applications per year				
A. All inventors who did not serve				
Supply shock in Collaboration space	-0.0335** (0.0146)	–	–	-0.0337** (0.0145)
Geographic space	–	0.0048 (0.0186)	–	0.0050 (0.0186)
Idea space	–	–	0.0768* (0.0393)	0.0770* (0.0393)
Dependent variable mean	0.1539			
Number of observations	1,055,438			
Number of inventors	119,208			
Number of counties	3,024			
B. Inventors who registered but did not serve				
Supply shock in Collaboration space	-0.0260 (0.0205)	–	–	-0.0263 (0.0204)
Geographic space	–	0.0039 (0.0267)	–	0.0035 (0.0267)
Idea space	–	–	0.1593*** (0.0568)	0.1594*** (0.0568)
Dependent variable mean	0.1684			
Number of observations	591,054			
Number of inventors	67,342			
Number of counties	2,973			
C. Inventors who neither registered nor serve				
Supply shock in Collaboration space	-0.0420** (0.0204)	–	–	-0.0419** (0.0204)
Geographic space	–	0.0148 (0.0239)	–	0.0146 (0.0239)
Idea space	–	–	-0.0436 (0.0443)	-0.0430 (0.0444)
Dependent variable mean	0.1356			
Number of observations	464,384			
Number of inventors	51,866			
Number of counties	2,918			

Notes: The sample consists of inventors who had at least one patent application prior to the WWI draft. The number of patents is winsorized at 10. Standard errors are clustered at the individual level.

Table B.19: FIRST-STAGE REGRESSIONS, INDIVIDUAL

	Dependent variable					
	Collaborator	Geographic	Idea	Collaborator	Geographic	Idea
Instrument	(1)	(2)	(3)	(4)	(5)	(6)
Collaborator (S^*_{iC})	0.6042***	–	–	0.6032***	0.0006	0.0021***
	(0.0059)			(0.0059)	(0.0007)	(0.0006)
Geographic (S^*_{iG})	–	0.6223***	–	0.0001	0.6222***	0.0204***
		(0.0043)		(0.0007)	(0.0043)	(0.0029)
Idea (S^*_{iF})	–	–	0.5545***	0.0011	0.0004	0.5544***
			(0.0056)	(0.0022)	(0.0007)	(0.0056)
F-test of excluded instruments	10,530.29	20,626.29	9,913.06	3,555.83	6,876.73	3,329.11

Notes: Standard errors are clustered at the individual level.

Table B.20: IMPACT OF SUPPLY SHOCK ON INNOVATION RATES, IV COEFFICIENTS, INDIVIDUAL

	Specification			
	(1)	(2)	(3)	(4)
Dependent variable: Number of patent applications per year				
A. All inventors who did not serve				
Supply shock in Collaboration space	-0.0687*** (0.0189)	–	–	-0.0688*** (0.0189)
Geographic space	–	0.0087 (0.0186)	–	0.0088 (0.0187)
Idea space	–	–	0.0406 (0.0331)	0.0408 (0.0331)
Dependent variable mean	0.1539			
Number of observations	1,055,438			
Number of inventors	119,208			
Number of counties	3,024			
B. Inventors who registered but did not serve				
Supply shock in Collaboration space	-0.0359* (0.0201)	–	–	-0.0361* (0.0201)
Geographic space	–	0.0195 (0.0256)	–	0.0194 (0.0256)
Idea space	–	–	0.1163** (0.0460)	0.1162** (0.0461)
Dependent variable mean	0.1684			
Number of observations	591,054			
Number of inventors	67,342			
Number of counties	2,973			
C. Inventors who neither registered nor served				
Supply shock in Collaboration space	-0.1136*** (0.0320)	–	–	-0.1133*** (0.0320)
Geographic space	–	-0.0074 (0.0269)	–	-0.0079 (0.0270)
Idea space	–	–	-0.0631 (0.0422)	-0.0625 (0.0423)
Dependent variable mean	0.1356			
Number of observations	464,384			
Number of inventors	51,866			
Number of counties	2,918			

Notes: The sample consists of inventors who had at least one patent application prior to the WWI draft. The number of patents is winsorized at 10. Standard errors are clustered at the individual level.

Table B.21: IMPACT OF SUPPLY SHOCK ON INNOVATION RATES, REDUCED FORM, INDIVIDUAL

	Specification			
	(1)	(2)	(3)	(4)
Dependent variable: Number of patent applications per year				
A. All inventors who did not serve				
Supply shock in Collaboration space	-0.0372*** (0.0108)	–	–	-0.0373*** (0.0108)
Geographic space	–	0.0054 (0.0122)	–	0.0055 (0.0122)
Idea space	–	–	0.0224 (0.0194)	0.0225 (0.0194)
Dependent variable mean	0.1539			
Number of observations	1,055,438			
Number of inventors	119,208			
Number of counties	3,024			
B. Inventors who registered but did not serve				
Supply shock in Collaboration space	-0.0248* (0.0147)	–	–	-0.0248* (0.0147)
Geographic space	–	0.0128 (0.0178)	–	0.0127 (0.0178)
Idea space	–	–	0.0633** (0.0267)	0.0633** (0.0267)
Dependent variable mean	0.1684			
Number of observations	591,054			
Number of inventors	67,342			
Number of counties	2,973			
C. Inventors who neither registered nor serve				
Supply shock in Collaboration space	-0.0507*** (0.0150)	–	–	-0.0506*** (0.0150)
Geographic space	–	-0.0043 (0.0164)	–	-0.0044 (0.0164)
Idea space	–	–	-0.0355 (0.0251)	-0.0351 (0.0252)
Dependent variable mean	0.1356			
Number of observations	464,384			
Number of inventors	51,866			
Number of counties	2,918			

Notes: The sample consists of inventors who had at least one patent application prior to the WWI draft. The number of patents is winsorized at 10. Standard errors are clustered at the individual level.

Table B.22: IMPACT OF SUPPLY SHOCK ON INNOVATION RATES, REDUCED FORM, INTERACTION TERMS FOR PERCENTILE IN PRE-WWI PATENTS

	Specification			
	(1)	(2)	(3)	(4)
Dependent variable: Patent applications per year				
Firms at the bottom percentile in pre-WWI patents				
Supply shock in Collaboration space	0.0334***	–	–	0.0198**
	(0.0090)			(0.0094)
Geographic space	–	0.4314***	–	0.3955***
		(0.0652)		(0.0690)
Idea space	–	–	-0.1090***	-0.1391***
			(0.0347)	(0.0362)
Interacted with the percentile in pre-WWI patents				
Supply shock in Collaboration space	-0.0040***	–	–	-0.0026**
	(0.0011)			(0.0012)
Geographic space	–	-0.0431***	–	-0.0385***
		(0.0084)		(0.0092)
Idea space	–	–	0.0118***	0.0155***
			(0.0038)	(0.0040)
Dependent variable mean	0.1618			
Number of observations	261,279			
Number of firms	29,031			

Notes: The sample consists of firms which had at least one patent application prior to the WWI draft and had no patent application relevant for the arms industry such as weapons, ammunition, and explosives. The outcome variable is the number of patent applications per year not relevant for the arms industry. The number of patent applications is winsorized at 10. Standard errors are clustered by firms.

Table B.23: IMPACT OF SUPPLY SHOCK ON ORIGINAL PATENT APPLICATIONS, REDUCED FORM, HIGHLY INNOVATIVE FIRM

	Specification			
	(1)	(2)	(3)	(4)
Dependent variable: Original patent applications per year				
A. Firms in the top 5 percentile of pre-WWI patents				
Supply shock in Collaboration space	-0.1047 (0.0797)	–	–	-0.0967 (0.0802)
Geographic space	–	1.0874* (0.5728)	–	1.0201* (0.5689)
Idea space	–	–	0.2074** (0.0825)	0.1854** (0.0836)
Dependent variable mean	0.2510			
Number of observations	12,447			
Number of firms	1,383			
B. Firms in the top 10 percentile of pre-WWI patents				
Supply shock in Collaboration space	-0.0481 (0.0443)	–	–	-0.0451 (0.0444)
Geographic space	–	0.5004* (0.2707)	–	0.4903* (0.2670)
Idea space	–	–	0.1358** (0.0580)	0.1286** (0.0582)
Dependent variable mean	0.1648			
Number of observations	26,397			
Number of firms	2,933			
C. Firms in the top 25 percentile of pre-WWI patents				
Supply shock in Collaboration space	-0.0199 (0.0170)	–	–	-0.0176 (0.0171)
Geographic space	–	0.1920** (0.0902)	–	0.1830** (0.0897)
Idea space	–	–	0.1153*** (0.0351)	0.1126*** (0.0352)
Dependent variable mean	0.0818			
Number of observations	73,314			
Number of firms	8,146			

Notes: The sample consists of firms which had at least one patent application prior to the WWI draft and had no patent application relevant for the arms industry such as weapons, ammunition, and explosives. The outcome variable is the number of original patent applications per year defined as patents with new one/two/three word phrases in patent title that did not exist in previous patent titles. The number of patent applications is winsorized at 10. Standard errors are clustered by firms.

Table B.24: IMPACT OF SUPPLY SHOCK ON PATENT CITATIONS, REDUCED FORM, HIGHLY INNOVATIVE FIRM

	Specification			
	(1)	(2)	(3)	(4)
Dependent variable: Patent citations per year				
A. Firms in the top 5 percentile of pre-WWI patents				
Supply shock in Collaboration space	-0.9958*** (0.3704)	–	–	-0.8994** (0.3703)
Geographic space	–	1.8670 (3.8225)	–	1.0469 (3.7989)
Idea space	–	–	2.3937*** (0.5956)	2.2689*** (0.5942)
Dependent variable mean	2.8476			
Number of observations	12,447			
Number of firms	1,383			
B. Firms in the top 10 percentile of pre-WWI patents				
Supply shock in Collaboration space	-0.6047*** (0.2088)	–	–	-0.5485*** (0.2082)
Geographic space	–	0.9828 (1.8921)	–	0.8056 (1.8716)
Idea space	–	–	2.0608*** (0.4282)	1.9975*** (0.4275)
Dependent variable mean	1.9534			
Number of observations	26,397			
Number of firms	2,933			
C. Firms in the top 25 percentile of pre-WWI patents				
Supply shock in Collaboration space	-0.2747*** (0.0848)	–	–	-0.2461*** (0.0847)
Geographic space	–	0.4368 (0.6362)	–	0.3122 (0.6315)
Idea space	–	–	1.5880*** (0.2755)	1.5611*** (0.2749)
Dependent variable mean	1.0267			
Number of observations	73,314			
Number of firms	8,146			

Notes: The sample consists of firms which had at least one patent application prior to the WWI draft and had no patent application relevant for the arms industry such as weapons, ammunition, and explosives. The outcome variable is the number of patent citations. The number of patent citations is winsorized at 20. Standard errors are clustered by firms.

Table B.25: QUALITY OF INVENTORS AND IMPACT OF SUPPLY SHOCK ON INNOVATION RATES, REDUCED FORM, MORE INNOVATIVE FIRM

	Specification			
	(1)	(2)	(3)	(4)
Dependent variable: Patent applications per year				
A. Supply shock of very high-quality inventors				
Supply shock in Collaboration space	-0.0895*** (0.0324)	–	–	-0.0823** (0.0325)
Geographic space	–	-0.0872*** (0.0333)	–	-0.0818** (0.0332)
Idea space	–	–	0.1557* (0.0891)	0.1551* (0.0894)
B. Supply shock of high-quality inventors				
Supply shock in Collaboration space	-0.0799*** (0.0253)	–	–	-0.0745*** (0.0253)
Geographic space	–	-0.0741** (0.0337)	–	-0.0680** (0.0336)
Idea space	–	–	0.1381* (0.0799)	0.1365* (0.0800)
C. Supply shock of low-quality inventors				
Supply shock in Collaboration space	0.0111 (0.0459)	–	–	0.0093 (0.0470)
Geographic space	–	0.0617 (0.0920)	–	0.0664 (0.0942)
Idea space	–	–	0.0938* (0.0548)	0.0944* (0.0548)
Dependent variable mean	0.3481			
Number of observations	81,837			
Number of firms	9,093			

Notes: The sample consists of firms which had at least one patent application prior to the WWI draft and had no patent application relevant for the arms industry such as weapons, ammunition, and explosives. More innovative firms had pre-WWI patents above the median. Very high-quality inventors had pre-WWI patents in the top 10 percentile. High-quality inventors had pre-WWI patents above the median and low-quality inventors had pre-WWI patents equal to or below the median. The outcome variable is the number of patent applications per year not relevant for the arms industry. The number of patent applications is winsorized at 10. Standard errors are clustered by firms.

Table B.26: QUALITY OF INVENTORS AND IMPACT OF SUPPLY SHOCK ON INNOVATION RATES, REDUCED FORM, LESS INNOVATIVE FIRM

	Specification			
	(1)	(2)	(3)	(4)
Dependent variable: Patent applications per year				
A. Supply shock of very high-quality inventors				
Supply shock in Collaboration space	-0.0050 (0.0043)	–	–	-0.0048 (0.0043)
Geographic space	–	-0.0048 (0.0043)	–	-0.0041 (0.0043)
Idea space	–	–	-0.0446*** (0.0135)	-0.0445*** (0.0135)
B. Supply shock of high-quality inventors				
Supply shock in Collaboration space	-0.0069* (0.0037)	–	–	-0.0068* (0.0037)
Geographic space	–	-0.0067 (0.0042)	–	-0.0058 (0.0042)
Idea space	–	–	-0.0387*** (0.0120)	-0.0387*** (0.0120)
C. Supply shock of low-quality inventors				
Supply shock in Collaboration space	0.0013 (0.0052)	–	–	-0.0001 (0.0052)
Geographic space	–	0.0278** (0.0112)	–	0.0268** (0.0113)
Idea space	–	–	-0.0267*** (0.0082)	-0.0264*** (0.0082)
Dependent variable mean	0.0768			
Number of observations	179,442			
Number of firms	19,938			

Notes: The sample consists of firms which had at least one patent application prior to the WWI draft and had no patent application relevant for the arms industry such as weapons, ammunition, and explosives. Less innovative firms had pre-WWI patents equal to or below the median. Very high-quality inventors had pre-WWI patents in the top 10 percentile. High-quality inventors had pre-WWI patents above the median and low-quality inventors had pre-WWI patents equal to or below the median. The outcome variable is the number of patent applications per year not relevant for the arms industry. The number of patent applications is winsorized at 10. Standard errors are clustered by firms.

Table B.27: QUALITY OF INVENTORS AND IMPACT OF SUPPLY SHOCK ON INNOVATION RATES, REDUCED FORM, HIGHLY INNOVATIVE FIRM

	Specification			
	(1)	(2)	(3)	(4)
Dependent variable: Patent applications per year				
A. Supply shock of very high-quality inventors				
Supply shock in Collaboration space	-1.0218*** (0.1486)	–	–	-0.9361*** (0.1468)
Geographic space	–	-0.3464* (0.1925)	–	-0.3197* (0.1891)
Idea space	–	–	2.6969*** (0.2887)	2.6461*** (0.2905)
B. Supply shock of high-quality inventors				
Supply shock in Collaboration space	-0.8577*** (0.1304)	–	–	-0.7824*** (0.1283)
Geographic space	–	-0.2801 (0.2028)	–	-0.2840 (0.1976)
Idea space	–	–	2.4511*** (0.2566)	2.4102*** (0.2569)
C. Supply shock of low-quality inventors				
Supply shock in Collaboration space	0.2825 (0.2510)	–	–	0.2936 (0.2570)
Geographic space	–	0.6749 (0.5901)	–	1.2053** (0.5910)
Idea space	–	–	1.7340*** (0.1758)	1.7517*** (0.1761)
Dependent variable mean	1.2970			
Number of observations	58,660			
Number of firms	2,933			

Notes: The sample consists of firms which had at least one patent application prior to the WWI draft and had no patent application relevant for the arms industry such as weapons, ammunition, and explosives. Highly innovative firms had pre-WWI patents in the top 10 percentile. Very high-quality inventors had pre-WWI patents in the top 10 percentile. High-quality inventors had pre-WWI patents above the median and low-quality inventors had pre-WWI patents equal to or below the median. The outcome variable is the number of patent applications per year not relevant for the arms industry. The number of patent applications is winsorized at 10. Standard errors are clustered by firms.