

A VERY BRIEF HISTORY OF THE MARKET FOR PATENTS IN THE UNITED STATES

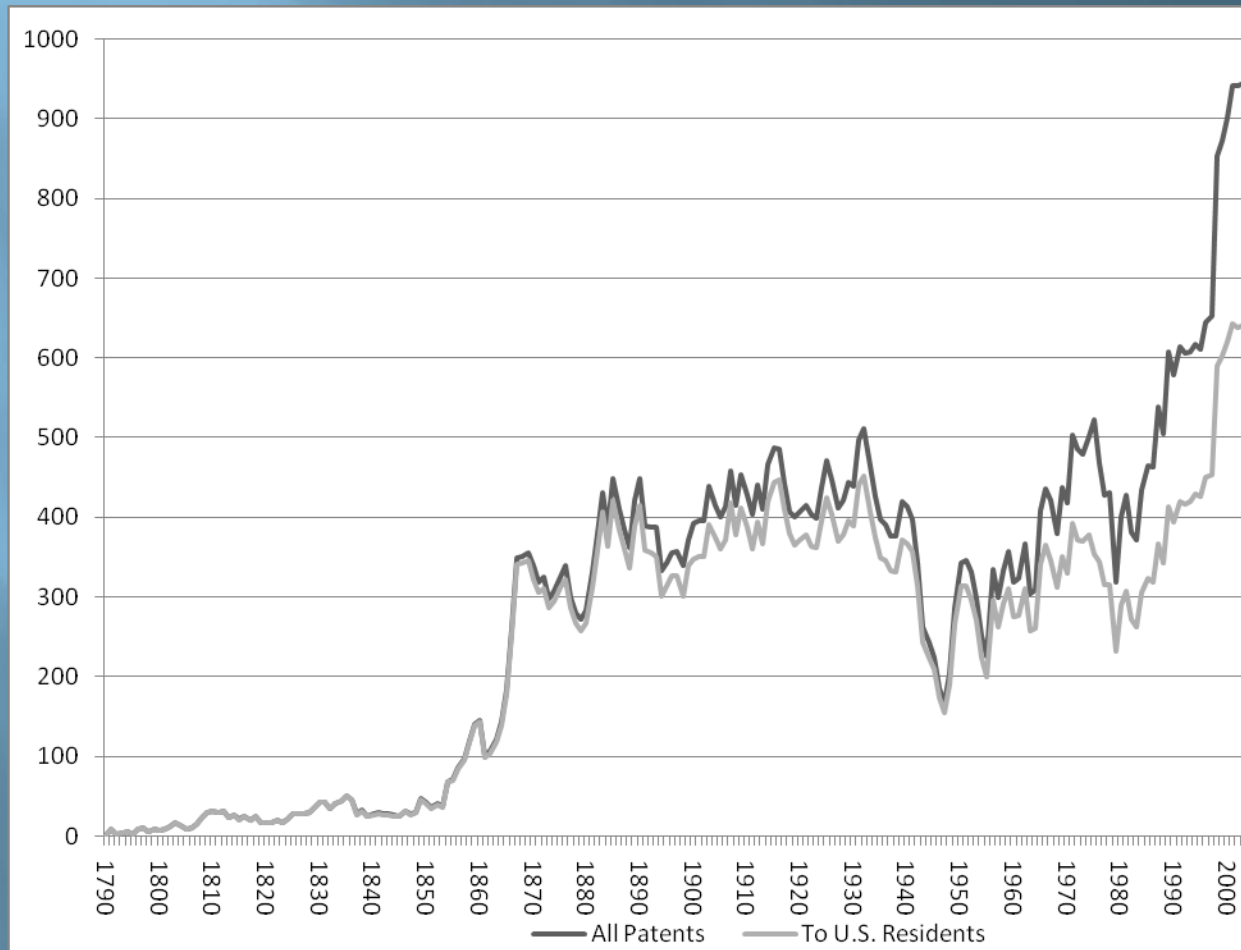
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Patents and the incentive to innovate

- ▣ Patent system, particularly after 1836 patent law, provides economic incentives to innovate with a very real impact on the rate of innovation in the United States
 - Increases in patenting per capita after 1836 establishment of patent office review
 - Patenting is pro-cyclical, increasing as demand increases
 - Patenting increases with access to markets, following the growth of the transportation grid

Patents Granted by the U.S. Patent Office, 1790-1998

(per million residents)



Source: Lamoreaux and Sokoloff, *Financing Innovation*

Patent licenses and the creation of a market for patents

- ▣ For the first $\frac{3}{4}$ of the 19th century, many inventors maintained ownership and commercialized patents in their own region
 - Inventors sold rights to commercialize in other regions of the country
 - Inventors assigned fractions of patents to investors or partners
- ▣ Patent attorneys facilitated this market for technology
 - Growth of this “distribution system” facilitated creation of cohort of people who specialized in invention
 - ▣ “Golden age of the independent inventor”

Patent attorneys & patent assignments

	1870-1871	1890-1891	1910-1911
<i>New England</i>			
% of Patents Assigned	26.5	40.8	50.0
Patent Attorneys/Population	-----	2.7	2.0
<i>Middle Atlantic</i>			
% of Patents Assigned	20.6	29.1	36.1
Patent Attorneys/Population	-----	2.2	2.0
<i>East North Central</i>			
% of Patents Assigned	14.7	27.9	32.3
Patent Attorneys/Population	-----	1.1	1.1
<i>West North Central</i>			
% of Patents Assigned	9.0	21.8	17.5
Patent Attorneys/Population	-----	0.3	0.7
<i>South</i>			
% of Patents Assigned	6.4	25.0	22.7
Patent Attorneys/Population	-----	0.1	0.2
<i>West</i>			
% of Patents Assigned	0.0	25.4	21.4
Patent Attorneys/Population	-----	0.5	1.1

Source: Lamoreaux and Sokoloff, *Decline of the Independent Entrepreneur*

Late 19th c. changes in organization and marketing of patents

- ▣ Increasing assignment of patents at issue
 - Arms-length transactions, often mediated by third parties
 - Sales associated with the recruitment of inventor as a principal of an established firm
 - Especially in the Midwest, increasing assignments to entrepreneurial firms formed to commercialize an invention
 - ▣ And increasing patenting rates in the Midwest overall

Two modes of innovation in the twentieth century

- ▣ In the mid-Atlantic, large firms with in-house R&D and employee-inventors
 - Contracts that require employees to assign patents to firm start showing up in the first 1/4 of the 20th c.
 - R&D units evaluate externally produced patents from across the country
 - Firms actively traded in national secondary securities market
- ▣ In the Midwest, networks of inventor-entrepreneurs
 - Patents assigned as part of process of attracting local capital and forming new entrepreneurial firms
 - Just as successful at invention and commercialization, but not at surviving economic crisis

Increasing importance of corporate patenting

Sample year	Number of observations	% not assigned	% assigned to individual	Assigned to a company with financial report				% assigned to other company
				Assets >= \$10 million		Assets < \$10 million		
				% with R&D lab	% with no R&D lab	% with R&D lab	% with no R&D lab	
Panel A: Percent of patents								
1870-71	1,425	83.9	13.4	0.0	0.1	0.0	0.0	2.6
1890-91	2,022	70.8	15.7	0.0	0.4	0.0	0.0	13.0
1910-11	2,498	69.2	11.0	1.2	2.2	0.2	2.6	13.5
1928-29	2,297	43.7	7.2	16.1	4.4	2.0	4.4	22.1

Midwestern innovation looked different:

Distribution of patent assignments by type of firm

		Firms w R&D labs	Firms w/o R&D labs	Privately held firms
1910-1911	Midwest	0.8	3.7	16.9
	Mid-Atlantic	3.3	8.8	16.4
1928-29	Midwest	17.4	11.9	27.5
	Mid-Atlantic	29.0	8.4	19.5

Cleveland case study

- ▣ Links samples of patents issued to Cleveland inventors firms to assignee firms (1870 – 1930)
 - Most inventors assigned their patents to local firms
 - Most firms relied on local invention
- ▣ Successful firms functioned as hubs, bringing together established and younger inventors, local manufacturers, and local financiers
 - Vetted inventions
 - Spawned new firms
 - Attracted productive inventors to Cleveland

Lots of Patenting: Cuyahoga County and the U.S., 1870-1930

Year	Average Annual Patents per Million Cuyahoga	Average Annual Patents per Million United States
1870-79	798	297
1880-89	961	360
1890-99	847	339
1900-09	835	376
1910-19	873	397
1920-29	777	384

Cleveland Patents by Type of Assignee

Type of Assignee	1884- 1886 sample	1898- 1902 sample	1910- 1912 sample	1925- 1929 sample
Assigned to Co. where Patentee is Principal Percent	1.5	17.6	19.6	19.2
Assigned to National Company Percent	1.3	11.3	20.0	32.4
Assigned to Local Company Percent	6.3	9.2	9.6	15.2
Assigned to Other Company Percent	4.8	10.7	1.7	3.6

Assignments by Cleveland Principals with More Than 15 Patents

	1884- 1886 sample	1898- 1902 sample	1925- 1929 sample
Disposition of Patent			
Not Assigned at Issue			
Percent	97.0	61.1	20.6
Assigned to Their Company			
Percent of Patents	2.2	27.0	45.6

Cleveland case study

- ▣ 1920s sample of patents issued to Cleveland inventors
 - More employee-inventors
 - More assignments to “national” firms
 - ▣ Particularly firms like GE that had bought local firms
- ▣ Currently examining lifetime inventive activity of Cleveland’s most prolific patentees
 - Some outmigration during 1930s, but many stay in Cleveland
 - ▣ But they are less inventive and less entrepreneurial
- ▣ Linking 1920s sample to 1930 Census

Cleveland case study: Future directions

- ▣ New sample of all patents issued to Cleveland firms
 - Did Cleveland firms become less reliant on local talent over time?
 - Does pattern of inventor-entrants endure?
- ▣ Current hypothesis: more likely that the Depression killed Midwestern inventive network model
 - Initial hypothesis focused on the rise of the large firm
 - WWII and increased federal role in innovation still to be explored