ESSAYS ON THE POLITICAL ECONOMY OF REGULATION

By

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ABSTRACT

This dissertation examines regulatory frameworks in historical contexts through three distinct case studies, shedding light on the interplay between public interest and public choice factors. The first paper investigates the enactment of the Pure Food and Drugs Act of 1906 within the whiskey industry. High and Coppin (1988) argue for a public choice interpretation, suggesting regulatory capture by rectifiers to stifle competition. Our study corroborates these findings using comprehensive historical data on alcohol consumption, chemical analyses of whiskey, and archival evidence of reported deaths and poisonings. We find that while rectifiers occasionally used poisons, these substances were often misunderstood or demanded in illicit markets, bolstering the public choice perspective. The second paper explores early American whiskey markets as a case of asymmetric information, where entrepreneurs faced challenges in assuring consumers of product authenticity and safety. Despite these hurdles and public health concerns over adulteration, historical newspapers reveal four mechanisms through which entrepreneurs effectively communicated and guaranteed product quality. This analysis underscores the resilience of market-based solutions in mitigating information asymmetry. The third paper investigates the adoption of barber licensure during the Progressive Era, ostensibly to curb the spread of "barber's itch." Using a novel dataset and a difference-in-difference model across states, we find scant evidence supporting the public health rationale for licensure. Instead, our results suggest that licensure was driven by public choice motivations, particularly efforts by barber unions to limit competition and raise prices. This study provides a rare empirical case of regulation primarily serving private interests over public health concerns. Together, these papers contribute nuanced perspectives on

regulatory frameworks, highlighting instances where public interest justifications intersect with or are overshadowed by public choice dynamics. The findings underscore the complex motivations underlying regulatory policies and offer insights into their implications for industry, consumer welfare, and economic governance.

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CHAPTER I: *Examining the Public Interest Rationale for Regulating Whiskey with the Pure Food and Drugs Act*[1]

Was there legitimate public interest justification for regulating whiskey with the Pure Food and Drugs Act of 1906? High and Coppin (1988) provide evidence for a public choice interpretation of the application of the act to the whiskey industry. The existence of public choice factors, however, does not preclude the simultaneous existence of genuine public interest rationales. The public interest justification was that rectifiers, who flavored neutral spirits to replicate straight whiskey, were commonly adulterating whiskey with poisonous ingredients. We examine these claims using alcohol consumption data, chemical tests of whiskey, trade book recipes, and reported deaths and poisonings from whiskey. We find that poisons were infrequently used in rectified whiskey and that the poisons used were overwhelmingly either not fully understood to be dangerous at that time or were demanded in underground markets. The historical evidence bolsters the public choice interpretation of High and Coppin (1988).

1.1 Introduction

Was there legitimate public interest justification for the regulation of whiskey with the Pure Food and Drugs Act of 1906? Public interest theory posits that legitimate concerns for consumer safety are the primary purpose of regulation (Christensen 2011; Viscusi, Harrington Jr. & Sappington 2018; See also Hantke-Domas 2003). Alternatively, public choice theory hypotheses that rent-seeking for special privileges is the primary objective of regulation (Holcombe and Holcombe 1986; Stigler 1971; Tullock 1967; Peltzman 1976).

[1] Published in *Public Choice* (2023) with Daniel J. Smith.

A growing literature tests these theories against each other in a wide variety of contexts (Armentano 1996; Djankov et al. 2002; Hansen and Law 2008; Law 2003; Law and Kim 2005; Leeson and Thompson 2021; Libecap 1992; Tollison 1985; Troesken 2002; Urban and Mancke 1972). However, distinguishing between these two theories is difficult when public interest and public choice factors are operative (Croley 2008; Joskow and Rose 1989; Levine and Forrence 1990; Posner 1974; Tullock 1984). This is especially the case when public interest justifications provide a political rationale for rent-seeking (Geloso and March 2021; Leeson 2019; Leeson, King, and Fegley 2020; McCraw 1975; Yandle 1983).[2] Thus, the existence of public choice factors alone does not preclude the simultaneous existence of genuine public interest rationales.

The Pure Food and Drugs Act of 1906 gave the federal government the regulatory authority to protect consumers from adulterated foods, drinks, and drugs. The act required a content label, forbade the use of poisonous ingredients, and banned imitation products. High and Coppin (1988) and Coppin and High (1999) provide evidence that public choice factors were operative in the adoption of whiskey regulation under the act. They rely extensively on the correspondence of Harvey Wiley, the Chief Chemist of the United States Department of Agriculture and the chief architect of the act, finding that the lobbying efforts leading up to its adoption had "little to do with public interest." The act offered an opportunity for straight whiskey distillers to use regulation to disadvantage their competitors.

The enforcement of the act, which focused overwhelmingly on the definition of whiskey for labeling purposes, and not on poisons in whiskey, tends to support High and Coppin (1988). Just as the Pure Food and Drugs Act was going into effect, Wiley issued food inspection decision 45, which defined whiskey as straight whiskey with no additives except water (Coppin and High

[2] Different political actors or agencies, or even units within the same agency, may have conflicting visions of the public interest, adding another confounding factor (McCraw 1975).

2010, p. 101). According to the decision, any product using coloring or flavoring ingredients could not be labeled as whiskey (Coppin and High 2010, p. 101). Wiley's decision, however, was stalled by legal challenges. Ultimately, President Taft issued a memo in 1909 that permitted rectifiers to label their product as "blended whiskey" and reserved the "straight whiskey" label for whiskey with no flavoring or coloring ingredients (High and Coppin 2010, Ch. 7).

This paper contributes to the literature examining the public interest and public choice theories of regulation by examining whiskey markets prior to the adoption of the Pure Food and Drugs Act.[3] Historical case studies such as this can be useful in determining the primary principles of regulatory origin when factors supporting both the public choice and public interest theories of regulation appear to be operative (Geloso 2019; McCraw 1975). This paper also contributes to the literature on early American whiskey markets (Minnick 2016; Clay and Troesken 2002 & 2003; Troesken 1998).

The public interest rationale for regulating whiskey through the act was that rectifiers, who flavored unaged, neutral alcohol spirits to attempt to replicate the taste of aged whiskey, were producing rectified whiskey commonly using ingredients known to be poisonous. In this paper, we examine alcohol consumption data, chemical tests of whiskey, trade book recipes, and reported deaths and poisoning from whiskey to assess the extent to which whiskey was poisoned before regulation. Our primary sources are whiskey trade books and historical newspapers from *Newspapers.com*, a searchable database of over 22,600 digitized U.S. newspapers. Research in economic history is increasingly using historical newspapers (Calderon, Fouka, and Tabellini 2023; Geloso and March 2021; Kronenberg 2021; Sprick Schuster 2023; White 2021). According to Beach and Hanlon (2022), *Newspapers.com* is the most utilized digitized database

[3] For a broader analysis of the Pure Food and Drugs Act, see Law (2003 & 2005), Law and Libecap (2006), and Young (1989).

for research using U.S. newspapers in the late 19th and early 20th century. We also use home recipe and medical books to determine whether the ingredients that were used in whiskey were considered dangerous according to the medical and scientific understanding of the time.

The historical evidence does not support the public interest rationale for whiskey regulation. While rectifiers attempted to approximate the flavor of popular styles of whiskey to avoid the steep costs of barrel-aging, we find that poisons were infrequently used in the rectification of whiskey. While there is evidence that some poisons were used in whiskey, these ingredients were overwhelmingly not fully understood to be dangerous at that time or were demanded in underground markets. Our results bolster the public choice interpretation of High and Coppin (1988) and Coppin and High (1999), providing evidence of a regulation that was driven by special interest groups from its origin rather than being captured by special interest groups after implementation (Peltzman 2022).

Section 1.2 provides a brief overview of historical U.S. whiskey markets. Section 1.3 uses four sources of historical evidence to examine the extent to which poisonous ingredients were used in whiskey. Section 1.4 analyzes the poisonous ingredients that were used in rectified whiskey to assess whether these ingredients were known to be toxic at that time using consumer recipe and medical books. Section 1.5 examines the use of poisonous ingredients in underground markets. Section 1.6 concludes.

1.2 Early U.S. Whiskey Markets

Prior to industrialization, whiskey was primarily produced locally in small batches (Miller 1991). Whiskey was often sold unaged to consumers, who would then age it themselves if desired (Wiley 1919, p. 303). The growing demand for liquor, however, necessitated more capital-intensive production methods. And the industrial revolution brought the technology,

transportation, and scientific processes that enabled large industrial distillers of whiskey to emerge in the 1800s to deliver a consistent product (Crowgey 2013, p. 52; Rorabaugh 1976, p. 129; Veach 2013, Ch. 3).[4]

Industrialized whiskey was manufactured as either straight or rectified.[5] Straight whiskey involved putting alcohol spirits into barrels for aging. This process became more widespread after U.S. tax law was modified in 1868 to allow distillers to postpone tax payments on distilled spirits by aging them in government-bonded warehouses (High and Coppin 1988, p. 291; Wiley 1919, p. 304). Distillers also sold neutral alcohol spirits to rectifiers who would then redistill, filter, flavor, color, age, or blend the product to fit the preferences of their consumers (Coppin and High 1999, p. 52; Regan and Regan 1995, p. 40; Troesken 1998, p. 758).

The turn away from the local production of whiskey, where individuals produced their whiskey or purchased it from someone they knew, to the industrialized production of whiskey created the opportunity for the introduction of adulterated whiskey. Rectifiers could add dangerous flavoring chemicals to neutral spirits to bypass the expensive aging process (Wiley 1919, p. 321; Regan and Regan 1995, p. 40).[6] Since whiskey was commonly sold out of opened barrels (Carson 2010, p. 150), it would have been difficult for consumers to verify that the whiskey they were purchasing was unadulterated. Even straight whiskey aged in a government-bonded warehouse could be adulterated upon removal (Freels 1900, p. 16). This is because, until

[4] The industrialization of whiskey was also driven by a 20-cent tax on whiskey in 1862, which was raised to $2 by 1864 (Wiley 1919, p. 303; Miller 1991, p. 40; Regan and Regan 1995, p. 59; Smith 1914, pp. 190, 197 & 203; *The Sun*, New York, NY (August 1st, 1886)).

[5] A mixture of both straight and rectified whiskey introduced a third category, blended whiskey (Coppin and High 1999, Ch. 7).

[6] Neutral spirits were also referred to as "high wine" or "cologne spirits" (*The Morning News*, Savannah, GA (April 19th, 1895) & *Boston Evening Transcript*, Boston, MA (April 29th, 1905)).

1893, the smallest allowable warehouse-bonded container by U.S. law, five gallons, still necessitated selling the whiskey out of a barrel (High and Coppin 1988, p. 291).[7]

The push for the regulation of whiskey through the Pure Food and Drugs Act was primarily framed as an attempt to protect consumers from rectifiers selling whisky adulterated with poisonous ingredients. At a Pure Food Commission hearing that was widely reported on in newspapers, the secretary of the commission criticized rectified whiskey, arguing that a sample of it he consumed at the meeting was beginning to adversely "affect" him, a professor called it "rank poison," and a straight whiskey lobbyist argued that:

> People who drank the old-time whiskey did not have stomachs disordered as they do now from drinking rectified whiskey. An old whiskey is the better and healthier. Before the introduction of whiskey made from high wines or rectified cologne spirits, with oils and flavoring extracts, a man never had the jimjams. He never drank to excess, his wife allowed him to stay at home. One drink did not create such a thirst for the another. The average man did not get drunk. […] practically everything in it except rough on rats [a brand of rat poison]…[8]

When President Taft was considering the labeling of rectified whiskey, Senator Garret Davis of Kentucky said, "One barrel of genuine liquor taken…will produce from three to four barrels of rectified whiskey. They put red pepper in the barrel; they put raw tobacco in the barrel; they put soapsuds in the barrel, they put arsenic in the barrel; they put strychnine in the barrel, and a great many other villainous compounds that I do not remember."[9] Harvey Wiley, the primary architect the Pure Food and Drugs Act, gave a strong indictment of rectified whiskey:

> If I could only talk, I'd tell you things about this particular subject [rectified whiskey] that would make your hair curl and that would result either in your becoming a total abstainer, or else in demanding affidavits from the distiller, the

[7] All containers over the size of five gallons had to have an appropriate stamp (*Wisconsin State Journal*, Madison, WI (August 13th, 1868)).
[8] *The Bedford Weekly Mail*, Bedford, IN (December 14th, 1906).
[9] *Herald and Review*, Decatur, IL (May 22nd, 1910).

> bottler, the retailer and the government revenue officers with every bottle you purchase.[10]

The concern was that adulterated whiskey could cause poisoning and death.[11] Cotter (1874, pp. 32) reported a broad perception at that time that whiskey was commonly adulterated and labeled rectifying as a "system of Drugging and *poisoning*" [italics in original].

1.3 Determining the Poisonous Ingredients in Whiskey

In this section, we examine the extent to which poisonous ingredients were used in whiskey in the United States from 1850 to 1906 using four sources of historical evidence.

1.3.1 Whiskey Consumption

The existence of widespread consumer harm from whiskey adulterated with poisonous substances would have unraveled the market before regulation (Akerlof 1970). Yet, the evidence shows that the liquor industry, primarily comprised of whiskey, saw expanded output over this period (DiLorenzo 1985; High and Coppin 1988, p. 291; Rorabaugh 1976; Smith 1914, Ch. VIII; Troesken 1998, p. 766).

The production data from the period is for spirits and not specifically whiskey. But, as Troesken (1998, p. 757) argues, "Spirits had virtually no other use except as an input for making whiskey." Spirits are estimated to have been 49 percent of alcohol consumption in the United States from 1888-1892 (Holmes and Anderson 2017, Table 2). The annual estimates of spirit consumption (in KL) in the United States from Anderson and Pinilla (2017, T46: Spirit Consumption), reproduced in **Figure 1**, show that consumption did dip in the mid-1890s but was on the rise before and after that period.

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[10] *The Morning Post*, Raleigh, NC (November 10th, 1904). Harvey Wiley's book, *Beverages and their Adulteration*, published in 1919, despite having a section on whiskey, did not produce evidence to back up his "hair curl[ing]" claims that served as the public interest rationale for the regulation of whiskey.

[11] *Alexandria Gazette*, Alexandria, VA (October 2nd, 1877), *The Boston Globe*, Boston, MA (August 16th, 1886), the *Daily National Democrat*, Marysville, CA (May 4th, 1860), & the *Journal Tribune*, Biddeford, ME (October 13th, 1905). Also see Story (1883).

The dip in consumption corresponds with the Depression of 1893 to 1897, with evidence suggesting that the consumption of alcoholic spirits fell during the economic downturn (Clay and Troesken 2002, p. 1015). Deflation during this time also caused the real tax on whiskey to rise (Clay and Troesken 2002, p. 1016). This was in addition to an increase in the tax rate on spirits in 1894 from 90 cents to $1.10, a tax rate much higher than beer.[12] Thus, aside from this slight dip attributable to the depression and an increase in relative taxes, the production and consumption of spirits and, thus, whiskey remained relatively robust despite the industry's tax disadvantage compared to brewers.[13] Estimates suggest that between 50 to 90 percent of the whiskey sold in the U.S. was rectified.[14]

[12] "Historical Tax Rates" from the Alcohol and Tobacco Tax and Trade Bureau: https://www.ttb.gov/tax-audit/historical-tax-rates.

[13] Rorabaugh (1976) and Hyman, Zimmerman, Gurioli, and Helrich (1980) show a decline in spirit consumption relative to beer from roughly 1850 to 1870 and then a stable market for spirits thereafter. The shift towards beer in the United States over this period has been attributed to 1) immigration to the United States from countries with strong beer cultures, 2) the rise of manufacturing and mining where workers drank beer during the work day, 3) the temperance movement encouraging beer, with its lower alcohol content, over liquor, 4) technological innovation in the brewing industry, and 5) the turn towards lager beer styles, which proved more popular than ales (Stack 2003). Furthermore, beer and cider were producible with far less capital than whiskey. These lower capital requirements would likely have offered a competitive advantage to local brewers who could better use reputational mechanisms to overcome potential asymmetric information problems.

[14] E. H. Taylor & Sons Co. v. Marion E. Taylor (Kentucky Court of Appeals 1905) estimated that rectified whiskey was 50 to 75 percent of the whiskey market. Professor Charles Pellew estimated that rectified whiskey was 90 percent of the market for whiskey (*New-York Tribune*, New York, NY (February 21st, 1897)). High and Coppin (1988, p. 291) state that rectified whiskey was 85 to 90 percent of the whiskey market.

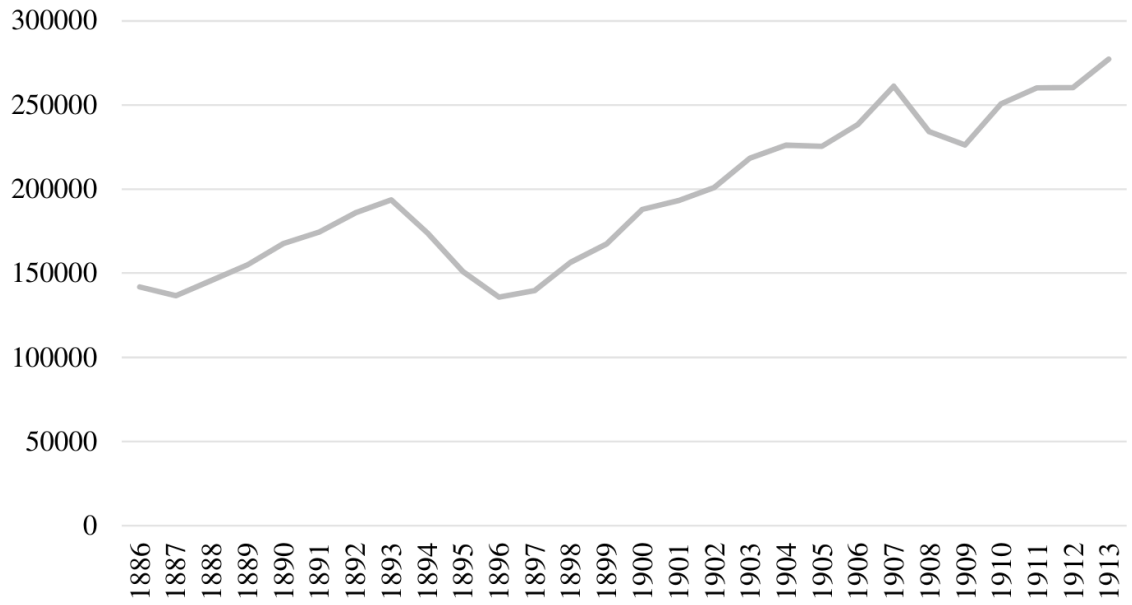

Figure 1: U.S. Spirit Consumption in KL, 1886-1913 (Anderson and Pinilla 2017, T46)

The robust market for whiskey, especially rectified whiskey, suggests that whiskey was not commonly adulterated with poisonous ingredients. The evidence also suggests that the adoption of the Pure Food and Drugs Act did not bolster the market for spirits.

1.3.2 Chemical Tests of Whiskey

Next, we examine chemical tests of whiskey. We did a thorough search of *Newspapers.com* for chemical tests of whiskey leading up to the Pure Food and Drugs Act. We found 25 reported tests of at least one whiskey (or whiskey and liquor if reported together), finding a total of 21 poisonous substances, as shown in **Table 1**.[15] **Table 1** also details the number of whiskies tested and the number of whiskies confirmed to have had each poisonous ingredient in the sample.

[15] We exclude chemical analyses where these ingredients were found in suspected suicide or murder cases or in areas under alcohol prohibition, which found ingredients such as cannabis and opium. Some of the tests left the sample size and number of whiskies containing poisonous ingredients unspecified. This is indicated by a "+" in the total columns.

Table 1: Chemical Tests of Whiskey, 1850-1906

	Whiskies Tested	Arsenic	Benzine	Brazilwood	Brucine	Chromic Acid	Copper	Creosote	Fusel Oil	Kerosene	Lead Acetate (Sugar of Lead)
Allyn (1905) [Westfield Normal School]	93										
Atkinson (1904) [NY Board of Health]	16										
Aughey (1874a) [University of Nebraska]	6		3 (50%)	4 (66.67%)							6 (100%)
Aughey (1874b) [University of Nebraska]	1									1 (100%)	1 (100%)
Aughey (1879) [University of Nebraska]	1							1 (100%)			1 (100%)
Carney (1860) [Am. Pharm. Assoc. of NY]	"large number"										
Cox (1858) [Cincinnati Inspector of Liquors]	2				1 (50%)		1 (50%)		1 (50%)		
Cox (1860a) [Cincinnati Inspector of Liquors]	2,279 liquors								Unspecified		
Cox (1860b) [Cincinnati Inspector of Liquors]	1				1 (100%)						
Darlington (1904) [NYC Health Commission]	Unspecified							Unspecified[1]	Unspecified		
Democrat and Sentinel (1866) [Unidentified]	>200 liquors										
Draper (1869) [University Medical College][2]	9								6 (66.67%)		
Green (1884) [Eigth Presbyterian Church]	3	3 (100%)				1 (33.3%)			2 (66.6%)		1 (33.3%)
Hayes (1864) [Vermont State Assayer]	3								3 (100%)		
Ladd (1906) [ND Food Commission]	42										
Leffman (1880) [Jefferson Medical College]	Unspecified liquors										
MA State Board of Health (1905)	60								"several samples"		
Miller 1860 [Wayne County Liquor Inspector]	382	0 (0%)									
NY Board of Excise (1868)	32 liquors								28 (87.5%)		
NJ State Board of Health (1905)	Unspecified										
O'Conner (1887) [Witchita Reveune Collector]	1	1 (100%)									
Peters (1892) [Bloomingdale Church]	1					1 (100%)		1 (100%)	1 (100%)		
Silliman (1870) [Yale College]	1								1 (100%)		1 (100%)
Slater (1904) [MN Dairy and Food Commission]	"many"	0 (0%)					0 (0%)		0 (0%)		0 (0%)
Warren (1904) [PA Dairy and Food Commission]	> 1,000	"some"									
Total	4,133+	4+	3	4	2	2	1	2+	42+	1	10
Total without Aughey and Cox	1,843+	4+	0	0	0	2	0	1+	41+	0	2

1. In Scotch and Irish Whiskey

2. Draper (1869) also reports a negative test for Spirits of Nitre (Nitric Acid).

	Logwood	Nitric Ether	Nux Vomica	Potash	Prussic Acid	Strontium	Strychnine	Sulphuric Acid (Oil of Vitriol)	Tobacco	Turpentine	Unslaked Lime	Wood Alcohol (Methanol)	Percentage of Sample Containing at Least One Poison
Allyn (1905)								1 (1.08%)					1.08%
Atkinson (1904)												11 (68.8%)	68.75%
Aughey (1874a)	2 (33.3%)			6 (100%)		6 (100%)	5 (83.3%)						100%
Aughey (1874b)				1 (100%)			1 (100%)						100%
Aughey (1879)						1 (100%)			1 (100%)				100%
Carney (1860)							0 (0%)						0%
Cox (1858)		1 (50%)	1 (50%)				1 (50%)	2 (100%)					100%
Cox (1860a)					Unspecified[1]	Unspecified[1]	Unspecified[1]	Unspecified[1]					73.67%
Cox (1860b)			1 (100%)	1 (100%)				1 (100%)					100%
Darlington (1904)													NA
Democrat and Sentinel (1866)								"some"					NA
Draper (1869)								0 (0%)					66.67%
Green (1884)								2 (66.6%)			1 (33.3%)		100%
Hayes (1864)													66.67%
Ladd (1906)												4 (9.5%)	9.52%
Leffman (1880)													0%
MA State Board of Health (1905)												0 (0%)	NA
Miller 1860							0 (0%)						0%
NY Board of Excise (1868)													87.50%
NJ State Board of Health (1905)												0 (0%)	0%
O'Conner (1887)													100%
Peters (1892)											1 (100%)		100%
Silliman (1870)								1 (100%)					100%
Slater (1904)	0 (0%)						0 (0%)		0 (0%)			0 (0%)	0%
Warren (1904)					"some"					"some"		"some"	NA
Total	2		1	2	8	7+	7+	7+	1	"some"	2	15+	
Total without Aughey and Cox	0		0	0	0	0	0	4+	0	"some"	2	15+	

1. Reported that 1,679 tested liquor samples contained prussic acid, stronium, strychnine, and/or oil of vitriol.

Most chemical analyses reporting negative results, indicating no poisonous ingredients found in the sampled whiskey, did not list every ingredient for which tests were performed. Thus, the table underreports negative results. For instance, the Massachusetts Board of Health, which tested 60 cheap whiskies from Boston, reported that "no poisonous substances foreign to whiskey were found," yet only mentioned a negative result for wood alcohol specifically.[16] The

[16] *Boston Evening Transcript*, Boston, MA (April 29th, 1905).

New York Board of Excise conducted tests of 32 liquors and only reported finding fusel oil but did not report the full range of other chemicals tested.[17] In another example, Dr. H. B. Warren of the Dairy and Food Commission of Pennsylvania conducted over 1,000 tests of whiskey and reported finding "some" samples of three chemicals, arsenic, prussic acid, and wood alcohol, but did not specifically mention the other ingredients for which he had negative results.[18] Finally, John T. Carney reported on a "large number" of whiskey tests at the American Pharmaceutical Association of New York meeting but only specifically mentioned not finding strychnine.[19] **Table 1** also excludes statements by experts that did not mention specific tests of whiskey. Dr. Lederle, a former commissioner of the New York Health Department, stated that the most common adulterants in whisky were "water, burnt sugar, and all sorts of flavoring stuff," but his negative results were excluded because the newspaper did not report specific tests of whiskey.[20]

The number of whiskies confirmed to contain poisonous ingredients was low. The number of poisons found overall in any test of whiskey is low as well. We also have good reason to be skeptical of six of the most incriminating tests by Samuel Aughey and Hiram Cox.[21] Samuel Aughey, a minister with ties to the Lincoln Temperance Society, conducted tests on eight whiskies.[22] The liquor samples he tested in his primary study were collected by the Lincoln

[17] *The New York Times*, New York, NY (December 31st, 1868)
[18] Initially Dr. Warren reported to the news that 95% of the samples contained wood alcohol, but under scrutiny, was forced to admit that it was only "some" samples. Another chemist involved with the report reported that "The quantity of wood alcohol found by me in my tests has invariably been so small that it could not have been used as a means of diluting the liquor. In fact I am inclined to believe it is produced by a chemical reaction due to other compounds introduced for the purpose of adulteration" (*Altoona Times*, Altoona, PA (February 8th, 1904) & *The Philadelphia Inquirer*, Philadelphia, PA (March 22nd, 1904)).
[19] *The Greensboro Times*, Greensboro, NC (September 29th, 1860).
[20] *New-York Tribune*, New York, NY (February 14th, 1904).
[21] The tests by Reverend Thomas Green (*Vermont Christian Messenger*, Montpelier, VT (December 18th, 1884)) and Reverend Madison Peters (*Public Ledger*, Memphis, TN (January 11th, 1892)) may also be suspect. The tests came from church leaders giving sermons. While the Green said the tests were done in Chicago, there was no mention of these tests in Chicago newspapers.
[22] http://plainshumanities.unl.edu/encyclopedia/doc/egp.pe.006.

Temperance Society, which also commissioned Aughey's analysis. Aughey's study was issued with an offer for any dealer disputing the analysis to monitor a retesting at the university laboratory.[23] Local saloon owners Zehrung & Harley challenged Aughey's analysis forcing Aughey to declare their spirits pure.[24] A second analysis was ordered to be performed by an unidentified professor in Illinois, suggesting that there were additional challenges to Aughey's tests.[25]

Aughey also revealed that the sample containing acetate of lead, creosote, strontia, and tobacco was "an extreme case – one of the worst" of the samples he ever conducted.[26] In a newspaper statement Aughey cited New York chemist Dr. John Draper as finding consistent results, including sugar of lead in wine and brandy "manufactured of poisons."[27] But, Aughey either misremembered or misrepresented Draper's analysis, as Draper's analysis found burnt sugar, not sugar of lead, and only reported finding fusel oil as a poisonous ingredient.[28] On another subject, Aughey, who frequently provided newspaper commentary on a wide range of topics beyond his field of geology, was accused of always having "a [l]arge stock of endorsements ready-made and on hand to suit the highest bidder."[29] His work in his primary area of expertise is modernly considered to be "of uneven quality," especially when scientific results clashed with his policy desires.[30] He was, for instance, criticized for lacking "scientific precision" by fellow academics.[31]

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[23] *Sterling Standard*, Sterling, IL (July 23rd, 1874).
[24] *The Nebraska State Journal*, Lincoln, NE (May 1st, 1874).
[25] *The Nebraska State Journal*, Lincoln, NE (April 29th, 1874).
[26] *Central City Courier*, Central City, NE (February 13th, 1879) & *Fremont Weekly Herald*, Fremont, NE (February 27th, 1879).
[27] *The Nebraska State Journal*, Lincoln, NE (May 8th, 1874).
[28] *The Daily Milwaukee News*, Milwaukee, WI (January 3rd, 1869). Burnt sugar was made by boiling white sugar in water until it burns brown (Rack 1868, p. 61).
[29] *The Omaha Evening Bee*, Omaha, NE (July 7th, 1883).
[30] http://plainshumanities.unl.edu/encyclopedia/doc/egp.pe.006
[31] https://unlhistory.unl.edu/exhibits/show/morrill-hall/augheyhicks/aughey-s-scandals

There is also reason to doubt the veracity of Hiram Cox's analysis. While Cox was a chemist and the inspector of liquors in Cincinnati, he was deeply connected to and frequently lectured for the temperance movement.[32] After a lecture by Hiram Cox, a newspaper reported that:

> We do not pretend to deny that a great deal of the liquor sold in this country is vile trash, and as such not fit to be taken into the stomach of any person ; but we do say that the Doctor's test in regard to some of the liquors handed to him were not correct. Admitting his ability as a practical chemist, we think that his zeal as an ultra prohibitionist often carries him where his cool reason would not.[33]

A *Scientific American* correspondent disputed the accurateness of Cox's initial analysis, arguing that distillers did not use a poisonous ingredient called strychnine because not only did it not increase the yield of whiskey (the alleged reason why it would be in whiskey), but that distillers, who frequently owned hogs fed with spent distillery grains, had a strong incentive not to kill their livestock.[34]A liquor inspector for Wayne County, Michigan, L. G. Miller, conducted a comprehensive analysis of the liquors in response to Cox's analysis and reported that he did not find any arsenic, strychnine, potash, or sulphuric acid.[35] Additionally, Miller argued that Cox's analysis was also suspect because it claimed to have found incompatible chemicals.

Professor Charles A. Seely of the New York Medical College also gave a lecture in response to one of Cox's lectures. Seely argued that the litmus paper tests Cox used were susceptible to small amounts of sulphuric acid and, thus, must be interpreted with caution.[36] Another newspaper article questioned the accuracy of Cox's tests conducted during one of his lectures, stating that his chemical analysis was "so basely misrepresented, either willfully or

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[32] *New-York Tribune*, New York, NY (March 28th, 1860), *Brooklyn Evening Star*, Brooklyn, NY (March 8th, 1860), & *Public Ledger*, Philadelphia, PA (March 31st, 1860).
[33] *The Lancaster Examiner*, Lancaster, PA (March 28th, 1860).
[34] *Scientific American* (July 4th, 1857). M'Harry's (1809) *Practical Distiller* has a section on raising and fattening hogs, suggesting that hog raising was a natural extension of operating a distillery.
[35] *Detroit Free Press*, Detroit, MI (February 5th, 1860).
[36] *The Lancaster Examiner*, Lancaster, PA (April 11th, 1860).

ignorantly, as the case may be, that the audience at once lost all confidence in his subsequent experiments."[37]

As discussed later in the paper, the fact that Aughey and Cox found 8 and 5 poisonous ingredients, respectively, that were not included in any trade recipe book casts further doubt on the validity of their results. They also reported finding, collectively, 12 poisons that no other chemical analysis found. Under questioning before the Committee on Manufactures, created by the 56th Congress to investigate the adulteration of food and beverage, Dr. Wiley admitted that:

> I cannot say that any of these materials [used to make rectified whiskey] are unwholesome or deleterious to health when used in moderate quantities. They are chemically the same as those which are produced by the natural methods of aging in whiskey. (…) There is something almost undescribable (sic) which makes a difference between the compounded and the natural products. (…) there is a difference in effect which the chemical laboratory fails to distinguish, as experience has shown that the injury to health which is produced by, for instance, a little excess in the drinking of alcoholic liquors is very much accentuated when these artificial drinks are employed to the exclusion of the natural product. I say that without being able to state that any single substance employed in blending is injurious to health, because it is exactly duplicated by what nature produces, and yet the whole effect seems to be different.[38]

Dr. Henry Leffman, a lecturer of toxicology at the Jefferson Medical College, in a study of liquor sold by ordinary bars in Philadelphia commissioned by the Philadelphia County Medical Society, found that "the stories we so frequently encounter in the public prints, that horrible poisons are used in adulterating liquors, are merely the fabrics of highly excitable imaginations."[39] Leffman is a highly credible source, as he lectured on the adverse health effects of alcohol and favored alcohol prohibition.[40] In one lecture on the dangers of alcohol, he argued that:

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[37] *The Lancaster Examiner*, Lancaster, PA (March 28th, 1860) & *The Lancaster Examiner*, Lancaster, PA (April 4th, 1860).
[38] *The Lexington Herald*, Lexington, KY (August 2nd, 1903).
[39] *The Daily Union-Leader*, Wilkes-Barre, PA (July 15th, 1880). See also *The Philadelphia Times*, Philadelphia, PA (December 23rd, 1882).
[40] *The Donaldsonville Chief*, Donaldsonville, LA (January 26th, 1884) & *The Philadelphia Inquirer*, Philadelphia, PA (February 11th, 1885).

> It is often said that the harm done by liquor is on account of its adulteration, but it is a great mistake. The adulterations of liquor are not, as a rule, any more harmful than the original article. It is the alcohols which are in the genuine liquor which do the harm.[41]

1.3.3 Trade Book Whiskey Recipes

Now we examine the extent to which poisonous ingredients were listed in whiskey recipes contained in trade books. Would trade books have included poisonous ingredients since this would have potentially opened the door to regulation? Most of these books were written before federal and state consumer regulations, so this was an unlikely consideration. And, if they did, in a world lacking most modern forms of trade communication, the rectifier would likely have followed the recipe as written.

We use a bibliography on alcoholic beverages published in the United States before 1901 to locate the trade books in circulation in the United States before regulation (Amerine and Borg 1996).[42] We examined the title and introduction to each book to ensure that it was written for rectifiers or bartenders. We also excluded any recipe containing 5 gallons or less of base alcohol, which may have indicated the recipe was intended for personal use.

Popular additives included syrup, burnt sugar, grains of paradise, brown sugar, tea, prune juice, and cochineal.[43] *The Bordeaux Guide* (1857, pp. v-vi [italics removed]) explicitly states that in their recipes, "the use of poisons and poisonous compounds are avoided ; and we wish it distinctly understood, that we do not in any case use in our imitations any material not found by

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[41] *The Philadelphia Inquirer*, Philadelphia, PA (January 9th, 1884).

[42] While listed in Amerine and Borg (1996), we could not locate copies of Corbyn (1888), Cotter (1851), L'abbe (1895), Lindemann (1875), *The English Innkeeper's Guide* (1868), Mida (1883), Morton (1900), or Wooten (1876). Bernhard (1853), Chester (1882), Clarke (1830), Duplais (1871), *The Liquor Dealer's Silent Partner* (1899), The Vinter's Brewer (1858), and Wehman (1891) were not utilized because they did not contain whiskey recipes. We also added in additional whiskey trade books that we could locate that were not included in Amerine and Borg (1996) and searched for books published between 1901 and 1906. We included one whiskey recipe from the *Chicago Tribune* (Chicago, Illinois (January 1st, 1869)) which was published as a "perfectly reliable" replication of recipes used in the manufacture of whiskey to make readers more knowledgeable about the contents of whiskey.

[43] Cochineal is a dye made from the dried bodies of female cochineal insects (Veach 2013, p. 46), which is still used today (Soteriou and Smale 2018).

chemical analysis to exist in the original spirit we seek to imitate." Rack (1868, pp. iii-iv) and *A Treatise on the Manufacture, Imitation, Adulteration, and Reduction* [Treatise] (1860) explicitly avoid toxic ingredients, arguing that it is more profitable to do so.[44]

In **Table 2,** we list all the styles of whiskey for which we found recipes.[45] Most of the books contained multiple recipes for the same type of whiskey, often differentiated by quality. We examined each recipe for the inclusion of any poisonous ingredients. We also looked at associated recipes for coloring, clarifying neutral spirits, or beading oil that were indicated as inputs into the whiskey. We included poisons even if they were listed as a substitute ingredient.

[44] Pierre Lacour, the author of one of the most popular recipe books, also manufactured and sold pre-mixed ingredients for liquors, requiring no preparation except to mix it with the whiskey *(The Times-Picayune*, New Orleans, LA (January 29th, 1857) & *The Placer Herald*, Rocklin, CA (May 8th, 1858)).
[45] The recipes range from 10 to 212 gallons of base alcohol.

Table 2: The Prevalence of Poisonous Ingredients in Whiskey Recipes, 1850-1905[46]

Whiskey Style	Number of Recipes	Black Oxide of Manganese	Chloroform	Copper Sulfate	Creosote	Enanthic Ether	Fusel Oil	Nitric Ether	Oxalate of Ammonium	Potash	Potassium Chlorate or Acetate	Spirits of Nitre (Nitric Acid)	Sulphuric Acid (Oil of Vitriol)	Unslaked Lime
Bourbon Whiskey	33	2 (6.1%)	-	2 (6.1%)	-	-	3 (9.1%)	1 (3%)	2 (6.1%)	-	2 (6.1%)	1 (3%)	2 (6.1%)	-
Scotch Whisky	20	-	-	-	14 (70%)	-	1 (5%)	-	-	-	-	1 (5%)	-	-
Irish Whisky	20	-	-	-	13 (65%)	-	1 (5%)	-	-	-	-	1 (5%)	-	-
Rye Whiskey	15	-	2 (13.3%)	-	-	1 (6.7%)	4 (26.7%)	-	-	1 (6.7%)	3 (20%)	-	4 (26.7%)	-
Monongahela Whiskey	14	-	-	-	-	-	-	-	-	-	-	5 (35.7%)	2 (14.3%)	-
General Whiskey	10	-	-	-	-	-	1 (10%)	-	-	1 (10%)	-	1 (10%)	4 (40%)	-
Old Bourbon Whiskey	7	-	-	-	-	-	4 (57.1%)	-	-	1 (14.3%)	-	2 (28.6%)	-	-
Old Rye Whiskey	5	-	-	-	-	-	-	-	-	-	-	-	-	-
Apple Whiskey	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Tuscaloosa Whiskey	3	-	-	-	-	-	-	1 (33.3%)	-	-	-	-	-	-
Wheat Whiskey	4	-	-	-	-	-	-	-	-	-	-	2 (50%)	-	-
Monongahela Rye Whiskey	3	-	-	-	-	-	-	-	-	-	-	1 (33.3%)	-	-
Corn Whiskey	2	-	-	-	-	-	-	-	-	-	-	1 (50%)	-	-
Roanoke Rye Whiskey	2	-	-	-	-	-	-	-	-	-	-	-	-	-
Old Roanoke Whiskey	2	-	-	-	2 (100%)	-	-	-	-	-	-	-	-	1 (50%)
Sweet Rye Whiskey	1	-	-	-	-	-	-	-	-	-	-	-	-	-
Malt Whiskey	1	-	-	-	-	1 (100%)	-	-	-	-	-	-	-	-
Neutralized Whiskey	1	-	-	-	-	-	-	-	-	-	-	1 (100%)	-	-
Nordhausen Whiskey	1	-	-	-	-	-	-	-	-	-	-	1 (100%)	-	-
Sour Mash Whiskey	1	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	149	2 (1.3%)	2 (1.3%)	2 (1.3%)	29 (19.5%)	2 (1.3%)	14 (9.4%)	2 (1.3%)	2 (1.3%)	3 (2%)	5 (3.4%)	17 (11.4%)	12 (8.1%)	1 (.7%)

[46] Sources: Adler (1890), Brannt (1885), Boothby (1891), Bryant (1895), *Chicago Tribune*, Chicago, Illinois (January 1st, 1869), Cross (1899), Eichler (1884), Feuchtwanger 1858), Fleischman (1885), Flora (1867), Fogelsonger (1898), Freels (1900), Lacour (1863), M'Harry (1809), *The Bordeaux Wine and Liquor Dealer's Guide* (1857), *A Treatise on the Manufacture, Imitation, Adulteration, and Reduction of Foreign Wines, Brandies, Gins, Rums, Etc*. (1860), & Rack (1868). Eichler (1884) and Freels (1900) both offered pre-mixed packages for different types of whiskies that were included in their recipes, so we did not have the full list of ingredients for all their recipes. Dropping them from our dataset does not substantially affect our results.

We found a total of 13 poisonous ingredients listed in trade book recipes. Nine of the 22 (41%) poisonous ingredients claimed to have been found in at least one chemical analysis of whiskey were not included in any whiskey recipe. The poisons were also overwhelmingly listed in small amounts compared to the base alcohol included in the recipe. The listing of poisonous ingredients was concentrated in a few books, with a total of 41% of the poisonous ingredients listed in only two trade books (Fleischman 1885; Fogelsonger 1898). These two trade books included the only recipes with black oxide of manganese, chloroform, copper sulfate, enanthic ether, and potassium chlorate or acetate. Fogelsonger (1898) offered a higher-grade recipe of bourbon containing only one poison (sulphuric acid) and Fleischman (1885) offered a higher-grade recipe containing no poisons.

Trade book recipes for whiskey did not commonly contain poisons. Because we do not have evidence on which of these books, or which of the often several recipes given in each book, were used more commonly, we must interpret this evidence alongside the other evidence examined in this section. Five poisonous ingredients were found only in a handful of recipes and in no chemical tests (chloroform, black oxide of manganese, enanthic ether, oxalate of ammonium, and potassium chlorate or acetate). Four poisons were included only in a small percentage of recipes and chemical tests (copper sulfate, nitric ether, potash, and unslaked lime).

1.3.4 Reported Poisonings and Deaths

A third way to gauge the extent of poisonous ingredients in whiskey is by examining the number of reported deaths and poisonings in newspapers. Would newspapers have reported on deaths and poisonings from whiskey at this time? Murders and suicides involving poisoned whiskey

were widely reported across the nation.[47] Newspapers also commonly reported cases of young children getting accidentally poisoned by whiskey.[48] A search of general "poisoning" revealed several reported cases of poisoning from other foods and drinks, including creosote poisoning from fish,[49] arsenic in flour,[50] ptomaine poisoning,[51] and coffee poisoning.[52] General poisoning cases were often reported in outlets beyond the locality where they occurred. Newspapers also reported on the emerging problem of butchers selling diseased meats to consumers, including court cases, arrests, public health lectures, and pleas by inspectors for consumer awareness.[53] The New York Police even reported arrests for "Selling Diseased Meat" along with other crime statistics such as burglary, disorderly conduct, and larceny.[54]

This suggests that if rectified whiskey were linked to documented cases of immediate or severe consumer harm, it would likely have been covered by newspapers. A mass poisoning of the patrons of a New York saloon by wood alcohol, for instance, was reported on in newspapers across the nation.[55] Certainly, there would have been a strong incentive to do so in states friendly to straight whiskey, such as Kentucky or Tennessee, or in a newspaper supportive of the temperance movement, given the growing influence of the movement over this period (Rohrer

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[47] A Mrs. Barnaby from Denver, Colorado was murdered with arsenic whiskey in 1891 and it was reported across the nation, including newspapers from Rhode Island, Maine, Vermont, New York, Massachusetts, Connecticut, Pennsylvania, Montana, Idaho, Alabama, Missouri, Nebraska, Kansas, Iowa, Texas, Virginia.
[48] *The Journal and Tribune*, Knoxville, TN (April 30th, 1901), *Harford Courant*, Hartford, CT (July 3rd, 1901), & *The Morning Post*, Raleigh, NC (November 28th, 1901).
[49] *Pittsburgh Daily Post*, Pittsburgh, PA (July 21st, 1873).
[50] *Argonia Clipper*, Argonia, KS (October 4th, 1895) & *The Iola Daily*, Iola, KS (October 31st, 1908).
[51] *The Democrat-American*, Sallisaw, OK (March 20th, 1914).
[52] *Republican Banner*, Nashville, TN (August 22nd, 1867).
[53] *New-York Tribune*, New York, NY (August 6th, 1850), *New-York Tribune*, New York, NY (April 8th, 1851), *Iowa Democratic Enquirer*, Bloomington, IA (August 16th, 1851), & *The Abbeville Press and Banner*, Abbeville, SC (March 9th, 1855).
[54] *New York Times*, New York, NY (July 16th, 1853).
[55] *The Honolulu Advertiser*, Honolulu, HI (October 12th, 1904), *Boston Evening Transcript*, Boston, MA(October 14th, 1904), *The Evening Journal*, Wilmington, DE (October 19th, 1904), *Line-Up*, Kansas City, KS (November 15th, 1904), *The Waterbury Democrat*, Waterbury, CT (October 26th, 1904), *Altoona Times*, Altoona, PA(October 12th, 1904), *Natchez Democrat*, Natcehz, MS (October 12th, 1904), *The Times Herald*, Port Huron, MI (October 12th, 1904), & *Eagle River Review*, Eagle Review, WI (October 17th, 1904).

2009; Zimmerman 1999). Law and Libecap (2006) note that the "Enactment of the Pure Food and Drugs Act was less a response to real economic problems than to rising consumer concerns fueled by a newly effective, sensational media."

We performed keyword searches of whiskey and each poisonous ingredient in a chemical test or recipe book from 1850 to 1905. We also did additional searches, including the words "death" and "poisoning." **Table 3** shows the total number of deaths and poisonings directly connected to whiskey, outside of suicides, murders, and the intentional addition of dangerous ingredients known to the consumer. We conservatively included cases where there was doubt as to whether the deaths or poisonings fit one of our excluded categories. The death of 10 Sitka Indigenous Americans from drinking a mixture of whiskey, kerosene, and lemon juice in 1897, for instance, was included.[56] The saloon owner was arrested, with it being reported that he "specially disliked two of the Indians who had informed on him for selling whiskey," but we could not find the verdict of the trial.[57]

[56] *Fall River Daily Globe*, Fall River, MA (September 1st, 1897).
[57] *The Standard Union*, Brooklyn, NY (August 26th, 1897).

Table 3: Reported Deaths and Poisonings from Whiskey, 1850-1906

Keyword Search	Deaths	Poisonings
whiskey, ammonium	0	0
whiskey, arsenic	0	0
whiskey, benzine	0	0
Variation: benzine whiskey	0	0
whiskey, black oxide of manganese	0	0
whiskey, brazilwood	0	0
whiskey, brucine	0	1
whiskey, chloroform	0	0
whiskey, chromic acid	0	0
whiskey, copper sulfate	0	0
whiskey, creosote	1	1
whiskey, enanthic ether	0	0
whiskey, fusel oil	0	0
whiskey, kerosene	10	0
whiskey, lead acetate	0	0
Variation: whiskey, sugar of lead	0	0
whiskey, logwood	0	0
whiskey, nitric ether	0	0
whiskey, nux vomica	0	1
whiskey, potash	1	1
whiskey, potassium chlorate	0	0
Variation: whiskey, potassium acetate	0	0
whiskey, prussic acid	0	0
whiskey, spirits of nitre	0	0
Variation: whiskey, nitric acid	0	0
whiskey, strontium	0	0
whiskey, strychnine	3	1
whiskey, sulphuric acid	1	3
Variation: whiskey, oil of vitriol	0	0
whiskey, tobacco	0	0
whiskey, turpentine	0	0
whiskey, unslaked lime	0	0
whiskey, wood alcohol	36	6
Variation: whiskey, methanol	0	0
whiskey, zinc sulfate	0	0
Total	**52**	**14**

Overall, there were few reported cases of death or poisoning from adulterated whiskey. This was even though there was underground production of whiskey due to the high tax on liquor.[58] There are a high number of wood alcohol deaths. Twenty-two of the wood alcohol deaths came from one case, the Stryker Farms Incident, in New York.[59] It was such an anomaly that the saloon owner was arrested, and a mob of over 150 people ransacked his saloon.[60] A newspaper reported that "revenue officers are firm in the belief that Fritsche's saloon [the guilty party]" was "an isolated case and that the use of wood alcohol has not been practiced…." more broadly in the city.[61]

1.4 Examination of the Poisons *More* Commonly Used in Rectified Whiskey

As judged by the evidence presented in Section 3, the poisons that were more commonly, but not necessarily widely use, in whiskey were creosote, fusel oil, spirits of nitre, sulphuric acid, and wood alcohol. In examining the use of chemicals in rectified whiskey, it is important to judge historical markets not according to modern scientific and medical knowledge but with the scientific and medical understanding of the day (Leeson 2022; Leeson, King, and Fegley 2020; also see Stanziani 2009 & 2015). There were undoubtedly chemicals used in the rectifying process that now are modernly known to be dangerous but were not known to be harmful, especially in small dosages, at that time.[62] In this section, we examine the use of these more commonly used ingredients to judge whether they were known, at that time, to be poisonous.

Table 4 shows the chemicals found in trade whiskey recipes and whether they were used in whiskey recipes found in general recipe books intended for consumers, non-whiskey recipes in

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[58] *Brookville Republican*, Brookville, PA (December 19th, 1866).
[59] *The Allen County Republican Gazette,* Lima, OH (April 14th, 1905) & *New-York Tribune*, New York, NY (October 17th, 1904).
[60] *The New York Times*, New York, NY (October 12th, 1904).
[61] *The Sun*, New York, NY (October 15th, 1904).
[62] The authors make no attempt to understand the accuracy of the chemical process. For the purposes of this paper, what matters is how the rectifiers acted given the chemical understanding of their time.

consumer recipe books, or family medical books of the era. Many of the poisonous ingredients used in whiskey recipes can also be found in recipe books explicitly written for general consumers. This suggests that these ingredients, at least in the small dosages prescribed, were not broadly considered to be dangerous at that time. For instance, potash was occasionally recommended for red coloring in whiskies (Lacour 1863, p. 121; Bryant 1895, p. 111). But, at that time, potash was used as a treatment for blood and skin disorders, so it was considered acceptable in small dosages. The lack of potash in food was considered a driver of scurvy, gout, rheumatism, lumbago, and neuralgia.[63] Dr. Henry Leffman (Jefferson Medical College) was quoted as saying, that potash "cannot be very injurious, for the formula only calls for half or three-quarters an ounce to a barrel of liquor."[64] Overall, of the 13 poisonous ingredients included in whiskey recipes, 11 (84.6%) were included in at least one consumer recipe and 10 (76.9%) were included in two or more recipes.

[63] *Polynesian*, Honolulu, HI (June 9th, 1849) & *Rutland Daily Herald*, Rutland, VT (February 11th, 1891).
[64] *St. Louis Globe-Democrat*, St. Louis, MO (December 26th, 1882).

Table 4: The Use of Ingredients in Home Recipe and Medical Books, 1850-1906

Book	Black Oxide of Manganese	Chloroform	Copper Sulfate	Creosote	Enanthic Ether	Fusel Oil	Nitric Ether	Oxalate of Ammonium	Potash	Potassium Chlorate or Acetate	Spirits of Nitre (Nitric Acid)	Sulphuric Acid (Oil of Vitriol)	Unslaked or Chlorinated Lime
Consumer Whiskey Recipes													
Dick (1872)				X									
Fitzgibbon (1867)			X			X					X		X
Marquart (1860)				X							X		
Terrington (1869)				X		X							
General Consumer Recipe Books (Non-Whiskey Recipes)													
Brannt (1886)		X		X				X	X	X	X	X	X
Dick (1872)		X		X		X	X		X		X	X	
Fitzgibbon (1867)							X		X		X		
Marquart (1860)									X		X	X	X
Terrington (1869)										X			
Family Medical Books													
Buchan (1869)											X	X	
Byrn (1876)		X									X	X	
Douglas (1894)								X			X	X	
Gunn (1864)									X		X	X	X
Humphreys (1906)													
Pierce (1895)									X		X	X	
Wark (1882)		X		X					X		X	X	

In the remainder of this section, we provide a more detailed analysis of creosote, fusel oil, spirits of nitre (nitric acid), sulphuric acid (oil of vitriol), and wood alcohol (methanol).

1.4.1 Creosote

Recipes for Irish, Scotch, and Old Roanoke whiskeys commonly called for creosote (or "creasote", "kreosote", or "oil of tar") (Lacour 1863, pp. 46 & 126; *The Bordeaux Guide* 1857, pp. 19 & 128; Marquart 1860, p. 141; Prescott 1875, p. 19). The dangers surrounding creosote, however, were not fully understood at the time. Newspaper articles suggested creosote as a remedy for cavities and listed it alongside other medications such as morphine, Epsom salt, and cayenne pepper and billed it as a cure for "Cancers, ulcers, old sores, tetter, ringworms, … bleeding from fresh wounds, [and] bleeding at the nose…".[65] The earliest mention of injury from creosote we could find in keyword searches was in 1870 of a man dying after creosote was applied to a tooth. The article mentions that "These local effects ascribed to creosote are remarkable. We are not aware of that any similar cases have been described as occurring in this country."[66] While an 1872 newspaper article mentions that creosote is "dangerous stuff," it goes on to recommend it for a simple remedy for dysentery and that "A preparation of creosote is getting to be a common remedy among physicians…."[67]

By 1874, Cotter (1874, p. 29) recognized creosote as a poisonous ingredient in whiskey. An 1882 article, however, quotes Dr. Henry Leffman (Jefferson Medical College), stating that "a few drops of creosote in a barrel of common whisky give the same flavor [as peat smoke] without doing any harm."[68] Thus, the danger of using creosote, especially in the quantities used in rectified Irish and Scotch whisky, was only becoming apparent when consumer-safety

[65] *The Star and Banner*, Gettysburg, PA (December 5th, 1836). Also see *The Pittsburgh Gazette*, Pittsburgh, PA (June 13th, 1849), *Richmond Dispatch*, Richmond, VA (January 17th, 1853), *Arkansas Intelligencer*, Van Buren, AR (June 6th, 1846), & *Shepherdstown Register*, Shepherdstown, WV (January 20th, 1855).
[66] *Harrisburg Telegraph*, Harrisburg, PA (May 2nd, 1870).
[67] *The North Alabamian*, Tuscumbia, AL (May 9th, 1872). Also see *Orleans County Monitor*, Barton, VT (June 26th, 1883).
[68] *St. Louis Globe-Democrat*, St. Louis, MI (December 26th, 1882).

legislation was adopted. Creosote, for instance, was listed as an ingredient in several home recipe or medical books, as indicated in **Table 4**.

The updated version of Lacour's (1863) trade recipe book published in 1895 (Bryant 1895) dropped creosote from its Old Roanoke whiskey recipe but retained it for Scotch and Irish whisky, which required its smokey taste. Getting real Irish or Scotch whiskey was prohibitively expensive due to the high tariff on foreign whiskies (Troesken 1998, p. 758).[69] Thus consumers buying Irish and Scotch whiskey knew they were drinking a product with creosote.

1.4.2 Fusel Oil

While fusel oil was included in some trade recipes to make rectified whiskey bead like straight whiskey, rectified whiskey typically contained less fusel oil than straight whiskey (High and Coppin 1988, p. 291; Wiley 1919, p. 284).[70] Regarding fusel oil, Harvey Wiley was reported as saying that he "recognizes the fact that a whiskey of that character [rectified] need not necessarily be harmful, and actually may be less deleterious to the system than straight whiskey."[71] Dr. Charles E. Pellew, a professor of industrial chemistry at Columbia University, stated that rectified whiskey is "much purer and much more free from possibly harmful ingredients" than straight whiskey.[72] The Minnesota Dairy and Food Commission Commissioner noted that "blended whiskies do not as a rule contain" fusel oil.[73]

Trade books commonly had detailed instructions for properly removing fusel oil from neutral spirits to make rectified whiskey (Boothby 1891, No. 337; Brannt 1886, p. 229; Brannt 1885, p. 235; Bryant 1895, p. 98; Fleischman 1885, p. 18; Lacour 1863, pp. 109-117; *The*

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[69] *Richmond Dispatch*, Richmond, VA (May 27th, 1884) & *The Coffeyville Record*, Coffeyville, KS (August 27th, 1904).
[70] A *Scientific American* (1871) article argued that aged whiskey had less fusel oil. Also see: *Chicago Tribune*, Chicago, IL (May 28th, 1884).
[71] *The Sun*, New York, NY (November 5th, 1904).
[72] *The Sun*, New York, NY (February 22nd, 1897). Also see: *Chicago Tribune*, Chicago, IL (May 28th, 1884).
[73] *The Redwood Gazette*, Redwood Falls, MN (August 2nd, 1905).

Bordeaux Guide 1857, p. 124). This was because fusel oil was considered a dangerous ingredient that could adversely affect the smell and taste of the whiskey (Feuchtwanger 1858, pp. 63-65; Prescott 1875, p. 17).[74] Some of the poisonous ingredients included in recipe books, including sweet spirits of nitre (Bryant 1895, pp. 98-99; *The Bordeaux Guid*e 1857, p. 124), sulphuric acid (Bootby 1891, Recipe No. 337), potash (Bryant 1895, pp. 98-99) were recommended in whiskey recipes to remove fusel oil.

There appears to have been debate as to whether covering up fusel oil with natural flavorings or removing it with chemicals was the more ethical practice. A "French" system of distilling was introduced, which favored using aromatic ingredients to disguise the fusel oil rather than chemicals to remove it. Fleischman (1885, p. 17) argues that "[natural fruit and tea] flavoring extracts. . .are used in every rectifying establishment…" and there is "nothing injurious", whereas no honest rectifier should introduce "sulphuric acid, suphate of copper, oxalic acid, chloroform, acetate of potash, & ammonia." Bryant (1895, p. 99) however, appears to dismiss the prospect of concealing fusel oil with aromatics, as a temptation to those "disposed to deal in this manner."

The removal of fusel oil prevailed in the industry. Rectifiers were so successful in eliminating fusel oil that its absence in rectified whiskey became a trait that regulators used to distinguish rectified from straight whiskey (Wiley 1919, pp. 286-289; Cross 1899, p. 118). However, many of the recipes, especially the recipes for higher grades of whiskey, called for the addition of some straight whiskey as a flavoring ingredient. This straight whiskey, of course, would have reintroduced fusel oil back into the neutral spirits.

[74] While considered dangerous at the time, fusel oil modernly is still contained in whiskey (Nishimura and Masuda 1971; Ryan 2014) and is considered safe in small amounts for flavoring (Zie, Tian, He, Wei, Peng, and Wu 2018).

1.4.3 Sweet Spirits of Nitre

Sweet spirits of nitre or nitric acid was recommended in small amounts, oftentimes for replicating Monongahela, old bourbon, and wheat whiskey in 17 trade book recipes. The only chemical test that reported testing for it, however, was negative. While it was well known to be fatal in large dosages, it was commonly prescribed by physicians and sold by pharmacists for strangury and fever (Feuchtwanger 1858, p. 131).[75] While Lacour (1863, pp. 39 & 85) and others recognized some of the potential dangers of the sweet spirits of nitre, the FDA did not ban sweet spirits of nitre until 1980.[76] As can be seen in **Table 4**, sweet spirits of nitre was a common ingredient in consumer recipes during this time.

1.4.4 Sulphuric Acid

Sulphuric acid was listed in 12 whiskey recipes in small quantities (one ounce or less in 8 recipes), with 7 of the recipes contained in one book (Fleischman 1885). As shown in **Table 4**, sulphuric acid was a common ingredient in consumer recipes at this time.

1.4.5 Wood Alcohol

While wood alcohol (methanol) was not listed in any trade whiskey recipe, it was found in some consumer tests of whiskey and was the most dangerous ingredient for consumers in terms of deaths and poisonings. Wood alcohol was alcohol manufactured for industrial or fuel purposes. While it was known to be dangerous, the suspicions regarding the danger of wood alcohol led to an investigation by the American Medical Association only in 1904.[77] A reprinted statement from the *Medical Record* observed that it was:

> widely used as a menstruum in many toilet preparations and remedies for internal and external use. The reasons for this practice are two-fold. First (…) is the

[75] *Fall River Globe*, Fall River, MA (May 27th, 1895), *New York Times*, New York, NY (October 29th, 1859), & *Alexandria Gazette*, Alexandria, VA (July 26th, 1860).
[76] *New York Times* (October 12th, 1980).
[77] *The Daily Mail*, Bedford, IN (December 2nd, 1904).

> comparative cheapness of wood alcohol, it being untaxed and costing but 50 cents a gallon, while grain alcohol, taxed, costs at retail $2.60 per gallon. The second reason is the ignorance of many manufacturers as to the deadly nature of methyl alcohol. Indeed, even among members of the medical profession views with regard to the poisonous nature of methyl alcohol are widely divergent…[78]

The widespread manufacture of wood alcohol, and the invention of deodorized wood alcohol, were caused by U.S. tax law. The high tax on grain alcohol, even for industrial purposes, sparked the search for a suitable alternative. The discovery of a way to deodorize wood alcohol improved its safety for industrial use by removing its pungent smell and taste.[79] As one article states:

> The cost of making wood alcohol is, probably, considerably greater than the cost of making spirit alcohol, and when made it is in many ways a less meritorious article. It has certain explosive qualities on account of its volatile nature, and for other causes could not compete in the market with alcohol at the same price. On this account, if the internal revenue tax were taken from spirit alcohol, the business of manufacturing wood alcohol would be as completely destroyed as if Congress had passed a law prohibiting production.[80]

When policymakers discussed the possibility of removing the tax on grain alcohol for industrial or fuel purposes or applying the grain alcohol tax to wood alcohol to equalize the tax burden, these proposals were rejected due to the harm it would cause the wood alcohol industry.[81] In 1906 the U.S. government permitted grain alcohol to go untaxed for industrial and fuel purposes under the condition that it was denatured (purposely poisoned) with wood alcohol to prevent it from being repurposed for consumptive purposes to evade the grain alcohol tax.[82]

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[78] *The Daily Mail*, Bedford, IN (December 2nd, 1904). Also see: *El Paso Herald*, El Paso, TX (June 16th, 1906).
[79] *The Indianapolis Journal*, Indianapolis, IN (December 3rd, 1885), *The Tennessean*, Nashville, TN (December 13th, 1885), *Des Moines Register*, Des Moines, IA (December 3rd, 1896), *The Daily Mail*, Bedford, IN (December 2nd, 1904), & *The Owensboro Messenger*, Owensboro, KY (June 3rd, 1906).
[80] *St. Joseph Gazette*, St. Joseph, MO (September 9th, 1888). Also see: *Chicago Tribune*, Chicago, IL (January 15th, 1905).
[81] *The Salt Lake Herald*, Salt Lake City, UT (December 3rd, 1896).
[82] *The Minneapolis Journal*, Minneapolis, MN (December 21st, 1904) & *The Owensboro Messenger* Owensboro, KY (June 3rd, 1906)).

It was a federal offense, under tax law, to mix wood alcohol with whiskey before the passage of the Pure Food and Drugs Act.[83] While newspaper reporting wasn't always clear, many of the deaths and poisonings from wood alcohol were due to isolated instances, labeling mistakes, or underground consumption.[84] Atkinson's 1904 analysis tested 16 liquors from the same saloon after 22 deaths in the Stryker Farms Incident in New York City. As mentioned earlier, revenue officers believed this poisoning was an isolated incident, especially since the barkeep and his patron friends consumed the alcohol and were among those who died from it.[85] An internal revenue officer observed that:

> In all my experience, ranging from all over the country, that is the only case in which wood alcohol has figured before. No one would attempt to make use of wood alcohol for this purpose unless through the grossest ignorance, because any but the most ignorant would know it would mean sickness and death to whoever drank such adulterated spirits. Another thing, any quantity of wood alcohol should betray itself to any one accustomed to the smell and taste of whiskey. Even ordinary poor whiskey does not taste the least bit like whiskey doctored with wood alcohol. The men who drank this stuff (…) must have noticed it unless they were very drunk. It was sufficiently plain to us the minute we looked at it.[86]

Ladd's analysis found that 4 out of 42 whiskies, all 4 from a single distilling company, had wood alcohol. Three analyses of whiskey conducted by the Massachusetts State Board of Health, the New Jersey State Board of Health, and the Minnesota Dairy and Food Commission, specifically reported negative tests for wood alcohol in their samples.

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[83] *The Evening Herald*, Fall River, MA (November 2nd, 1904), *The Morning Post*, Raleigh, NC (November 12th, 1904), *The Chelsea Herald*, Randolph, VT (April 5th, 1906), & *New-York Tribune*, New York, NY (November 12th, 1904).
[84] *The News-Journal*, Lancaster, PA (February 2nd, 1904), *Altoona Tribune*, Altoona, PA (March 3rd, 1904), *The Forest Republican*, Tionesta, PA (December 21st, 1904), & *Akron Beacon Journal*, Akron, OH (December 1st, 1897).
[85] *The Evening World*, New York, NY (October 11th, 1904). Disputing account: *New-York Tribune*, New York, NY (November 13th, 1904).
[86] *Fall River Globe*, Fall River, MA (October 13th, 1904).

1.5 Underground Whiskey

There were some poisons found in whiskey in underground markets. Due to the high tax on whiskey and, primarily, federal, state, or local alcohol prohibitions, bootleggers could operate illegally outside standard market mechanisms that would have provided consumer-protecting discipline.[87] Adulterated alcohol, or a drink made with alcohol substitutes, known by names such as "squirrel whiskey," was sold overwhelmingly in localities under alcohol prohibition.[88] Bootleg whiskey in Kansas, which implemented statewide prohibition in 1881, was found even to lack whiskey, having cannabis, quillaia, sulphuric acid, acetic ether, prickly ash, and powdered opium instead.[89] An 1888 article also reports on two Kansas prisoners serving a term for selling "benzine and logwood" as whiskey.[90] There were also a few cases of Laudanum, an opium extract, being added to whiskey intentionally to commit suicide or murder.[91]

While not broadly used in whiskey, there was a demand among a small group of consumers, outside of prohibition, for strychnine due to its unique intoxicating effect. Some public interest advocates argued that strychnine was widely used in whiskey since its use significantly increased the yield of liquor out of grain. However, there is mixed evidence on whether this was true or even believed at that time.[92] Furthermore, this would have implied that both straight and rectified whiskey contained strychnine.

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[87] See Dills and Miron (2004), Dills, Jacobson, and Miron (2005), Fisher (1927a & 1927b), Miron (1998 & 1999), and Okrent (2010).
[88] *Montpelier Evening Argus*, Montpelier, VT (May 21st, 1918), *The Crowley Post-Signal*, Crowley, LA(January 6th, 1909), *St. Joseph Daily Press*, Saint Joseph, MI (July 28th, 1910), & *The North Adams Transcript*, North Adams, MA (July 16th, 1914).
[89] *The Fort Scott Republican*, Fort Scott, KS (August 20th, 1910), *The Topeka Daily Capital*, Topeka, KS (December 13th, 1908), *The Dispatch-Republican*, Clay Center, KS (October 29th, 1908), & *The Wichita Beacon*, Wichita, KS (October 26th, 1908).
[90] *Horton Commercial*, Horton, KS (April 13th, 1888).
[91] *The Coffeyville Weekly Journal*, Coffeyville, KS (August 16th, 1901).
[92] *The Evansville Daily Journal*, Evansville, IN (July 29th, 1854) and *Scientific American* (July 4th, 1857). See also Story (1883, p. 340). One possible connection we found between strychnine whiskey and rectifiers was in *The Ottawa Free Trader*, Ottawa, IL (May 9th, 1857).

We found multiple examples of general consumer harm from consuming strychnine, so it was widely known as a dangerous substance. However, it was also considered safe in small doses. Strychnine, for instance, was commonly prescribed as a heart stimulant.[93] Nux vomica, a derivative of strychnine, was also prescribed by physicians.[94] It wasn't until 1937 that the *Scientific American*, based on an article in the *American Journal of Clinical Pathology*, advised outlawing "the use of strychnine in medical practice" and advised people taking strychnine not to take whiskey simultaneously (Norris 1937).[95]

The studies conducted by Cox and Aughey provide the most substantial evidence that rectifiers were using strychnine in their whiskey.[96] But, as mentioned earlier, there are reasons to be skeptical of Aughey's and Cox's analyses.[97] The editor of the *Boston Journal of Chemistry* was asked about the use of strychnine in whiskey in 1876 and answered that:

> never in a single instance have I found the slightest trace of strychnine in whisky. I do not believe it ever has been used, for the article does not admit of such sophistication. No possible advantage could be derived from its use by the distiller and its presence, owing to the intense bitter, would destroy the sale of his liquors. In my judgement it is a vulgar notion to suppose it is ever employed by distillers in their processes.[98]

A report from the American Pharmaceutical Association of New York in 1881 and Albert Prescott, the author of the *Chemical Examination of Alcoholic Liquors* (1875, p. 19) offered similar assessments, arguing that strychnine was not used in whiskey.[99] From our analysis of whiskey trade books, we also know that strychnine was also not listed in any trade whiskey

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[93] *The Salt Lake Tribune*, Salt Lake City, UT (October 7th, 1899), *The Buffalo Sunday Morning News*, Buffalo, NY (June 14th, 1896), *Tulare Advance-Register*, Tulare, CA (March 2nd, 1895), & *The New York Times*, New York, NY (June 27th, 1892). Also see Wark (1882, p. 236).
[94] *The Brooklyn Daily Eagle*, Brooklyn, NY (May 24th, 1867), *Quad-City Times*, Davenport, IA (March 3rd, 1880), and *Dollar Weekly News*, Wilkes-Barre, PA (February 25th, 1899).
[95] *Scientific American* (June 19th, 1937) & *New York Times*, New York, NY (June 6th, 1937).
[96] *Tennessee Baptist*, Nashville, TN (May 29th, 1858).
[97] *Scientific American* (July 4th, 1857) & *Detroit Free Press*, Detroit, MI (February 5th, 1860).
[98] *The Abbeville Press and Banner*, Abbeville, SC (July 5th, 1876).
[99] *The Greensboro Times*, Greensboro, NC (September 29th, 1860).

recipe. It was a costly ingredient that would have reduced its marketability due to the "nauseously bitter" taste it would have imparted to the whiskey (Prescott 1875, p. 19).[100] There appears, however, to have been a small, niche market demand for strychnine whiskey, with the strychnine being added at the request of willing consumers due to its unique, intoxicating effect similar to methamphetamine (Carlton 2021).[101]

We found several instances of newspapers reporting on deaths from strychnine whiskey and whiskey being chemically tested to confirm the presence of strychnine.[102] But a complication in interpreting the use of strychnine in whiskey is that the majority of the deaths from strychnine whiskey we found in a search of *Newspapers.com* were from the fact that it was commonly added to whiskey to commit murder, suicide, theft (to incapacitate a victim), and, in at least one case, to fatally catch a whiskey thief.[103] Even among the deaths and poisonings included in **Table 3,** it was sometimes unclear whether these were the result of people drinking whiskey while prescribed strychnine, people who demanded strychnine whiskey due to its intoxicating

[100] *Tuskegee Republican*, Tuskegee, AL (December 3rd, 1857). An 1857 article, reprinted from the *Journal of Commerce*, quotes the price of strychnine as $2.50 to $3 an ounce, approximately $72 to $87 in 2021 dollars (*The Abbeville Press and Banner*, Abbeville, SC (October 30th, 1857)). Inflation adjustments used the Minneapolis Fed CPI, 1800-: https://www.minneapolisfed.org/about-us/monetary-policy/inflation-calculator/consumer-price-index-1800-.

[101] *The Evansville Daily Journal*, Evansville, IN (July 29th, 1854), *Raftsman's Journal*, Clearfield, PA(August 22nd, 1860), *Perrysburg Journal*, Perrysburg, OH (April 29th, 1854), & *Belmont Chronicle*, Saint Clairsville, OH (June 25th, 1857).

[102] *Grand River Times*, Grand Haven, MI (August 19th, 1857), *The Daily Journal*, Wilmington, NC (December 21st, 1857), *Buffalo Weekly Express*, Buffalo, NY (August 30th, 1859), *San Antonino Evening News*, San Antonio, TX (February 24th, 1919), *Fayetteville Semi-Weekly Observer*, Fayetteville, NC (December 28th, 1857), *Bangor Daily Whig and Courier*, Bangor, ME (November 8th, 1859), *Alexandria Gazette*, Alexandria, VA (February 24th, 1860), *Belmont Chronicle*, Saint Clairsville, OH (August 6th, 1857), *The Belvidere Standard*, Belvidere, IL (March 20th, 1860), *The Atlanta Constitution*, Atlanta, GA (January 17th, 1895), *Friend's Intelligencer*, Philadelphia, PA (April 28th, 1860), & *Green-Mountain Freeman*, Montpelier, VT (February 18th, 1858). Also see Stevens and Murphy (1859, pp. 277-278).

[103] *New-York Tribun*e, New York, NY (August 12th, 1881), *The Tipton Advertiser*, Tipton, IA (June 6, 1861), *Pittsburgh Daily Post*, Pittsburgh, PA (March 17th, 1859), *The Athens Post*, Athens, TN (March 11th, 1859), *Buffalo Courier*, Buffalo, NY (June 29th, 1860), *Weekly Raleigh Register*, Raleigh, NC (March 16, 1859), & *The Washington Post*, Washington, D.C. (July 27th, 1907).

effects who overindulged or had dosage inconsistency, people committing suicide or murder, or strychnine being used by dishonest rectifiers as an ingredient.

The temperance movement played a role in exaggerating the prevalence of strychnine whisky to bolster their case against alcohol. An 1874 newspaper article details a representative of the temperance movement, Rev. Franklin Tuxbury, asserting that strychnine was commonly used in whiskey. The statement was challenged by Dr. C. L. Case, who stressed that he was not in opposition to the temperance movement but "did not wish to have anything but truth used in its defense." Dr. Case read letters from several chemists, including two with academic appointments, stating that strychnine "was not, and could not be, used in the distillation of whiskey."[104] In response, Rev. Tuxbury revised his comments, stating that "He had not said that strychnine was used in the still but had said that the effects of whiskey might be induced by mixing (or extending) the common article by the mixture of Drugs." An article in the *Medical and Surgical Reporter* referred to strychnine in whiskey as a "popular temperance myth" and that:

> If strychnia has the power of increasing the yield of whiskey from a given amount of "mash," it is a new property of that alkaloid, which is not mentioned in any work on chemistry… […] The whole thing is an absurd story, invented, no doubt, to frighten people. Why not say the truth at once? Whiskey kills more than enough people when pure ; it needs no assistance from other deadly poisons."[105]

Thus, the historical evidence strongly suggests that strychnine whiskey was primarily sought after by a small group of consumers and supplied by a small group of dealers. If there were

[104] *Rutland Daily Herald*, Rutland, VT (April 20th, 1874).
[105] *Medical and Surgical Reporter* (July 25th, 1874).

rectifiers using strychnine whiskey in their distillation process and selling the poisoned whiskey to unsuspecting consumers, it appears to have been, at the most, a few isolated instances.[106]

1.6 Conclusion

This paper used historical newspapers and whiskey trade books to analyze the public interest rationale for regulating whiskey with the Pure Food and Drugs Act of 1906. The public interest justification for whiskey regulation through the act was that there was widespread use of poisonous ingredients in rectified whiskey. We examine this public interest justification using alcohol consumption data, reported chemical tests of whiskey, trade book recipes, and reported deaths and poisonings.

We find that poisons were infrequently used in the rectification of whiskey leading up to the passage of the Pure Food and Drugs Act of 1906. While there is evidence that some poisons were used in whiskey, these ingredients were overwhelmingly either not fully understood to be dangerous at that time or were demanded in underground markets. The public interest rationale for the regulation of whiskey in the Pure Food and Drugs Act of 1906 does not hold up to historical scrutiny. This evidence bolsters the public choice explanation of High and Coppin (1988) and Coppin and High (1999).

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[106] There may have also been a small demand for benzine whiskey, presumably due to a unique, intoxicating effect (*Burlington Free Press*, Burlington, VT (August 18th, 1868) & *Bangor Daily Whig and Courier*, Bangor, ME (February 24th, 1871)). Whiskey recipe books and a search of *Newspapers.com* both suggest that benzine was certainly not a common ingredient in rectified whiskey. The frequent use of parentheses around the term in newspaper stories, however, suggests that "benzine" may have just been used primarily as an intentionally negative descriptor attached to whiskey rather than an actual product commonly consumed (*Clarion Democrat*, Clarion, PA (October 2nd, 1869), *Norfolk Virginian*, Norfolk, VA (November 26th, 1869), *York Gazette*, York, PA (September 15th, 1874), & *Lawrence Daily Reporter*, Lawrence, KS (September 2nd, 1879)). Instances of death from benzine whiskey were commonly assumed to be murders, suicides, or accidents from voluntary consumption (*Richmond Dispatch*, Richmond, VA (July 21st, 1869), *Times Union*, Brooklyn, NY (February 7th, 1899), & *The Standard Union*, Brooklyn, NY (August 11th, 1902)).

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CHAPTER II: *Assuring Consumers of Authenticity, Safety, & Quality in Early American Whiskey Markets*[107]

Do entrepreneurs have the incentives to assure consumers of authenticity, safety, and quality in the presence of asymmetric information? Early American whiskey markets present a classic case of asymmetric information where markets might be expected to unravel because consumers could not discern the authenticity, safety, and quality of whiskey sold out of open barrels. In addition, public health experts claimed whiskey was commonly adulterated with poisons. Despite these market obstacles, early American whiskey markets were robust. Using historical newspapers, we detail the four mechanisms entrepreneurs in the whiskey industry invested in to assure consumers of authenticity, safety, and quality.

2.1 Introduction

Do markets incentivize entrepreneurs to help consumers overcome asymmetric information problems? Asymmetric information, where the information held by a producer is prohibitively expensive for ordinary consumers to acquire, can cause markets to unravel (Akerlof 1970). Counteracting institutions, developed either by entrepreneurs or state regulation, are necessary to enable the market to operate in the presence of severe asymmetric information problems (Akerlof 1970, p. 499).[108] The literature, however, has often not focused on the entrepreneur's role in overcoming asymmetric information problems.

Early American whiskey markets before the Pure Food and Drugs Act of 1906 might have been expected to unravel due to asymmetric information problems. Whiskey was commonly sold out of a barrel at saloons, pharmacies, and general stores. The average consumer

[107] Working paper with Daniel J. Smith.
[108] Regulation may be captured by regulators (Stigler 1971), imposing substantial costs with no discernable increase in consumer safety (Djankov, La Porta, Lopez-De-Silanes, and Shleifer 2002).

would have found it difficult to determine if the whiskey offered for sale was represented correctly or had been "watered down" with cheaper whiskey. Even more problematically, newspapers widely reported on claims from prominent public health experts that whiskey was commonly poisoned.

It would be difficult for a market to operate given these severe asymmetric information problems. Yet, production and consumption data from whiskey markets during this era demonstrate that whiskey markets did not unravel. In this paper, we use digitized historical newspapers from *Newspapers.com* to examine whether counteracting institutions developed by entrepreneurs in the whiskey industry emerged to assure consumers of authenticity, safety, and quality in early American whiskey markets.[109] We find that entrepreneurs in the whiskey industry, which included both distillers and rectifiers, developed four mechanisms to assure consumers of the authenticity, safety, and quality of their product: 1) the development of whiskey with distinctive characteristics, 2) the adoption of brand names, 3) exclusive dealer agreements, and 4) the introduction of sealed glass bottles. While some of these mechanisms were less effective than others, demonstrating an entrepreneurial market process of discovery and learning, we argue that the gradual development of effective mechanisms helped prevent the market for whiskey from unraveling in the presence of asymmetric information problems.

This paper builds on the existing literature examining the theoretical and empirical emergence of assurance of quality (Klein 1998, 2000, & 2002; Klein and Leffler 1981; Klein and Saft 1985) by providing a historical case study of the emergence of quality of assurance mechanisms. This paper extends this literature by examining the emergence of quality of assurance mechanisms in early industrial capitalism in the United States before the Pure Food

[109] On the use of historic newspapers in economics, see Beach and Hanlon (2022). Also see Geloso and March (2021), Sprick Schuster (2023), and White (2021).

and Drugs Act and by introducing the literature on quality of assurance to the entrepreneurship literature. The entrepreneurial response to these asymmetric information problems reflects a market process requiring learning and development (Bylund 2017; Kirzner 1973, 1997, & 2017; Koppl and Minniti 2010; Langlois 2007; Sautet 2000; Yates 2000).

Finally, this paper is also relevant to the literature examining whether the Pure Food and Drugs Act of 1906, as it pertained to whiskey, was of public interest or public choice origins (Coppin and High 1999; High and Coppin 1988) including building on our previous work (Smith and Scheck 2023). If entrepreneurs face market incentives to invest in mechanisms to assure consumers in the presence of asymmetric information, it can undermine the need for regulation.

Section 2.2 provides a brief history of early American whiskey markets and the asymmetric problems that plagued the whiskey market. Section 2.3 provides evidence that the market for whiskey in America was robust before regulation, examining production and consumption data. Section 2.4 examines the four mechanisms entrepreneurs in the whiskey market invested in to help assure consumers of authenticity, safety, and quality. Section 2.5 concludes.

2.2 Authenticity and Quality Problems in Early American Whiskey

The adoption of industrial methods in whiskey production, as well as more efficient transportation, moved whiskey from a good often produced locally to a mass-produced good that could be sold across the nation (Crowgey 2013, p. 52; Rorabugh 1976, p. 129; Veach 2013, Ch. 3). Two methods of producing whiskey emerged: straight and rectified whiskey. Straight whiskey was made by aging whiskey in a barrel. Rectified whiskey was made by flavoring neutral alcohol spirits to approximate the taste of straight whiskey, albeit at a much cheaper cost (Coppin and High 1999; High and Coppin 1988).

Before the invention of an industrialized process for producing bottles in 1903, whiskey was commonly sold out of barrels, with customers bringing in their containers to take it home (Carson 2010, p. 150-1). This introduced the possibility that whiskey could be misrepresented. A whiskey dealer could "water down", or entirely replace, an opened barrel of whiskey with an inferior grade of whiskey. Even having straight whiskey aged in government-bonded warehouses did not solve this problem because, until 1893, the government forbade whiskey barrels under five gallons, which meant that even these barrels were being opened for sale in smaller quantities to the average consumer (High and Coppin 1988, p. 291).

More concerningly, this also opened up the possibility of introducing poisonous ingredients. Cheap rectified whiskey, claimed at that time to have required several poisonous ingredients, such as creosote, potash, logwood, and turpentine, could be made to approximate the looks, smell, and taste of straight whiskey and thus could be presented to consumers as straight whiskey (Smith and Scheck 2023). Newspapers broadly reported on the claims coming from public health experts that rectified whiskey was commonly poisoned. The concern that rectified whiskey contained poisonous ingredients was the primary justification for extending the Pure Food and Drugs Act to the whiskey industry (Smith and Scheck 2023). For instance, Cotter (1874, p. 32) reports that it was broadly perceived that whiskey was adulterated with poisonous ingredients. Harvey Wiley, who was the leading proponent of the Pure Food and Drugs Act of 1906, argued that:

> If I could only talk, I'd tell you things about this particular subject [rectified whiskey] that would make your hair curl and that would result either in your becoming a total abstainer, or else in demanding affidavits from the distiller, the bottler, the retailer and the government revenue officers with every bottle you purchase.[110]

[110] *The Morning Post*, Raleigh, NC (November 10th, 1904).

Similarly, Senator Garrett Davis said "One barrel of genuine liquor taken…will produce from three to four barrels of rectified whiskey. They put red pepper in the barrel; they put raw tobacco in the barrel; they put soapsuds in the barrel, they put arsenic in the barrel; they put strychnine in the barrel, and a great many other villainous compounds that I do not remember."[111] Chemical tests of whiskey, especially those performed by Samuel Aughey, a professor of geology at the University of Nebraska-Lincoln, and Dr. Hiram Cox, a chemist, and Inspector of Liquors in Cincinnati, which reported finding a wide range of poisonous ingredients in whiskey, were also widely reported on in newspapers across the nation.[112]

While in our previous work (Smith and Scheck 2023) we argue that the claims about the widespread adulteration of rectified whiskey with poisonous ingredients were exaggerated and provide evidence questioning the veracity of some of the most incriminating chemical analyses, the belief that whiskey was, or could be, adulterated with poisons by duplicitous dealers would have presented a major obstacle to the operation of the whiskey market.

2.3 The Robust Market for Whiskey

Despite the severe asymmetric information problems in the market for early American whiskey, the whiskey market before the Pure Food and Drugs Act of 1906 was quite robust. Whiskey production data suggests that there was expanded output during this period (DiLorenzo 1985; High and Coppin 1988, p. 291; Rorabaugh 1976; Smith 1914, Ch. VIII; Troesken 1998, p. 766). While the production data is for all spirits, Troesken (1998, p. 757) argues that "Spirits had

[111] *Herald and Review*, Decatur, IL (May 22nd, 1910).
[112] *The Tiffin Tribune*, Tiffin, Ohio (May 21st, 1874), *Grant County Witness*, Platteville, Wisconsin (May 7th, 1874), *The Nebraska State Journal*, Lincoln, Nebraska (September 25th, 1874), *Carbondale Daily News*, Carbondale, Pennsylvania (May 16th, 1874), *Central City Courier*, Central City, Nebraska (February 13th, 1879), *Fremont Weekly Herald*, Fremont, Nebraska (February 27th, 1879), *Tennessee Baptist*, Nashville, Tennessee (May 29th, 1858), *Daily National Democrat*, Marysville, California (May 4th, 1860), *The Fremont Weekly Journal*, Fremont, Ohio (December 14th, 1860), *Brooklyn Evening Star*, Brooklyn, New York (March 8th, 1860), & *Daily National Democrat*, Marysville, California (May 4th, 1860).

virtually no other use except as an input for making whiskey." The high tax on grain alcohol led to the development of wood alcohol which enabled industrial users of alcohol to evade the tax (Smith and Scheck 2023).

Whiskey consumption data is consistent with the production data. Older data reflects a broader decline in spirit consumption relative to beer consumption from 1850 to 1870 (Rorabaugh 1976; Hyman, Zimmerman, Gurioli, and Helrich 1980). But, Stack (2003) attributes this shift to beer consumption to five factors unrelated to the whiskey market: 1) the high number of immigrants coming from countries with beer cultures, 2) the emergence of industrialization occupations where beer was the drink of choice while working, 3) the effect of the temperance movement, which encouraged lower-alcohol drinks, 4) innovation in the brewing industry, and 5) the introduction of lager beers.

After that period, whiskey consumption remained relatively stable. From 1888-1892, for instance, spirits were 49 percent of alcohol consumption in the United States (Holmes and Anderson 2017, Table 2). Anderson and Pinilla (2017, T46: Spirit Consumption) show that spirit consumption was robust from 1886 to 1900. There was, however, a dip in spirit consumption from 1893 to 1897, but that corresponds with the decline in alcohol consumption that could be expected during the Depression of 1893 to 1897 (Clay and Troesken 2002, p. 1015). A tax increase on whiskey from 90 cents to $1.10 in 1894 as well as deflation during that depression, which raised the real tax, also contributed to this dip (Clay and Troesken 2002, p. 1016).[113]

Most of the whiskey produced and consumed was rectified, with estimates ranging from 50 to 90 percent of the whiskey market (High and Coppin 1988, p. 291).[114]

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[113] "Historical Tax Rates" from the Alcohol and Tobacco Tax and Trade Bureau: https://www.ttb.gov/taxaudit/historical-tax-rates

[114] E. H. Taylor & Sons Co. v. Marion E. Taylor (Kentucky Court of Appeals 1905) & *New-York Tribune*, New York, NY (February 21st, 1897).

2.4 Mechanisms to Assure the Authenticity, Safety, and Quality of Whiskey

The robust market for whiskey before the Pure Foods and Drugs Act, despite its severe asymmetric information problems, suggests that entrepreneurs in the whiskey industry must have developed mechanisms to assure whiskey consumers of authenticity, safety, and quality. In this section, we use archival work from digitized historical newspapers to explore the entrepreneurial development and learning process that resulted in mechanisms that effectively assured consumers.

2.4.1 Quality Control Measures Imparting Distinctive Characteristics

One of the first methods used by entrepreneurs in the whiskey industry to ensure their prospective customers of the authenticity, safety, and quality of their whiskey was the adoption of unique distillation processes, which resulted in distinctive features that could be more readily discerned in the look, smell, and taste of their whiskey. At least to some extent, this moved whiskey from being a credence to an experience good.

The most obvious way for distillers to impart quality in whiskey's look, smell, and taste was to use unique ingredients. While the decision to use local grains was most certainly also economical and amenable to the flavor profile of local consumers who, prior to industrialization, would have been exposed to whiskey produced with local ingredients, the use of unique ingredients also served as an indicator of quality. Very early on, corn-based whiskey was being

sold as "Kentucky Whiskey" or "Western Whiskey" to distinguish it from "Eastern Rye Whiskies."[115] The quality of the ingredients also could affect the quality of the whiskey.[116]

The distilling process itself could also affect the noticeable attributes of whiskey. Compared to Scotland, American whiskey, produced in a similar-sized region, developed a much broader variety of techniques and recipes (Regan and Regan 1995, p. 13). This variation was fostered to differentiate their product (Regan and Regan 1995, p. 31). Bourbon County (Kentucky) whiskey became known as a high-quality source of bourbon due to its initially unique use of charred barrels for aging, which distinctly impacted whiskey's look, smell, and taste (Wiley 1919, pp. 284-5 & 307).[117] For instance, the aging of whiskey in burnt barrels imparts a deep red color, affecting its aroma and flavor (Wiley 1919, p. 307). Bourbon county whiskey was being advertised in newspapers as early as 1824.[118]

The Robertson County and Lincoln County distillation process, modernly referred to as "Tennessee Whiskey" used limestone water to make clear whiskey which was then distilled through maple wood charcoal to improve its quality (Veach 2013, p. 10; also see Troesken 1998, p. 757). This process also created a distinct look, smell, and taste readily discernable by dealers and consumers. Robertson County Whiskey was advertised in newspapers starting in 1855,[119] and Lincoln County Whiskey in 1861.[120] At least one advertisement for Lincoln County whiskey

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[115] *The Impartial Review and Cumberland Repository*, Nashville, Tennessee (October 4th, 1806) and *The Pittsfield Sun*, Pittsfield, Massachusetts (February 17th, 1819). The authors thank Michael R. Veach for answering a clarifying question on the exact distinction of western whiskey. For examples of rye whiskey advertisements, see *Butler Citizen*, Butler, Pennsylvania (November 30th, 1899) and *The Osage City Free Press*, Osage City, Kansas (September 21st, 1898).

[116] The use of subpar ingredients, especially grain that was moldy, frostbit, or decayed, tended to impact the whiskey's quality negatively and thus the distiller's reputation (Wiley 1919, p. 306).

[117] The origins of the name Bourbon are uncertain, as the “Limestone” area that developed the whiskey was in Mason, not Bourbon, County (Veach 2013, p. 25).

[118] *Natchez Gazette*, Natchez, Mississippi (August 7th, 1824).

[119] *Nashville Union and American*, Nashville, TN (December 13th, 1855).

[120] *Republican Banner*, Nashville, Tennessee (February 20th, 1861).

explicitly mentions the smell of the whiskey as an indicator of the quality of the whiskey.[121] Similarly, copper stills tended to impart a distinct taste to whiskey and improved the quality of whiskey (Harrison et al. 2011). To convey this quality, copper stills were also frequently mentioned in whiskey advertising (Carson 2010, p. 81).[122]

Local whiskey dealers would build their reputations by selling whiskey using these distinctive distilling processes. One advertisement, for instance, states that the City Bar, run by Jno Ramagnano has "with particular care selected for this season a very fine lot of best Lincoln County Whiskey Direct from the Distillery…"[123] Some early advertisements even distinguished between the two Tennessee whiskey counties, offering both Robertson County and Lincoln County Whiskey for the discerning customer.[124]

Early whiskey was advertised without an explicit age statement but referred to the product as "old" or 'new" to indicate if it was aged in barrels or not (Crowgey 2013, pp. 111 & 127). An 1855 advertisement, for instance, lists both "Old and superior Robertson County Whiskey" for sale.[125] Presumably, customers could tell the difference between old and new whiskey.

Explicit age statements followed as whiskey drinkers learned to appreciate and were willing to pay more for longer-aged whiskies. Chas E. Alter advertised ten-year-Old Rye Whiskey in 1865.[126] An 1884 advertisement by C. H. & W. L. Halsey states that they had just

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[121] *Republican Banner*, Nashville, Tennessee (February 20th, 1861).
[122] *Buffalo Gazette*, Buffalo, New York (July 1st, 1817), *The Morristown Gazette*, Morristown, Tennessee (January 18th, 1899), and *The Courier-Journal*, Louisville, Kentucky (January 8th, 1847).
[123] *Jacksonville Republican*, Jacksonville, Alabama (February 10th, 1883).
[124] *Nashville Union and American*, Nashville, TN (November 19th, 1872), *Clarksville Semi-Weekly Tobacco Leaf*, Clarksville, Tennessee (June 21st, 1881), and *The Democrat*, McKinney, Texas (February 16th, 1893).
[125] *Nashville Union and American*, Nashville, Tennessee (December 13th, 1855).
[126] *The Times-Picayune*, New Orleans, Louisiana (August 27th, 1865). Also see *The Times-Picayune*, New Orleans, Louisiana (August 24th, 1869).

received "twenty-five barrels very fine three-year-old hand-made sour mash Lincoln County Whiskey, selected by us and aged in bond."[127]

Other geographic variations created distinct appearances, smells, and flavors. For instance, Tuscaloosa Whiskey was distinguished by its pale color and Old Rye Whiskey for its slight red color (Lacour 1863; Bryant 1895). Other geographic variations included Old Roanoke and Monongahela (rye Pennsylvania whiskey).

There were limits to this mechanism, however, in assuring quality. Rectifiers quickly devised recipes to attempt to replicate the taste of aged whiskey as well as the regional variations in whiskey (Lacour 1863; Bryant 1895). To the extent that rectifiers could learn to replicate the taste of the straight whiskey, it diminished the whiskey industry entrepreneurs' ability to use distinct processes to impart quality attributes to the product to ensure consumers of authenticity, safety, and quality.[128]

2.4.2 Branded Whiskey

Local reputation was often sufficient for assuring the quality of locally produced alcohol. However, entrepreneurs in the whiskey industry seeking to scale production and sell beyond a local geographic region had to develop brand names. Building on the family names that had already developed local-level reputations made economic sense. Brands were thus created, along with logos and specific marks, to help ensure the quality of their whiskey to consumers beyond the immediate geographic region where it was produced.

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[127] *Huntsville Independent*, Huntsville, Alabama (May 15th, 1884). While the Bottled-in-Bond Act introduced in 1897 added the requirement that whiskey labelled as straight must be aged at least four years, it was not uncommon for distillers to be offering whiskey with age statements before this act and for whiskey aged beyond these requirements even after the act was passed.

[128] Rectifiers often could not replicate straight whiskey but did produce a less-expensive sweet-tasting alcohol (Veach 2013, p. 45).

The development of brands suggests that the whiskey industry was shifting to compete on quality, not just price. Brands serve a critical economic function in reducing transaction costs by ensuring consumers of a recognized, consistent level of quality (Akerlof 1970, pp. 499-500; Klein 2014).[129] They also were an essential step towards helping ensure consumers of the product's authenticity since brands had different flavors, tastes, and appearances.

Some of the first brands in whiskey were Old Overholt Rye Whiskey (1810), Yellowstone and J.W. Dant Bourbons (1836), and James E. Pepper and Old Crow Bourbons (1838) (Regan and Regan 1995, p. 39). Distillers and rectifiers initially published their brands and marks in trade magazines, including Mida's *Criteria* and Bonfort's *Wine and Spirits*, to publicly exert their brand ownership (Veach 2013, p. 57).

The introduction of brand names also enabled distillers and rectifiers to advertise directly to consumers, where previously, most whiskeys had been advertised by local whiskey dealers.[130] Taylor's O. F. C. whiskey, one of the first branded American whiskies, was advertised in newspapers as early as 1874.[131] Nelson Lincoln Whiskey was advertised in 1893.[132] The earliest newspaper advertisement for Jack Daniel's Whiskey was in 1902.[133] In Montgomery, the Alabama Grocery Store advertised unbranded "Pure Sour Mash…Lincoln County Whiskey" that was "7 years old" on July 31st, 1902.[134] The following week, the Alabama Grocery Store inserted "Jack Daniel's" into the copy of the advertisement.

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[129] The timeframe for the development of brand names in whiskey corresponds with the introduction of brand names more broadly. The first newspaper mention of Coca-Cola we could find was 1877 (*Sterling Standard*, Sterling, Illinois, Thursday, December 6th) and the first mention of Colgate was 1870 (*The Cecil Whig*, Elton, Maryland, January 1st).

[130] The effectiveness of newspaper advertisement as a way for distillers and dealers to assure consumers of quality and genuineness declined in the 1910's as papers across the United States started adopting no-liquor advertising policies and, especially, as states passed laws prohibiting the practice (Pickett, Wilson, and Smith 1917, pp. 9-10).

[131] *The Pacific Commercial Advertiser*, Honolulu, Hawaii (August 15th, 1874).

[132] *The Democrat*, McKinney, Texas (February 16th, 1893).

[133] *The Montgomery Advertiser*, Montgomery, Alabama (Wednesday, August 6th)

[134] *The Montgomery Advertiser*, Montgomery, Alabama (Thursday, July 31st).

The introduction of branded whiskey also enabled distillers and rectifiers to start offering guarantees.[135] To build their reputations, many distillers also advertised the positive results of their product's chemical analysis to demonstrate its purity (at least as it was when it left the distillery).[136] Once brand names were introduced, whiskey distillers could also advertise their distillation process and ingredients to connect the unique characteristics to their brand name and differentiate themselves from rectifiers. For instance, an advertisement in 1899 states that "A.C. Jenkins and Robt. Wood make pure Corn Whiskey at their distillery, three miles north of Morristown. Made by open fire furnace process; a pure Copper Distilled Whiskey…"[137] Nelson Greenbrier went further by openly revealing his complete recipe and distilling process in annual barbeques for consumers and reporters.[138]

Despite these innovations brought about by the introduction of brand names, they still failed to assure the customer that the product in an opened branded barrel was actually the genuine product. While E. H. Taylor, the distiller of O. F. C. whiskey, introduced shiny brass barrel rings to differentiate his barrels from other distillers (Veach 2013), who at that time used wood or iron rings, this still did not assure customers that the product in the opened barrel was genuine.

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[135] *The Courier-Journal*, Louisville, Kentucky (February 14th, 1909). Also see *Butler Citizen*, Butler, Pennsylvania (November 30th, 1899), *The Morrison Gazette* (January 18th, 1899), and *Meridian Evening Star*, Meridian, Mississippi (December 15th, 1902).

[136] *Buffalo Morning Express and Illustrated Buffalo Express*, Buffalo, New York (July 6th, 1859), *Nashville Union and American*, Nashville, Tennessee (July 27th, 1860), *Republican Banner*, Nashville, Tennessee (March 6th, 1860), *The Lancaster Examiner*, Lancaster, Pennsylvania (January 25th, 1860), *Vermont Phoenix*, Brattleboro, Vermont (August 21st, 1862), *Chicago Tribune*, Chicago, Illinois (November 27th, 1885), and *The Baltimore Sun*, Baltimore, Maryland (August 9th, 1885).

[137] *The Morristown Gazette*, Morristown, Tennessee (January 18th, 1899). Also see *The Comet*, Johnson City, Tennessee (February 24th, 1910) and *Hartford Courant*, Hartford, Connecticut (September 16th, 1887).

[138] *Daily American*, Nashville, TN (May 23rd, 1877)

2.4.3 Leveraging the Reputation of Local Dealers

Entrepreneurs in the whiskey industry had to find a way to ensure consumers that the product labeled with their brand, especially when whiskey was sold out of barrels, was genuine and unadulterated. Distillers developed another mechanism to help assure consumers of the authenticity of their products. They started vetting liquor dealers with established reputations for selling quality liquor in regional markets to grant them the exclusive right to sell their whiskey in designated markets. Many local dealers had already begun offering guarantees, a common way to overcome asymmetric information problems, for the authenticity and quality of the whiskey they sold.[139]

Distillers would leverage the reputation of these local dealers to sell their products in local markets. Local dealers benefitted from these relationships because they received the right to be the exclusive whiskey seller in that regional market, with the monopoly rents providing assurance to consumers (and creating an additional deterrence, aside from reputation, not to adulterate or misrepresent the whiskey).

These arrangements were quite common. An 1861 newspaper article, for instance, mentions Thompson, Sperry & Co. as "the agents of the manufacturer for the sale of this brand [Henry Kelsoe's] of whiskey."[140] An 1895 advertisement states, "Remember that I handle the product of the Charles Nelson's Green Brier Distillery, also Isaac Vanzant Distillery, also Ben Tolley's Distillery, and no other Liquor house in this town can buy from either of these

[139] *The Progressive Age*, Scottsboro, Alabama (December 20th, 1900), *The Union-Banner*, Clanton, Alabama (August 6th, 1903), *The Marion County Democrat*, Marion, Florida (December 18th, 1902), and *Jacksonville Republican*, Jacksonville, AL (February 10th, 1883).
[140] *Republican Banner*, Nashville, Tennessee (February 20th, 1861). Also see *The Daily Exchange*, Baltimore, Maryland (August 19th, 1859).

distilleries. These distilleries sell me these goods under a guarantee that they are absolutely pure…"[141]

The opportunity emerged, however, for some distributors to falsely claim they were the sole agents for distillers. In some cases, distillers, or the genuine exclusive dealer, would advertise to alert consumers of this fraud. A 1904 advertisement for Jack Daniel's Whiskey, for instance, states that "I wish to state to the public that there have been houses in Nashville advertising them-selves as sole agents of Jack Daniel's No. 7 Whiskey I have no sole agents in Nashville but W. F. Baker & Co. […] have always been recognized as the headquarters for my whisky…"[142]

2.4.4 Sealed Bottles

Bottling whiskey in sealed containers sold directly to distributors was a major innovation that helped protect consumers against dealer fraud.[143] Until the development of Michael J. Owens' bottling machine in 1903, the mass production of bottles for whiskey was quite expensive, so distillers and rectifiers bottling before this date were making a substantial investment to assure their consumers of the authenticity of their product (Carson 2010, p. 151).

Brown, Thompson & Co.'s Old Forrester Whiskey (now produced as Old Forester by Brown-Forman) was the first American whiskey sold in a bottle, beginning in the 1870s (Carson 2010, p. 151; Rothbaum 2015, p. 12).[144] Early advertisements suggest that whiskey entrepreneurs specifically advertised bottled whiskey to assure consumers of quality. An early ad for whiskey,

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[141] *Our Mountain Home*, Talladega, Alabama (April 10th, 1895). For additional examples see *Appleton Post*, Appleton, Wisconsin (May 5th, 1881), *The Comet*, Johnson City, Tennessee (April 26th, 1900), *The Virginia Enterprise*, Virginia, Minnesota (November 28th, 1902), *Waterbury Democrat*, Waterbury, Connecticut (March 2nd, 1904), and the *Los Angeles Herald* (April 27th, 1887).

[142] *Nashville Banner*, Nashville, TN (April 21st, 1904).

[143] Counterfeiting, of course, remains a problem for high-end aged whiskey markets despite being sold in sealed containers (McCormick 2017). It also potentially remained a problem in saloons, where whiskey was often poured out of opened bottles.

[144] Bottled whiskey was first introduced by Hiram Walker (Walker's Club) in Canada (Veach 2013, pp. 54-55).

from 1881, features three monkeys unable to "monkey" around with the bottle's contents by opening it (Rothbaum 2015, p. 12). Advertisements for whiskey, such as White Oak,[145] Golden Age,[146] Cascade Pure Whiskey, [147] and Jack Daniel's,[148] also began featuring bottles prominently.

The seal on the bottle also became a vital assurance to consumers that the bottle had not been tampered with.[149] A Duffy Malt Whiskey Company advertisement in 1884 provides a guarantee if "the MOUTH OF THE BOTTLE is SECURED BY A CAP bearing THEIR NAME, with the COMPANY'S NAME BLOWN INTO THE BOTTLE, and the Signature of the SECRETARY, THOMAS J. HURLEY, appended to the Bottom of this Label."[150]

2.5 Conclusion

Consumers in early American whiskey markets faced severe asymmetric information problems because whiskey was often sold out of opened barrels, and thus created the possibility for fraudulent dealers to sell mispresented whiskey. More concerningly for consumers, prominent public health experts claimed that rectified whiskey, flavored to replicate the taste of straight whiskey, commonly contained poisonous ingredients. Yet, the market for whiskey at this time was quite robust.

Using historical newspapers, we explored the mechanisms entrepreneurs in the whiskey industry adopted to assure consumers of authenticity, safety, and quality in order to keep the whiskey market from unraveling. The mechanisms developed included 1) distinctive characteristics, 2) brand names, 3) exclusive local dealer agreements, and 4) sealed bottles. The

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[145] *The Comet*, Johnson City, Tennessee (April 26th, 1900).
[146] *Meridian Evening Star*, Meridian, Mississippi, (December 15th, 1902).
[147] *Chattanooga Daily Times*, Chattanooga, Tennessee (December 18th, 1903).
[148] *Nashville Banner*, Nashville, Tennessee (April 21st, 1904).
[149] *The Boston Globe*, Boston, Massachusetts (March 3rd, 1889).
[150] *The Times*, Philadelphia, Pennsylvania (November 15th, 1884). Also see *The Chicago Tribune* (March 20th, 1886) and *Brooklyn Daily Eagle* (January 28th, 1912).

robust market for whiskey suggests these mechanisms were effective in assuring consumers of authenticity, safety, and quality.

The learning and development that occurred highlights the role of entrepreneurs in offering quality assurance to consumers. Like other entrepreneurial market processes, the development of effective mechanisms was clearly a process of learning and development. The market incentive for quality of assurance, along with other research examining the public choice origins of the Pure Food and Drugs Act (Coppin and High 1999; High and Coppin 1988; Smith and Scheck 2023), also undermines the public interest case for the act.

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CHAPTER III: *Examining the Public Health Rationale for Barber Licensure During the Progressive Era*[151]

Did public health or public choice factors drive the initial adoption of barber licensure in the United States during the Progressive Era? The public health rationale for licensure was to prevent the spread of a contagious disease known as "barber's itch." Newspaper accounts suggest that barber unions sought licensure under this pretense to restrict competition from discount barbershops and barber college graduates. Using Newspapers.com, we craft a novel dataset of the reported individual cases and outbreaks of barber's itch and printed or advertised cures for barber's itch for 16 states that adopted and maintained licensure from 1897 to 1920 and 16 non-adopting states. Using a staggered treatment difference-in-difference model, we fail to find evidence that licensure was adopted in response to high caseloads. We also fail to find evidence that licensure was effective against barber's itch, finding a weak, statistically significant increase in post-licensure cases. We use reported price increases for barbering services in licensed and non-licensed states to test the public choice rationale. We find a statistically significant increase in reported barbershop prices following licensure. Our results imply that barber licensure provides a rare example of regulation driven primarily by public choice rather than public interest rationales.

3.1 Introduction

Eighteen U.S. states adopted and maintained barber licensure between 1897 and 1920, with outcome data available for sixteen states. The given public health rationale for this initial adoption of barber licensure was "barber's itch." Barber's itch is a contagious disease whose symptoms often include a prominent chin rash, itchiness, and mild pain. It

[151] Working paper with Daniel J. Smith and Sean-Patrick Alvarez.

could be transmitted in barbershops directly or indirectly through equipment and towels. State policymakers during the Progressive Era instituted barber licensure, which established barber commissions to create and enforce minimum standards for entry to the barber profession, ostensibly to protect the public from barber's itch. These standards often included registration, a mandatory exam and practical, and sanitary standards created, monitored, and enforced by a barber board.

This public health rationale aligns with the public interest theory of occupational licensure, which posits that professional entry standards are adopted to protect the safety and health of consumers (Akerlof 1970; Darby and Karni 1973; Dulleck and Kerschbamer 2006; Leland 1979).[152] Alternatively, the public choice theory of licensure argues that professions seek entry barriers primarily to restrict competition to raise industry wages.[153]

The literature examining the modern effects of occupational licensing largely concludes that occupational licensure, in line with public choice theory, tends to restrict entry and to raise the wages of practitioners in licensed industries (Barrios 2022; Kleiner 2000 & 2006; Kleiner and Koumenta 2022; Kleiner and Krueger 2013; Kleiner and Soltas 2023; Leland 1979; Maurizi 1974; Pagliero 2019; Peterson, Pandya, and Leblang 2014; Stigler 1971; Timmons and Konieczny 2018; Timmons and Mills 2018; Zapletal 2018).[154] These results hold even in cases where there is no corresponding increase in quality or safety for consumers (Adams, Ekelund Jr., and Jackson 2003; Bae and

[152] See Christensen (2011), Hantke-Domas (2003), Hertog (2012), Posner (1974), and Viscusi, Harrington Jr., and Sappington (2018) for the public interest theory of regulation.
[153] See Downs (1957), Olson (1965), Stigler (1971), Truman (1951), Tullock (1967), and Peltzman (1976) for the public choice theory of regulation. Also see Djankov, La Porta, Lopez-de-Silanes, and Shleifer (2002).
[154] Also see Stigler (1971) and Mulligan and Shleifer (2005).

Timmons 2022; Carroll and Gatson 1981 & 1983; Deyo 2022; Hogan 1983; Gross 1986; Koumenta and Williams 2022).[155] These results have been confirmed in studies specifically examining barber licensure (Corley and Witcher 2021; Friedman 1965; Hall and Pokharel 2016; Thornton and Weintraub 1979; Timmons and Thornton 2010 & 2019).

Disentangling public interest and public choice theories, however, can prove problematic given that public choice motivations have a higher chance of political success in the presence of genuine public interest concerns (Geloso and March 2021; Leeson 2019; Leeson, King, and Fegley 2020; McCraw 1975; Scheck and Smith 2023; Yandle 1983). This is particularly the case with occupational licensing for two reasons.

The first reason is that many studies examine the impact of licensure on price, with a price increase taken as evidence supporting public choice theory. But, by improving the quality or safety of service, occupational licensing can lead to an increase in price driven by an increase in demand (Law and Kim 2005). Thus, price increases alone are not sufficient evidence in favor of public choice theory when it comes to occupational licensing.

The second reason is that occupational licensing can generate a "Cadillac effect" that improves measurable aspects of consumer safety or quality along dimensions that consumers do not value or cannot afford. This can lead budget-constrained consumers to go without the service or to rely on black market provision, potentially leading to offsetting increases in consumer harm (Carroll and Gaston 1981 & 1983; Kleiner and Soltas 2023; Shapiro 1986). Thus, measurable improvements in quality that do not

[155] Licensure can also affect firm location and employment (Plemmons 2022).

account for potential Cadillac effects do not offer sufficient evidence in favor of public interest theory when it comes to occupational licensing.

More fundamentally, evidence consistent with public choice theory based strictly on post-licensure data cannot distinguish between public choice regulatory origins and capture theory (Law and Kim 2005). Industry capture occurs when regulation of public interest origins is captured by the regulated industry (McChesney 1987; Peltzman 2022; Posner 1971; Stigler 1971; Yandle 2022). Demonstrating that modern licensure has effects consistent with public choice theory cannot rule out that the possibility that licensure was established under legitimate public interest rationales and was only later captured by the licensed profession. Historical circumstances may have provided a genuine public interest justification for occupational licensure at the time of adoption, even if licensure was ultimately captured by the licensed industry.

This paper uses historical newspapers from *Newspapers.com*, a database of digitized U.S. newspapers, to build novel datasets to examine the public health justification for barber licensure.[156] Eighteen states adopted and maintained barber licensing between 1897 and 1920, with outcome data available for sixteen of these states.[157] We collect the reported outbreaks and individual cases of barber's itch and articles or advertisements with cures for barber's itch for both licensed and non-licensed states. Using a staggered treatment difference-in-difference model, we fail to find

[156] Historical economic research is increasingly using digitized historic newspapers, especially *Newspapers.com* (Beach and Hanlon 2022; Calderon, Fouka, and Tabellini 2023; Geloso 2020; Geloso and March 2021; Kronenberg 2021; Scheck and Smith 2023; Sprick Schuster 2023; White 2021).

[157] Following the drafting of model legislation by the Journeymen Barber's Union, the Master Barbers of America, and the National Association of Barber and Beauty Culture Schools, a second wave of licensure laws followed in California (1927), Iowa (1927), North Dakota (1927), South Dakota (1927), Alabama's Jefferson County (1931), Kentucky (1932), Indiana (1933), and Arkansas (1937) (Associated Master Barbers of America 1928). We save the analysis of this second wave of licensure for future research.

evidence that licensure was adopted in response to high caseloads of barber's itch. We also fail to find evidence that licensure reduced the incidence of barber's itch. We observe a weakly, statistically significant increase in barber itch cases of roughly one case per two million people following licensure. Licensure failed to raise the quality of barbering services in terms of the mitigation of barber's itch or generated a Cadillac effect that led to off-setting increases in the prevalence of barber's itch.[158]

Accounts from historical newspapers suggest that barber's unions exaggerated the public health threat of barber's itch, in the eyes of the public, to advance licensure to eliminate competition from discount barbershops and to restrict the supply of barbers coming from barber colleges. We examine this alternative public choice rationale using reported price changes for haircuts and shaves from newspapers in licensed and non-licensed states to test the effectiveness of barber licensure in restricting competition.

Our data enables us to measure both the quality of barbering services, along the public health dimension on which barber licensure was legislated, and observed price increases, circumventing the problems identified above with many existing studies of occupational licensure. We find a statistically significant increase in reported price hikes for barbering services following licensure. Using newspaper reports of before and after pricing, we find that, on average, the price of haircuts increased 37.97 percent, and the price of shaves increased 50.46 percent.

[158] While an investigation into the potential drivers of the Cadillac effect in this context falls beyond the scope of this present paper, a reasonable speculation might be that the closure of discount barbershops due to the adoption of licensure as well as the restriction on entry to the practice, might have simultaneously led to increased patronage of the remaining barbershops and the development of an underground market for barbering services among price conscious patrons, both of which would have potentially increased the prevalence of barber's itch.

Our results imply barber licensure was driven primarily by public choice rather than public interest rationales. While public health concerns were *used* by barber unions to gain public support for barber licensure, our evidence suggests that barber's itch did not drive the adoption of barber licensure. Barber licensure also failed to effectively reduce barbers itch, the stated public health purpose of licensure. It also led to an observed increase in the price of barbering services. This suggests that barber licensure during the Progressive Era provides rare evidence of regulation that primarily fits the public choice rather than the public interest model of regulation at its origination (Peltzman 2022; Yandle 2022).

Section 3.2, using anecdotal evidence from U.S. newspapers outlines the public health rationale for U.S. barber licensure during the Progressive Era. Section 3.3, also using anecdotal evidence form U.S. newspapers, provides the alternative public choice rationale for barber licensure. Section 3.4 describes our data and model. Section 3.5 reports our results and robustness checks. Section 3.6 concludes.

3.2 The Public Health Rationale for Barber Licensure

The public health justification for the initial adoptions of state barber licensure during the Progressive Era was to prevent the spread of contagious diseases that could be transmitted directly or indirectly through barbershops.[159] The primary disease of concern was "barber's itch."[160] *The Medical Record*, in calling for rules to protect barber patrons in 1897, specifically

[159] "Antiseptic Barber Shops," *St. Joseph News-Press*, St. Joseph, Missouri, p. 2 (June 9th, 1898), "Barber Bill Up," *Ledger-Enquirer*, Columbus, Georgia, p. 5 (July 21st, 1914), & "Barber's for Regulation," *Chattanooga Daily Times*, Chattanooga, Tennessee, p. 4 (January 15th, 1918).

[160] "Barber's Want Legislation," *The Inter Ocean*, Chicago, Illinois, p. 2 (January 6th, 1897), "Danger in Getting Shaved," *Minneapolis Daily Times*, Minneapolis, Minnesota, p. 8 (September 12th, 1897), "Knights of the Razor Want State to Issue Diplomas to Barbers," *Chicago Tribune*, Chicago, Illinois, p. 13 (November 19th, 1898), "Kansas Barbers," *The Western Barber*, Topeka, Kansas, p. 3 (February 15th, 1899), "A Wise and Just Decision," *Minneapolis Daily Times*, Minneapolis, Minnesota, p. 4 (February 11th, 1900), "Many Have The Itch," *The Inter*

lists barber itch as the primary disease of public concern.[161] For instance, a newspaper in Nebraska reported, "About the only excuse given by the members of the [barber's] board for their official existence is that the law grants them certain sanitary powers which if enforced will abolish barbers' itch from the state."[162] In a 1928 health column, one medical doctor attributed 90 percent of the justification for the state licensure laws to barber's itch.[163] Barber's itch was also commonly used as the primary metric to evaluate the success or failure of barber licensure.[164] We found sample questions from the barber licensure exams published in newspapers in four states (Minnesota, Michigan, Missouri, and Utah).[165] Every exam contained one or more questions specifically naming barber's itch, or, in the case of Michigan's exam, a question about "skin and

Ocean, Chicago, Illinois, p. 12 (June 28th, 1900), "That State Barber Board Graft," *Omaha Daily Bee*, Omaha, Nebraska, p. 4 (July 9th, 1900), "Barber's Favor License Law," *The Journal Times*, Racine, Wisconsin, p. 8 (December 5th, 1900), "Barber's Commission," *The Los Angeles Times*, Los Angeles, California, p. 10 (September 17th, 1901), "Barber's Want License Law," *The News*, Paterson, New Jersey, p. 1 (December 9th, 1903), "Barber's Itch in Town," *Freeport Daily Bulletin*, Freeport, Illinois, p. 5 (September 1st, 1904), untitled, *Rutland Daily Herald*, Rutland, Vermont (November 1st, 1904), & "Where State Boards Are Not Effective," *The Rock Island Argus*, Rock Island, Illinois, p. 4 (May 5th, 1905). The alleged success of barber licensing in reducing barber's itch was also used, at least in two cases, as an argument for extending licensure to beauty shops ("Beauty Shops Striving for New Prestige," *Wisconsin State Journal*, Madison, Wisconsin, p. 24 (December 7th, 1924) & "Beauty Expert Licenses Urged," *The Los Angeles Times*, Los Angeles, California, p. 5 (December 8th, 1924)).

[161] "Danger in Getting Shaved," *Minneapolis Daily Times*, Minneapolis, Minnesota, p. 8 (September 12th, 1897).

[162] "Barber's Board at it Still," *Lincoln Nebraska State Journal*, Lincoln, Nebraska, p. 3 (July 10th, 1900).

[163] "Barber's Itch," *Detroit Free Press*, Detroit, Michigan, p. 6 (October 22nd, 1928). Barber's itch was also the primary reason barbers were licensed in Arkansas in 1937 (Corley and Witcher 2021).

[164] "Much Barber's Itch," *The Minneapolis Journal*, Minneapolis, Minnesota, p. 6 (November 25th, 1902), "Will Fight Barbers' Itch," *The Saint Paul Globe*, Saint Paul, Minnesota, p. 3 (November 26th, 1902), "Barber's Itch Is Epidemic," *The Saint Paul Globe*, Saint Paul, Minnesota, p. 3 (December 16th, 1902), "Barbers' Itch Here," *The Topeka State Journal*, Topeka, Kansas, p. 10 (October 9th, 1903), "Barbers Are Warned," *The Oshkosh Northwestern*, Oshkosh, Wisconsin, p. 8 (November 9th, 1903), "Where State Boards Are Not Effective," *The Rock Island Argus*, Rock Island, Illinois, p. 4 (May 5th, 1905), untitled, *The Oshkosh Northwestern*, Oshkosh, Wisconsin, p. 5 (May 27th, 1916), "Barber's Itch Has Been Eliminated From Shops," *The Ogden Standard*, Ogden, Utah, p. 16 (September 2nd, 1916), & "Celluloid Cards Attest Barbers Have Registered," *Deseret News*, Salt Lake City, Utah, p. 11 (Saturday, May 31st, 1919). See also "About Barbers' Itch," *The Topeka State Journal*, Topeka, Kansas, p. 10 (November 3rd, 1903).

[165] "Barber School Rules," *The Saint Paul Globe*, Saint Paul, Minnesota, p. 12 (February 13th, 1898), "The Unkindest Cut of All," *Detroit Free Press*, Detroit, Michigan, p. 35 (September 23rd, 1900), "St. Louis Barbering Is Almost a Science," *St. Louis Dispatch*, St. Louis, Missouri, p. 41 (July 27, 1902), & "Examination of Barbers," *The Ogden Standard*, Ogden, Utah, p. 6 (September 5th, 1903).

scalp diseases, for faces with eruptions caused principally by close shaving…", clearly referring to barber's itch, suggesting barber's itch was the primary public interest concern.[166]

While not fatal, barber's itch was a rash of the chin and neck skin that caused itching and mild pain.[167] Its visibility often caused embarrassment and social ostracism. The term barber's itch, however, was often colloquially used to broadly refer to any infection of the neck or chin with visible symptoms and thus included a broader range of diseases (Adamson 1886). Smallpox, scabies, and the itch mite, for instance, were often mistaken for barber's itch and vice versa (Gunn 1867, p. 295).168

Despite its name, barber's itch could be developed outside barbershops ("Barber's Rash" 1908).[169] For instance, barber's itch could be contracted by self-shaving too close in unsanitary conditions. It could also be transmitted through non-shaving contact. We found multiple newspaper accounts of women and boys too young to shave, or people that shaved themselves,

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[166] "The Unkindest Cut of All," *Detroit Free Press*, Detroit, Michigan, p. 35 (September 23rd, 1900).

[167] We found two newspapers claiming a fatality from barber's itch ("Dead in Mille Lacs," *The Minneapolis Journal*, Minneapolis, Minnesota, p. 1 (February 1st, 1896) & untitled, *The Cincinnati Enquirer*, Cincinnati, Ohio, p. 3 (June 10th, 1908)), but a subsequent newspaper article in the first case found that it was untrue (untitled, *The Princeton Union*, Princeton, Minnesota, p. 5 (February 8th, 1896)) and in the second case another article mentioned that a physician would not declare barber's itch to be the cause of death (untitled, *The Tribune*, Hicksville, Ohio, p. 7 (June 18th, 1908)).

[168] "Scratching Above Reading," *Reading Times*, Reading, Pennsylvania, p. 8 (March 6th, 1900), "Another One," *Quad-City Times*, Davenport, Iowa, p. 5 (June 27th, 1900), "Barber's Itch, Not Smallpox," The Inter Ocean, Chicago, Illinois, p. 12 (July 4th, 1900), " Maybe Barber's Itch.," *Herald and Review*, Decatur, Illinois, p. 4 (March 7th, 1901), "Small Pox in Dunkirk," *The Buffalo Times*, Buffalo, New York, p. 1 (July 5th, 1901), "Scourge of the Itch Mite," *The Brooklyn Daily Eagle*, Brooklyn, New York, p. 22 (March 23rd, 1904), "Smallpox Physician is Sued," *The Evansville Journal*, Evansville, Indiana, p. 3 (August 20th, 1905), "Had the "Barber's Itch"," *Rutland Daily Herald*, Rutland, Vermont, p. 1 (November 18th, 1908),"Ringworm from Mice," *The Sacramento Bee*, Sacramento, California, p. 10 (November 4th, 1909), "Itch or Smallpox," *Parson Daily Eclipse*, Parsons, Kansas, p. 3 (February 1st, 1912), "Rockford Has Over 40 Cases of Small Pox," Republican-Northwestern, Belvidere, Illinois, p. 2 (February 9th, 1917), & "Other Muscotah Items," *The Atchison Daily Globe*, Atchison, Kansas. P. 7 (August 27th, 1920).

[169] "The Barber's Itch," *The Buffalo Times*, Buffalo, New York, p. 23 (January 24th, 1904), untitled, *The Atchison Daily Globe*, Atchison, Kansas, p. 5 (November 22nd, 1907), "City News," *The Atchison Daily Globe*, Atchison, Kansas, p. 2 (December 16th, 1907), *The Tacoma Times*, Tacoma, Washington (August 14th, 1913), & "City News," *The Atchison Daily Globe*, Atchison, Kansas, p. 4 (July 6th, 1920).

contracting barber's itch.[170] But, by the start of the Progressive Era, it was widely repeated in newspapers that barbershops were the primary means by which barber's itch spread.[171]

Barber's itch presented a potential asymmetric information problem for barbershop patrons. Since barber's itch was contagious through direct and indirect contact, a barber could pass it along to another patron if they shaved an infected patron and then reused the same razor, shaving cup, brush, or towel, or failed to wash their hands properly.[172] Thus, it was difficult for customers to verify if barbers were undertaking the necessary sanitary protocols to prevent the transmission of barber's itch.

The public interest justification for barber licensure during the Progressive Era was to create a set of standards that a prospective barber must meet, including registration, a mandatory exam and practical, and sanitary standards created, monitored, and enforced by a barber board.

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[170] Untitled, *The Atchison Daily Globe*, Atchison, Kansas, p. 8 (September 23rd, 1898), "City News," *The Atchison Daily Globe*, Atchison, Kansas, p. 2 (August 23rd, 1899), "Bar Kissing Games," *Star Tribune*, Minneapolis, Minnesota, p. 1 (January 17th, 1900), "Mrs. Fuller as Witness," *Detroit Free Press*, Detroit, Michigan, p. 2 (October 26th, 1901), untitled, *The Atchison Daily Globe*, Atchison, Kansas, p. 4 (May 6th, 1902), "City News," *The Atchison Daily Globe*, Atchison, Kansas, p. 2 (July 30th, 1902), "Oh, Grief!" *The Kentucky Post and Times-Star*, Covington, Kentucky, p. 4 (Tuesday, June 9th, 1903), "Try to Avoid Germs," *The Oshkosh Northwestern*, Oshkosh, Wisconsin, p. 10 (May 9th, 1906), "Ringworm from Mice," *The Sacramento Bee*, Sacramento, California, p. 10 (November 4th, 1909), & "Heroines Snubbed in Camp at Brest," *Detroit Free Press*, Detroit, Michigan, p. 3 (February 16th, 1919).

[171] "A Shave for Five Cents," *Minneapolis Daily Times*, Minneapolis, Minnesota, p. 3 (February 27th, 1891), "Fice Cent Shaving," *Miners Journal*, Pottsville, Pennsylvania, p. 3 (March 20th, 1891), "That Shaving Case," *The Ottawa Journal*, Ottawa, Ontario, p. 4 (December 31st, 1891), "Danger in Barber Shops," *Minneapolis Daily Times*, Minneapolis, Minnesota, p. 5 (July 28th, 1896), "Danger in Barber Shops," *Buffalo Co. Beacon*, Gibbon, Nebraska, p. 3 (September 18th, 1896), "Dr. McVey Writes an Article on "Barber's Itch," *The Topeka Daily Capital*, Topeka Daily Capital, p. 8 (November 29th, 1898), "Epidemic of Barber's Itch in Chicago," *The Topeka Daily Capital*, Topeka, Kansas, p. 16 (October 19th, 1902), & "About Barbers Itch," *The Labor Champion*, Topeka, Kansas, p. 4 (November 27th, 1903).

[172] "A Contagious and Particularly Troublesome Disease," *Oregon Republican*, Dallas, Oregon, p. 4 (August 5th, 1871), "Diseases from the Razor," *The Plain Speaker*, Hazelton, Pennsylvania, p. 3 (October 11th, 1890), "Disease from the Razor," *The Tribune*, Scranton, Pennsylvania, p. 6 (November 26th, 1890), untitled, *The Courier*, Waterloo, Iowa, p. 5 (January 8th, 1897), "Sycosis Barbae, or Barbers' Itch," *The Western Barber*, Topeka, Kansas, p. 10 (November 15th, 1898), "Epidemic of Barber's Itch in Chicago," *The Topeka Daily Capital*, Topeka, Kansas (October 19th, 1902), "The True Cost of Barbers' Itch," *The Lincoln Star*, Lincoln, Nebraska (September 12th, 1903), "About Barbers' Itch," *The Topeka State Journal*, Topeka, Kansas, p. 10 (November 3rd, 1903), "New Health Rule Caused by Barber," *Asbury Park Press*, Asbury Park, New Jersey, p. 5 (November 4th, 1903), "Local Barbers Deny That Itch Prevails," *The Chronicle-Telegram*, Elyria, Ohio, p. 1 (October 23rd, 1906), "Seattle Has Barber's Itch," *Spokane Chronicle*, Spokane, Washington, p. 14 (May 3, 1907), & untitled, *The Atchison Daily Globe*, Atchison, Kansas, p. 2 (September 9th, 1910). Also see: "Barber's Itch," *Los Angeles Evening Post-Record*, Los Angeles, California, p. 2 (November 26th, 1897).

Using searches of historical newspapers from *Newspapers.com*, we determined that during the Progressive Era, state-level licensure was adopted in 21 of the then-existing U.S. states.[173] **Table 5** lists those states that adopted licensure, the date of adoption, and any exclusions provided in the law. In some instances, statewide licensure was restricted to specific cities or cities of specified population thresholds. New York and Texas dropped licensure three and one years, respectively, after adopting it. Kansas, similarly, adopted licensure initially in 1903 and repealed it in 1905. But, Atchison and Kansas City, Kansas then immediately adopted city-level licensure. Kansas re-adopted state-wide licensure in 1913. Dropping New York, Texas, and Kansas leaves eighteen states that adopted and maintained licensure during the Progressive Era. Due to a lack of outcome data, we dropped Rhode Island and Colorado, both licensing states, leaving sixteen licensed states.

Table 5: State Barber Licensure Adoption and Exclusions, 1897-1920

Licensing State	Year	Exclusions
Minnesota	1897	-
St. Louis, St. Joseph, and Kansas City, Missouri	1899	Any barber in cities over 5,000
Michigan **[Updated in 1915]**	1899	-
Nebraska	1899	-
Oregon	1899	-
North Dakota	1900	-
California [**Updated in 1903]**	1901	-
Connecticut	1901	-
Washington **[Elements declared unconstitutional in 1920 / Revised in 1923]**	1901	Cities of the 1st, 2nd, and 3rd Class
Kentucky	1902	Cities of the 1st, 2nd, and 3rd Class
Kansas **[Repealed in 1905]**	1903	Cities over 3,000
New York **[Repealed in 1906]**	1903	-
Rhode Island	1903	-
Utah	1903	Cities of the 1st and 2nd Class
Wisconsin	1903	-
Maryland	1904	-
Texas **[Declared unconstitutional in 1908]**	1907	University students, charitable organizations, towns under 1,000
Colorado	1909	-
Illinois	1909	-
Kansas **[Re-Adopted]**	1913	-
Georgia	1914	Cities over 5,000
New Jersey	1920	-

[173] We exhaustively searched newspapers.com for mentions of "barber licensing" and "barber law" in every U.S. state from 1890 and 1920 and found no evidence of state-level licensure in the rest of the states. We excluded Delaware from our control states due to its city-level licensure of Wilmington.

Table 6 provides the state-level licensure details acquired from newspapers, which often printed the full text or summaries of licensure bills. All states required written or oral examinations, usually followed by practical examinations where the prospective barber was required to demonstrate their ability to cut hair and shave. Most licensing states also charged explicit exam, application, and renewal fees. Every state except Maryland and Connecticut also required an apprenticeship period ranging from 1 to 3 years. Many states allowed an equivalent amount of time spent in barber college to substitute for an apprenticeship. Several states also added apprenticeship restrictions, which required registration and restricted the number of apprentices allowed per barber or barbershop. Additionally, some states also created age restrictions for barbers. The Missouri law, uniquely, required that prospective barbers "have some conversational ability."[174] Every licensing state allowed barbers practicing within the state for a set period to be grandfathered in as licensed barbers and thus avoid the initial licensure requirements, aside from the barbershop sanitation requirements, provided they properly registered.[175]

[174] "New Law Puzzling Barbers," *The Kansas City Times*, Kansas City, Missouri, p. 8 (November 2nd, 1899)
[175] The fact that existing barbers were not held to the licensure requirements undermines the public interest theory interpretation of barber licensure. If there was a legitimate public health concern, then current barbers, not just new barbers entering the profession, needed training.

Table 6: State Licensure Requirements, 1897-1920

Licensing States	Exam	Practical	Exam Fee	Application Fee	Renewal Fee	Apprenticeship	Barber College Substitute	Enforceable Sanitary Requirements	Age Requirement	Apprenticeship Restrictions
Minnesota	Yes	Yes	5	1	-	2 Years	2 Years	Yes	21	One per barbershop
Michigan	Yes	Yes	5	1	0.5	2 Years	NA	NA	-	-
Missouri (St. Louis, St. Joseph, and Kansas City)	Yes	Yes	0	5	NA	2 Years	NA	Yes	-	
Nebraska	Yes	Yes	5	1	1	2 Years	2 Years	NA	-	-
Oregon	Yes	Yes	5	1	1	3 Years	NA	Yes	-	Registration required
North Dakota	Yes	Yes	5	2	1	3 Years	3 Years	Yes	19	One per two barbers
California	Yes	No	5	1	1	3 Years	3 Years	Yes	18	-
Connecticut	Yes	Yes	5	1	1	Assessed By Board		Yes	-	One per two barbers
Washington	Yes	Yes	5	1	0.5	3 Years	NA	Yes	18	One per barber / Registration required
Kentucky	Yes	NA	5	1	NA	3 Years	3 Years	Yes	19	Age 16
Kansas (1903)	Yes	Yes	5	1(initial) / 5	NA	Assessed By Board	NA	Yes	-	-
New York	Yes	Yes	NA	1(initial) / 5	-	3 Years	NA	Yes	-	-
Rhode Island	Yes	Yes	5	1	1	2 Years	2 Years	Yes	19	Registration required
Utah	Yes	Yes	5	1	1	1 Year	1 Year	Yes	15	Registration required
Wisconsin	Yes	Yes	1	1	1	1 Year	NA	Yes	-	-
Maryland	Yes	Yes	5	1		No	No	Yes	-	-
Texas	Yes	Yes	2	2	NA	2 Years	No	Yes	No	Registration required
Colorado	Yes	Yes	5	1	NA	3 Years	No	Yes	-	Registration required
Illinois	Yes	Yes	3	1	1	2 Years	3 Years	Yes	-	-
Kansas	Yes	Yes	5	1	1	1 Year	1 Year	Yes	19	Registration required
Georgia	Yes	NA	5	2	1	3 Years	NA	Yes	-	Registration required
New Jersey	Yes	NA	5	1	1	3 Years	3 Years	Yes	19	Registration required / Age 16

3.3 The Public Choice Rationale for Barber Licensure

An alternative theory for barber licensure is that incumbent barbers advocate for licensure to restrict entry to the profession to raise wages.[176] Accounts from historic newspapers reporting on the efforts of barbers to promote the adoption of licensing laws during the Progressive Era suggest that licensure, while often framed as a public health initiative, had an ulterior motive. Barber unions sought licensure to eliminate two competitive threats.[177] The first competitive

[176] Another public choice explanation, though from newspaper anecdotal evidence it appears to be more limited in scope, was to prevent out-of-state competition. As people left Chicago to summer in Michigan, Chicago barbers often traveled to work in Michigan for the summer. The Michigan licensure law put an end to this practice ("Good for Barbers," *The Herald-Press*, Saint Joseph, Michigan, p. 1 (April 26th, 1902)). This appeared to be a contributing factor for licensure in Connecticut ("Barbers' License to Fight Repeal," *The Journal*, Meriden, Connecticut, p. 2 (January 14th, 1907)), New Jersey ("Barber License Bill," *The Montclair Times*, Montclair, New Jersey, p. 8 (February 6th, 1904)), and Washington ("They Want Better Laws," *Spokane Chronicle*, Spokane, Washington, p. 7 (September 1st, 1899) & "Barbers Like License Law," *Spokane Chronicle*, Spokane, Washington, p. 19 (August 4th, 1909)). Barber's unions argued that once licensing was passed in a nearby state, that all the barbers from that state that couldn't be licensed would flow to unlicensed states, though this was suspect because all practicing barbers were grandfathered in by licensing states.

[177] "Hopes of Barbers," *The Saint Paul Globe*, Saint Paul, Minnesota, p. 3 (January 24th, 1897), "Barbers Oppose It," *The St. Joseph Herald*, St. Joseph, Missouri, p. 5 (March 22nd, 1899), "The Author the Barber's Manual on the Science of Barbering," *The Western Barber*, Topeka, Kansas, pp. 3-4 (February 15th, 1899), & "Barbers Favor Licensing Law," *The Journal Times*, Racine, Wisconsin, p. 8 (December 5th, 1900). In an interesting exception, at least some members of a barber's union in Connecticut opposed licensure (Barber's Oppose Sanitary Bill," *Record-Journal*, Meriden, Connecticut, p. 5 (February 21st, 1901)).

threat was discount barbershops, especially those that operated only on the weekends with barbers whose primary occupation was outside of barbering. The second competitive threat was the supply of new barbers from barber's colleges. Both threats were outlined in a poem published in *Professional Barber* and republished in the *Western Barber*:

"Declare yourselves for short hours,
For higher prices, too.
Those five cent shops can have no place,
With craftsman good and true.

"In union there is strength," we know;
If there we would begin,
With right and justice on our side,
We cannot fail to win.

The Moler Barber Schools must go,
We say this first and last;
The time will come when they will be
A relic of the past.

Their filthy practice we abhor,
Our profession they disgrace.
We'll fight with energy and vim,
This low, degraded race."[178]

Licensure would have offered barber unions a mechanism to limit both competitive threats. In this section, we use anecdotal evidence from newspaper accounts to detail these public choice rationales for barber licensure.

3.3.1 Discount Barbershops

The explicit purpose of the Journeymen Barbers' Union of America, established in 1887 (Thorpe 1951, p. 11), was to restrict competition from barbers offering discount shaves and haircuts.[179]

[178] Mrs. M. E. Murray ("A Word to You," *The Western Barber*, Topeka, Kansas (August 15th, 1899)).
[179] "The Men Who Talk," *Sunday Truth*, Buffalo, New York, p. 1 (November 6th, 1887), "Journeymen Barbers," *The Commercial* Appeal, Memphis, Tennessee, p. 16 (January 16th, 1898), "The Author the Barber's Manual on the Science of Barbering," *The Western Barber*, Topeka, Kansas, pp. 3-4 (February 15th, 1899), "Napolean Le Blanc to Second Annual Convention K. S. B. A., Topeka, Kan. Feb 6-7," *The Western Barber*, Topeka, Kansas, pp. 7-8 (February 15th, 1899) "Barbers," *The Western Barber*, Topeka, Kansas, p. 10 (May15th, 1899), "Labor World," *Kentucky Irish American*, Louisville, Kentucky, p. 4 (July 29th, 1899), "War on Cheap Barbers," *New York Times*, New York, New York, p. 14 (September 9th, 1900), & "War on Cheap Barbers," *The Western Barber*, Topeka, Kansas, p. 13 (September 15th, 1900).

The barbers' unions saw discount barbers, and the customers that patronized them, as an obstacle to higher wages and better working conditions for its members.[180] Charles Prinz, the President of the Barbers' Protective Association of Rochester asked, "…how long before the whole country is overrun by cheap barbers' shops and the good barbers will have to go out of business or else cut their prices accordingly?"[181] Similarly, an article in *The Western Barber* argued that "…every barber that shaves for five cents, and every man who patronizes them, ought to be boycotted and drummed out of this country. Any man who is that cheap is not a true American. A worthy American does not want a cheap price for what he buys."[182]

The use of "transient" barbers, barbers that held full time jobs outside of barbering but barbered on the weekend, was in particular seen as a threat to union barbers.[183] According to the *San Francisco Call*, for instance, "The existence of this large class of transient barbers has always been a thorn in the side of the Journeymen Barber's Union, and has often materially influenced them in their union plans for the benefit of the regularly employed and organized barbers."[184]

These concerns led union barbers to lobby for laws that prevented barbershops from operating on Sunday.[185] While it was often the busiest day for barbering, it was also often the

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[180] "Must Have Air," *The San Francisco Call*, San Francisco, California, p. 5 (January 3rd, 1893), "Battle of the Barbers," *St. Louis Globe-Democrat*, St. Louis, Missouri, p. 7 (June 23rd, 1898), untitled, *Star Tribune*, Minneapolis, Minnesota (September 22nd, 1895), "The Author the Barber's Manual on the Science of Barbering," *The Western Barber*, Topeka, Kansas, pp. 3-4 (February 15th, 1899), "Napolean Le Blanc to Second Annual Convention K. S. B. A., Topeka, Kan. Feb 6-7," *The Western Barber*, Topeka, Kansas, pp. 7-8 (February 15th, 1899), & "Barbers," *Minneapolis Daily Times*, Minneapolis, Minnesota, p. 7 (October 6th, 1899).
[181] "Razor Knights Aroused," *The New York Times*, New York, New York, p. 17 (September 27th, 1896).
[182] "Napolean Le Blanc to Second Annual Convention K. S. B. A., Topeka, Kan. Feb 6-7," *The Western Barber*, Topeka, Kansas, pp. 7-8 (February 15th, 1899)
[183] "Barbers Plan a Coup," *The Minneapolis Journal*, Minneapolis, Minnesota, p. 5 (August 14th, 1897).
[184] "Must Have Air," *San Francisco Call*, San Francisco, California, p. 5 (January 3rd, 1893).
[185] "Once More at Work," *Star Tribune*, Minneapolis, Minnesota, p. 2 (February 15, 1887), "May Have to Close," *St. Louis-Dispatch*, St. Louis, Missouri (October 26th, 1892), "Must Have Air," *The San Francisco Call*, San Francisco, California, p. 12 (January 3rd, 1893), "The Sunday Shaving Law," *Minneapolis Daily Times*, Minneapolis, Minnesota, p. 10 (April 16th, 1895), "Sunday Shaving," Star Tribune, Minneapolis, Minnesota, p. 24

only day that potential transient barbers had off their regular job to work in discount barbershops.[186]

Occupational licensure, however, quickly became the primary way barber's unions sought to restrict competition from discount barbershops (Fuchs and Wilburn 1967).[187] Unionized barbers advocated for licensure laws because the competition from discount barbers was a "…growing evil that must be checkmated or the legitimate barber will suffer in consequence."[188] Rather than seeking to convince consumers to pay a higher price for a quality shave or haircut, union members believed consumers would only come to appreciate the "utility of a first class barber and a clean, hygienic shave" once licensure eliminated discount options.[189]

Once barber licensure was adopted, unions quickly used its provisions to shut down discount barbers. The *St. Joseph Gazette* reports, after the passage of licensure in Missouri, that "Then followed the fight among union and non-union barbers and the efforts at closing the 5-cent shops."[190] The concern of abuse was apparently strong enough that one non-union barber asked the board of state health to have someone present when non-union barbers were "being

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(April 17th, 1898), "The Barbers' Plea," *The Philadelphia Inquirer*, Philadelphia, Pennsylvania, p. 17 (December 25th, 1898), "Blue Laws," *The Cincinnati Enquirer*, Cincinnati, Ohio, p. 4 (April 20th, 1902), "To Test Sunday Barber Law," *San Francisco Chronicle*, San Francisco, California, p. 26 (June 21st, 1903), & "Croul Won't Stop Sunday Shaves," *The Detroit Times*, Detroit, Michigan, p. 3 (August 4th, 1910). In Wisconsin, the barber's unions had reverends also speak in favor of Sunday closing laws ("Barbers' License," *The Oshkosh Northwestern*, Oshkosh, Wisconsin, p. 10 (March 17th, 1905)).

[186] "Blind pig" barbershops, that sprung up in violation of the Sunday law, benefited from the law and thus may have supported the Sunday closure laws along with union barbers ("Sunday Shaving," *Star Tribune*, Minneapolis, Minnesota, p. 24 (April 17th, 1898)).

[187] "Barber's Aroused," *The St. Joseph Herald*, St. Joseph, Missouri, p. 3 (February 2nd, 1897), "Barbers," *Lexington Herald-Leader*, Lexington, Kentucky (December 31st, 1897), "To License Barbers," *Arkansas Democrat*, Little Rock, Arkansas, p. 1 (January 10th, 1898), "War Against Cheap Shops," *St. Joseph News-Press*, St. Joseph, Missouri, p. 7 (October 18th, 1899), & "Hygienic Shaves," *The Morning News*, Wilmington, Delaware, p. 2 (April 15th, 1901).

[188] "The Author the Barber's Manual on the Science of Barbering," *The Western Barber*, Topeka, Kansas, pp. 3-4 (February 15th, 1899). See also: untitled, *The Kay County Sun*, Blackwell, Oklahoma, p. 1 (September 27th, 1900).

[189] "Dr. R. E. M'Vey," *The Western Barber*, Topeka, Kansas, pp. 10-11 (February 15th, 1899).

[190] "After Forsting's Scalp," *St. Joseph Gazette*, St. Joseph, Missouri, p. 5 (November 25th, 1899). See also: "Barbers in a Fight," *The St. Joseph Herald*, St. Joseph, Missouri, p. 6 (October 22nd, 1899).

examined on charges of uncleanliness and incompetency."[191] Once licensing laws were passed in New York, there were accusations that it was being biasedly enforced against non-union shops.[192] Members of the Missouri barber board even explicitly came out against discount barbershops.[193]

There is also some evidence of racial and gender discrimination driving licensure efforts.[194] Barber unions primarily represented white barbers since only a small number of African Americans were admitted to barber unions, often only in the North (Bernstein 2001, Ch. 2). For instance, since the barber law in Kansas required that appointed members of the barber commission be union members, this was unacceptable to African American barbers since "the union will not permit colored barbers to become members."[195]

Some newspapers reported on African American barbers opposing licensure efforts since they saw it as a direct threat to their livelihood.[196] The African American barber Dan Lucas, while the owner of a popular high-end barbershop, recognized the intent of the law and told a newspaper after the passage of licensure, "I'll go to jail and close my shop before I'll submit to the iniquity. Not until the highest court decides against me will I give in. The law [barber licensure] was made to drive the colored barber out of business."[197] Dan Lucas was, indeed, the first barber arrested for violating the licensure law (and, previously, the Sunday closure laws as

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[191] "After Forsting's Scalp," *St. Joseph Gazette*, St. Joseph, Missouri, p. 5 (November 25th, 1899).
[192] "Barber Law is Not Properly Enforced," *Buffalo Evening News*, Buffalo, New York, p. 1 (December 21st, 1903).
[193] "Barbers May Adopt a Uniform Scale," *The St. Louis Republic*, St. Louis, Missouri, p. 3 (August 1st, 1901).
[194] "Razors Past and Present," *The Minneapolis Journal*, Minneapolis, Minnesota, p. 2 (August 1st, 1885), "Topics of the Times," *Minneapolis Daily Times*, Minneapolis, Minnesota, p. 4 (October 4th, 1891), "About Barber's Itch," *The Atchison Daily Globe*, Atchison, Kansas, p. 8 (November 16th, 1894), & "A Card from a Barber," *The Topeka State Journal*, Topeka, Kansas, p. 5 (October 22nd, 1895).
[195] "Recognition of Black Barbers," *The Topeka Daily Capital*, Topeka, Kansas, p. 1 (March 3rd, 1903).
[196] "Negros Oppose It," *The Western Barber,* Topeka, Kansas, p. 8 (June 15th, 1899), "Will Fight the Barber Law," *The Kansas City Times*, Kansas City, Missouri, p. 1 (July 29th, 1899), "Colored Barbers Will Fight," *Beatrice Evening Times*, Beatrice, Nebraska, p. 1 (July 31st, 1899), "Against Barber's Bill," *The Bystander*, Des Moines, Iowa, p. 6 (March 2nd, 1900), "Colored Barbers," *Nashville Banner*, Nashville, Tennessee, p. 6 (February 6th, 1903), "Colored Barbers," The Tennessean, Nashville, Tennessee, p. 7 (March 21st, 1908).
[197] "Negros Oppose It," *The Western Barber,* Topeka, Kansas, p. 8 (June 15th, 1899) & "Barbers Will Be Arrested," *The Kansas City Times*, Kansas City, Missouri, p. 5 (November 22nd, 1899). Also see "Dan Lucas' Barber Shop," *The Kansas City Gazette*, Kansas City, Kansas, p. 3 (June 8th, 1892).

well).[198] In another example of discrimination, a newspaper reported that the newly formed barber's examiner board in Colorado was noting poor conditions in barbershops in Pueblo due to the presence of foreign barbers; "There are Japs, Austrians, Servians [sic], a few Irish and several Missourians."[199]

Barber licensure was also aimed at preventing women from entering the barbering procession. The international organizer for the International Union of Journeymen Barbers explicitly stated that women did not belong in the union, noting that no women on record had served a three-year apprenticeship.[200] Licensure efforts in Missouri were driven in part because "women barbers from the barber schools are rapidly engaging in the trade…."[201] In another example from Kentucky, barber unions sought licensure to shut down "the women barber shops which are becoming common in some cities."[202]

3.3.2 Barber Colleges

Barber unions also pursued licensure to eliminate the increasing flow of barbers entering the barbering profession through barber's colleges.[203] A Minnesota newspaper reporting on barbers

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[198] Dan Lucas, also fought against Sunday closing laws (untitled, *The Kansas City Kansas Globe*, Kansas City, Missouri, p. 4 (October 19th, 1907)).
[199] "State Official Pours Hot Shot into High Court," *The Larimer County Independent*, Fort Collins, Colorado, p. 3 (November 24th, 1909).
[200] "A Few Cutting Remarks Concerning Affairs Among Tonsorial Artists," *Los Angeles Evening Post-Record*, Los Angeles, California, p. 4 (November 19th, 1910).
[201] "Barbers Aroused," *The St. Joseph Herald*, St. Joseph, Missouri, p. 3 (February 2nd, 1897).
[202] "Barbers," *Lexington Herald-Leader*, Lexington, Kentucky, p. 4 (December 31st, 1897).
[203] "Razor Knights Aroused," *The New York Times*, New York, New York, p. 17 (September 27th, 1896), "Hopes of Barbers," *The Saint Paul Globe*, Saint Paul, Minnesota, p. 3 (January 24th, 1897), "Barbers Do Not Like Colleges," *The Philadelphia Times*, Philadelphia, Pennsylvania, p. 6 (December 26th, 1897), "Barbers Aroused," *The St. Joseph Herald*, St. Joseph, Missouri (February 2nd, 1897), "Must Study Two Years," *The Minneapolis Journal*, Minneapolis, Minnesota, p. 5 (January 22nd, 1898), "Pirate Barbers Unchecked," *Omaha Daily Bee*, Omaha, Nebraska, p. 7 (September 22nd, 1898), "It Aims At Clean Faces," *The Saint Paul Globe*, Saint Paul, Minnesota, p. 12 (February 13th, 1898), "Barbers Oppose It," *The St. Joseph Herald*, St. Joseph, Missouri (March 22nd, 1899), "Clean Shaves," *The Times-Democrat*, New Orleans, Louisiana, p. 3 (July 11th, 1900), "The Barbers' Law Again," *Lincoln Nebraska State Journal*, Lincoln, Nebraska (July 30th, 1900), "The Barbers Want Only Skilled Men in their Calling," *Oakland Tribune*, Oakland, California, p. 8 (September 3rd, 1900), "Examining the Barbers," *The Bismark Tribune*, Bismark, North Dakota, p. 2 (August 28th, 1901), untitled, *Evening Sentinel*, Santa Cruz, California, p. 4 (December 28th, 1901), "Barber Examiners Issue Certificates," *Record Searchlig*ht, Redding, California, p. 3

organizing to advocate for licensure stated that "Probably the greatest evil now confronting journeymen barbers, and which the state association proposes to wage war against, even to carrying it to the legislature, is the "school" or "college," which guarantees to make full-fledged barbers out of all comers, white or black, male or female, in six weeks' time…" and that "… the barbers of the state, like the printers who have been displaced by machinery, will be compelled to go to farming, tramping, begging or stealing."[204]

When the barber licensure bill in Minnesota was proposed in 1896, it was seen as a "direct blow to the barbers' schools."[205] *The Minneapolis Journal* observed that the law was passed to "kill the schools, and on this ground alone it received the hearty support of a large number of barbers who believe that the schools are demoralizing the trade."[206] An article in *The Western Barber* argued:

> Why, if there was no other reason for the existence of a license law regulating and testing the qualification of those who seek to enter the profession, the development of the barber college, with their false claims and pernicious effect upon the barber profession, would be sufficient to warrant the most vigorous and unceasing effort on the part of the legitimate barbers to secure the enactment of such a law.[207]

The Barbers' State Board of Examiners of Minnesota described barber colleges in their biennial report as "The greatest evil with which the barbers of this State have to contend, and an evil

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(February 13th, 1902), "May Force Barber Schools to Quit," *Buffalo Evening News*, Buffalo, New York, p. 5 (June 2nd, 1903), "Barbers Meet Today at Falls," *Buffalo Courier*, Buffalo, New York, p. 7 (January 4th, 1904), "Barbers' License Law," *The Oshkosh Northwestern*, Oshkosh, Wisconsin, p. 8 (February 17th, 1905), untitled, *The Atchison Daily Globe*, Atchison, Kansas, p. 3 (May 2nd, 1905), "Barber Law Test," *Austin American-Statesman*, Austin Texas, p. 3 (August 8th, 1907), "To Test the Barber Law," *Abilene Semi-Weekly*, Abilene, Texas, p. 7 (September 18th, 1907), & "The Joys of a Free Shave in Barber College," *The Spokane Press*, Spokane, Washington, p. 3 (January 9th, 1910). The Western Barber even called for legislation to ban barbers' colleges from advertising in newspapers and sending mail ("Where there's a Will There's a Way," *The Western Barber*, Topeka, Kansas, p. 12 & 14 (February 15th, 1899)).

[204] "In Labor's Realm," *The Saint Paul Globe*, Saint Paul, Minnesota, p. 8 (May 17th, 1896).

[205] "License for Barbers," *Minneapolis Daily Times*, Minneapolis, Minnesota, p. 3 (December 8th, 1896).

[206] "Must Study Two Years," *The Minneapolis Journal*, Minneapolis, Minnesota, p. 5 (January 22nd, 1898).

[207] "The Author of the Barber's Manuel on the Science of Barbering," *The Western Barber*, Topeka, Kansas, p. 3 (February 15th, 1899).

which at one time threatened the complete demoralization of the trade…."[208] The Minnesota barber board established by licensure quickly imposed stringent registration, reporting, instructional content, and inspection rules on barber colleges.[209]

Traditionally, barbers entered the profession through an apprenticeship that typically lasted three years.[210] The apprenticeship often involved a lengthy beginning period doing menial tasks, such as sweeping the floors and washing out shaving mugs, that imparted no barbering skills and often offered little compensation.[211]

The first barbers' college, founded by A. B. Moler, was opened in 1893 in Chicago and was quickly franchised in major cities across the United States (Thorpe 1951, p. 7). These colleges often charged between $25 and $60 for an eight-week program.[212] They also provided an opportunity for students to earn money by operating college barbershops that offered discount haircuts and shaves to attract willing subjects to help their students develop their barbering skills.[213]

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[208] "Minnesota View of the Evil," *The San Francisco Call*, San Francisco, California, p. 9 (July 6th, 1901).
[209] "It Aims at Clean Faces," *The Saint Paul Globe*, St. Paul, Minnesota (February 13th, 1898).
[210] "Barbers Do Not Like Colleges," *The Philadelphia Times*, Philadelphia, Pennsylvania, p. 6 (December 26th, 1897), "The Author of the Barber's Manuel on the Science of Barbering," *The Western Barber*, Topeka, Kansas, p. 3-4 (February 15th, 1899).
& "Napoleon Leblanc's Catechism of the Barber "College"," *The Western Barber*, Topeka, Kansas, p. 7 (November 15th, 1899).
[211] "Razor Knights Aroused," *The New York Times*, New York, New York, p. 17 (September 27th, 1896), "State Board," *The Courier-Journal*, Louisville, Kentucky, p. 8 (February 19th, 1902), "New Instructor in Barber's School," *The Oregon Daily Journal*, Portland, Oregon, p. 7 (October 26th, 1903), & "Later Up!" *Quad-City Times*, Davenport, Iowa, p. 12 (January 1st, 1915).
[212] "In the Barbers' College," *St. Louis Globe-Democrat*, St. Louis, Missouri, p. 3 (August 24th, 1896), "Barbers Do Not Like Colleges," *The Philadelphia Times*, Philadelphia, Pennsylvania, p. 8 (December 26th, 1897), "Wanted–Barber," *The Los Angeles Times*, Los Angeles, California, p. 8 (June 21st, 1904), "The Joys of a Free Shave in Barber College," *The Spokane Press*, Spokane, Washington, p. 3 (January 9th, 1910), "New Barber College of Topeka," *The Topeka State Journal*, Topeka, Kansas, p. 4 (October 1st, 1910), "Only Modern Barber College," *Des Moines Tribune*, Des Moines, Iowa (December 30th, 1912), "Lather Up!" *Quad-City Times*, Davenport, Iowa, p. 12 (January 1st, 1915), "Male Help Wanted," *The Wichita Eagle*, Wichita, Kansas, p. 10 (February 26th, 1915), & "Learn Barber Trade," *The Nonpartisan Leader*, Fargo, North Dakota, p. 15 (April 26th, 1920). Moler Barber Colleges also offered scholarships (untitled, *Minneapolis Daily Times*, Minneapolis, Minnesota, p. 9 (January 28th, 1902)).
[213] "In the Barbers' College," *St. Louis Globe-Democrat*, St. Louis, Missouri, p. 3 (August 24th, 1896), "Barbers Do Not Like Colleges," *The Philadelphia Times*, Philadelphia, Pennsylvania, p. 8 (December 26th, 1897), "Wanted–

Barber's unions justified using licensure to shutdown barber colleges on the basis that college barbershops were deceiving customers and were a threat to consumer safety and health due to their unsanitary conditions and because student lacking experience were practicing their barber skills.[214] An article in *The Western Barber*, for instance, referred to A. B. Moler as a "criminal" and "murderer of an honorable profession."[215]

These claims, however, did not appear to be credible. College barbershops appeared to have explicit pricing structures, based on the experience level of the student, that enabled patrons to select the price and level of experience they desired. For instance, it was common for barber colleges to create two to three tiers of discount pricing based on the experience of the student, with novices giving free shaves and haircuts.[216] The Atlanta Barber College openly advertised in the *Atlanta Constitution*, "OH YES–We give you a haircut, shave, massage, shampoo and singe FREE–yes, absolutely FREE."[217] Despite offering free services for novice barbers, many barber colleges still had to recruit orphans and the needy through charitable organizations to drum up the subjects they needed.[218]

Barber," *The Los Angeles Times*, Los Angeles, California, p. 8 (June 21st, 1904), "The Joys of a Free Shave in Barber College," *The Spokane Press*, Spokane, Washington, p. 3 (January 9th, 1910), "New Barber College of Topeka," *The Topeka State Journal*, Topeka, Kansas, p. 4 (October 1st, 1910), "Only Modern Barber College," *Des Moines Tribune*, Des Moines, Iowa (December 30th, 1912), "Lather Up!" *Quad-City Times*, Davenport, Iowa, p. 12 (January 1st, 1915), "Male Help Wanted," *The Wichita Eagle*, Wichita, Kansas, p. 10 (February 26th, 1915), & "Learn Barber Trade," *The Nonpartisan Leader*, Fargo, North Dakota, p. 15 (April 26th, 1920).

[214] "Razor Knights Aroused," *The New York Times*, New York, New York, p. 17 (September 27th, 1896) & "There's a Lively War Among the Barbers Now," *Spokane Chronicle*, Spokane, Washington, p. 1 (October 25th, 1905).

[215] "Where There's a Will There's a Way," *The Western Barber*, Topeka, Kansas, p. 12 & 14 (February 15th, 1899).

[216] "In the Barbers' College," *St. Louis Globe-Democrat*, St. Louis, Missouri, p. 3 (August 24th, 1896), "The Joys of a Free Shave in Barber College," *The Spokane Press*, Spokane, Washington, p. 3 (January 9th, 1910), "Lather Up!" *Quad-City Times*, Davenport, Iowa, p. 12 (January 1st, 1915), ""You're Next" is College Yell of Barber Schools," *The Seattle Star*, Seattle, Washington, p. 9 (August 1st, 1918), & "Free Hair cut [sic] and Shave," *Nashville Banner*, Nashville, Tennessee, p. 18 (August 24th, 1919).

[217] "Oh Yes," *The Atlanta Constitution*, Atlanta, Georgia, p. 8 (October 11th, 1909).

[218] "In the Barbers' College," *St. Louis Globe-Democrat*, St. Louis, Missouri, p. 3 (August 24th, 1896), "School for Barbers" *The Time-Picayune*, New Orleans, Louisiana, p. 9 (May 5th, 1899), "The Joys of a Free Shave in Barber College," *The Spokane Press*, Spokane, Washington, p. 3 (January 9th, 1910), & ""You're Next" is College Yell of Barber Schools," *The Seattle Star*, Seattle, Washington, p. 9 (August 1st, 1918),.

Barber colleges did allow untrained barbers to cut hair and shave patrons, often for free. The apprenticeship system, however, would have necessarily entailed a prospective, untrained, barber practicing on someone, so any dangers associated with barber college students would have applied to apprentices as well. The practical exam required for licensure itself also meant that every prospective barber applying for licensure had to cut the hair and shave the beard of a man before they could receive a license. Thus, the process of barber licensing itself required recruiting patrons to receive free shaves and haircuts from unproven barbers.[219] In at least one case, prisoners were even used to get the necessary patrons for a state barber examination.[220]

Once licensure was implemented, barber unions often aggressively used the provisions of the law against barber colleges.[221] To make the route to the profession through barber colleges less attractive, the Minnesota barber board required that students had to attend a minimum of two years of barber college, substantially lengthening the required instructional time, and thus necessary tuition costs. They also required instructors to pass a practical exam set by the licensing board.[222] The president of the licensing board noted that "It is impossible for a man to learn the trade in eight weeks, if he learns how to sharpen a razor in that time he is doing well.

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[219] "Barbers Called Upon to Answer Hard Questions," *The St. Louis Republic*, St. Louis, Missouri, p. 9 (July 23rd, 1901), "Barbers Ask That Their Board be Abolished," *The San Francisco Examiner*, San Francisco, California, p. 15 (February 25th, 1903), "To Examine Barbers," *Newport Mercury*, Newport, Rhode Island, p. 8 (August 15th, 1903), "More Free Shaves at the State Capitol," *Hartford Courant*, Hartford, Connecticut, p. 5 (October 2nd, 1909), "Haircuts and Shaves Free in Middletown," *Hartford Courant*, Hartford, Connecticut, p. 18 (May 14th, 1910), "Secures Barber's License," *The Newton Record*, Newton, Mississippi, p. 2 (February 3rd, 1910), untitled, *Lansing State Journal*, Lansing, Michigan, p. 2 (February 12th, 1915), untitled, *The Sun*, Pittsburg, Kansas, p. 2 (December 15th, 1915), & "Haircuts Shaves Are Free Tonight," *Spokane Chronicle*, Spokane, Washington, p. 6 (October 17th, 1921).

[220] "Razor "Artists" Want 'Em Tough," *The Spokesman-Review*, Spokane, Washington, p. 6 (May 18th, 1903).

[221] "Must Study Two Years," *The Minneapolis Journal*, Minneapolis, Minnesota, p. 5 (January 22nd, 1898).

[222] Only two years after passing the first barber licensure law, Minnesota was already considering amendments to the original bill. One of the major extensions proposed was that practicing barbers needed to work for three years as an apprentice or attend barber college for three years. In addition, monetary fines or even imprisonment were proposed for any barber college advertising to students that they could become a legal barber within less than three years ("Regulates the Barber," *The Minneapolis Journal*, Minneapolis, Minnesota, p. 3 (February 18th, 1899)).

There is no reason why the schools should not make their courses two years. Of course, they will have to increase their charges for tuition."[223]

Shortly after the Minnesota bill was passed, the barber commission issued rules for barber's colleges necessitating strict reporting criteria, admission standards, curriculum, sanitary regulations, and inspection rules.[224] A barber college in Minneapolis was almost shut down by the board of examiners through licensure revocation, but the order was blocked by a judge when charges were brought to him by the college that the reasons for revoking licensure "were not supported by the evidence, that they were biased and prejudiced and that they deprive him of property and rights without due process of law."[225] The Minnesota Barber Commission was able to limit the number of barber students per instructor to 15, require instructors to be certified, restrict the number of apprentices at a shop to one, and prohibit night classes at barber colleges.[226] Three years after the passage of the barber licensing law in Minnesota, barber's unions declared their war against the barber colleges in the state nearly over after over 20 actions for fraud were brought against the Moler Barber Colleges.[227]

In California, the self-described "father" of the licensure bill, who was appointed as the inaugural chairman of the barber commission, stated that:

> One immediate result of the appointment of this commission will be the closing of a number of so-called Barber's Colleges, which graduate numbers of incompetent men. Such colleges will be allowed to continue only under properly qualified barbers, but no apprentices will receive certificates until they have served three years in the business.[228]

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[223] "Must Study Two Years," *The Minneapolis Journal*, Minneapolis, Minnesota, p. 5 (January 22nd, 1898).
[224] "It Aims At Clean Faces," *The Saint Paul Globe*, Saint Paul, Minnesota, p. 12 (February 13th, 1898).
[225] "Court Blocks Closing of Barber College," *The Minneapolis Journal*, Minneapolis, Minnesota, p. 25 (May 6th, 1930).
[226] The student limitation and teacher requirements were ruled unconstitutional in 1948 ("Court Liberalizes Barber College Laws," *The Minneapolis Star*, Minneapolis, Minnesota, p. 17 (February 3rd, 1948)).
[227] "Barbers at the Capitol," *The Saint Paul Globe*, Saint Paul, Minnesota, p. 4 (September 26th, 1900).
[228] "Calish Predicts Doom of Some "Tonsorial" Colleges," *The San Francisco Examiner*, San Francisco, California, p. 2 (June 2nd, 1901). Also see: "Redding Barbers Give Their Views," *The Searchlight*, Redding, California, p. 1 (February 25th, 1903).

After his appointment, he paid an unexpected visit to a barber college and harangued the students for not saluting their "superior officer" and told them that he "wouldn't give certificates to the graduate of a barber's college…."[229] He went on to call them "heinous offenders" that were "not agreeable to the union."[230] The California Barber Commission shut down a barber college before barbers were even completed with registering for licensure.[231]

In another example, the passage of licensure in Kansas forced the Schwartz Barber College of Wichita to move out-of-town.[232] Oregon's licensing law gave the barber commission the ability to define all the necessary requirements for licensure, so the commission declared that:

> The present manner of conducting the barber school does not meet the approval of the board. The students are not given the proper instruction, in our opinion, and for this reason alone we shall not grant certificates to graduates of the institution. Furthermore, we shall refuse to give credit for the time such pupils have put in learning the barber's trade in the school."[233]

Barber commissions also used licensure exams explicitly to prevent entry into the profession. For example, one of the questions asked prospective barbers under Minnesota's first exam for barbers was, "Dou [sic] you consider the barber schools of this state competent to teach the barber trade?"[234] The Michigan barber licensure exam asked prospective barbers if they had ever worked at a barber's college because they were "not recognized by the profession."[235]

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[229] "Barber College Hears from Calish," *The Los Angeles Times*, Los Angeles, California, p. 7 (April 2nd, 1902).
[230] "Barber College Hears from Calish," *The Los Angeles Times*, Los Angeles, California, p. 7 (April 2nd, 1902).
[231] "Barber College Finally Closes," *The San Francisco Call*, San Francisco, California, p. 14 (July 13th, 1901).
[232] "Barber Colleges Leave," *Fort Scott Daily Tribune and Fort Scott Daily Monitor*, Fort Scott, Kansas, p. 4 (August 12th, 1913). Advertisements show Schwartz Barber College moved to Oklahoma City ("Barber Trade," *The Topeka Daily Capital*, Topeka, Kansas, p. 7 (February 5th, 1917)).
[233] "One License was Revoked," *Statesman Journal*, Salem, Oregon, p. 1 (September 29th, 1903) & untitled, *The Capital Journal*, Salem, Oregon, p. 5 (September 29th, 1903).
[234] "It Aims at Clean Faces," *The Saint Paul Globe*, Saint Paul, Minnesota, p. 12 (February 13th, 1898).
[235] "The Unkindest Cut of All," *Detroit Free Press*, Detroit, Michigan, p. 35 (September 23rd, 1900).

3.4 Data and Model

In this section, we describe the data and model we use to test the public interest rationale for barber licensure against the public choice theory rationale. Our data includes barber itch outbreaks and individual cases, recipes and advertisements for barber itch remedies, and reported instances of price increases in barbering services, as reported on in U.S. Newspapers.

3.4.1 Barber's Itch Outbreaks and Individual Cases

To examine the extent of barber's itch we collected reported outbreaks and individual cases of barber's itch in U.S. newspapers. While many states had several diseases that required official notification and reporting of cases, only one state, Oregon, required cases of barber's itch to be reported (*"The Notifiable Diseases"* 1916).[236] The fact that barber's itch was excluded from the list of notifiable diseases in all but one state suggests that state health departments did not see it as a major public health concern.[237] For instance, when one individual in Iowa was taken to a public detention hospital due to barber's itch, the city health authorities "refused to admit the man, saying he was not affiliated with a disease that should be treated at public expense."[238] In the Weekly Reports of the Public Health Reports, which collected city and state public health data and was published starting in 1878, there are only two cases of barber's itch reported, both involving foreign passengers coming to the United States (Public Health Reports 1900a & 1900b).

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[236] State Health Board commissioned the list in 1903, after Oregon's 1899 adoption of barber licensure ("State Health Board," *Weekly Oregon Statesman*, Salem, Oregon, p. 5 (March 17th, 1903) & https://www.oregon.gov/oha/PH/BIRTHDEATHCERTIFICATES/VITALSTATISTICS/ANNUALREPORTS/Documents/historicalreports/Hsannual1905.pdf).

[237] We could not find a single mention of barber's itch in examining Oregon's State Health Boards biennial reports covering 1903 to 1918, which listed caseloads for many other communicable diseases (https://www.oregon.gov/oha/PH/BIRTHDEATHCERTIFICATES/VITALSTATISTICS/ANNUALREPORTS/Pages/historicalreports.aspx).

[238] "Fight Over Barber's Itch," *Sioux City Journal,* Sioux City, Iowa, p. 5 (November 6th, 1903).

We do find, however, that newspapers did regularly report on any outbreaks of barber's itch. It was common for newspapers to even report on outbreaks of barber's itch outside the city or state in which it was located. Newspapers even reported individual cases of the barber's itch or reported on lawsuits where a patron was suing a barber for allegedly giving them barber's itch.

To create our dataset, we first searched *Newspapers.com* in each licensing and non-licensing state for newspapers that mentioned "barber's itch" between our entire data collection run from 1887 to 1926. We then used *Newspapers.com*'s Browse page to identify those newspapers with positive search results for "barber's itch" that met our criteria. To prevent the introduction and exit of newspapers from affecting our results we only included newspapers that had 12-month publication runs for our entire data collection run (1887 to 1926). We also restricted our searches to daily newspapers to prevent variance in reporting between states. Rhode Island and Colorado were dropped from our analysis because they did not have any newspapers meeting our criteria, reducing the number of licensing states in our database to sixteen states. **Figure 2** provides a map of the 32 U.S. states included in our analysis, 16 of which adopted and maintained licensure.

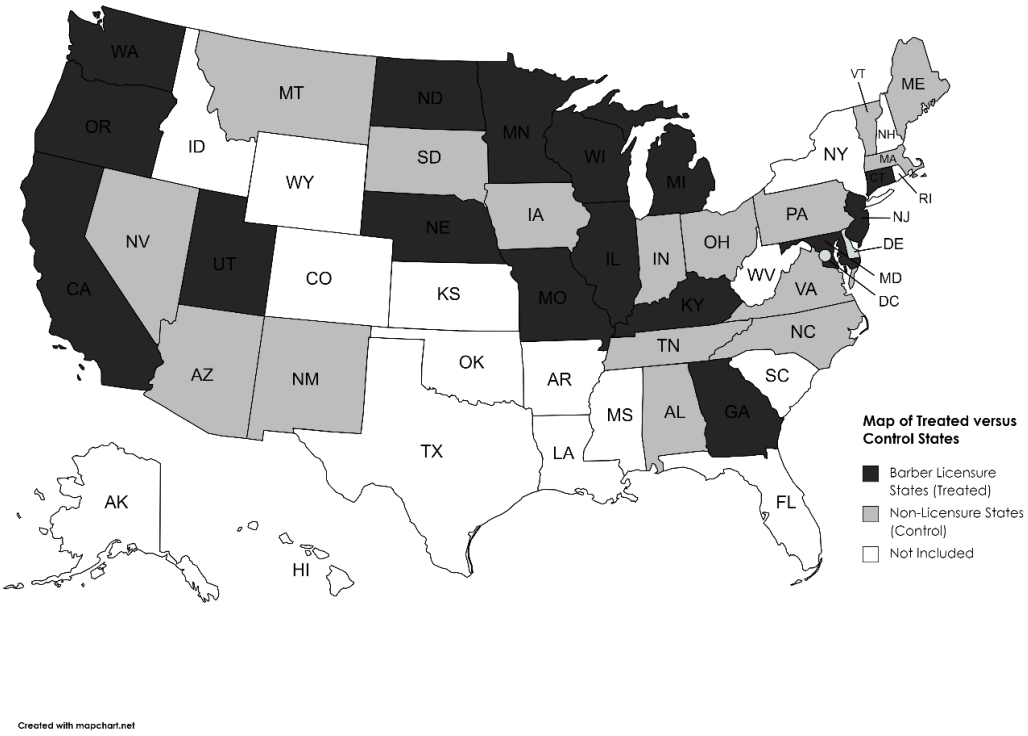

Figure 2: Barber Licensure in U.S. States, 1897-1920

We then used *Newspapers.com* to perform year-by-year keyword searches for "barber's itch" to craft a dataset containing all reported outbreaks and cases of barber's itch for licensed and non-licensed states by year.[239] We went through every mention of "Barber's Itch" and determined if it could be classified as an individual case or outbreak of barber's itch individual. We collected outbreaks separately since newspapers often only reported that there was an "outbreak," "several,", or "many" cases and did not provide caseload estimates. Many of these outbreaks were small. For instance, the *Daily Herald* referred to a dozen cases of barber's itch as a "bad epidemic".[240] The *St. Louis Post-Dispatch* referred to three prisoners catching barber's itch as an "epidemic of the disease".[241] Members of the Wisconsin barber board were sent to Racine,

[239] Newspapers also referred to barber's itch as "barbers' itch", but *Newspapers.com*'s search function pulled up all results irrespective of the apostrophe's position in the search term.
[240] "Two Bad Epidemics," *The Daily Herald,* Port Huron, Michigan, p. 5 (December 2nd, 1901).
[241] "Suffering from Sychosis," *St. Louis Post-Dispatch,* St. Louis, Missouri, p, 3 (July 31st, 1899).

Wisconsin to investigate an outbreak of barber's itch for which "At the lowest estimate the number of cases is given at thirty and in some instances it is exceedingly bad."[242] Another newspaper described "at least forty cases" as an epidemic.[243] We also classified any newspaper report of five or more connected cases of barber's itch at the same time as an outbreak rather than as separate individual cases.

Since some of these newspapers were from the same state or even city, we cross-referenced every outbreak and individual case of barber's itch reported to ensure there was no double-counting in our database. We included only outbreaks and individual cases that occurred within the state of the reporting newspaper. We also excluded outbreaks that were recognized at the time to have not been transmitted by barbershops. Overall, we excluded one outbreak of barber itch and ten individual cases that explicitly did not originate or transmit through barbershops in licensing states and three outbreaks and four individual cases in non-licensing states.

3.4.2 Articles and Advertisements for Barber's Itch Cures

Many newspapers published recipes or cures for barber's itch as well as paid advertisements for barber's itch cures, ointments, or specialists. These were, overwhelmingly, advertisements that included barber's itch as one of several diseases or problems cured by the advertised ointment. Given that each item included in an advertisement contributed to the cost of the advertisement, which were sold by word count or physical space, we interpret the inclusion of barber's itch as a costly signal that provides an additional indicator for the prevalence of barber's itch as a robustness check on newspaper reporting of cases and outbreaks. We tallied the number of these advertisements by year for licensed and unlicensed states.

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[242] "Will Pay Racine a Visit," *The Journal Times*, Racine, Wisconsin, p. 7 (October 24th, 1905).
[243] "Vicinity Gleanings," *Freeport Daily Bulletin*, Freeport, Illinois, p. 5 (April 14th, 1904).

3.4.3 Instances of Barber Price Increases

Many newspapers observed price increases following barber licensure. The *Stevens Point Journal*, for instance, reported that "Since the passage of the law creating a supervisory board many of the barbers have increased their price for shaving…."[244] Similarly, the *Chicago Tribune* reported that a rise in the price of shave was due to "The new law compelling registration…."[245] Following licensure, barbers in Michigan, who had previously been reported to have been in a price war that reduced the costs of barbering services, were able to agree to a price increase as a "result of the new barbers' registration law…"[246] In some cases, a price increase in barbering services was an explicitly expected outcome of licensure. When asked if the new law would raise barber wages, for instance, a barber commissioner member in Wisconsin replied:

> Certainly it will. The public will have to take care of itself. We barbers are looking out for our own interests, and the public must do the same. We are underpaid now, and we intend to get what is right and reasonable.[247]

To empirically assess the extent to which licensure enabled barbers to raise prices, we searched the *Newspapers.com* newspapers meeting our search criteria (daily, with runs between 1887 and 1926) in the licensing and non-licensing states for "barber, prices", looking for price increases. We excluded data after 1913, however, to avoid any effects associated with World War I from interfering with our data.[248] Some of the price increases came in the form of new charges for shaving the back of the neck or for the use of bay rum or witch hazel on hair.[249]

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[244] untitled, *Stevens Point Journal*, Stevens Point, Wisconsin, p. 1 (February 3rd, 1904).
[245] "More Barbers Raise Price of Shaves," *Chicago Tribune*, Chicago, Illinois, p. 7 (September 9th, 1909).
[246] "Up Go the Prices," *Detroit Free Press, Detroit*, Michigan, p. 7 (April 18th, 1900).
[247] "Prices Will be Raised," *The Journal Times*, Racine, Wisconsin, p. 3 (July 10th, 1903).
[248] Not only was there inflation during the WWI period, but the transfer of civilians to the military and the concentration of military members in camps likely influenced the supply and demand for barbers.
[249] "Adopt Union Scale," *The Evening News*, Benton Harbor, Michigan, p. 24 (September 17th, 1901), "The Salem Barbers," *Statesman Journal*, Salem, Oregon, p. 5 (July 4th, 1902), "Sacramento Shaves are Still 15 Cents," *The Evening Mail*, Stockton, California, p. 4 (January 29th, 1903), "Have Raised the Prices," *Spokane Chronicle*, Spokane, Washington, p. 9 (May 11th, 1903), "Master Barbers Signing to Give Men Shorter Hours," *The Buffalo Enquirer*, Buffalo, New York, p. 21 (April 29th, 1904), "Hot Towels now are Extra," *Buffalo Courier*, Buffalo, New

3.4.4 Summary Statistics

Table 7 provides the descriptive statistics of the dataset constructed for this paper. The table provides descriptive statistics for the entire sample of 32 states as well as the subsample of our treated (licensed) and control (unlicensed) states.

Table 7: Descriptive Statistics

	(1) Full sample	(2) Licensing States	(3) Non-Licensing States
Individual Cases	0.04	0.05	0.04
	(0.222)	(0.246)	(0.194)
Outbreaks	0.04	0.05	0.02
	(0.217)	(0.266)	(0.152)
# of Newspapers	3.00	3.00	3.00
	(1.803)	(1.839)	(1.769)
Average # of Ads	3.37	3.11	3.62
	(5.825)	(5.436)	(6.182)
Population	1.9e+06	1.9e+06	1.9e+06
	(1643220.8)	(1328012.0)	(1908128.8)
N	1280	640	640

mean coefficients; sd in parentheses

Figure 3 shows our treated and control states, with the year of adoption for the treated states.

York, p. 8 (May 4th, 1904), & "Neck Shaves Extra," *Portage Daily Register*, Portage, Wisconsin, p. 3 (July 21st, 1906).

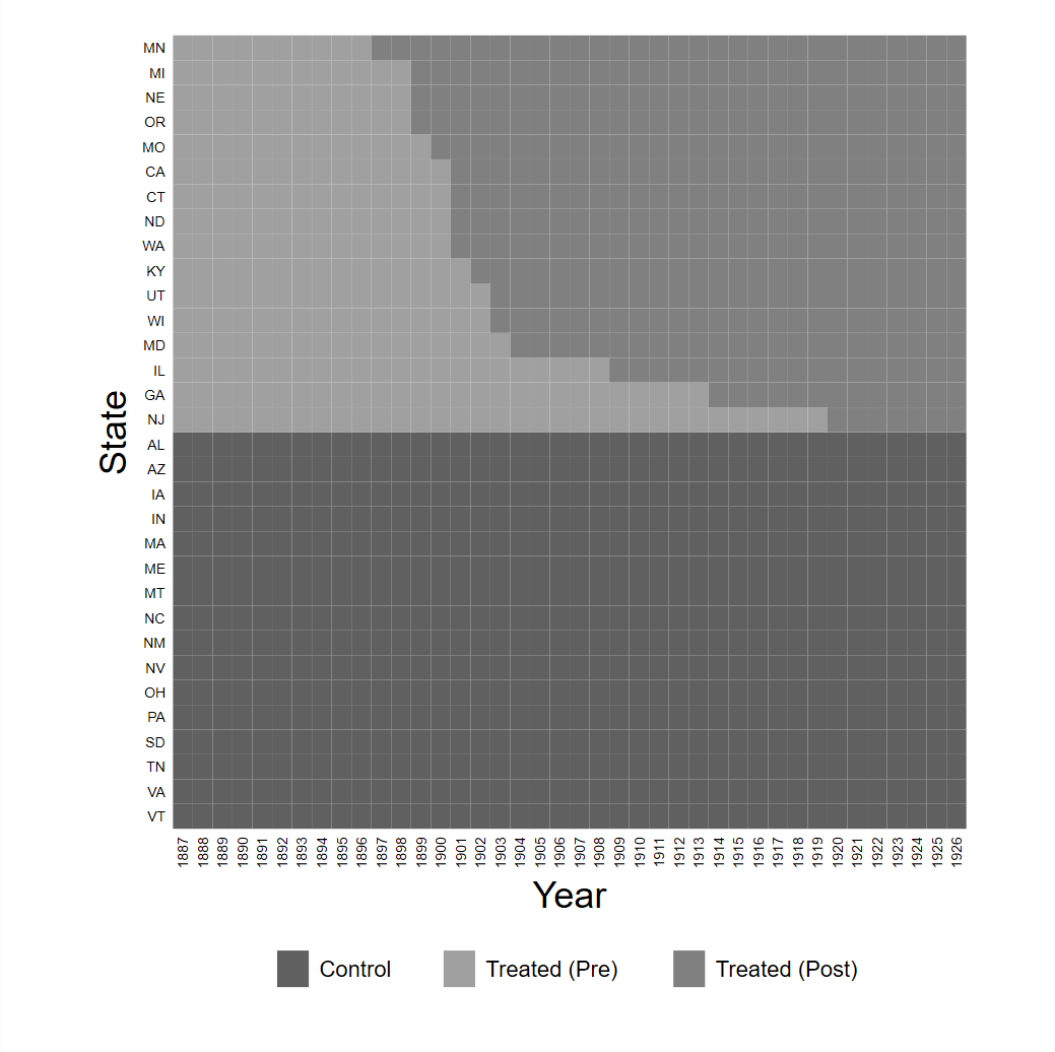

Figure 3: Treated and Control States

3.4.5 Model

With states enacting barber licensure at different times, we used the staggered treatment difference-in-difference estimator of de Chaisemartin and D'Haultfoelle (2020) to estimate the following regression models:

$$Indiviudal\ BI\ cases\ per\ capita_{st} = \alpha_s + \alpha_t + \beta \times License_{st} + \epsilon_{st} \quad \text{(Eq. 1)}$$

$$BI\ outbreaks\ per\ capita_{st} = \alpha_s + \alpha_t + \beta \times License_{st} + \epsilon_{st} \quad \text{(Eq. 2)}$$

$$Total\ BI\ cases\ per\ capita_{st} = \alpha_s + \alpha_t + \beta \times License_{st} + \epsilon_{st} \quad \text{(Eq. 3)}$$

$$Avg\ \#\ of\ \ BI\ ads_{st} = \ \alpha_s + \ \alpha_t + \beta \times License_{st} + \epsilon_{st} \quad \text{(Eq. 4)}$$

$$Price\ increases_{st} = \ \alpha_s + \ \alpha_t + \beta \times License_{st} + \epsilon_{st} \quad \text{(Eq. 5)}$$

Where *s* and *t* are states and years. Our dependent variables are as follows: the number of individually reported barber's itch cases per capita, the number of reported barber's itch outbreaks per capita, both individual cases and outbreaks combined (per capita), the average number of newspaper ads regarding barber's itch cures. *License* is a dummy variable equal to one if the given state has a barber licensing law in effect and zero otherwise. The two alpha terms represent state and time fixed effects. Rather than using the traditional two-way fixed effects model, our estimator (de Chaisemartin & D'Haultfoelle 2020) allows for staggered adoption time and dynamic effects over time which is something we would expect to see with a policy change such as a state adopting barber licensure. Thus, our results will be robust to potential biases that can occur when treatment exposure varies across time or has heterogenous effects (Goodman-Bacon 2021; Callaway & Sant'Anna 2020). Equations 1-4 test the public health rationale, the prevalence of barber's itch, for barber licensure. Equation 5 tests the public choice rationale, as measured by the instances of price increases following licensure, for barber's itch.

3.5 Results and Robustness Checks

In this section we provide our results and robustness checks for testing the public interest theory (subsection 3.5.1) against the public choice theory (subsection 3.5.2) for barber licensure in the Progressive Era.

3.5.1 Testing the Public Interest Hypothesis for Barber Licensure

Figure 4 provides the results of Eq. 1 graphically. We include a lead of two years to account for the potential of a legislative lag in all our specifications.[250] We find no evidence that the enactment of barber licensure was driven by high caseload in the pre-period, nor does the enactment appear to decrease the number of individual cases of barber's itch reported. Our results indicate there may have even been an increase in cases post-period.

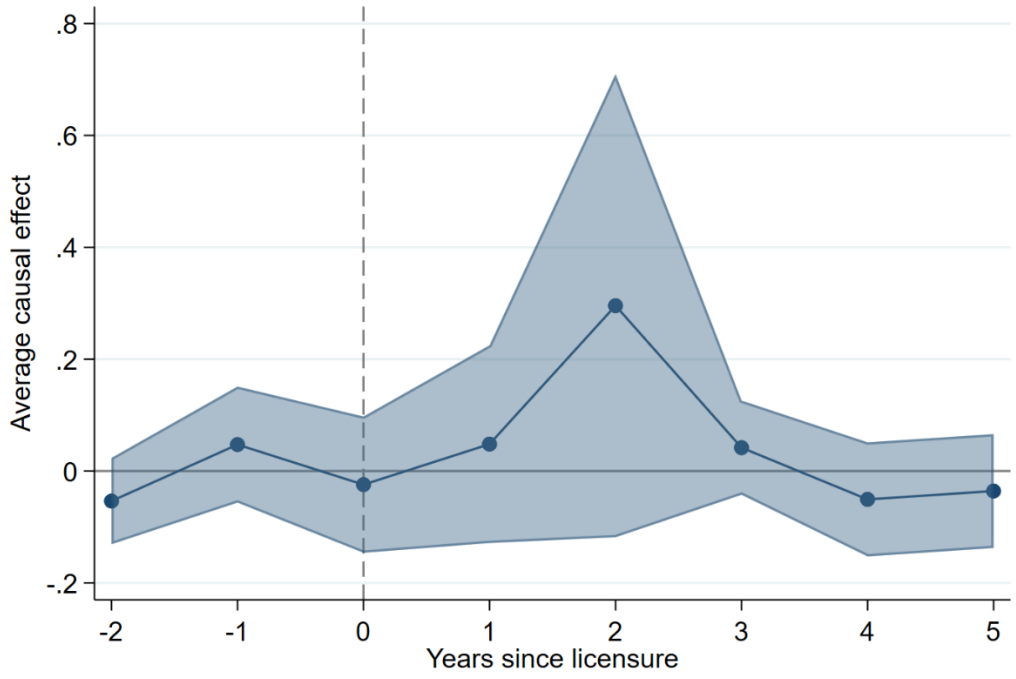

Figure 4: Individual Cases of Barber's Itch per 1,000,000, 1887-1926

[250] We assume that legislation truly driven by the prevalence of barber's itch would have been implemented, at the very least, within two years of a spike in caseloads. The first convention of barbers advocating for licensure in Minnesota, the first state to adopt licensure, started two years prior to its adoption ("No Boodle in This," *The Saint Paul Globe*, Saint Paul, Minnesota, p. 4 (May 20th, 1897)), but their intentions were explicitly to suppress competition, not prevent the spread of disease.

Figure 5 presents the results of Eq. 2. The number of reported barber's itch outbreaks is similar to individual cases. We again find no evidence that barber licensure was pursued during peak caseload.

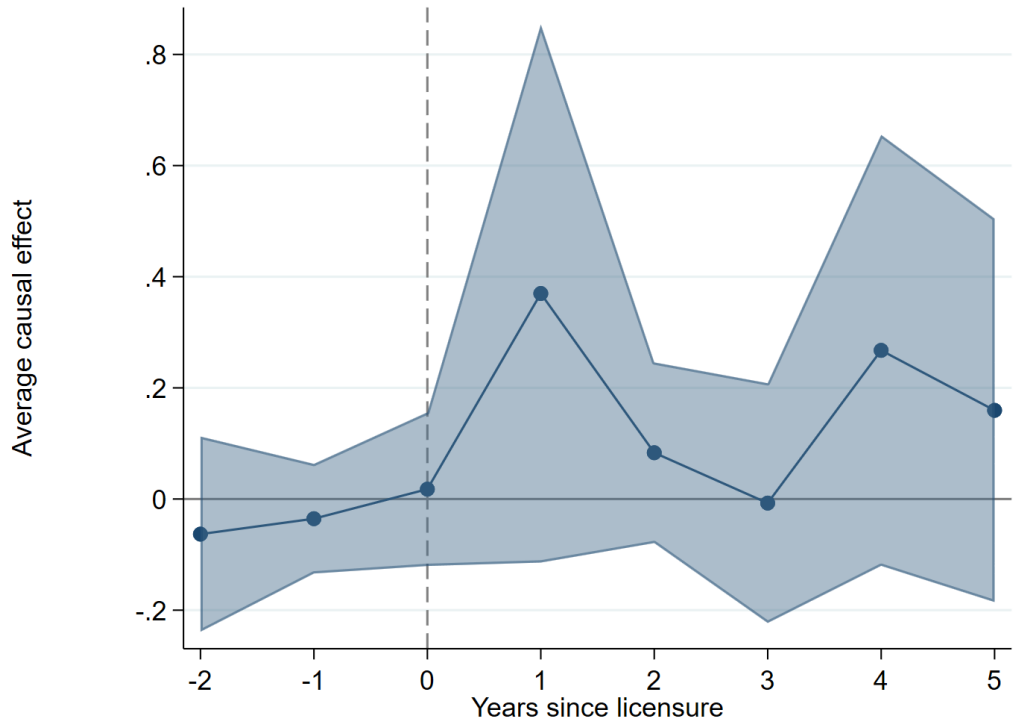

Figure 5: Outbreaks of Barber's Itch per 1,000,000, 1887-1926

Figure 6 shows both individual cases and outbreaks combined (Eq. 3). As mentioned, news of an outbreak rarely included an exact caseload number. We conservatively estimate an outbreak as three cases in our analysis. Again, we find no evidence that total caseload spurred the passage of barber licensing laws. Like the deconstructed measures above, there is evidence that total caseload increased post-licensure. While only weakly statistically significant, we see an increase of about one case per two million people two years after the adoption of licensure ($p = 0.074$).

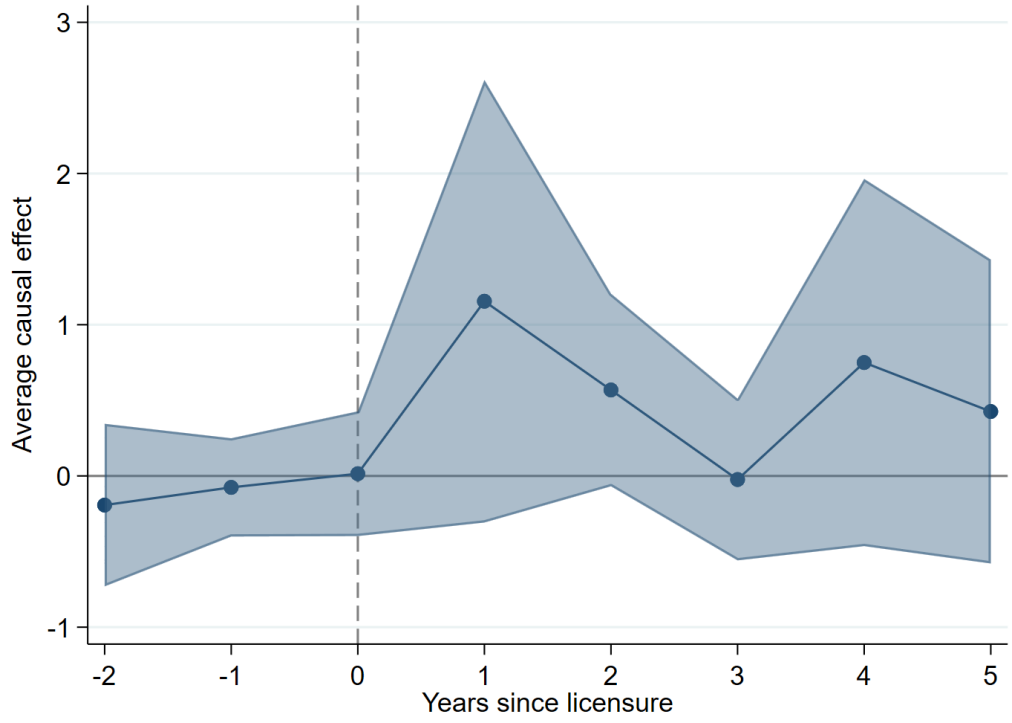

Figure 6: Total Cases of Barber's Itch per 1,000,000, 1887-1926

The respective coefficients from **Figures 4, 5, and 6** can be found in **Table 8**.

Table 8: Individual Cases, Outbreaks, and Total Cases of Barber's Itch, 1887-1926 – Coefficients

	(1) Total Cases	(2) Outbreaks	(3) Individual Cases
$t-2$	-.1926 (.2673)	-.0632 (.0940)	-.0030 (.0107)
$t-1$	-.0755 (.1571)	-.0354 (.0517)	.0308 (.0483)
t	.0148 (.2170)	.0177 (.0742)	-.0384 (.0514)
$t+1$	1.155 (.7376)	.3698 (.2428)	.0458 (.0894)
$t+2$	.5687* (.3418)	.0833 (.0816)	.3188 (.2163)

$t+3$	-.0238	-.0073	-.0018
	(.3189)	(.1005)	(.0631)
$t+4$	.7501	.2675	-.0525
	(.5990)	(.1969)	(.0512)
$t+5$	.4261	.1596	-.0526
	(.5214)	(.1646)	(.0556)
N	1280	1280	1280

mean coefficients; sd in parentheses
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$
Note: Estimates are per 1,000,000 for interpretation.

The results of Eq. 4 are presented in **Figure 7**. While not statistically nonzero, the increase in barber's itch ads one to two years after licensure provides additional supporting evidence for our earlier findings. We also see a weakly statistically significant decrease in the average number of advertisements for barber's itch of 2.4 in the year of licensure *($p = 0.10$).* Interestingly, the advertising trend looks to decrease in the post-period overall, but we see a slight resurgence two years after licensure enactment.

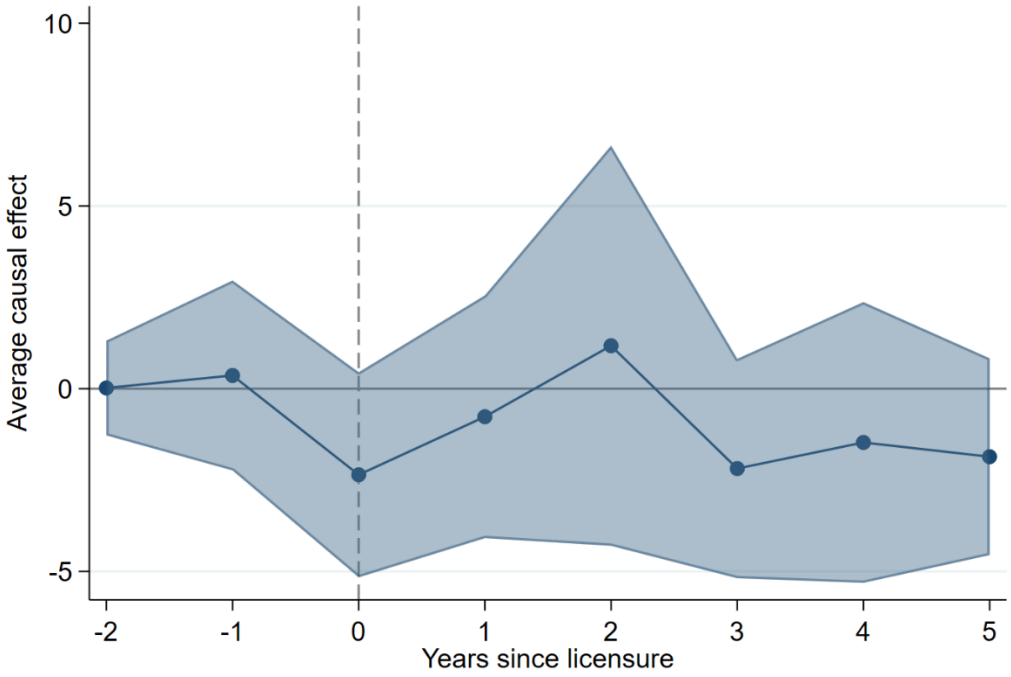

Figure 7: Average Number of Barber Itch Advertisements, 1887-1926

The respective coefficients from **Figure 7** can be found in **Table 9**.

Table 9: Barber Itch Advertisements, 1887-1926 - Coefficients

	BI Ads
$t-2$	.0185
	(.6617)
$t-1$	.3619
	(1.326)
t	-2.357*
	(1.431)
$t+1$	-.7673
	(1.694)
$t+2$	1.175
	(2.793)
$t+3$	-2.186

	(1.531)
$t+4$	-1.472
	(1.960)
$t+5$	-1.862
	(1.374)
N	1280

mean coefficients; sd in parentheses
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

As mentioned previously, we excluded barber itch individual cases and outbreaks that were explicitly noted to have not been transmitted through barbershops. Perhaps these, however, provided additional justification for the adoption of barber licensure. As a robustness check, we ran our regressions including these cases. **Figures 8**, **9**, & **10** provide our results including non-barbershop outbreaks, individual cases, and total cases, respectively.

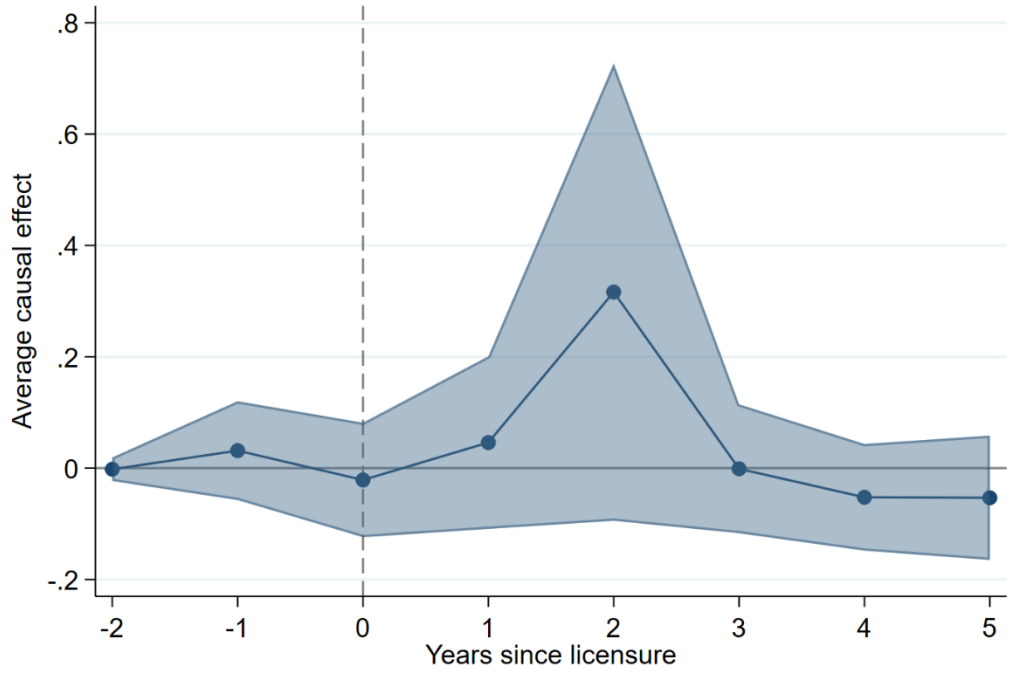

Figure 8: Outbreaks per 1,000,000 Including Non-Barbershop Cases, 1887-1926

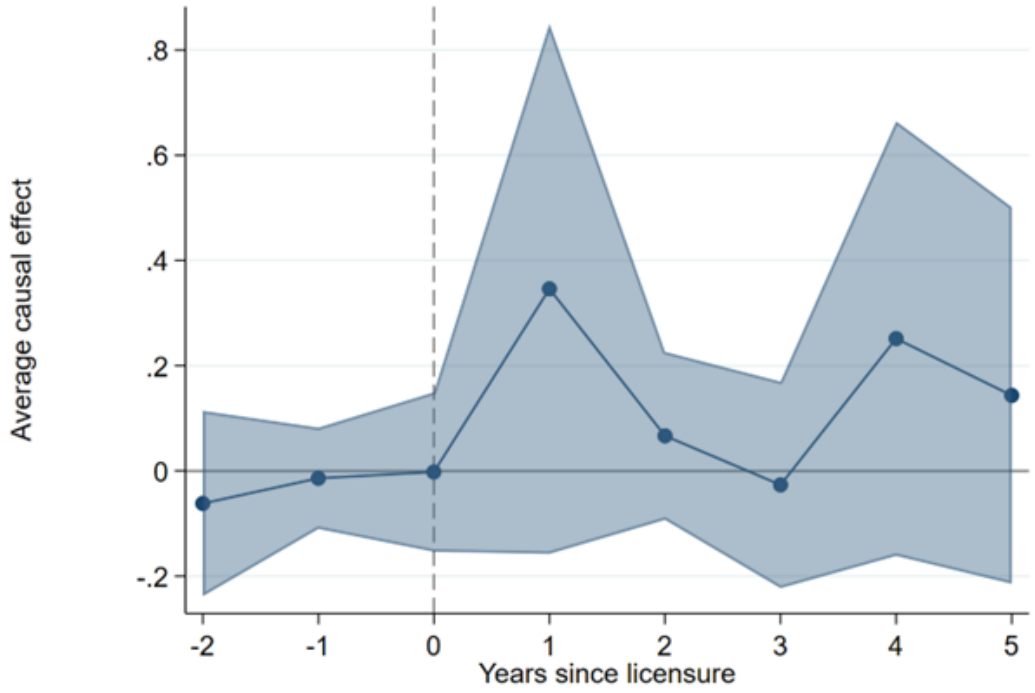

Figure 9: Individual Cases per 1,000,000 Including Non-Barbershop Cases, 1887-1926

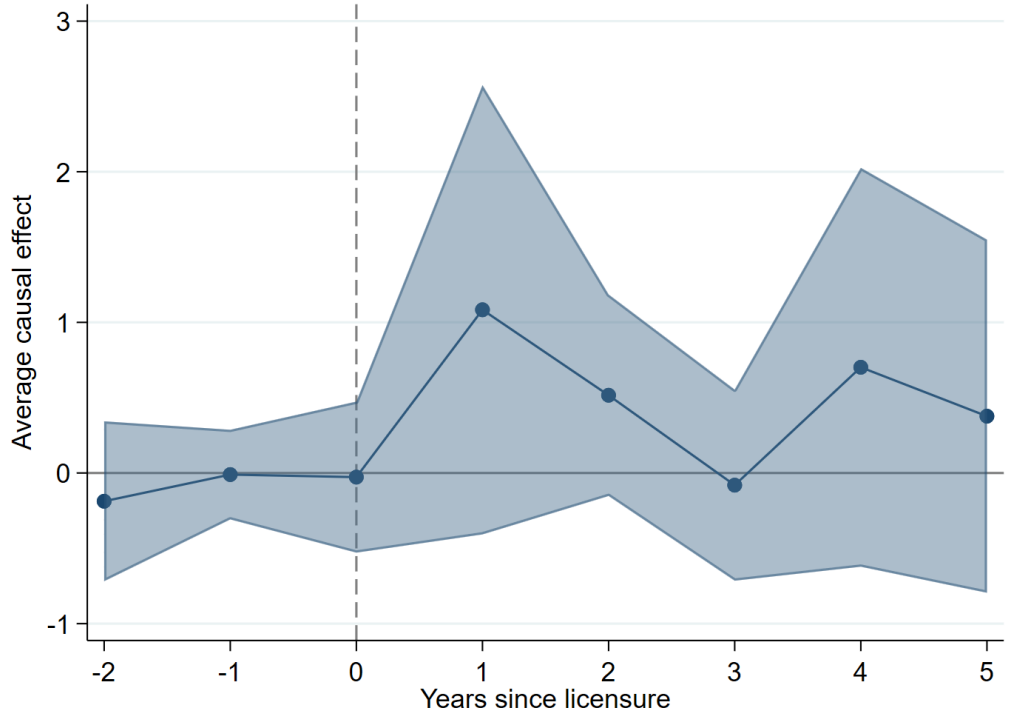

Figure 10: Total Cases per 1,000,000 Including Non-Barbershop Cases, 1887-1926

Coefficients are provided in **Table 10**.

Table 10: Individual Cases, Outbreaks, and Total Cases of Barber's Itch Including Non-Barbershop Cases, 1887-1926 – Coefficients

	(1) Total Cases	(2) Outbreaks	(3) Individual Cases
$t-2$	-.1874	-.0618	-.0020
	(.2536)	(.0898)	(.0108)
$t-1$	-.0104	-.0139	.0315
	(.1465)	(.0490)	(.0453)
t	-.0272	-.0020	-.0212
	(.2263)	(.0772)	(.0525)
$t+1$	1.084	.3460	.0459
	(.7458)	(.2568)	(.0791)
$t+2$	.5163*	.0667	.3162
	(.3060)	(.0814)	(.2096)
$t+3$	-.0806	-.0265	-.0011
	(.3061)	(.1000)	(.0591)
$t+4$	.7020	.2515	-.0524
	(.6138)	(.2106)	(.0489)
$t+5$	.3772	.1435	-.0532
	(.5420)	(.1825)	(.0570)
N	1280	1280	1280

mean coefficients; sd in parentheses
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$
Note: Estimates are per 1,000,000 for interpretation.

Overall, while barber's itch was undoubtedly a troublesome disease for the individuals who contracted it, the data consistently suggests licensure was not adopted during peak caseloads of

barber's itch, even if allowing for a one-to-two-year legislative lag.[251] Barber's itch, in line with the lack of attention paid to it by health agencies focused on communicable diseases, was rare and containable with only 46 small, localized outbreaks in our 32 licensed and non-licensed states over a 39 year period.

The evidence also indicates that the prevalence of barber's itch was not mitigated by the adoption of licensure. Barber licensure failed to achieve its public health objective. As the *Lincoln Nebraska State Journal* observed, "that diseases [barber's itch] has increased rapidly since the board came into existence."[252]

3.5.2 Testing the Public Interest Hypothesis for Barber Licensure

We use the staggered treatment difference-in-difference model in Equation 5 to test the impact of licensure on the instances of price increases in treated states against our control states. **Figure 11** provides the results of Eq. 5 graphically. We see a statistically significant increase in reported barbershop price increases in the year following licensure *($p = 0.021$)*. It is important to note that this is not the running price of a haircut or shave but rather any instance of a reported price increase at a barbershop. Thus, the increase shown in **Figure 11** after the enactment of licensure speaks to a one-time price hike rather than prices returning to normal thereafter.

[251] A search for "Barber's Itch," in Google's Ngram Viewer, which shows the mention of the term primarily in medical books and journals, also provides support for our results, suggesting that the adoption of licensure was not driven by public health concern.

[252] "Barber's Board at it Still," *Lincoln Nebraska State Journal*, Lincoln, Nebraska, p. 3 (July 10th, 1900).

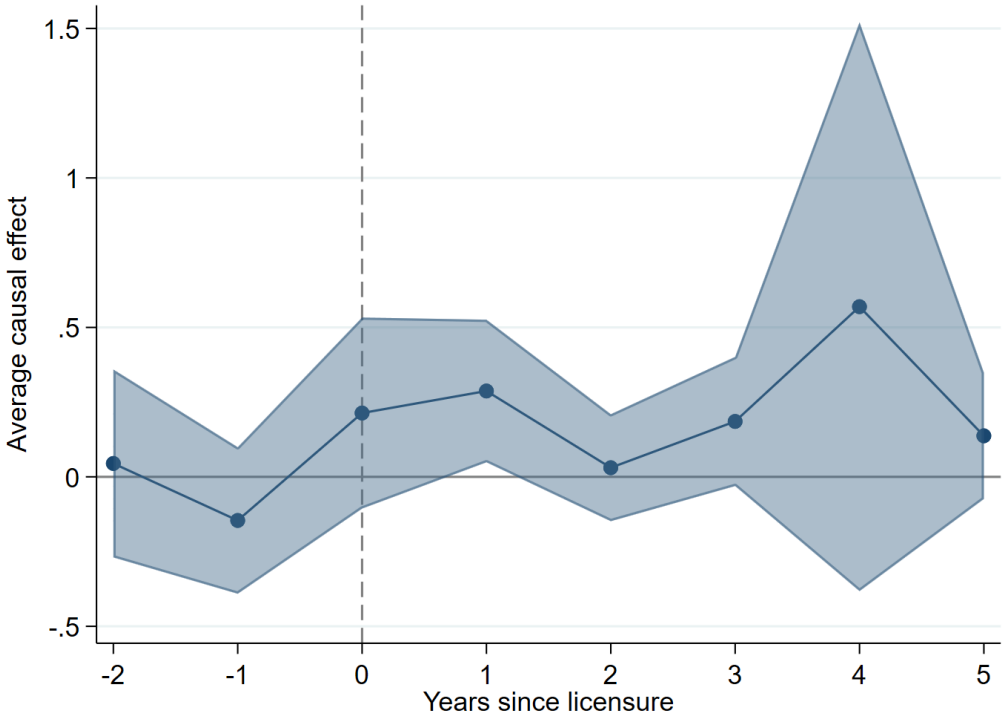

Figure 11: Instances of Price Hikes, 1887-1913

The respective coefficients for Figure 11 can be found in **Table 11.**

Table 11: Price Increases, 1887-1913 – Coefficients

	Price Increases
$t-2$	.0449
	(.1595)
$t-1$	-.1458
	(.1339)
t	.2135
	(.1658)
$t+1$	.2873**
	(.1243)
$t+2$	.0307
	(.0855)
$t+3$	.1855
	(.1194)

$t+4$	.5693
	(.4793)
$t+5$	.1373
	(.1184)
N	810

mean coefficients; sd in parentheses
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Some newspapers also reported the old and new price of haircuts or shaves. Expanding our search to all newspapers in licensing states, to get broader coverage of the magnitude of any price changes after licensure, we compiled the before and after reported prices of barbering services in **Table 12**. We found reported price increases for shaves and/or haircuts, which included the old and new price, in 36 newspapers from 13 different licensing states. We adjusted the prices for inflation, converting them all to 1930 dollars, using the Federal Reserve Bank of Minneapolis' "Consumer Price Index, 1800-".[253] Following licensure, the average price of haircuts from these reports increased 37.97 percent and the average price of shaves increased 50.46 percent.[254]

[253] Available online: https://www.minneapolisfed.org/about-us/monetary-policy/inflation-calculator/consumer-price-index-1800-.

[254] As a robustness check for any localized inflation, we also collected any cost increases from the cover price of reporting newspapers, or the closest newspaper reporting a cover price if not available. Reporting newspaper prices, on average, only increased 2.15% in comparison to a nominal increase in haircuts of 44.44% and shaves 54.9%. Dropping the only two newspapers with a newspaper price increase, the *Los Angeles Times* and the *Herald News*, which only reported a price increase for shaves, increases the average rise in the price of shaves to 55.32%.

Table 12: Reported Price Increases Post Licensure, 1897-1913

Licensing State	Licensing Year	City	Year of Price	Haircut Price		Shave Price		Source
				Old	New	Old	New	
Minnesota	1897	Saint Paul	1899	0.25	0.50	NA	NA	*Saint Paul Globe*
		Minneapolis	1902	NA	NA	0.30	0.39	*Minneapolis Daily Times*
St. Louis, St. Joseph, and Kansas City, Missouri	1899	St. Louis	1901	0.20	0.30	0.10	0.20	*St. Louis Globe-Democrat*
Michigan	1899	Benton Harbor	1901	NA	0.50	NA	0.20	*The Evening News*
		Kalamazoo	1900	0.30	0.50	0.10	0.20	*Detroit Free Press*
Nebraska	1899	Omaha	1903	NA	NA	0.20	0.28	*The Omaha Daily Bee*
California	1901	Los Angeles	1901	NA	NA	0.20	0.30	*Los Angeles Times*
		Sacramento	1902	NA	0.48	0.30	0.39	*The Sacramento Bee*
		Sacramento	1903	0.50	0.65	NA	NA	*The Sacramento Bee*
		St. Helena	1903	NA	NA	0.30	0.46	*Napa Journal*
		San Francisco	1901	NA	NA	0.20	0.30	*San Francisco Chronicle*
		San Francisco	1906	0.50	0.65	0.30	0.46	*The Record Searchlight & The San Francisco Examiner*
Connecticut	1901	Waterbury	1901	0.30	0.50	0.10	0.30	*Waterbury Democrat*
		Hartford	1903	0.40	0.46	NA	NA	*Hartford Courant*
Washington	1901	Seattle	1901	0.50	0.70	NA	NA	*The Seattle Star*
Kentucky	1902	Lexington	1906	NA	NA	0.19	0.28	*Lexington Herald-Leader*
		Louisville	1903	0.19	0.28	0.10	0.19	*The Courier-Journal*
New York [Repealed in 1906]	1903	Manhattan	1903	NA	NA	0.28	0.46	*The Brooklyn Citizen*
		Poughkeepsie	1903	0.33	0.46	NA	$0.05 ir	*Poughkeepsie Eagle-News*
Utah	1903	Ogden	1903	0.46	0.65	NA	NA	*Salt Lake Telegram*
		Salt Lake	1904	0.46	0.65	0.28	0.28	*The Salt Lake Herald*
Wisconsin	1903	Eau Claire	1907	NA	NA	0.19	0.27	*Leader-Telegram*
		Green Bay	1907	NA	NA	0.19	0.27	*Green Bay Press-Gazette*
		Janesville	1907	NA	NA	0.19	0.27	*Green Bay Press-Gazette*
		Kaukauna	1906	NA	NA	0.19	0.28	*The Menasha Record*
		Madison	1906	NA	NA	0.19	0.28	*Wisconsin State Journal*
Colorado	1909	Cripple Creek	1913	0.65	0.85	NA	NA	*The Daily Sentinel*
Illinois	1909	Alton	1913	0.46	0.59	NA	NA	*Alton Evening Telegraph*
		Belleville	1910	NA	NA	0.28	0.45	*The Semi-Weekly Advocate*
		Champaign	1913	0.46	0.59	NA	NA	*The Champaign Daily Gazette*
		Decatur	1912	0.46	0.61	NA	NA	*Herald and Review*
		Lockport	1912	NA	NA	0.19	0.26	*Herald News*
		Morrison	1909	NA	NA	0.19	0.28	*Chicago Tribune*
		Rock Island	1913	0.46	0.59	NA	NA	*The Dispatch*
		Sterling	1909	NA	NA	0.19	0.28	*The Champaign Daily News*
		Sycamore	1912	NA	NA	0.19	0.26	*The Daily Chronicle*
			Average	**0.41**	**0.56**	**0.20**	**0.31**	
			Percentage Increase	**37.97%**		**50.46%**		

3.6 Conclusion

Barber licensure was initially adopted during the Progressive Era under the public interest justification that licensure was necessary to protect the public from barber's itch. We used historical newspapers to compile a unique dataset to test this public health rationale. Our data includes the reported outbreaks of barber's itch, reported individual cases of barber's itch, and advertisements or recipes or cures for barber's itch. Our data enables us to measure both the quality of barbering services, along the public health dimension on which barber licensure was legislated, and observed price increases, circumventing the problems identified above with many existing studies of occupational licensure. Using a staggered treatment difference-in-difference

model, our results fail to support the public interest rationale. Based on our evidence collected from historical newspapers, barber licensure was not adopted in response to high caseloads of the barber's itch. Overall, the small number of barber itch cases and localized outbreaks reported in newspapers across the country also suggest that barber's itch was not a major health threat, in line with the non-consideration that public health boards afforded it.

We also examined the impact that barber licensure had on reported cases and outbreaks of barber's itch. We find a weak, statistically significant increase in barber itch cases following the adoption of licensure, suggesting that barber licensing was also ineffective at achieving its public interest objective.

The ulterior motive for barber licensing, as detailed in historic newspapers, was that barber unions used the public health justification of barber's itch to advocate for licensure to restrict competition from discount barbershops and barber colleges. To test this public choice theory of barber licensure, we created another dataset of reported price increases of barber services in licensing and non-licensing states. Using a staggered treatment difference-in-difference model we find a statistically significant increase in reported barbershop price increases following the adoption of barber licensure. With many newspapers reporting both the new and old prices for barber services, we found that, on average, the price of haircuts increased 37.97 percent and the price of shaves increased 50.46 percent in the five years following licensure.

Our results cast doubt on the public health justification for initial barber licensure and its effectiveness. Rather, we find evidence in support of a public choice theory, that barber unions pursued licensure primarily to restrict competition from discount barbershops and barber college graduates. We find that the price of barbering services increased without an increase in quality,

as measured by the public health justification given for licensure. By providing an example of occupational licensure that was driven by public choice factors from its origins, rather than the more common capture of public interest regulation, our paper provides further evidence in support of the public choice theory of regulation, and, more specifically, the public choice theory of occupational licensure.

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