CAN ROBINSON-PATMAN ENFORCEMENT BE PRO-CONSUMER?

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ABSTRACT

Antitrust agencies are once again interested in the Robinson-Patman Act, a dormant Depression Era statute that prohibits discriminatory wholesale pricing. This paper is the first to empirically study retailer market exit caused by discriminatory pricing—a key concern for the Act's drafters. In doing so, it addresses and refutes the central objection to the Robinson-Patman Act—that the Act protects small retailers at the expense of consumers. The paper employs an economic model to identify three forces that determine consumer welfare effects of discriminatory pricing: heterogeneity in consumer preferences for retailer attributes, wholesaler-retailer bargaining, and retailer exit. The model shows that while chain stores often secure wholesale discounts under discriminatory pricing, this advantage can drive independent stores out of the market, ultimately reducing competition and harming consumers. An empirical analysis of the U.S. liquor sector—currently under FTC investigation—supports these conclusions, showing that discriminatory pricing results in an annual consumer welfare loss of $4.91 per individual, totaling $529 million in a year across the industry. These findings challenge the prevailing arguments in the ongoing legal debate, which often lean toward categorically permitting or prohibiting discriminatory pricing. Instead, this paper recommends a nuanced, case-by-case evaluation of price discrimination, emphasizing the importance of considering the interaction between the three forces.

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INTRODUCTION

More attention is being paid to the Robinson-Patman Act (RPA) now than any point in the past four decades. This Depression-era antitrust statute from 1936, which has been relentlessly criticized for protecting small businesses at the expense of consumers, requires manufacturers and wholesalers to provide same prices to all buyers of like products, unless specific affirmative defenses apply.[1] Consequently, the Act prohibits sellers from offering lower prices to large and sophisticated retailers, effectively banning what is commonly known as "discriminatory" or "differential" wholesale pricing.[2]

The Federal Trade Commission (FTC) is now actively conducting investigations in various industries under the RPA. By January 2023, the FTC had begun investigating Coca-Cola and PepsiCo for potential price discrimination in the soft-drink industry.[3] In March 2023, the FTC launched its second investigation under the RPA, this time targeting the liquor industry—the focus of this paper's empirical study. The investigation is directed at Southern Glazer's Wine and Spirits (SG), the largest alcohol distributor in the United States with approximately $25 billion in revenues and over 7,000 beverage brands distributed.[4] The agency is assessing whether SG has engaged in discriminatory practices by offering preferential prices to major retailers, the largest of which—Total Wine (TW)—has 263 stores across 28 states and generates $6 billion in revenues.[5] In June 2024, *The Wall Street Journal* humorously reported,

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[1] *See infra* Section I.

[2] "Discriminatory pricing," "price discrimination," or "differential pricing" simply refers to the practice of charging different prices to different buyers. This concept does not carry the same connotation as the word "discrimination" does in other areas of the law, such as civil rights and constitutional law, where the term refers to the breach of legal protections for protected classes. Under Section 2(a) of the Robinson-Patman Act, the secondary line of injury necessitates competition between favored and disfavored buyers, and the Act's prohibition of such injury is confined to intermediary markets. As a result, the Act's prohibition does not apply to prices that retailers charge to consumers. For example, senior or student discounts do not violate the Act. *See* discussion *infra* Section I Subsections B and C.

[3] Josh Sisco, *Pepsi, Coke Soda Pricing Targeted in New Federal Probe*, POLITICO (Oct. 1, 2023), https://www.politico.com/news/2023/01/09/pepsi-coke-soda-federal-probe-00077126.

[4] Josh Sisco, *Feds Target Alcohol Pricing in New Antitrust Probe*, POLITICO (Mar. 30, 2023), https://www.politico.com/news/2023/03/30/feds-target-alcohol-pricing-in-new-antitrust-probe-00089676.

[5] Liz Thach, *How Total Wine & More Became the Target U.S. Wine Retailer*, FORBES (Feb. 14, 2024), https://www.forbes.com/sites/lizthach/2024/02/14/how-total-wine--more-became--largest-us-wine-retailer/.

> Dinosaurs roam the earth again, and not merely in the movies. They've been spotted at the Federal Trade Commission, which is excavating ancient bones like the Robinson-Patman Act to harass business as an inflation scapegoat. Our sources say the FTC is preparing to file a complaint against Southern Glazer's Wine and Spirits … for giving big retailers discounts on volume purchases.[6]

The drafters of the Robinson-Patman Act were particularly concerned about the effect of discriminatory pricing on retailer exit, fearing that price discrimination could drive smaller, mom-and-pop shops out of business.[7] In its 1936 report on the Patman Bill, the House Committee on the Judiciary said, "Your committee is of the opinion that the evidence is overwhelming that price discrimination practices exist to such an extent that the survival of independent merchants, manufacturers, and other businesses is seriously imperiled and that remedial legislation is necessary."[8] However, no studies have previously examined whether discriminatory wholesale pricing causes retailers to exit the market, and if so, what the consequences are for consumer welfare. Hence, this paper is the first to empirically study retailer market exit induced by wholesale price discrimination.[9] By finding that discriminatory pricing can indeed harm consumers through retailer market exit, this paper addresses and refutes the central objection to the RPA—that the Act protects small retailers at the expense of consumers.

To see the potential effects of wholesale price discrimination on

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[6] The Editorial Board, *The FTC Brings Back the 1930s*, WALL ST. J. (Jun. 12, 2024), https://www.wsj.com/articles/federal-trade-commission-robinson-patman-act-southern-glazers-lina-khan-ca8c9dbf.

[7] The early 1930s were marked not only by the Great Depression, but also by the rapid growth of chain stores, such as A&P. In response to the rise of these chain stores, a Senate Resolution directed the FTC to study their purchasing practices. This investigation aimed to determine whether volume discounts violated any laws and to recommend any necessary legislation. In December 1934, just before the enactment of the Robinson-Patman Act, the Federal Trade Commission issued its Final Report on the Chain Store Investigation. FED. TRADE COMM'N, ANNUAL REPORT OF THE FEDERAL TRADE COMMISSION FOR THE FISCAL YEAR ENDED JUNE 30 1935, https://www.ftc.gov/sites/default/files/documents/reports_annual/annual-report-1935/ar1935_0.pdf. *See also* RICHARD A. POSNER, THE ROBINSON-PATMAN ACT: FEDERAL REGULATION OF PRICE DIFFERENCES (1976).

[8] EARL W. KINTNER & JOSEPH P. BAUER, FEDERAL ANTITRUST LAW, A TREATISE ON THE ANTITRUST LAWS OF THE UNITED STATES 3183 (Anderson Publications 1989).

[9] These findings depend on the independence conditions between state laws and determinants of demand and supply. Specifically, to establish a causal relationship between state wholesale pricing laws and market outcomes, it is essential that these laws are independent of relevant market primitives and outcomes, such as firm profits. Moreover, empirical conclusions regarding the consumer welfare effects of discriminatory pricing and counterfactual simulations are derived by calibrating the economic model to obtain estimates of supply and demand parameters. *See* Sections IV, V, and IX.

consumer welfare, consider a market where a large chain store competes with several smaller independent stores. Discriminatory pricing allows the chain store to negotiate much lower wholesale prices than those offered under the RPA, which requires uniform wholesale pricing. Now, consider two extreme scenarios. In the first scenario, the market structure remains unchanged when discriminatory pricing is permitted, meaning all existing independent retailers stay in business and competition is preserved. The chain store, benefitting from lower wholesale prices, passes some of these savings onto its customers. Here, price discrimination likely enhances consumer welfare by reducing retail prices. In the second scenario, the smaller independent retailers cannot compete with the chain store's low prices and exit the market, leaving the chain as a monopolist. The chain store then exercises its market power and, despite its lower wholesale costs, ultimately raises retail prices to much higher levels. Here, price discrimination harms consumers. Therefore, the effect of wholesale price discrimination and the RPA on consumer welfare is theoretically ambiguous. Since retailer market exit and wholesale pricing mechanism work in opposite directions, failing to account for market exit can lead to an overestimation of the positive effect of price discrimination on consumer welfare.

In this paper, I study the impact of wholesale price discrimination on consumer welfare by accounting for three key forces: heterogeneous consumer preferences for retailer attributes, wholesaler-retailer bargaining, and retailer market exit. To isolate the effects of these forces, I employ an economic model with a wholesaler, chain and independent stores, and consumers. These entities make decisions in three stages. In the first stage, each retailer determines whether to remain in the market or to exit. These exit decisions then dictate the number of active retailers in subsequent stages, which in turn affects both wholesale and retail prices.[10] The second stage involves the determination of wholesale prices, which depends on the prevailing legal regime. In the third stage, consumers make purchasing decisions and stores set their retail prices.

The first force identified by this model is the variation in consumer preferences for store convenience. For example, shopping at an independent corner store takes much less time than at a large retailer because of the

[10] Decisions about market entry and exit, which determine market structure, are long term commitments due to the significant fixed costs involved. In contrast, pricing decisions are short term and can be easily adjusted. Therefore, retailers are assumed to make their long-term entry and exit decisions before setting their retail prices. This timing assumption is reasonable because stores cannot realistically commit to specific retail prices before deciding on entry and exit, given the ease with which prices can be changed later. *See* discussion *infra* Section II Subsection C.

smaller store size, streamlined layout, quicker checkout process, and more accessible parking. Independent stores capitalize on their convenience by charging higher retail prices. As a result, these stores tend to appeal to price-insensitive consumers who value convenience over cost. When price discrimination is permitted, wholesalers can also take advantage of these retailer attributes by imposing higher wholesale prices on independent stores. This pricing strategy subsequently increases the price disparity between independent and chain stores.

The second force involves bilateral bargaining between the wholesaler and each retailer. This force is only relevant under price discrimination, as the RPA requires uniform wholesale prices. Chain stores typically have greater bargaining leverage and power due to their size, alternative supply options, and skilled negotiation teams, enabling them to negotiate significantly lower wholesale prices than independent stores when price discrimination is permitted.[11]

The third force involves retailer exit, which occurs when a store's profits are insufficient to cover its fixed operational costs. Recall that under price discrimination, chain stores often secure significantly lower wholesale prices, which they often partially pass on to consumers through lower retail prices. If an independent store cannot compete with these lower prices, it is forced to exit the market. Thus, discriminatory pricing may allow large retailers to eliminate their smaller competitors without resorting to predatory pricing, which involves selling goods below cost. The departure of numerous independent stores reduces competition in the retail sector, thereby granting more market power to the remaining stores and allowing them to charge higher retail prices. As a result, even though chain stores benefit from lower wholesale prices under price discrimination, they may still end up charging higher retail prices to consumers.[12]

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[11] Antitrust and industrial organization economics scholars carefully distinguish between "bargaining power" and "bargaining leverage." For a description of these concepts, *see infra* Section II Subsection B. The remainder of the paper adopts this terminology. *See also* C. Scott Hemphill & Nancy L. Rose, *Mergers that Harm Sellers*, 127 YALE L. J. 2078, 2093 (2018); Aviv Nevo, Mergers that Increase Bargaining Leverage, (U.S. Dep't of Justice Deputy Assistant Att'y Gen. for Econ. Antitrust Division, Conference on Antirust in Highly Innovative Industries, 2014), https://www.justice.gov/atr/file/517781/dl.

[12] Economist William Baumol showed that in markets without barriers to entry and exit, the mere threat of potential competitors can keep prices at competitive levels. He introduced the term "contestable markets" to describe this phenomenon. For a detailed explanation, *see* William J. Baumol, *Contestable Markets: An Uprising in the Theory of Industry Structure*, 72 AM. ECON. REV. 1 (1982). In contrast, markets susceptible to price discrimination may not be "contestable" due to the fixed costs that independent stores face, creating barriers to entry. When chain stores raise prices, reentry by competitors might not

I corroborate the predictions of this model by empirically studying the welfare effects of price discrimination and its prohibition in the U.S. liquor industry. This industry provides an optimal setting for such a study, as price discrimination in liquor wholesale is banned in some states but permitted in others. The external variation in these bans arises from differences in state laws. Drawing their legislative power from the Twenty-First Amendment to the U.S. Constitution, which leaves the regulation of alcoholic beverages to state governments, some states require that liquor wholesalers provide uniform prices to retailers, while others do not regulate wholesale pricing.[13] As federal agencies have not enforced the RPA for the past four decades, the absence of state regulation has effectively allowed liquor wholesalers in some states to charge different prices to each retailer. The prevalence of volume discounts in states without mandated uniform wholesale prices underscores the significance of price discrimination in the U.S. liquor industry.[14] Volume discounts, an example of price discrimination, allow

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occur because the chain may lower prices below the new entrant's costs if reentry is attempted.

[13] The second section of the Twenty-First Amendment is as follows: "The transportation or importation into any State, Territory, or possession of the United States for delivery or use therein of intoxicating liquors, in violation of the laws thereof, is hereby prohibited." U.S. Const. amend. XXI, § 2. Uniform wholesale pricing is established by state statues. However, states allowing discriminatory pricing do so through inaction, as federal agencies have not challenged these pricing practices for the past four decades. It remains untested in courts whether the absence of state statutes under the Twenty-First Amendment effectively shields wholesale price discrimination from federal antitrust challenges.

[14] This information is public because some states, such as Massachusetts and New Jersey, require wholesalers to post their pricing schedules. *See* discussion *infra* Section IV Subsection B. In those states that do not impose any restrictions on wholesale pricing, the characteristics of the industry suggest that retailers also negotiate individualized prices. For instance, according to the Total Wine website, "[Total Wine's] tremendous buying power and special relationships with producers, importers and wholesalers bring [the company] considerable savings, which [they] pass on to [their] customers." *Our Company*, TOTAL WINE, https://www.totalwine.com/about-us/our-company (last visited Apr. 30, 2024). Furthermore, the two largest distributors, Southern Glazer's and RNDC are reported to have special teams to service National Accounts—retailers with numerous locations throughout the country. *See* Complaint at 24, Provi v. Southern Glazer's Wine & Spirits (N.D. Ill. 2022) (No. 22 Civ. 1648), https://www.provi.com/hubfs/Provipercent20percent20Filedpercent20Complaint.pdf. As these negotiations are confidential, public information about their terms do not exist. Furthermore, evidence from the industry quoted in the main text indicates that preferential pricing comes in the form of reduced marginal costs rather than transfers. Similarly, in other product markets, cases report that big retailers receive individualized prices. For instance, in *L.A. International Corp. v. Prestige Consumer Healthcare, Inc.*, plaintiff distributors alleged that Costco received reduced prices from the manufacturer of Clear Eyes eye drops. L.A. International Corp. v. Prestige Brands Holdings Inc., 2:17-cv-06809

wholesalers to offer lower per-unit prices to large retailers who buy in bulk. For example, during the period of this study, the wholesale price for a case of Absolut vodka in Massachusetts, a state without uniform pricing regulations, was around $246. However, retailers purchasing 25 cases or more received a discount of about $90 per case, equivalently a 36.5 percent reduction.[15]

Four stylized facts emerge from the empirical study. First, states that effectively permit discriminatory pricing have approximately half as many stores as those that ban this pricing practice. Second, the average retail price of liquor at independent stores in states that permit price discrimination is $3.49 higher per bottle than in states that ban this practice. Given that the average price of a bottle of liquor is approximately $35, this represents a 10 percent price difference across legal regimes. Third, the average price of liquor at chain stores in states that allow price discrimination is $2.56 lower per bottle than in states that ban this practice. Fourth, the market share of independent stores in states that allow price discrimination is approximately 20 percentage points lower than in states that ban it.

Using these market characteristics, I calibrate the theory model to quantify the impact of price discrimination on consumer welfare in the U.S. liquor industry.[16] I find that price discrimination leads to an annual consumer welfare loss of $4.91 per individual, which amounts to an annual loss of $529 million in consumer welfare within the affected geographic markets. Notably, the effect of price discrimination on consumer welfare is closely related to the market features. For example, my counterfactual analyses suggest that if independent retailers had greater bargaining power in the liquor industry, discriminatory pricing could have enhanced consumer welfare.

The alleged wholesale price discrimination in these markets is important in and of itself, because the FTC is currently investigating a major liquor wholesaler for potential violations of the RPA. At the time of writing this article, the FTC was awaiting data from a major retailer, necessary to initiate litigation. This process may be protracted, because the retailer recently contested the agency's investigative authority, leading the FTC to sue the company for failing to comply with its civil investigative demand.[17]

(C.D. Cal. 2024). In *U.S. Wholesale Outlet & Distrb. v. Innovation Ventures*, family-owned wholesalers charged the manufacturer of 5-Hour Energy with providing rebates and discounts to Costco in violation of the RPA.U.S. Wholesale Outlet & Distrb. v. Innovation Ventures, LLC, 74 F.4th 960 (9th Cir. 2023).

[15] MASSACHUSETTS BEVERAGE BUSINESS BOOKLET MARCH 2024 207.

[16] Throughout the Article, liquor and spirit are used interchangeably.

[17] Press Release, Fed. Trade Comm'n, FTC Takes Total Wine to Federal Court to Enforce Compliance with Antitrust Civil Investigative Demand, (Oct. 20, 2023),

As the empirical study of this paper presents insights into wholesale and retail liquor markets, it relates to the FTC's ongoing case.

Despite the FTC's recent efforts to revive the RPA, legal scholars are divided on the issue. Critics of the RPA contend that price discrimination, which allows large chain stores to negotiate lower wholesale prices, ultimately benefits consumers through partial savings passed on to them. According to this viewpoint, the only parties harmed by discriminatory pricing are those retailers who cannot compete at these reduced costs.[18] As a result, the RPA is seen as protecting small businesses at the expense of consumers. For example, Robert Bork believed that economics did not support the RPA, saying, "If the new economics is right, there is never a case in which price discrimination injures competition."[19] Herbert Hovenkamp noted that "harm to competition [from discriminatory pricing] would be highly exceptional," and said, "[t]his author, like many others, would prefer to see the Robinson Patman Act repealed."[20] Timothy Muris, former Chair of the FTC, wrote in *The Wall Street Journal*, "the enforcement of Robinson-Patman raised costs and otherwise hurt the low-

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https://www.ftc.gov/news-events/news/press-releases/2023/10/ftc-takes-total-wine-federal-court-enforce-compliance-antitrust-civil-investigative-demand; Alva C. Mather, Lesli Esposito & Marisa Poncia, *Total Wine Tests the Boundaries of FTC CIDs*, ALCOHOL LAW ADVISOR (Dec. 7, 2023), https://www.alcohollawadvisor.com/2023/12/total-wine-tests-the-boundaries-of-ftc-cids/.

[18] 14 PHILLIP AREEDA & HERBERT HOVENKAMP, ANTITRUST LAW: AN ANALYSIS OF ANTITRUST PRINCIPLES AND THEIR APPLICATION §23b, at 12 (3d ed. 2012) ("Clearly, the class targeted for protection was not consumers, who benefitted from the chains' success; rather, the class comprised the various small businesses and intermediaries who lost market share, profits, or in some case their entire business as a result of more efficient distribution methods."). *See also* Tom Hebert, *FTC Should Leave Robinson-Patman In the Great Depression*, REALCLEARMARKETS (Jun. 27, 2024), https://www.realclearmarkets.com/articles/2024/06/27/ftc_should_leave_robinson-patman_in_the_great_depression_1040454.html.

[19] Tamar Levin, *Business and Law Antitrust Ideas: 3 Problems*, N.Y. TIMES (Mar. 9, 1983), https://www.nytimes.com/1983/03/08/business/business-and-the-law-antitrust-ideas-3-problems.html.

[20] Herbert Hovenkamp, *The Robinson-Patman Act and Competition: Unfinished Business*, 68 ANTITRUST L. J. 125, 126-143 (2000). For other academics who called for the repeal of the Act, *see* Roger D. Blair & Christina DePasquale, *"Antitrust's Least Glorious Hour": The Robinson-Patman Act*, 57 J. L. & ECON. S201, S214 (2014); Kenneth G. Elzinga & Thomas F. Hogarty, *Utah Pie and the Consequences of Robinson-Patman*, 21 J. L. & ECON. 427, 434 (1978). For academics who deemed the Act protectionist, *see* DENNIS W. CARLTON & JEFFREY M. PERLOFF, MODERN INDUSTRIAL ORGANIZATION 675 (4th ed. 2005); Daniel Sokol, *Analyzing Robinson-Patman*, 83 GEO. WASH. L. REV. 2064, 2066 (2015); Edward H. Levi, *The Robinson-Patman Act—Is It in the Public Interest?*, 1 ABA ANTITRUST SECTION 60 (1962).

priced chains that were its intended targets, harming consumers."[21] Terry Calvani and Gilde Breidenbach stated, "It is quite clear that the underlying predicate of the Robinson-Patman Act was not consumer welfare. Rather, the Act is protectionist legislation."[22] As Andrew Gavil, William Kovacic, and Jonathan Baker highlighted, "no U.S. antitrust statute has been subjected to as much harsh criticism and repeated calls for reform or repeal as the Robinson-Patman Act."[23]

Conversely, some scholars advocate for a ban on discriminatory pricing. For instance, Mark Glick, David Mangum and Lara Swensen defended the Act's protection of small businesses from the buyer power of large firms, opposing efforts to limit the Act's scope.[24] Erik Peinert and Katherine Van Dyck attributed the weakening of the RPA to the consumer welfare standard.[25] They argued that the consumer welfare standard focused too narrowly on reducing wholesale prices, thereby overlooking the threat posed by powerful buyers.[26]

Few scholars take the middle ground. For example, John Kirkwood acknowledged the Act's shortcomings while calling for its reform.[27] Tim Wu stated, "if lower prices is to be the goal of antitrust laws writ large, the [RPA] is counterproductive in all but very rare cases," but "[a] strong Robinson-Patman Act might also […] help regional economies" and Congress can choose to favor localism over efficiency.[28]

The findings of this paper challenge the prevailing views on both sides of the current scholarly debate. By showing that price discrimination can

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[21] Timothy J. Muris, *Lina Khan and the FTC Go Back to the Antitrust Future,* WALL ST. J. (Jan 30. 2023), https://www.wsj.com/articles/lina-khan-goes-back-to-the-antitrust-future-consumer-benefit-economy-courts-precedent-company-merger-acquisition-11675089139.

[22] Terry Calvani & Gilde Breidenbach, *An Introduction to the Robinson-Patman Act and Its Enforcement by the Government*, 59 ANTITRUST L.J. 765, 770 (1991).

[23] ANDREW I. GAVIL ET AL., ANTITRUST LAW IN PERSPECTIVE: CASES, CONCEPTS AND PROBLEMS IN COMPETITION 1082 (2017).

[24] Mark A. Glick et al., *Towards a More Reasoned Application of the Robinson-Patman Act: A Holistic View Incorporating Principles of Law and Economics in Light of Congressional Intent*, 60 ANTITRUST BULL. 279 (2015).

[25] Erik Peinert & Katherine Van Dyck, *The Needless Desertion of Robinson-Patman*, PROMARKET (Oct. 10, 2022), https://www.promarket.org/2022/10/10/the-needless-desertion-of-robinson-patman/.

[26] *Id.*

[27] John Kirkwood*, Reforming the Robinson-Patman Act to Serve Consumers and Control Powerful Buyers,* 60 ANTITRUST BULL. 358 (2015).

[28] TIM WU, THE CURSE OF BIGNESS: ANTITRUST IN THE GILDED AGE (SUPPLEMENT) 18-19 (2018) ("The real question is whether Congress is allowed to make that choice: to favor localism over efficiency… [T]he idea that Congress doesn't get to choose is profoundly anti-democratic.")

reduce consumer welfare, this paper demonstrates that economic analysis can indeed justify a Robinson-Patman enforcement action. Furthermore, by showing that the consumer welfare effects vary with market structure, this paper argues against either uniformly banning or universally approving price discrimination. Instead, courts and agencies should assess price discrimination on a case-by-case basis, evaluating the effects and interaction of the three forces identified in this paper's theory model.

Overall, this paper contributes to the law and economics literature on intermediate market price discrimination, which has found the welfare effects of this pricing practice to be ambiguous, by addressing a previously unexplored area: endogenous retailer market exit due to discriminatory pricing.[29] Given the absence of definitive conclusions in the theory

[29] Michael Katz examines price discrimination in a market where the chain store can vertically integrate backward into supply of the input, but where bargaining or retailer exit does not exist. Michael Katz, *The Welfare Effects of Third-Degree Price Discrimination*, 77 AM. ECON. REV. 154 (1987). He concludes that price discrimination reduces welfare when a retailer does not integrate backward. Paul Dobson and Roman Inderst warn against the "waterbed effect"—whereby better terms for more powerful buyers worsen the supply terms for less powerful buyers and harm consumers if they lessen downstream competition. Paul W. Dobson & Roman Inderst, *The Waterbed Effect: Where Buying and Selling Power Come Together*, 2 WIS. L. REV. 332 (2008). In the accompanying paper, Roman Inderst and Tommaso Valletti study the conditions under which the asymmetric exercise of buyer power raises other buyers' wholesale prices through the "waterbed effect." Similar to other studies in the literature, this model treats the number of firms controlled by the large buyer as an exogenous market attribute. Roman Inderst & Tommaso M. Valletti, *Buyer Power and the "Waterbed Effect"*, 59 J. INDUS. ECON. 1 (2011). Furthermore, Paul Dobson and Michael Waterson consider the effect of increased retail concentration on countervailing power within the negotiations between manufacturers and retailers. They find that final prices fall following an exogenous reduction in the number of retailers only when retailer services are close substitutes. Paul W. Dobson & Michael Waterson, *Countervailing Power and Consumer Prices*, 107 ECON. J. 418 (1997). Thomas von Ungern-Sternberg uses the Nash bargaining concept to study countervailing power and finds that an exogenous decrease in the number of firms increases consumer prices if retailers compete in quantities, but decreases prices if the retailers are perfectly competitive. Thomas von Ungern-Sternberg, *Countervailing Power Revisited*, 14 INT'L J. INDUS. ORG. 507 (1996). Conversely, Daniel O'Brien and Greg Shaffer argue that prohibiting price discrimination leads to higher wholesale prices for all retailers and unambiguously reduces welfare. Daniel P. O'Brien & Greg Shaffer, *The Welfare Effects of Forbidding Discriminatory Discounts: A Secondary Line Analysis of Robinson-Patman Act*, 10 J. L., ECON. & ORG. 297 (1994). While Patrick DeGraba shows that long-run welfare can be lower under price discrimination because downstream producers may select production technologies with higher marginal cost, Roman Inderst and Tommaso Valletti conclude that price discrimination could ultimately benefit consumers in the long run by incentivizing downstream firms to invest and innovate. Daniel P. Patrick DeGraba, *Input Market Price Discrimination and the Choice of Technology*, 80 AM. ECON. REV. 1246 (1990); Roman Inderst & Tommaso Valletti, *Price Discrimination in Input Markets*, 40 RAND J. ECON 1

literature, empirical studies have assumed increased significance. This paper further adds to the few empirical studies on wholesale price discrimination. Unlike other studies that primarily rely on simulations of uniform pricing due to the rarity of settings where wholesale price discrimination is prohibited, this paper uses a unique industry where price discrimination is banned in some, but not all, comparable geographic markets.[30]

(2009). Yoshihiro Yoshida finds that input-market price discrimination could either decrease or increase the total output of the final good and welfare, noting that an increase in the total output of the final good under price discrimination is a sufficient condition for welfare deterioration under this regime. Yoshihiro Yoshida, *Third-Degree Price Discrimination in Input Markets: Output and Welfare*, 90 AM. ECON. REV. 240 (2000). This result is in stark contrast with the findings of the literature on final good markets.

There exists a separate and earlier literature on price discrimination in final good markets. In this literature, there are three degrees of price discrimination. First degree price discrimination is perfect price discrimination. "This occurs, for instance, when consumers have unit demands and the producer knows exactly each consumer's reservation price ... It then suffices for the producer to charge an individualized price equal to the consumer's reservation price." JEAN TIROLE, THE THEORY OF INDUSTRIAL ORGANIZATION 135 (1988). Under this regime, consumers have zero surplus, as the producer captures the entire consumer surplus. When the producer has incomplete information about individual preferences, a producer "may imperfectly extract consumer surplus through self-selection devices." *Id.* at 135. This is referred to as second-degree price discrimination. The consumer welfare effect of second-degree price discrimination is ambiguous. *Id.* at 149. If a producer observes "some signal that is related to the consumer's preferences (e.g. age, occupation, location) and uses this signal to price discriminate, this is termed third degree price discrimination." *Id.* at 149. Third-degree price discrimination adversely affects consumers in low elasticity markets, whereas it benefits consumers in high elasticity markets. *Id.* at 137-138. In a simple monopoly with direct sales to consumers where all markets are served under uniform pricing, third-degree price discrimination decreases welfare unless output increases. *See* Richard Schmalensee, *Output and Welfare Implications of Monopolistic Third-Degree Price Discrimination*, 71 AM. ECON. REV. 242 (1981); Hal R. Varian, *Price Discrimination and Social Welfare,* 75 AM. ECON. REV. 870 (1985); Hal R. Varian*, Revealed Preference and Its Applications*, 122 ECON J. 332 (2012). As Michael Katz highlights, "[M]odels of final good markets are inappropriate for the analysis of intermediate good markets" because "in an intermediate good market, unlike a typical final good market, the buyers' demands for the product are interdependent." Michael Katz, *The Welfare Effects of Third-Degree Price Discrimination*, 77 AM. ECON. REV. 154, 155 (1987).

[30] At the frontier of empirical research are two studies: those by Sofia Villas-Boas and Matt Grennan, who use structural demand and supply models to simulate the effects of a ban on discriminatory wholesale pricing. Villas-Boas finds that a hypothetical ban on price discrimination would improve welfare in the German coffee retail market, while Grennan concludes that uniform pricing would adversely affect hospitals in the medical device market. *See* Sofia Berto Villas-Boas, *An Empirical Investigation of the Welfare Effects of Banning Wholesale Price Discrimination*, 40 RAND J. ECON 20 (2009) (Villas-Boas simulates the effects of uniform wholesale price legislation in German retail market for

This Article proceeds in seven parts. Section II presents a brief history of the Robinson-Patman Act and describes its doctrinal elements, relevant caselaw and enforcement actions. Section III explains the economic model. Section IV presents the forces shaping wholesale and retail prices and their effects on consumer welfare. This section also examines the interaction between these forces in legal regimes where price discrimination is either permitted or prohibited. Section V presents the empirical study of the U.S. liquor industry, summarizing the role of the Twenty-First Amendment to the Constitution and the specific characteristics of the U.S. liquor markets. Additionally, this section quantifies the effect of price discrimination on retail prices, market exit, and consumer welfare. Section VI presents the recommended policy framework and illustrates its application through counterfactual analyses in the U.S. liquor industry. Section VII concludes.

I. THE ROBINSON-PATMAN ACT

A. *History*

Two key economic developments in the late 1920s and early 1930s prompted the enactment of the RPA. First, the Great Depression led to widespread foreclosures on homes and businesses, along with an unemployment rate of around 25 percent.[31] Second, chain stores began to dominate the U.S. retail sector. A notable example is the Great Atlantic and Pacific Tea Company (A&P), which by 1930 operated nearly 16,000 stores and offered a variety of products, including meat and dairy. A&P further intensified competition by securing goods at significantly lower wholesale prices and by receiving brokerage and advertising allowances unavailable to smaller stores.[32] A Congressional investigation revealed that prior to 1935, A&P received discounts totaling $6 million per year.[33]

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coffee, and estimates that banning price discrimination has positive welfare effects in the market. She notes that the estimated positive effect diminishes with lower downstream cost differences or reduced competition in the market.); Matthew Grennan, *Price Discrimination and Bargaining: Empirical Evidence from Medical Devices*, 103 AM. ECON. REV. 145 (2013) (Grennan studies price discrimination and negotiation in a medical device market, and finds that more uniform pricing harms buyer hospitals by softening competition due to the bargaining effect).

[31] *Great Depression Facts*, FRANKLIN D. ROOSEVELT PRESIDENTIAL LIBRARY AND MUSEUM, https://www.fdrlibrary.org/great-depression-facts.

[32] MARC LEVINSON, THE GREAT A&P AND THE STRUGGLE FOR SMALL BUSINESS IN AMERICA (2012). *See also How the A&P Changed the Way We Shop,* NPR (Aug. 23, 2011), https://www.npr.org/2011/08/23/139761274/how-the-a-p-changed-the-way-we-shop; POSNER, *supra* note 7, at 26.

[33] Everette MacIntyre, *The Role of the Robinson-Patman Act in the Antitrust Scheme*

Three legal developments compounded these economic changes and heightened the pressure on federal and state governments to regulate chain stores.[34] First, courts did not recognize price discrimination as a violation of the Sherman Act of 1890.[35] For example, even though it was alleged that railroads provided secret discounts and rebates to Standard Oil Trust, the Supreme Court's 1911 decision did not address these acts of price discrimination.[36] Second, the original Clayton Act did not sufficiently deal with price concessions to large retailers. Although Section 2 of the Act, prior to being amended by the Robinson-Patman Act, prohibited price discrimination when the effect might be to substantially lessen competition, courts interpreted the statute to provide a blanket exemption for volume discounts.[37] Third, earlier attempts to curb price discrimination and control

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of Things–The Perspective of Congress, 17 SECTION OF ANTITRUST L. 325, 333 (1960).

[34] States responded by enacting anti-chain store laws. By 1939, twenty-seven states had imposed taxes on chain stores. *See* JOSEPH CORNWALL PALAMOUNTAIN JR., THE POLITICS OF DISTRIBUTION 162 (1955). *See also* Paul Ingram & Hayagreeva Rao, *Store Wars: The Enactment and Repeal of Anti-Chain Store Legislation in America*, 110 AM. J. SOCIO JOURNAL OF SOCIOLOGY 446 (2004).

[35] POSNER, *supra* note 7, at 22.

[36] United States v. Standard Oil. Co., 173 Fed 177, 193 (Cir. Ct. E.D. Mo. 1909) ("[The United States alleges in its bill] that at various times between 1870 and the date of the filing of the bill the defendants (1) secured from common carriers preferential rates and rebates.");

> The Supreme Court in the Standard Oil case did not discuss either area price discrimination or rebates as specific illegal acts by the Standard Oil Trust. Although both practices were alleged in the government's complaint and the subject of evidence at trial, neither the trial court nor the Supreme Court found it necessary to decide whether Standard Oil had committed either practice or, if it had, what the legal significance of the practices was. The illegality of the trust was determined on different grounds.

POSNER, *supra* note 7, at 22.

[37] Originally, the statute reads:

> That it shall be unlawful for any person engaged in commerce, in the course of such commerce, either directly or indirectly, to discriminate in price between different purchasers of commodities, which commodities are sold for use, consumption, or resale within the United States or any Territory thereof or the District of Columbia or any insular possession or other place under the jurisdiction of the United States, where the effect of such discrimination may be to substantially lessen competition or tend to create a monopoly in any line of commerce: Provided, That nothing herein contained shall prevent discrimination in price between purchasers of commodities on account of differences in the grade, quality, or quantity of the commodity sold, or that makes only due allowance for differences in the cost of selling or transportation, or discrimination in price in the same or different communities made in good faith to meet competition: And provided further, That nothing herein contained shall prevent persons engaged in

the power of chain stores through legislation failed. For example, Codes of Fair Competition, which were established pursuant to the National Industrial Recovery Act of 1933 (NIRA), required manufacturers in some industries to adhere to minimum wholesale discounts and prohibited price discrimination in other sectors.[38] However, these regulations became ineffective when the Supreme Court held the NIRA unconstitutional in 1935 with *Schechter Poultry Corp. v. United States*.[39] As a result, amidst growing public demand for the protection of small retailers from large chains, Congress passed the Robinson-Patman Act in 1936.

B. *Statute*

Section 2(a) of the RPA bans price discrimination when this pricing practice reduces competition. The statute states,[40]

> It shall be unlawful for any person engaged in commerce, in the course of such commerce, either directly or indirectly, to discriminate in price between different purchasers of commodities of like grade and quality, …, where the effect of such discrimination may be substantially to lessen competition or tend to create a monopoly … or to injure, destroy, or prevent competition with any person who either grants or knowingly receives the benefit of such discrimination.

Earl Kintner, former Chair of the FTC, summarized the jurisdictional requirements of the statute in the following way:

> In order to bring the substantive portions of the Act into play, there must be (1) two or more consummated sales, (2) reasonably close in point of time, (3) of commodities, (4) of like grade and quality, (5) with a difference in price, (6) by the same seller, (7) to two or more different purchasers, (8) for use, consumption, or resale within the United States or any territory thereof, (9) which may result in competitive injury. Furthermore, (10) the commerce requirement must be satisfied.[41]

> selling goods, wares, or merchandise in commerce from selling their own customers in bona fide transactions and not in restraint of trade.

38 Stat. 730. However, courts construed the section as permitting volume discounts. Goodyear Tire & Rubber Co. v. F.T.C., 101 F.2d 620 (6th Cir. 1939).

[38] *National Industrial Recovery Act of 1933,* Pub. L. No-73-67, 48 Stat. 195 (1933). *See also* Terry Calvani & Gilde Breidenbach, *An Introduction to the Robinson-Patman Act and Its Enforcement by the Government*, 59 ANTITRUST L.J. 765, 769 (1991).

[39] Schechter Poultry Corp. v. United States, 295 U.S. 495 (1935). *See also* Terry Calvani & Gilde Breidenbach, *An Introduction to the Robinson-Patman Act and Its Enforcement by the Government*, 59 ANTITRUST L.J. 765, 769 (1991).

[40] 15 U.S.C. § 13(a) (2018).

[41] International Tel. & Tel. Corp., 104 F.T.C. 280, 417 (1984) (quoting E. KINTNER, A ROBINSON-PATMAN PRIMER 35 (2d ed. 1979)). The first element stipulates that the Act

The main goal of the statute is to prevent sellers from charging different prices to buyers for the same product when such price difference harms competition. Courts have interpreted this statute to address practices that not only pose actual harm to competition but also present a "reasonable possibility" of negative competitive effects.[42] Whether realized or imminent, the harm must be substantial.

Competitive injury under the statute can occur in two ways.[43] The first is the "primary line of injury," which involves harm to competition within the seller's own market. A typical example is predatory pricing, where a seller sets prices below cost to eliminate competitors from the market.[44] In the landmark case of *Brooke Group v. Brown & Williamson Tobacco*, the Supreme Court held that "primary line of competitive injury under the Robinson-Patman Act is of the same general character as the injury inflicted by predatory pricing schemes actionable under Section 2 of the Sherman Act."[45] The Court also established a two-pronged test for proving such injury: the plaintiff, typically a competing retailer unable to match the defendant's low prices, must demonstrate that (1) the defendant's prices were below cost, and (2) that the defendant "had a reasonable prospect …

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does not apply to most leases, offers to sell, or licenses. The second element, whether sales are reasonably contemporaneous, is a question of fact that depends on market conditions. The third element highlights that the statute does not apply to sales of services or intangible property. The fourth element is met if the sale is of tangible goods that have same physical attributes. In *FTC v. Borden*, the Supreme Court held that "mere differences in brand or design, unaccompanied by genuine physical, chemical, or market distinction, are insufficient to negate a finding of 'like grade and quality' under 2(a)." F.T.C. v. Borden Co., 383 U.S. 637 (1966). In order to determine whether there is an actual difference in prices, courts compare net prices charged to each buyer after deducting all discounts, rebates or allowances. F.T.C. v. Anheuser-Busch, Inc., 363 U.S. 536, 549 (1960). The sixth element stipulates that the sales must be done effectively by a single legal entity. Sales by a parent and wholly owned subsidiary are also deemed to be done by a single seller. The seventh element requires that the sales be made to two or more distinct buyers. The eighth element simply requires that that sale be in interstate commerce, and highlights that the statute does not apply to export sales. *See* Gulf Oil Corp. v. Copp Paving Co., 419 U.S. 186, 196-200 (1974). Falls City Industries, Inc. v. Vanco Beverage Co., 460 U.S. 428, 434-35 (1983); accord, Corn Products Refining Co. v. FTC, 324 U.S. 726, 742 (1945); International Tel. & Tel. Corp., 104 F.T.C. 280, 423 (1984).

[42] Falls City Industries, Inc. v. Vanco Beverage Co., 460 U.S. 428, 434-35 (1983); accord, Corn Products Refining Co. v. FTC, 324 U.S. 726, 742 (1945); International Tel. & Tel. Corp., 104 F.T.C. 280, 423.

[43] In *George Van Camp & Sons Co. v. Am. Can Co.*, the Supreme Court held that Section 2 of the Clayton Act covered both types of injury. George Van Camp & Sons Co. v. Am. Can Co., 278 U.S. 245 (1929).

[44] Brooke Group v. Brown & Williamson Tobacco Corp., 509 U.S. 209 (1993).

[45] Brooke Group v. Brown & Williamson Tobacco Corp., 509 U.S. 209 (1993), citing, e.g., Matsushita Electric Industrial Co. v. Zenith Radio Corp., 475 U.S. 574, 589 (1986).

or dangerous probability, of recouping its investment in below-cost prices."[46]

The renewed interest in the RPA centers on the secondary line of injury, which is also the focus of this paper. In cases involving secondary line of injuries, harm to competition arises when a disfavored buyer is charged higher prices by a seller than those offered to a favored competitor. To establish a secondary line of injury, the plaintiff must first prove that the favored and disfavored buyers are competitors. This requires showing that both buyers function at the same level of the supply chain, operate in the same geographic area, and deal in the same products. Due to this requirement, secondary line of injury can only occur in intermediate markets. In other words, price discrimination by retailers—where a retailer charges different prices to different consumers—does not fall under the purview of this doctrine, as end users are not in competition with each other.

Once competition between buyers is established, plaintiffs can demonstrate injury either directly, through evidence of displaced sales, or indirectly, by invoking the "*Morton Salt* presumption." According to this presumption, a substantial price difference over a substantial period of time implies injury to a competitor, which is then taken as indicative of injury to competition.[47]

The Act provides three statutory defenses against allegations of price discrimination. First, a defendant has a complete defense if the price difference can be attributed to cost savings realized with the favored but not disfavored buyer.[48] Essentially, a seller is allowed to charge a higher price to a buyer if making sales to that buyer involves additional costs.[49] Second, a defendant also has a complete defense if the lower price was offered to match a competitor's price.[50] Third, a defendant is allowed to reduce its prices due to changes in market conditions, such as deterioration of perishable goods, sales necessitated by legal proceedings, and "going out of business sales."[51]

Two additional defenses have emerged out of caselaw. The first defense allows sellers to charge different prices if they can show that the lower prices are functionally available to the disfavored buyer. Functional availability depends on the disfavored buyer's awareness of the lower prices and their ability to meet the conditions for these discounts. For example, if a discount requires purchasing exceptionally high volumes that only large

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[46] *Id*.
[47] FTC v. Morton Salt Co., 334 U.S. 37, 41-42 (1948).
[48] 15 U.S.C. §13(a) (2018).
[49] *See* Texaco Inc. v. Hasbrouck, 496 U.S. 543, 563 n.21 (1990).
[50] 15 U.S.C. §13(b) (2018).
[51] 15 U.S.C. §13(a) (2018).

buyers with considerable purchasing power can meet, courts may deem these lower prices essentially inaccessible to smaller buyers. This issue was central in *FTC v. Morton Salt*, where the Supreme Court declared the discount program illegal because it was practically unavailable to smaller retailers.[52] The Court explained, "Theoretically, these discounts are equally available to all, but functionally they are not. For as the record indicates … no single independent retail grocery store, and probably no single wholesaler, bought as many as 50,000 cases or as much as $50,000 worth of table salt in one year."[53]

The second defense allows for price reductions to a buyer when these reductions are reasonable reimbursements for services rendered to the seller, such as marketing or storage.[54] In *Texaco v. Hasbrouck*, the Supreme Court held that these "functional discounts" did not violate the RPA.

The "meeting competition" and "cost justification" defenses are frequently invoked in Robinson-Patman challenges.[55] For example, when powerful buyers receive wholesale discounts by playing sellers off against each other, the meeting competition defense often protects these price differences. Similarly, sellers may justify price reductions to powerful buyers by citing cost savings. Scholars, including John Kirkwood, have observed that these defenses can shield discriminatory pricing practices from Robinson-Patman challenges, even when they harm competition.[56] Specifically, Professor Kirkwood recommends eliminating these defenses in cases that seek solely equitable remedies.[57]

The FTC and the Antitrust Division of the Department of Justice are both authorized to enforce the RPA. In addition, private plaintiffs may bring Robinson-Patman challenges. Section 4 of the Clayton Act entitles private parties harmed by a Robinson-Patman violation to sue for treble damages.[58] Furthermore, Section 16 of the Clayton Act allows private plaintiffs to seek injunctive relief, provided they show that a Robinson-Patman violation threatens loss or damage.[59] However, filing a class action lawsuit based on a Robinson-Patman challenge is often difficult due to the need for a highly

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[52] In *Morton Salt*, only five companies, all of which were large retail chains, have ever purchased quantities sufficient to meet the volume requirement for the highest discount. FTC v. Morton Salt Co., 334 U.S. 37, 41-42 (1948).

[53] *Id.*

[54] Texaco Inc. v. Hasbrouck, 496 U.S. 543, 571 (1990); U.S. Wholesale Outlet & Distrib. Inc. v. Inno. Ventures, LLC, 89 F.4th 1126, 1139-41 (9th Cir. 2023).

[55] John Kirkwood, *Reforming the Robinson-Patman Act to Serve Consumers and Control Powerful Buyers,* 60 ANTITRUST BULL. 358 (2015).

[56] *Id.*

[57] *Id.*

[58] 15 U.S.C. §15 (2018).

[59] 15 U.S.C. §26 (2018).

individualized showing of competitive injury.[60] Furthermore, the Supreme Court's *Truett Payne* decision, which imposes heightened requirements for private plaintiffs seeking damages, generally discourages private litigation under the RPA.[61]

C. *Litigation and Enforcement*

The Supreme Court's approach to secondary line cases has evolved gradually over time without any drastic shifts. The landmark 1948 *Morton Salt* decision established that plaintiffs need not demonstrate a generalized injury to competition; they must only show "a reasonable possibility that [discrimination] may have such an effect."[62] Furthermore, the Court explained that the RPA "was intended to justify a finding of injury to competition by showing of injury to the competitor victimized by the discrimination."[63] *Morton Salt* has remained good law.[64]

While subsequent Supreme Court rulings on price discrimination reflect influences of the law and economics movement, which gained prominence in the 1970s, the core principles of the RPA doctrine have remained relatively unchanged, distinguishing it from other areas of antitrust law.[65] For example, in its 1979 *Great Atlantic & Pacific Tea Corporation v. FTC* decision, the Court cautioned "against interpretations of the Robinson-Patman Act which extend beyond the prohibitions of the Act and, in doing so, help give rise to a price uniformity and rigidity in open conflict with the purposes of other antitrust legislation."[66] That same year, in *Reiter v. Sonotone*, the Court said that "Congress designed the Sherman Act as a consumer welfare prescription."[67]

Despite these influences of the law and economics movement, the Court

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[60] *See* Mad Rhino Inc. v. Best Buy Co., 2008 WL 8760854, at 3-4 (C.D. Cal. Jan. 14, 2008); ABC Distrib., Inc. v. Living Essentials LLC, 2017 WL 2603311, at 4-5 (N.D. Cal. Apr. 7, 2017). *See also* Meera Gorjala, Richard J. Hoskins & Brian D. Schneider, *Is the Robinson-Patman Act Returning? Or Was it Never Really Gone?*, ARENTFOXX SCHIFF (Apr. 22, 2024), https://www.afslaw.com/perspectives/alerts/the-robinson-patman-act-returning-or-was-it-never-really-gone.

[61] J. Truett Payne Co. v. Chrysler Motors Corp., 451 U.S. 557, 562 (1981) ("To recover treble damages, then, a plaintiff must make some showing of actual injury attributable to something the antitrust laws were designed to prevent.")

[62] FTC v. Morton Salt Co., 334 U.S. 37, 46-47 (1948).

[63] *Id.*

[64] The Supreme Court did not reverse *Morton Salt* in its 2006 *Volvo Trucks* decision. *See* Volvo Trucks N. Am., Inc. v. Reeder-Simco GMC, Inc., 546 U.S. 164 (2006).

[65] Cont'l T.V. v. GTE Sylvania, 433 U.S. 36 (1977).

[66] Great Atl. & Pac. Tea Co. v. FTC, 440 U.S. 69, 80 (1979).

[67] Reiter v. Sonotone Corp. 443 U.S. 330 (1979).

continued to rule against various discriminatory pricing practices. In 1983, the Court reaffirmed its holding from *Morton Salt* with *Vanco Beverage*, stating that "injury to competition is established prima facie by proof of a substantial price discrimination between competing purchasers over time."[68] Furthermore, in *Texaco, Inc. v. Hasbrouck*, involving a gasoline company that made sales at different prices to different customers, the Court held that such discriminatory pricing was anticompetitive and illegal under the Act.[69]

Although the Supreme Court arguably narrowed the scope of the RPA in its most recent 2006 secondary-line case, *Volvo Trucks North America, Inc. v. Reeder-Simco GMC Inc*, by raising the competitive injury bar, it did not reverse precedent set by *Morton Salt*.[70] The case involved alleged price discrimination in a rather unconventional market of custom-made trucks, typically sold through auctions. Customers looking to purchase trucks would solicit bids from retailers representing different brands. These retailers, upon being invited to bid, would then seek discounted wholesale prices from manufacturers to offer competitive retail prices to the potential customer. The plaintiff, a retailer, accused Volvo, a global manufacturer, of providing it smaller discounts than those given to other retailers. However, in most of the auctions, the plaintiff did not directly compete with another Volvo retailer; price differences occurred in separate auctions.[71] Noting this, the Court concluded that the plaintiff failed to demonstrate competition between itself and the favored dealers. In the remaining auctions, favored and disfavored treatment appeared to be random. Drawing on principles from Sherman Act cases, the Court highlighted that the primary concern of antitrust law was competition between different brands.[72]

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[68] Falls City Indus., Inc. v. Vanco Beverage Inc., 460 U.S. 428, 435 (1983).

[69] Texaco Inc. v. Hasbrouck, 496 U.S. 543, 571 (1990).

[70] Volvo Trucks N. Am., Inc. v. Reeder-Simco GMC, Inc., 546 U.S. 164 (2006).

[71] The Court observed that in the two auctions where the plaintiff Reeder competed with another Volvo dealer,

> Reeder's evidence showed loss of only one sale to another Volvo dealer, a sale of 12 trucks that would have generated $30,000 in gross profits for Reeder. Per its policy, Volvo initially offered Reeder and the other dealer the same concession. Volvo ultimately granted a larger concession to the other dealer, but only after it had won the bid. In the only other instance of head-to-head competition Reeder identified, Volvo increased Reeder's initial 17% discount to 18.9%, to match the discount offered to the other competing Volvo dealer; neither dealer won the bid. In short, if price discrimination between two purchasers existed at all, it was not of such magnitude as to affect substantially competition between Reeder and the "favored" Volvo dealer.

Id. at 180.

[72] Volvo Trucks N. Am., Inc. v. Reeder-Simco GMC, Inc., 546 U.S. 164, 180 (2006) (citing Cont'l T.V. v. GTE Sylvania, 433 U.S. 36, 51-52 (1977)). The decision left open

Recent lower court cases related to the RPA typically involve private lawsuits where independent retailers accuse wholesalers or manufacturers of offering lower prices to large retailers. For example, the 2023 case of *U.S. Wholesale Outlet & Distribution Inc. v. Inno*vation *Ventures LLC* involved allegations that the manufacturer of 5-Hour Energy gave rebates and discounts to Costco in violation of the RPA.[73] The Ninth Circuit remanded the case, noting that the lower court had erred in not recognizing the competition between Costco and the plaintiff family-owned wholesalers.

In contrast to courts, federal antitrust authorities drastically scaled back their enforcement of the RPA from the 1970s until just a few years ago. In its famous 1977 report, the Department of Justice (DOJ) announced that it would cease enforcing the Act, calling it "protectionist" with "deleterious impact on competition."[74] Unlike the DOJ, the FTC never formally stopped bringing cases under the Act. However, the FTC's level of RPA activity declined sharply since the 1970s. Whereas the FTC initiated 97 RPA investigations and 27 complaints annually between 1965 and 1968, these numbers fell to merely 4 investigations and 3 complaints per year in the mid-1970s.[75] The FTC brought 8 RPA cases during the Carter Administration, and only one case since the end of the George H.W. Bush presidency.[76] No cases were filed under the administrations of George W.

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whether its implications are confined to markets characterized by competitive bidding or if they extend to more traditional secondary line cases. ANDREW I. GAVIL, WILLIAM E. KOVACIC ET AL., ANTITRUST LAW IN PERSPECTIVE: CASES, CONCEPTS AND PROBLEMS IN COMPETITION 1089 (2017) ("The decision, therefore, can be viewed both narrowly and broadly. Narrowly, the case holds that competitive bidding generally falls outside of the reach of the Robinson-Patman Act because it never involves two competing sales—just one.... More broadly, the decision seems intended to signal that a clear majority of the Court is willing to stretch the Act's language—and discount its origins and legislative history—in order to harmonize it with other antitrust laws"). For scholars who interpreted *Volvo* as a narrow ruling, *see* John Kirkwood, *The Robinson-Patman Act and Consumer Welfare: Has Volvo Reconciled Them?*, 30 SEATTLE U. L. REV. 349 (2007). For scholars who contend that *Volvo* made it substantially harder for plaintiffs to win secondary-line RPA cases, *see* Neal R. Stoll & Shepard Goldfein, *Supreme Court Places Robinson-Patman Act on Life Support*, N.Y. L. J. 3 (2006), Simon A. Rodell, *Antitrust Law: The Fall of the Morton Salt Rule in Secondary-Line Price Discrimination Cases*, 58 FLA. L. REV. 967 (2006). Luchs and coauthors find that the success of disfavored plaintiffs in secondary line cases at lower courts dropped from 27 percent to 5 percent after *Volvo*. Ryan Luchs, Tansev Geylani, Anthony Dukes & Kannan Srinivasan, *The End of the Robinson-Patman Act? Evidence from Legal Case Data*, 56 MGMT. SCI. 2123, 2124 (2010).

[73] U.S. Wholesale Outlet & Distrb. v. Innovation Ventures, LLC, 74 F.4th 960 (9th Cir. 2023).

[74] DEP'T OF JUSTICE, REPORT ON THE ROBINSON-PATMAN ACT 6–7 (1977).

[75] D. Daniel Sokol, *Analyzing Robinson-Patman*, 83 GEO. WASH. L. REV. 2064, 2073 (2015).

[76] *Id.*

Bush or Barack Obama.[77] In 2007, Antitrust Modernization Commission, appointed by Congress, recommended that the Act be repealed. The reason behind Congress' decision not to repeal the Act has not been disclosed. Some commentators suggest that Congress might have found it unnecessary to repeal a statute that had long gone unenforced. Others believe that Congress might have been reluctant to appear as though it was opposing protections for small businesses.[78]

Recently, both the executive and legislative branches have shown renewed interest in the RPA. In July 2021, President Biden issued an Executive Order on Competition, urging stricter enforcement of antitrust laws, including the RPA.[79] In January 2023, *Politico* reported that the FTC was investigating Coke and Pepsi for alleged price discrimination. [80] According to the news article, FTC had asked major retailers, including Walmart, to provide details about the pricing strategies employed by these beverage manufacturers.[81] By October 2023, FTC had begun investigating the pricing practices of Southern Glazer's, the largest liquor wholesaler in the country. Most recently, in March 2024, several Members of Congress, including Senators Warren, Blumenthal, and Sanders, issued a letter urging the FTC to actively enforce the RPA.[82] In May 2024, a bipartisan House letter led by Representatives Lofgren and Tiffany asked to allocate $10

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[77] *Id.* at 2074; Decision and Order, McCormick & Co., FTC Docket No. C-3939 (Apr. 27, 2000).

[78] Daniel Crane, *Reviving the Robinson-Patman Act*, NETWORK LAW REVIEW (Feb. 28, 2023), https://www.networklawreview.org/cranes-cartel-three/ ("In 2007, the bi-partisan Antitrust Modernization Commission recommended that the R-P Act be repealed in its entirety. By 2007, that recommendation seemed almost superfluous."); Steven Cernak, *Forgotten But Not Gone—Antitrust, Price Discrimination, and the Robinson-Patman Act in the 21st Century*, BONA LAW PC (Feb. 26, 2020), https://www.theantitrustattorney.com/forgotten-but-not-gone-antitrust-price-discrimination-and-the-robinson-patman-act-in-the-21st-century/ ("One [colleague] insisted that Robinson-Patman would never be repealed—after all, what member of Congress would vote against protecting small business?…He was right."); *Dominic Pino*, *The FTC is Using a Tool It Shouldn't Even Have in Its Toolbox*, NATIONAL REVIEW (Jan. 31, 2023), https://www.nationalreview.com/corner/the-ftc-is-using-a-tool-it-shouldnt-even-have-in-its-toolbox/ ("Since the FTC had essentially stopped enforcing Robinson-Patman for decades, Congress may have felt it unnecessary to do anything about it.").

[79] Exec. Order No. 14,036, 86 C.F.R. 36987 (2021).

[80] Josh Sisco, *Pepsi, Coke Soda Pricing Targeted in New Federal Probe*, POLITICO (Oct. 1, 2023), https://www.politico.com/news/2023/01/09/pepsi-coke-soda-federal-probe-00077126.

[81] *Id.*

[82] Letter from Elizabeth Warren, U.S. Senator, to Lina Khan, Chair, FTC (Mar. 28, 2024), https://www.warren.senate.gov/newsroom/press-releases/warren-scanlon-lawmakers-urge-ftc-to-revive-enforcement-of-robinson-patman-act-to-promote-competition-lower-food-prices.

million of the FTC's budget for Robinson-Patman enforcement.[83]

II. ECONOMIC MODEL

To evaluate the effect of discriminatory pricing on competition and to identify the forces at work, I present and calibrate an economic model that captures key market characteristics. The model features a wholesaler, chain and independent stores, and consumers. These entities make decisions in three stages. In the first stage, incumbent retailers decide whether to remain in the market or exit, and new retailers decide whether to enter. In the second stage, wholesalers set prices, which can involve price discrimination depending on the prevailing legal regime. In the third stage, stores set their retail prices, and consumers make their purchasing decisions.[84]

The wholesaler and retailers solve the game using backwards induction, so I will describe the model starting with the third stage and work backward to the first. The formal description of the model, which is used for simulations and counterfactual analyses in later sections, is presented in the Appendix.[85]

A. *Stage III: Consumer Demand and Retailer Pricing*

In the third stage of the model, stores set their retail prices and consumers decide whether to make a purchase. Each consumer has unit demand and can choose to buy from a chain store, an independent store, or not buy at all. Despite all stores selling the same product, the unique characteristics of stores set them apart. Independent stores typically offer greater convenience to consumers but have higher marginal costs of operation, whereas chain stores, though less convenient, operate at lower marginal costs. The convenience of an independent store often stems from factors like store size and layout, shorter checkout lines, and parking. The canonical example is a mom-and-pop store where customers can complete their shopping quickly, in contrast to a chain store, which typically requires a minimum of thirty minutes to navigate.

Generally, all consumers dislike high prices, if everything else is held constant. However, they differ in how strongly they prefer convenience. Some consumers prioritize time and are willing to pay higher prices for it. For instance, consider a shopper who, after a long day at work, prefers to

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[83] *Bipartisan Push in the House to Designate $10 Million of FTC Budget for Enforcement of Robinson-Patman*, THE CAPITAL FORUM (May 6, 2024), https://thecapitolforum.com/the-antitrust-agenda-bipartisan-push-in-the-house/.

[84] For the timing assumption, *see* discussion *infra* Section II Subsection C.

[85] *See* discussion *infra* Section VII.

quickly stop by the nearby mom-and-pop store despite knowing that it is more expensive. For this price-insensitive shopper, the convenience and time saved justify the higher prices. On the other hand, other consumers are more budget-conscious and prioritize savings over convenience. For instance, a consumer might choose to drive to a chain store that offers lower prices, accepting the additional time and effort spent shopping as a worthwhile trade-off for financial savings. Each consumer chooses the option that maximizes their utility.

Facing this demand from consumers, retailers set their prices to maximize profits. For example, an independent store recognizes that some consumers—such as those stopping by after a busy day at work—value convenience highly. This feature of consumer demand allows the independent store to charge higher retail prices. In contrast, a chain store, recognizing the need to compensate for the less convenient shopping experience, targets price sensitive, budget-conscious shoppers by offering lower prices.

B. *Stage II: Wholesale Pricing*

For simplicity, I assume that the wholesaler is a monopolist with the same marginal cost for all retailers. The pricing strategy of the wholesaler depends on the legal regime. When the RPA is effectively enforced, discriminatory pricing is prohibited and the wholesaler is compelled to charge the same price to all retailers. Under these circumstances, I assume that the wholesaler and retailers can commit to a take-it-or-leave-it wholesale price, precluding any possibility for bargaining. Consequently, the wholesaler selects a single price that maximizes its profits, taking into account all supply and demand factors.

In the absence of Robinson-Patman enforcement, the wholesaler has the flexibility to set different prices for different retailers. For example, the wholesaler can charge a higher price to an independent store, whose customers value convenience, while offering a lower price to a chain store, whose customers value affordability. Furthermore, when price discrimination is permitted, each store can negotiate its own wholesale price with the wholesaler. Following common practice in the economics literature, I assume that the two parties Nash-bargain over the surplus generated by their agreement.[86]

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[86] The wholesaler-retailer negotiation is modeled using Nash-in-Nash bargaining game—a bilateral Nash bargaining within a Nash equilibrium of a game played among all pairs of firms. *See* discussion *infra* Section VII. This bargaining game is first proposed by Horn and Wolinsky (1988) and is widely used in the industrial organization economics literature. Henrik Horn & Asher Wolinsky, 19 RAND J. ECON 408 (1988). *See* Kate Ho

The outcome of bargaining depends on two factors. The first is the retailer's bargaining power against the wholesaler, which determines the share of the bargaining surplus allocated to the retailer if an agreement is reached.[87] If a retailer has more power vis-à-vis the power, it is likely to secure a lower wholesale price. In contrast, if the wholesaler has more power, the negotiated price tends to be higher.

To illustrate this bargaining process, consider the negotiation between the wholesaler and a chain store. It is reasonable to assume that large chain stores—such as Walmart, CVS, Target, Walgreens, and Total Wine—possess greater bargaining power against wholesalers than independent stores do. A chain store may have greater bargaining power for several reasons. For example, a chain store may hire a more skilled negotiator who can exert stronger influence during negotiations with a wholesaler. This bargaining power allows chain stores to negotiate lower wholesale prices compared to independent stores.

The second factor influencing the outcome of bargaining is leverage, which reflects the surplus each party contributes to the negotiation.[88] Bargaining leverage depends on the outside options available to each party

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& Robin S. Lee, *Equilibrium Provider Networks: Bargaining and Exclusion in Health Care Markets*, 109 AM. ECON. REV. 473 (2019); Kate Ho & Robin S. Lee, *Insurer Competition in Health Care Markets*, 85 ECONOMETRICA 379 (2017); Gautam Gowrisankaran, Aviv Nevo & Robert Town, *Mergers When Prices are Negotiated: Evidence from the Hospital Industry*, 105 AM. ECON. REV. 172 (2015); Michaela Draganska, Daniel Klapper & Sofia Villas-Boas, *A Larger Slice or a Larger Pie? An Empirical Investigation of Bargaining Power in the Distribution Channel*, 29 MKTG. SCI. 57 (2010). Although "Nash-in-Nash" bargaining is cooperative, multiple papers have proposed noncooperative foundation for this bargaining game. *See* Allan Collard-Wexler, Gautam Gowrisankaran and Robin Lee, who extend Rubinstein's alternating offers model to multiple upstream and downstream firms, showing that for sufficiently short time between offers and without delayed agreement, there exists a unique equilibrium at prices arbitrarily close to Nash-in-Nash prices. (In the context of industrial organization economics, "upstream firms" refer to companies involved in the initial stages of production, supply or distribution. Conversely, "downstream firms" refer to companies that operate in the later stages of the supply chain, close to the final consumer."). Allan Collard-Wexler, Gautam Gowrisankaran & Robin S. Lee, *"Nash-in-Nash" Bargaining: A Microfoundation for Applied Work*, 127 J. POL. ECON. 163 (2019). *See also* Gregory Crawford and Ali Yurukoglu describing a noncooperative extensive form game with Nash-in-Nash bargaining solution. Gregory S. Crawford & Ali Yurukoglu, *The Welfare Effects of Bundling in Multichannel Television Markets*, 102 AM. ECON. REV. 643 (2012) ("Each distributor and each conglomerate send separate representatives to each meeting. Once the negotiations start, representatives of the same firm do not coordinate with each other.").

[87] In the formal description of the model, the bargaining power corresponds to the bargaining parameter. *See infra* Section VII Subsection B.3.

[88] In the formal description of the model, bargaining leverage relates to the gains-from-trade from an agreement. *See infra* Section VII Subsection B.3.

and their ability to increase the counterparty's profits. The bargaining process allocates more profits to the party with higher reservation profits—the gains a party would retain if the current negotiation were to fail. Essentially, a party with substantial alternative options will demand better terms to be persuaded into an agreement, as they have less to lose by walking away.

A chain store will likely have a higher bargaining leverage than an independent retailer. For example, a national chain can use its multiple locations as leverage by threatening to stop selling the wholesaler's product in all of its stores unless it receives favorable pricing at a specific location.[89] In contrast, a mom-and-pop store, with its single location, cannot make such a credible threat.

To illustrate, first consider a hypothetical negotiation between Walmart and a new brand. If Walmart cannot reach an agreement with this brand's wholesaler, it can readily switch to other brands, likely without any significant loss in sales. In contrast, if the new brand fails to secure Walmart as a retailer, it would suffer a significant setback. Therefore, to ensure its products are carried by Walmart, the wholesaler will feel compelled to offer much lower wholesale prices. This asymmetry in outside options grants Walmart a considerable advantage in negotiations. In contrast, losing business from one independent store is unlikely to substantially impact the new brand's profits, making the wholesaler less inclined to concede to lower prices in negotiations with such a retailer.

C. *Stage I: Retailer Entry and Exit*

In the first stage, incumbent retailers decide whether to remain in the market or exit, while new retailers decide whether to enter. Entry and exit decisions, which determine market structure, are long term commitments as they involve significant fixed costs. In contrast, pricing decisions are short term and can be quickly revised. Therefore, retailers are assumed to make their long-term entry and exit decisions before setting retail prices. This timing assumption is further substantiated by the fact that retailers cannot reasonably commit to specific retail prices before making their entry and exit decisions, given the ease with which they can adjust prices afterwards. Consequently, entry and exit decisions precede pricing decisions.

Should an incumbent retailer opt to stay or a new retailer choose to

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[89] As Tasneem Chipty and Christopher Snyder highlight, a merger between two downstream firms, such as two retailers, increases their bargaining power against an upstream firm, such as a wholesaler, if the upstream firm's gross surplus function is concave. Tasneem Chipty & Christopher M. Snyder, *The Role of Firm Size in Bilateral Bargaining: A Study of the Cable Television Industry*, 81 REV. ECON. & STAT. 326 (1999).

enter, it incurs a fixed cost of operation. However, being in the market also presents the possibility of earning profits in the subsequent stages. Therefore, a retailer will choose to be in the market if and only if its expected profit exceeds its fixed cost of operation.

III. COMPETITIVE ANALYSIS OF ROBINSON-PATMAN ENFORCEMENT

In this section, I take the uniform wholesale price under the RPA as the baseline and gradually relax this restriction to study the effects of discriminatory pricing. When discriminatory pricing is permitted, three distinct forces come into play: heterogeneous consumer preferences for retailer characteristics, wholesaler-retailer bargaining, and retailer exit. These forces lead to deviations from the uniform price charged under the RPA, which in turn alter retail prices and ultimately affect consumer welfare.[90] For completeness, I also consider the impact of discriminatory pricing on total welfare at various points in the analysis.[91]

A. *Heterogeneous Consumer Preferences for Retailer Attributes*

The first force involves the variation in consumer preferences for retailer attributes, which affects the wholesale prices charged to each store even in the absence of bargaining or retailer exit. The wholesaler recognizes that chain stores primarily cater to relatively price-sensitive consumers who prioritize lower prices over store convenience. Anticipating that any increase in wholesale prices would likely be passed on to consumers and potentially reduce sales, the wholesaler finds it unprofitable to charge high

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[90] As Chief Justice White stated in *Standard Oil*, a conduct's reasonableness is evaluated in light of the objectives of the antitrust laws, and the Supreme Court in *Reiter v. Sonotone* said that "Congress designed the Sherman Act as a 'consumer welfare prescription.'" Reiter v. Sonotone Corp. 443 U.S. 330 (1979). Enhancing consumer welfare continues to be the accepted goal of the modern antitrust law. *See* National Collegiate Athletic Ass'n v. Board of Regents, 468 U.S. 85, 104 (1984) ("Price is higher and output lower than they would otherwise be, and both are unresponsive to consumer preference. This latter point is perhaps the most significant, since "Congress designed the Sherman Act as a 'consumer welfare prescription'."). *See also* Brooke Group v. Brown & Williamson Tobacco Corp., 509 U.S. 209, 113.

[91] In this paper, I primarily examine the welfare of consumers, following the precedent set by the Supreme Court. *See supra* note 90. Additionally, I consider the profits of retailers as relevant. However, discriminatory pricing can also impact other stakeholders, including employees. For example, price discrimination may result in retail store closures, adversely affecting workers who lose their jobs. This issue is complicated, however, by the fact that stores benefitting from price discrimination may create new employment opportunities. While the impact on labor could be examined in specific cases, concerns related to labor are not a central focus for the RPA and are beyond the scope of this paper.

prices to these stores. Therefore, responding to the preferences of price-sensitive consumers, the wholesaler offers lower prices to chain stores. These stores, in turn, often pass on some of these savings to their customers by setting lower retail prices.

In contrast, the wholesaler recognizes that independent stores appeal to consumers who are less sensitive to prices but who highly value store convenience. This consumer preference allows independent stores to command higher prices. Recognizing this, the wholesaler sets higher wholesale prices to independent stores, who then pass these costs onto their customers by increasing their retail prices. As a result, while discriminatory pricing yields lower prices for chain store customers compared to the uniform price under the RPA, it leads to higher prices for the customers of independent stores.

The overall effect of this force on consumer welfare tends to hinge on the distribution of consumer preferences.[92] If a significant share of consumers is price-sensitive, the wholesaler is likely to set a low uniform price under the RPA to appeal to this group. This low uniform price benefits both price-sensitive and price-insensitive consumers. In contrast, with discriminatory pricing, the wholesaler can impose higher prices on independent stores, disadvantaging price-insensitive consumers who frequent these outlets. Thus, when a large number of consumers are price-sensitive, the RPA tends to enhance consumer welfare. These results are likely reversed in a market where many consumers are price-insensitive.

B. *Wholesaler-Retailer Bargaining*

When price discrimination is permitted, wholesalers are not confined to offering take-it-or-leave-it prices, thereby paving the way for negotiations with retailers. Bargaining typically results in lower prices compared to a

[92] The earlier literature on price discrimination in the final goods markets yields similar results with respect to consumer preference for retailer attributes. This literature examines a single retailer's price discrimination among consumers, rather than a wholesaler's price discrimination among retailers. *See* Richard Schmalensee, *Output and Welfare Implications of Monopolistic Third-Degree Price Discrimination*, 71 AM. ECON. REV. 242 (1981); Hal R. Varian, *Price Discrimination and Social Welfare*, 75 AM. ECON. REV. 870 (1985). This literature concludes that (a) with two groups of consumers, discrimination leads to higher prices for the price-insensitive group and lower prices for the price-sensitive group; (b) the effect of discrimination on welfare in comparison to uniform pricing depends on the curvature of consumers' demand curves. However, as this literature focuses on price discrimination in final goods, it does not consider the competitive effects of discriminatory pricing observed in the intermediate goods markets, such as those arising from bargaining and retailer entry/exit.

take-it-or-leave-it offer.[93] The intuition behind this conclusion is straightforward: a take-it-or-leave-it offer implies that the retailer has no bargaining power or leverage. As a retailer's bargaining power or leverage increases, it is able to negotiate lower wholesale prices.[94]

Chain stores are able to negotiate lower wholesale prices primarily for two reasons. First, they typically have considerable bargaining power and leverage over wholesalers due to their multiple locations, the expertise of their negotiators, and their access to alternative supply options.[95] Second, the wholesaler's initial take-it-or-leave-it offer to a chain store, which serves as an anchor for negotiations, is already set below the uniform price stipulated under the RPA. This lower offer reflects the wholesaler's understanding that the chain store caters to price-sensitive consumers, who indirectly exert downward pressure on the wholesale price before negotiations even begin.[96]

Although bargaining allows an independent store to negotiate a lower price than the wholesaler's take-it-or-leave-it offer, the final negotiated wholesale price for an independent store typically remains higher than that for a chain store. This discrepancy is driven by two factors. First, an independent store usually has less bargaining power and leverage against the wholesaler due to its single location, limited outside options, and the wholesaler's access to alternative retail stores. Second, the wholesaler's

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[93] John Kenneth Galbraith introduces the term "countervailing market power" to describe the idea that bargaining counters concentration in the demand side with concentration in the supply side. John Kenneth Galbraith, *Countervailing Power*, 44 AM. ECON. REV. 1 (1954).

[94] Legal scholars have observed that retailer market power can detrimentally impact competition by enabling retailers to pressure wholesalers into unfavorable price concessions or compel them to impose higher prices on retail competitors. *See* Herbert Hovenkamp, *The Robinson-Patman Act and Competition: Unfinished Business*, 68 ANTITRUST L. J. 125, 139 (2000). ("A&P may then be in a position to *force* manufacturers to charge other dealers higher prices, in the same way that it might force manufacturers to impose resale price maintenance or nonprice restraints on rival dealers. In that case a reasonable interpretation of the Robinson-Patman Act is to identify and discipline such situations, but leave manufacturers generally free to use rebates or other price concessions as a device to reward dealer effectiveness) *See also* Herbert Hovenkamp, *The Robinson-Patman Act and Competition: Unfinished Business*, 68 ANTITRUST L. J. 125, 140 (2000). ("The Court's statement [in *Morton Salt*] failed to distinguish the quantity purchaser who pressures its buyer to make non-cost-justified discounts it would prefer not to make, from those given to larger purchases generally.") This paper acknowledges these concerns. However, it also emphasizes that even seemingly benign bargaining can lead to a reduction in consumer welfare in the long run. For instance, if a chain store negotiates lower wholesale prices, it may prompt independent stores to exit the market, thereby reducing competition and potentially leading to higher retail prices.

[95] *See* discussion *supra* Section II Subsection B.

[96] *See* discussion *supra* Section II Subsection A.

initial take-it-or-leave-it offer to an independent store, which sets the baseline for negotiations, is already relatively high. This higher starting point is strategic and arises because the wholesaler recognizes that consumers often value the convenience offered by independent stores, which allows these retailers to charge higher retail prices.[97] Consequently, even though the independent store may negotiate a reduction from this high initial price, its final negotiated wholesale price still tends to be higher than that secured by a chain store.

C. *Retailer Market Entry and Exit*

Ex ante, every incumbent retailer must decide whether to remain in the market or to exit, and every new retailer must decide whether to enter the market. Being in the market offers the potential for profit, but these profits are not guaranteed, and the ongoing viability of the business may be a concern. Additionally, being in the market requires incurring a fixed cost of operation. Therefore, a retailer will choose to be in the market if and only if its expected future profits are at least equal to or exceed its fixed operational costs, thereby ensuring profitability.

Foreshadowing the results in the following section, it is crucial to recognize that a store's expected profit inherently depends on competition from other retailers. If a competitor negotiates a favorable wholesale price, it can afford to sell at a lower retail price. A retailer that cannot access such advantageous wholesale prices is forced to set higher retail prices, which often lead to decreased sales. This discrepancy could leave the disadvantaged retailer struggling to cover its fixed operational costs, ultimately causing it to exit the market. The departure of one or more stores reduces competition in the retail market. With retailer exit in the first stage of the economic model, the market in the third stage will have fewer stores and higher retail prices.

D. *The Effect of the Robinson-Patman Act on Consumer Welfare*

When price discrimination is permitted, all three forces—heterogeneous consumer preferences for retailer attributes, wholesaler-retailer bargaining, and retailer exit—jointly determine the wholesale and retail prices. Therefore, to compare consumer welfare under price discrimination with that under the RPA, it is essential to study how these forces interact. For clarity and ease of presentation, I begin by describing the interaction between bargaining and consumer preference heterogeneity, momentarily

[97] *Id.*

abstracting away from retailer exit.

Recall that variation in consumer preferences results in different wholesale prices for chain and independent stores, while bargaining yields lower prices compared to take-it-or-leave-it offers.[98] Through bargaining, chain stores secure wholesale prices substantially lower than the uniform price under the RPA, which results in noticeably lower prices for their customers. For independent stores, the ability to negotiate wholesale prices below the uniform RPA price hinges on their bargaining power and leverage.

Nevertheless, even if an independent store fails to negotiate a wholesale price lower than the uniform price, bargaining, and thereby discriminatory pricing, still tend to benefit consumers if all retailers stay in the market. As chain stores secure markedly lower wholesale prices and, consequently, reduce their retail prices, their customers enjoy notably greater surplus under price discrimination compared to the RPA. These gains may effectively offset the losses incurred by the customers of independent stores, who face higher retail prices. Thus, the overall effect of bargaining and discriminatory pricing on consumer welfare can be positive when all existing retailers remain in the market.

However, including retailer exit in the analysis significantly alters conclusions about consumer welfare. A retailer will remain in the market as long as its expected profits surpass its fixed operational cost. To stay in the market, independent stores must be competitive against chain stores. However, when price discrimination is permitted, independent stores, facing high wholesale prices, are unable to match the lower retail prices of chain stores. As a result, they lose sales and profits to the chain stores. When independent stores anticipate that they cannot generate sufficient profits to cover their fixed costs, one or more will exit the market. These departures reduce the number of sellers in the retail market, enabling remaining retailers to charge higher markups due to reduced competition. As a result, despite chain stores securing low wholesale prices through bargaining, this reduction in competition can lead to increased retail prices under discriminatory pricing, ultimately reducing consumer welfare relative to that under the RPA. In extreme cases, where the exit of independent stores leads to a near-monopoly for a chain store, any benefits from bargaining and discriminatory pricing may be entirely lost.

IV. EMPIRICAL STUDY OF THE U.S. LIQUOR INDUSTRY

Assessing the welfare effects of discriminatory pricing or its prohibition

[98] *See* discussion *supra* Section II Subsections A and B.

requires an external variation in the wholesalers' pricing practices across different geographical markets. To this end, the variation in state regulations governing liquor wholesale prices offers an optimal quasi-experimental setting. As Justice Brandeis noted in his 1932 dissenting opinion, "It is one of the happy incidents of the federal system that a single courageous State may [...] serve as a laboratory; and try novel social and economic experiments without the risk to the rest of the country."[99]

Specifically, states like Connecticut and Kansas require that liquor wholesalers offer uniform prices to all retailers, thereby prohibiting price discrimination. Meanwhile, others states do not regulate wholesale pricing in the liquor industry.[100]

The salience of volume discounts in states that do not mandate uniform wholesale prices clearly illustrates the prominence of discriminatory pricing within the U.S. liquor industry.[101] A volume discount is a pricing strategy in which the wholesale price per unit of a product decreases as the quantity purchased increases. This pricing strategy enables wholesalers to offer different prices to large chains and independent retailers based on their purchasing volumes. Large chains typically benefit from lower wholesale prices because they can meet the high quantity thresholds required for discounts, whereas independent stores, usually purchasing smaller quantities, face higher wholesale prices. At the time of this writing, the wholesale price of Absolut Vodka in New York, where uniform pricing is not mandated, was $268 per case. However, purchasing 20 cases would yield a discount of $110 per case, representing a 41 percent discount.[102] Similarly, in Rhode Island, the wholesale price of Johnnie Walker Red Label Blended Scotch Whisky was $238 per case, but buying 15 cases would result in a discount of $103 per case, equivalent to a 43 percent discount.[103]

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[99] New State Ice Co. v. Liebmann, 285 U.S. 262, 311 (1932) (Brandeis, J., dissenting).

[100] Conn. Gen. Stat. §30-68k (2023); Kan. Stat. Ann. §41-1101 (2023). The majority of states that mandate uniform pricing also requires liquor wholesalers publicly disclose their prices under statutes known as "post and hold." This practice enhances the efficacy of uniform price laws in preventing price discrimination, as the transparency of posted prices eliminates any opportunity for bargaining between liquor wholesalers and retailers. Although nearly all states with uniform pricing regulations also have "post-and-hold" laws, not all states with "post-and-hold" laws require uniform prices. Georgia and Massachusetts, for instance, have post-and-hold statutes but still permit volume discounts. Using this variation, I distinguish the competitive effects of uniform pricing from those of posting and holding prices.

[101] Dave McIntyre, *Wine Prices and the Small Specialty Stores*, WASH. POST (Jul. 17, 2014), https://www.washingtonpost.com/lifestyle/food/wine-prices-and-the-small-specialty-stores/2014/07/16/c4739b30-0b97-11e4-8c9a-923ecc0c7d23_story.html

[102] Provi, https://www.provi.com (last visited Apr. 30, 2024) (Documentation of this listing is on file with the author).

[103] Provi, https://www.provi.com (last visited Apr. 30, 2024) (Documentation of this

I use the external variation in uniform pricing requirements across state liquor wholesale markets to study the welfare implications of the RPA.[104] In this section, I begin by briefly reviewing the constitutional foundations that underlie the variation in state liquor laws. I then provide an overview of state-specific regulations for liquor wholesale and the structure of the U.S. liquor industry. Subsequently, I present my empirical study, which investigates the effects of wholesale price discrimination on retail prices and the exit decisions of stores. The results of this empirical study corroborate the insights gained from the theory model. In the final subsection, I calibrate the theory model according to the empirical features of the U.S. liquor industry to quantify the consumer welfare effect of price discrimination.

A. *The Twenty-First Amendment*

The Twenty-First Amendment, which ended Prohibition in 1933, granted special deference to state regulations on alcoholic beverages. This deference emerged from the Amendment's second section, which states: "The transportation or importation into any State, Territory, or possession of the United States for delivery or use therein of intoxicating liquors, in violation of the laws thereof, is hereby prohibited."[105] When asked to decide how this section affected Congress' power "to regulate commerce … among the several states" under Section 8 of Article I of the Constitution, courts have held that Congress' authority under the Commerce Clause is more limited regarding alcohol than it is for other goods and services.[106]

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listing is on file with the author).

[104] *See supra* note 9, and Sections IV, V, and IX.

[105] U.S. Const. amend. XXI, § 2.

[106] Specifically, the Supreme Court implements a balancing test to resolve conflicts between state liquor laws and federal laws. Using the balancing test articulated in *Capital Cities*, courts look at "whether the interests implicated by state regulation are so closely related to the powers reserved by the Twenty-First Amendment that the regulation may prevail, notwithstanding that its requirements directly conflict with express federal policies." Capital Cities Cable, Inc. v. Crisp, 467 U.S. 714, 714 (1984). *See also* North Dakota v. United States, 495 U.S. 423 (1990); California Retail Liquor Dealers Ass'n v. Midcal Aluminum Inc., 445 U.S. 97, 110 (1980) ("[t]he Twenty-first Amendment grants the States virtually complete control over whether to permit importation or sales of liquor and how to structure the liquor distribution system."); Ziffrin, Inc. v. Reeves, 308 U.S. 132, 138 (1939) ("the Twenty-first Amendment sanctions the right of a State to legislate concerning intoxicating liquors brought from without, unfettered by the Commerce Clause."). *But see* 324 Liquor Corp. v. Duffy, 479 U.S. 335 (finding that the state's liquor price control statute was not immune to the Sherman Act challenge); Bacchus Imports, Ltd. v. Dias, 468, U.S. 263 (1984); State Board of Equalization v. Young's Market Co., 299 U.S. 59 (1936). *See also* Robert P. George & Davis A. J. Richards, *Twenty-First Amendment Common Interpretation*, NATIONAL CONSTITUTION CENTER,

B. *State Liquor Laws*

Empowered by this deference, each state has established a three-tiered structure for alcohol distribution, comprising manufacturers, wholesalers and retailers.[107] Within this framework, producers can only sell to state-licensed wholesalers, who in turn are allowed to sell only to state-licensed retailers. Furthermore, businesses are required to operate within a single tier, and cross-tier investments are prohibited.[108]

Additionally, many states enacted laws to regulate pricing practices within the liquor wholesale markets, though there is considerable variation in the stringency of these regulations. At one end of the spectrum, states like New Hampshire and Mississippi operate as the direct sellers of liquor to retailers. At the other end, states such as California and Texas provide wholesalers with complete autonomy in setting their prices. Between these extremes, many states impose one or more restrictions on how wholesalers can price liquors.

The primary focus of this empirical study is the uniform wholesale pricing requirements, which prevent wholesalers from offering lower per unit prices to sophisticated, large retailers. In liquor wholesale markets, four states—Connecticut, Kansas, Louisiana, Oklahoma—ban price discrimination, while two states—Minnesota and Missouri—have specific limitations on the wholesalers' use of volume discounts.[109] The map provided in Figure 1 illustrates state laws governing price discrimination in

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https://constitutioncenter.org/the-constitution/amendments/amendment-xxi/interpretations/151; OHN E. NOWAK & ROBERT D. ROTUNDA, CONSTITUTION LAW §4.9 at 163 n.33, § 8.8, at 300-01 (West 5th ed. 1995) (discussing generally the interplay between the Twenty-First Amendment and the Commerce Clause.) Although challenges to state liquor laws under the Interstate Commerce Clause and Sherman Antitrust Act led to different, and sometimes conflicting results, many states continue to impose a variety of restrictions on liquor wholesale pricing, and the empirical study presented in this paper relies on state liquor laws as of March 2024. *See* Costco Wholesale Corp. v. Maleng, 522 F.3d 874 (9th Cir. 2008) (The court upheld the state's volume discount and minimum markup restrictions but eliminated the post-and-hold requirement.); Manuel v State of Louisiana, 982 So.2d 316 (3rd Cir. 2008) (The court affirmed state regulations governing liquor wholesale pricing and rejected challenges raised under the Sherman Act.); TFWS, Inc. v. Franchot, 572 F.3d 186 (4th Cir. 2009) (After ten years of litigation, the court revoked Maryland's post-and-hold law and differential pricing ban.).

[107] Duncan Baird Douglass, *Constitutional Crossroads: Reconciling the Twenty-First Amendment and the Commerce Clause to Evaluate State Regulation of Interstate Commerce in Alcoholic Beverages*, 49 DUKE L. J. 1619, 1621 (2000).

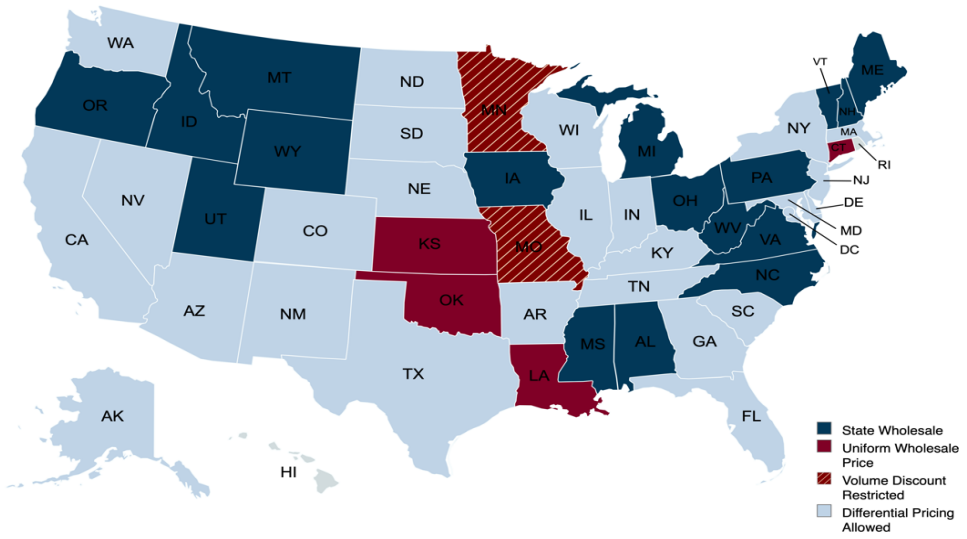
[108] Dickerson v. Bailey, 87 F. Supp. 2d 691, 709-10 (S.D. Tex. 2000).

[109] Conn. Gen. Stat. §30-68k (2023); Kan. Stat. Ann. §41-1101 (2023); La. Rev. Stat. Ann. § 26:287(12) (2023); Okla. Stat. tit. 37A § 3–119 (2023); Minn. Stat. § 340A.312 (2023); Mo. Rev. Stat. § 311.332 (2023).

liquor wholesale.

Other common restrictions on liquor wholesalers include "post-and-hold" regulations.[110] These laws require that wholesalers publish product prices and maintain them for a specified period.[111] Massachusetts and New Jersey are among the states with such regulations.[112] States may impose more than one type of restriction. Figure 26 in the Appendix provides a comprehensive overview of state laws governing liquor wholesale prices.[113]

Figure 1. STATE UNIFORM PRICING LAWS ON LIQUOR WHOLESALE



In the rest of the Article, I categorize states into five groups based on their regulations governing liquor wholesale pricing. The first group, labeled "State Wholesale and Retail (SW&R)," includes states that administratively set both wholesale and retail liquor prices. The second group, "State Wholesale (SW)," consists of states that administratively set

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[110] Minimum-markup-maximum-discount laws require that wholesalers set a minimum markup or a maximum discount for each product, with states like Colorado and Wisconsin enforcing these regulations. Robustness checks conducted as part of this paper's empirical study have shown that states with these laws exhibit outcomes nearly identical to those states without wholesale pricing regulations. As a result, these states are grouped together with UR States in the rest of the paper.

[111] *See* Christopher Conlon & Nirupama Rao, *The Cost of Curbing Externalities with Market Power: Alcohol Regulations and Tax Alternatives* (Nat'l Bureau of Econ. Rsch., Working Paper No. 30896, 2023); James C. Cooper & Joshua D. Wright, *Alcohol, Antitrust, and the 21st Amendment: An Empirical Examination of Post and Hold Laws*, 32 INT'L REV. L. & ECON. 379 (2014).

[112] N.J. Admin. Code tit. 13, §2-24.6; Mass. Gen. Laws ch. 138, § 25B (2023).

[113] *See* Figure 26 in Section XI.

wholesale but not retail prices of liquor. The third group comprises states that ban discriminatory pricing.[114] Since this legal regime is akin to the enforcement of the RPA, I refer to this group as "RPA States (RPA)."[115] The fourth group, "Post and Hold States (PH)," requires that liquor wholesalers publicly disclose their prices and maintain them for a brief period.[116] Finally, the fifth group, "Unrestricted States (UR)," imposes no restrictions on liquor wholesale pricing. These states allow wholesaler-retailer bargaining and permit wholesalers to charge different prices to each retailer.[117] Table 1 summarizes these categories.

Table 1. STATE LIQUOR WHOLESALE PRICING REGULATIONS

Abbreviation	*Category*
SW&R	State Wholesale and Retail
SW	State Wholesale
RPA	Uniform Wholesale Pricing
PH	Post and Hold
UR	Unrestricted States

C. *U.S. Liquor Industry*

1. Market Characteristics

To empirically assess the effect of discriminatory pricing on competition, I focus on markets for liquor, as various characteristics of these products lend themselves well to quantifying competitive dynamics.

First, the differentiation among liquor is more pronounced and easier to observe than in other alcoholic beverages, such as wine. For example, consumer preferences for different vodkas can be more readily attributed to

[114] Some states that ban discriminatory pricing also require wholesalers to post and hold their prices. These states are grouped together as "RPA States." To differentiate the price effects of uniform wholesale pricing from those of post-and-hold statutes, the regressions separately control for these two regulations.

[115] Although Louisiana bans discriminatory pricing, it does not require wholesalers to post their prices, which may make the detection of violations challenging. *See* SAMSHA, POLICY SUMMARY: WHOLESALER PRICING RESTRICTIONS 105 (2018), https://www.stopalcoholabuse.gov/media/ReportToCongress/2018/report_main/State_Performance_Best_Practices.pdf. For this reason, I omit Louisiana throughout the empirical study.

[116] The hold period ranges from 10 to 30 days. *See* N.J. Admin. Code tit 13, §2-24.6; Mass. Gen. Laws ch. 138, § 25B (2023).

[117] Among these states are California, Florida, Illinois, Kentucky, Nevada, Texas, Tennessee and Washington.

tangible factors such as brand and price, both of which are clearly observable to researchers. In contrast, wine preferences often depend on a unique combination of attributes such as acidity, sweetness, tannin levels, alcohol content, and aging process. The vast array of important product characteristics and the significant variation in consumer preferences for these traits can present challenges in accurately identifying and controlling for these demand features in an empirical study.

Second, unlike certain alcoholic beverages such as beer, which tend to be less expensive and exhibit less price variation, liquor features higher and more widely dispersed prices. This pricing pattern, together with high sales volume, suggests discernible markups, providing an opportunity to study how discriminatory pricing affects wholesale and retail prices.

Third, the liquor industry, with revenues of $37.7 billion in 2023, constitutes a robust market in the United States.[118] The U.S. accounts for 42.2 percent of the global liquor consumption market, exceeding its market shares for beer and wine by 0.4 percent and 26.1 percent, respectively. Vodka, tequila and American whiskey are the most popular liquors among American consumers.[119]

2. Firms

The U.S. liquor market predominantly features global manufacturers with extensive brand portfolios. Among the industry leaders, Diageo stands out with a market capitalization of $76.02 billion, known for iconic brands such as Johnnie Walker, Captain Morgan and Smirnoff. Pernod Ricard follows closely with a market capitalization of $38.73 billion, home to popular brands like Absolut, Jameson, and Glenlivet. Additionally, Bacardi, although privately held, holds a significant market presence with its eponymous rum brand and Grey Goose vodka.[120] Collectively, the top ten suppliers account for over 70 percent of distilled spirits market in the United States.[121]

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[118] Brandon Gomez, *Spirits Sales Beat Out Beer and Wine for Second Straight Year Despite Little Growth*, CNBC (Feb. 7, 2024), https://www.cnbc.com/2024/02/07/spirits-sales-top-beer-and-wine-in-2023.html.

[119] *Id.*

[120] GLOBAL SPIRITS MANUFACTURING INDUSTRY REPORT, IBISWORLD (2024); *Diageo PLC ADR*, MARKETWATCH, https://www.marketwatch.com/investing/stock/deo (last visited Apr. 30, 2024); *Brands*, DIAGEO, https://www.diageo.com/en/our-brands (last visited Apr. 30, 2024); *Our Brands*, PERNOD-RICARD, https://www.pernod-ricard.com/en/brands (last visited Apr. 30, 2024).

[121] Complaint at 2, Provi v. Southern Glazer's Wine & Spirits (N.D. Ill. 2022) (No. 22 Civ. 1648) https://www.provi.com/hubfs/Provi percent20- percent20Filed percent20Complaint.pdf.

The wholesale market for liquor is characterized by a small number of major distributors.[122] Southern Glazer's, the nation's largest wine and liquor wholesaler, distributes over 7,000 alcohol brands across 44 U.S. states and the District of Columbia, generating revenues of around $20 billion.[123] The company has secured exclusive distribution rights for many popular liquor brands in numerous states, exemplified by its nationwide exclusive distributorship agreement with Bacardi since 2016.[124] Southern Glazer's was formed through a merger in 2016 between Southern Wine & Spirits, the largest U.S. wholesaler, and Glazer's Inc., the fourth largest wholesaler at the time.[125]

RNDC, the second-largest wholesaler, operates in 37 states and the District of Columbia, with revenues of approximately $11.9 billion.[126] Like Southern Glazer's, RNDC has exclusive distributorship contracts with many popular liquor brands, including Jack Daniels, Absolut and Tito's in many states.[127] In 2019, RNDC intended to merge with Breakthru Beverage, the third-largest wholesaler, but the deal was abandoned following an FTC investigation.[128] The combined market share of Southern Glazer's and

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[122] *Exclusive: The U.S. Market's Top Wholesalers Aim for New Heights in 2022,* SHANKEN NEWS DAILY (Apr. 12, 2022), https://www.shankennewsdaily.com/2022/04/12/30802/exclusive-the-u-s-markets-top-wholesalers-aim-for-new-heights-in-2022/.

[123] Complaint at 8, Provi v. Southern Glazer's Wine & Spirits (N.D. Ill. 2022) (No. 22 Civ. 1648) https://www.provi.com/hubfs/Provi percent20- percent20Filed percent20Complaint.pdf.

[124] *Id.; Southern Wine & Spirits of America Announces Organizational Appointments to Transatlantic Spirits Division*, PR NEWSWIRE (Feb. 16, 2016), https://www.prnewswire.com/news-releases/southern-wine--spirits-of-america-announces-organizational-appointments-to-transatlantic-spirits-division-300220466.html.

[125] *Southern Wine & Spirits of America and Glazer's to Combine Creating the Only Comprehensive North American Wine and Spirits Distribution Footprint*, PR NEWSWIRE (Jan. 11, 2016), https://www.prnewswire.com/news-releases/southern-wine--spirits-of-america-and-glazers-to-combine-creating-the-only-comprehensive-north-american-wine-and-spirits-distribution-footprint-300202187.html.

[126] Complaint at 18, Provi v. Southern Glazer's Wine & Spirits (N.D. Ill. 2022) (No. 22 Civ. 1648) https://www.provi.com/hubfs/Provi percent20- percent20Filed percent20Complaint.pdf.

[127] *Id.*

[128] *RNDC and Breakthru Beverage Group to Form $12 Billion Company with North America Footprint*, REPUBLIC NATIONAL DISTRIBUTING COMPANY (Nov. 20, 2017), https://www.rndc-usa.com/republic-national-distributing-company-and-breakthru-beverage-group-to-form-12-billion-company-with-north-american-footprint/; Press Release, Fed. Trade Comm'n, Statement of the FTC's Bureau of Competition Regarding Announcement that Republic National Distributing Company and Breakthru Beverage Group Have Terminated Their Acquisition Agreement (Apr. 8, 2019), https://www.ftc.gov/news-events/news/press-releases/2019/04/statement-ftcs-bureau-

RNDC allegedly exceeds 60 percent in many states.[129]

The retail market features both independent single-location stores and large chain stores. Total Wine & More, the largest retailer, operates 263 stores across 28 states, with plans to add 15 to 20 stores annually.[130] In 2023, the company had a national market share of 7.9 percent with revenues of $6 billion.[131] According to the Total Wine website, "[Total Wine's] tremendous buying power and special relationships with producers, importers and wholesalers bring [the company] considerable savings, which [they] pass on to [their] customers."[132] In addition, regional chains also play a crucial role in liquor retail markets. For example, ABC Fine Wine & Spirits operates 127 stores in Florida; BevMo has 161 stores in California, Arizona, and Washington; and Binny's has 45 stores in Illinois.[133]

D. *Data*

Throughout the empirical study, a product is defined as a specific combination of brand, flavor and size, such as Johnnie Walker Red Label Blended Scotch Whisky in a 1.75L bottle. Wine Searcher, an online search engine for alcoholic beverages, provides retail prices for each product at each liquor or grocery store, along with store details such as name, city, and state. The store names allow to differentiate between chain and independent retailers, while store locations enable the identification of specific regulations governing wholesale purchases by each store. For this study, I use the retail prices from March 2024 of the most popular liquor products. Table 2 provides product names and retail price summary

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competition-regarding-announcement-republic-national-distributing-company.

[129] Complaint at 8, Provi v. Southern Glazer's Wine & Spirits (N.D. Ill. 2022) (No. 22 Civ. 1648), https://www.provi.com/hubfs/Provi percent20- percent20Filed percent20Complaint.pdf.

[130] Tom Ryan, *What's the Recipe for Total Wine's Success*, PR NEWSWIRE (Feb. 21, 2024), https://retailwire.com/discussion/whats-the-recipe-for-total-wines-success/.

[131] GLOBAL SPIRITS MANUFACTURING INDUSTRY REPORT, IBISWORLD (2024); *Diageo PLC ADR*, MARKETWATCH, https://www.marketwatch.com/investing/stock/deo (last visited Apr. 30, 2024); Liz Thach, *How Total Wine & More Became the Largest U.S. Wine Retailer*, FORBES (Feb. 14, 2024), https://www.forbes.com/sites/lizthach/2024/02/14/how-total-wine--more-became--largest-us-wine-retailer/.

[132] *Our Company*, TOTAL WINE, https://www.totalwine.com/about-us/our-company (last visited Apr. 30, 2024).

[133] *Store Directory*, ABC FINE WINE & SPIRITS, https://www.abcfws.com/stores (last visited Apr. 30, 2024); *Store Locator*, BEVMO!, https://bevmo.com/pages/store-locator (last visited Apr. 30, 2024); *Store Locator*, BINNY'S BEVERAGE DEPOT, https://www.binnys.com/store-locator/ (last visited Apr. 30, 2024).

statistics. An observation corresponds to a brand-size-store combination, where all observations belong to 1.75L bottles. [134]

Data Axle provides comprehensive information on liquor retailers across the United States.[135] The database includes details for each store, such as its name, address, total sales and number of employees at that location. I use the most recent data, sourced from February 2024. By examining the store names, I can distinguish between stores affiliated with retail chains and those that operate independently.

Table 2. RETAIL PRICE SUMMARY STATISTICS

Product	*Count*	*Mean*	*St. Dev.*
Absolut Vodka	1,312	$33.21	$5.82
Bacardi Superior White Rum	1,178	$23.81	$4.86
Bacardi Superior Gold Rum	1,175	$23.75	$4.55
Captain Morgan Original Spiced Gold Rum	1,183	$29.58	$6.45
Crown Royal Whisky	993	$52.91	$8.26
Grey Goose Vodka	1,270	$51.76	$10.33
Jack Daniel's Tennessee Whiskey	1,281	$48.45	$8.43
Jameson Irish Whiskey	1,287	$57.02	$9.29
Johnnie Walker Red Label Blended Scotch Whisky	1,150	$39.23	$7.18
Makers Mark Kentucky Straight Bourbon Whisky	1,201	$56.00	$13.31
Smirnoff No.21 Red Label Vodka	1,279	$22.06	$4.30
Tito's Handmade Vodka	1,493	$35.25	$6.00

E. *Empirical Results*

1. Price Effect

Recall from the economic model that discriminatory pricing allows chain stores to negotiate substantially lower wholesale prices than the uniform prices under the RPA. These savings are then partially passed on to consumers. In contrast, independent stores, which are less likely to secure favorable wholesale prices, tend to charge higher retail prices when discriminatory pricing is permitted.

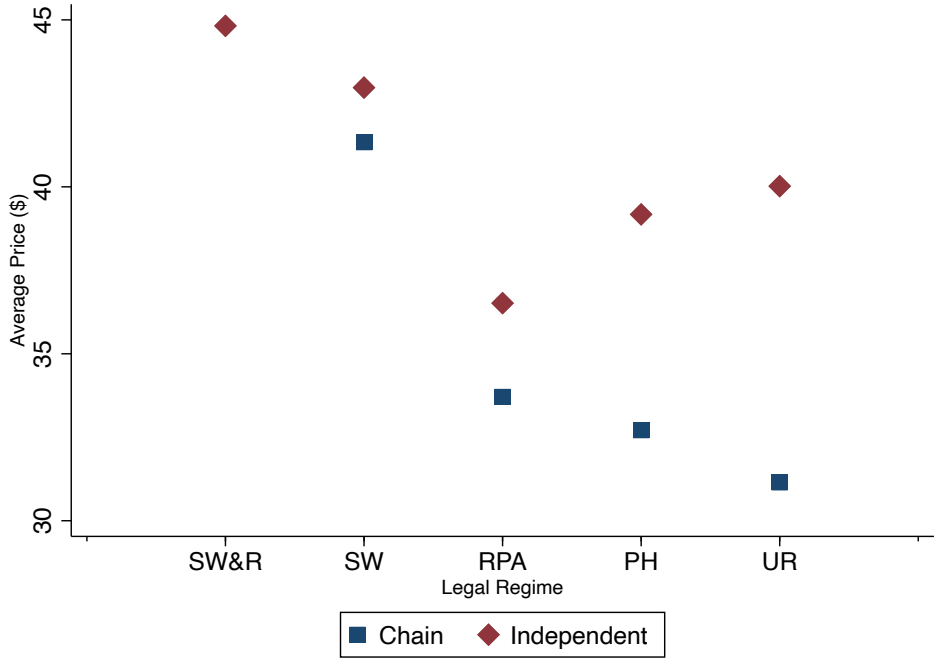
To empirically test this hypothesis, I examine the average retail prices at chain and independent stores under each legal regime. Figure 2 reports

[134] Retail prices exclude sales and liquor retail taxes. The empirical study also deducts liquor wholesale taxes with an assumption of 50 percent incidence.

[135] A liquor retailer is any business that reports "beer, wine, and liquor retailers" as its primary NAICS description.

the results. On the horizontal axis are categories of state regulations governing liquor wholesale pricing, ordered from most to least stringent. On the vertical axis is the average liquor price at a retail store type in dollars.[136] Diamonds denote average retail prices at independent stores, while squares depict the average retail prices at chain stores.[137]

Figure 2. AVERAGE LIQUOR PRICES BY LEGAL REGIME



Four patterns are especially striking. First, states that administratively set both wholesale and retail prices, as well as those that only set wholesale prices, have considerably higher retail prices. This pattern aligns with these states' goals of discouraging excessive alcohol consumption. Notably, average prices are slightly higher in the former category than in the latter,

[136] For this exercise, I begin by calculating the average price of a product in both independent and chain stores within a state. Next, I compute an average across all products within each state for each store type, obtaining an average liquor price in independent and chain stores for each state. Finally, I calculate the average of state liquor prices within each category of legal regime for independent and chain stores. This practice weighs each state and product equally. The dataset is balanced with respect to brands at the state and store type level.

[137] A chain is defined as a company that operates four or more locations within a state, according to the dataset. This definition is supplemented by identifying national chains using industry reports, company websites, and news articles. Additionally, stores that share similar names but are not connected through a corporate structure are excluded from the chain category.

which may be attributed to the presence of retail market competition in latter group of states.

Second, consistent with the predictions of the theory model, chain stores in UR States tend to offer slightly lower retail prices than those in RPA States. Specifically, the average retail price at chain stores is $31.15 in UR States, compared to $33.71 in RPA States. This price difference is likely due to the lower wholesale prices that chain stores in UR States are able to negotiate with wholesalers.

Third, in RPA states, chain stores still charge a lower price than independent stores, despite the law requiring wholesalers to offer identical prices to all retailers. This price difference tends to suggest that chain stores cater to price-sensitive customers and have lower marginal costs of operation, leading them to offer lower retail prices even when they pay the same wholesale prices as independent stores.

Fourth, independent stores in UR States charge notably higher prices compared to those in RPA States. Specifically, the average retail price at independent stores is $40.00 in UR States, compared to $36.51 in RPA States. This difference can be explained by the two key predictions of the theory model. First, independent stores often charge higher retail prices because they are unable to secure favorable wholesale prices under discriminatory pricing. Second, retail markets in UR States likely have reduced competition, as retailers unable to match chain store prices may have already exited the market. Consequently, the remaining retailers can raise their prices. Substantiating this latter prediction requires an empirical study of the average liquor prices and market structure, which will be presented shortly. Before discussing these empirical findings, I formalize the price effects illustrated in Figure 2.

To do so, I regress average product prices at each retailer type in each state on indicators for different legal regimes. The estimating equation is given by

$$\begin{aligned} price_{kjs} = {} & \beta_0 + \beta_c I_{c(k)} + \beta_j I_j + \sum_{r \in R} \beta_{r(s)} I_{r(s)} + \sum_{r \in R} \beta_{c(k),r(s)} I_{c(k),r(s)} \\ & + \beta_{inc} ln(inc_s) + \beta_{pop} ln(pop_s) + \beta_{rent} ln(rent_s) \\ & + \beta_{gas} ln(gas\_price_s) + \beta_{wage5} ln(wage\_5_s) \\ & + \beta_{wage10} ln(wage\_10_s) + \sum_{j \in J} \beta_j I_j + \varepsilon_{ksj}. \end{aligned}$$

In this specification, k indexes retailer type, j indexes products, and s indexes states. The variable c indexes chain stores, with $I_{c(k)}$ denoting chain store indicator variables. The variable r indexes legal regimes—with RPA for states that ban volume discounts, PH for states requiring wholesalers to

post and hold their prices, and SW for states that control liquor wholesale.[138] The indicator variable $I_{r(s)}$ takes the value one if state s is under legal regime r, and $I_{c(k),r(s)}$ takes the value one if retailer type k is a chain store located in a state with legal regime r. This specification controls for different state characteristics, such as per capita income, population, and various measures of the cost of doing business—including rent, gas prices, and average wages in businesses employing fewer than five and between five to nine employees. Additionally, the regression includes product fixed effects. β_0 is the regression constant. All coefficients are relative to an independent store operating in an UR State, and errors are clustered at the state level. The coefficients of interest are those for RPA States (β_{RPA}) and chain stores in RPA States ($\beta_{c,RPA}$).

Figure 3. PRICE REGRESSION COEFFICIENTS

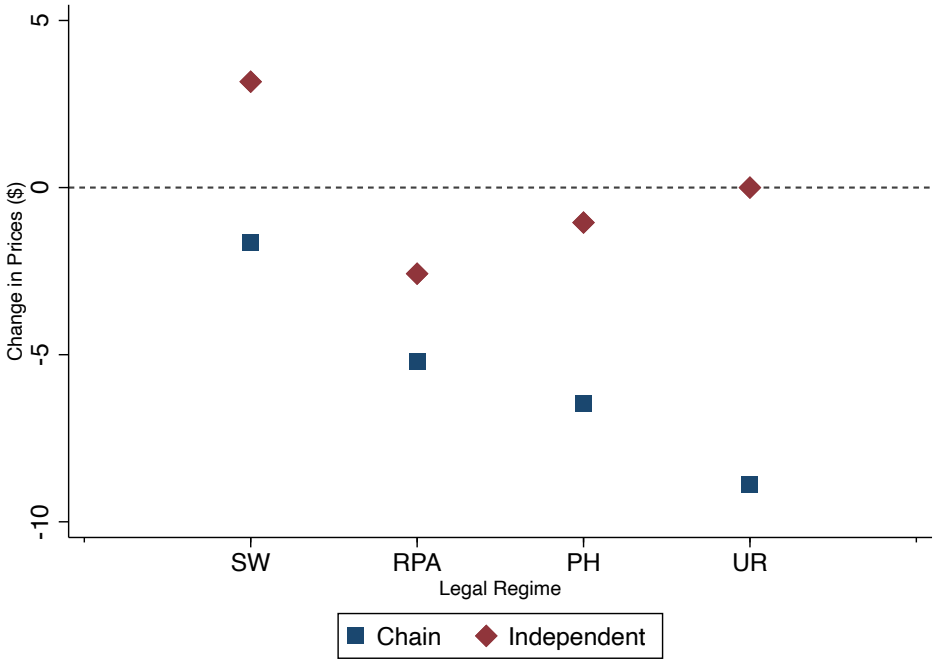


Figure 3 presents the regression coefficients, with the price effect for an independent store in an UR State set as the reference point and normalized to zero.[139] On the horizontal axis are legal regimes, and on the vertical axis

[138] Since the legal framework "UR" serves as the benchmark in the regressions throughout the paper, the set R is defined to exclude this regulatory framework.

[139] Regression results are presented in both tabular format and graphically with 95 percent confidence intervals in the Appendix. *See* the first column of Table 5 and Figure 15 in Section X Subsection A. The appendix also provides regression results where each observation is at the store-brand level. *See* the second column of Table 5 in Section X

is the change in price, measured in dollars. Squares denote coefficients for chain stores, while diamonds represent those for independent stores.[140]

As expected, retail prices at chain stores in RPA States are, on average, $3.65 higher compared to those in UR States, while prices at independent stores in RPA States are $2.37 lower than those in UR States. The coefficient for RPA States (β_{RPA}) is statistically significant at the 5 percent level, and the coefficient for chain stores in RPA States ($\beta_{c,RPA}$) is statistically significant at the 10 percent level.

Next, I examine the average liquor prices across different legal regimes.[141] To do so, I first calculate the average price of each product within a state by equally weighting the mean price from each type of retailer. Then, I regress these state level average prices for each product on indicators for different legal regimes. The estimating equation is given by

$$\begin{aligned} price_{js} = {} & \beta_0 + \beta_j I_j + \sum_{r \in R} \beta_{r(s)} I_{r(s)} + \beta_{inc} ln(inc_s) + \beta_{pop} ln(pop_s) \\ & + \beta_{rent} ln(rent_s) + \beta_{gas} ln(gas\_price_s) \\ & + \beta_{wage5} ln(wage\_5_s) + \beta_{wage10} ln(wage\_10_s) + \sum_{j \in J} \beta_j I_j \\ & + \varepsilon_{js}. \end{aligned}$$

In this specification, j indexes products, s indexes states, and r indexes legal regimes. The indicator variable $I_{r(s)}$ is set to one if state s implements legal regime r. The regression controls for state-level per capita income, population, and various measures of the cost of doing business, and it includes product fixed effects. β_0 is the regression constant. All coefficients are relative to the average liquor price in an UR State, with errors clustered at the state level. The coefficient of interest is that for RPA States (β_{RPA}).

Figure 4 reports the results.[142] On the horizontal axis are the legal

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Subsection A.

[140] To obtain the data point for chain stores in a certain legal regime, add the coefficient for chain stores and the coefficient for chain stores in that legal regime. For instance, the data point for chain stores in RPA states is obtained by adding the coefficient for chains, -8.88, with the coefficient for chains in RPA states, 3.65, which yields –5.23.

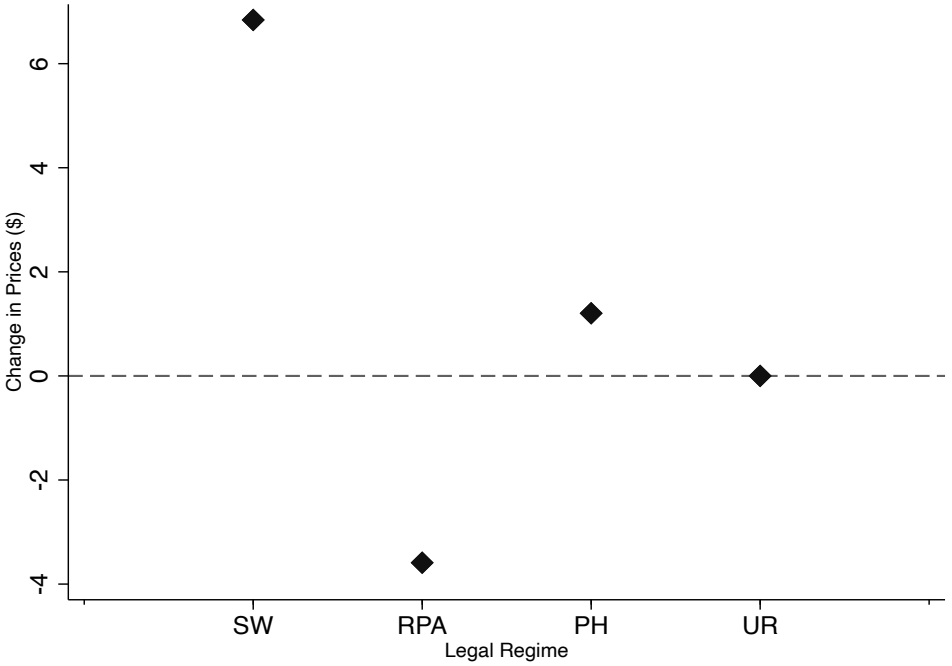
[141] For this exercise, I begin by calculating the average price of a product in both independent and chain stores within each state. Then, I take the mean price in each state for each product, equally weighing average chain and independent store prices. The dataset is balanced with respect to brands at the state and store type level. The summary statistics for this analysis, along with robustness checks that incorporate sales volume-based weights, are detailed in the Appendix. *See* Figure 16 in Section X Subsection A.

[142] Regression results are presented in both tabular format and graphically with 95 percent confidence intervals in the Appendix. *See* the third column of Table 5 and Figure 17 in Section X Subsection A.

regimes, and on the vertical axis is the average liquor price in dollars.

Two features of the figure are especially salient. First, the average retail price in states that administratively set wholesale prices is $6.84 higher than in states without wholesale pricing regulations.[143] This difference is statistically significant at the 1 percent level. Second, in states that allow discriminatory pricing, the average liquor price is $3.59 higher than in states with uniform wholesale prices. This finding is statistically significant at the 5 percent level. The latter result supports a key conclusion of the theory model, which posits that store exits prompted by discriminatory pricing may reduce retail market competition, resulting in higher prices for consumers.

Figure 4. STATE AVERAGE LIQUOR PRICE REGRESSION



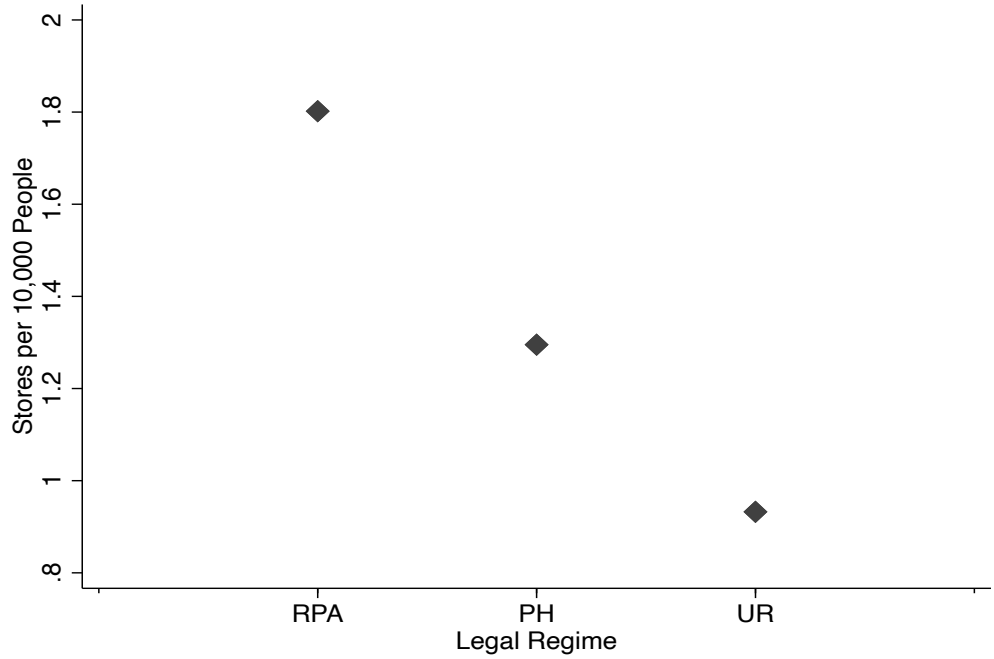
2. Retailer Exit Effect

The economic model posits that discriminatory pricing can drive some retailers out of the market when they are unable to compete with chain stores. These departures reduce the number of retailers in the market and decrease competition. In contrast, markets where discriminatory pricing is

[143] SW states set prices and implement additional restrictions through their legislative and administrative roles. As a result, these states fall outside the scope of this paper and will not be considered in the subsequent empirical analyses.

banned are expected to have more stores, particularly independent ones. To empirically test this hypothesis, I compare the market structure in states that ban discriminatory pricing with those that impose no restrictions.[144]

Figure 5. NUMBER OF STORES PER 10,000 PEOPLE

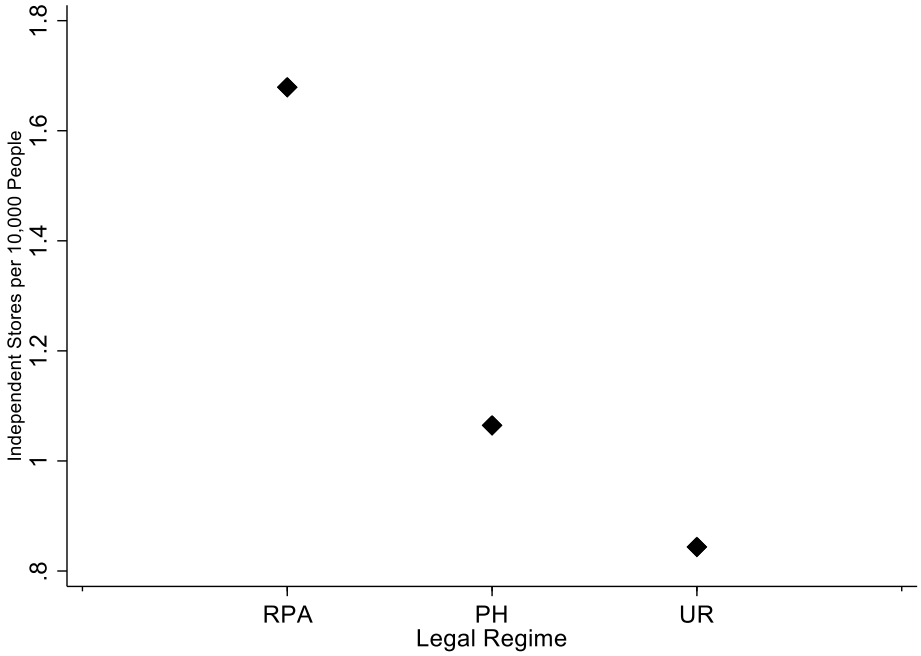


[144] Under every type of legal regime, certain localities impose quotas on the number of liquor licenses that can be issued. Despite these limits, many of these states still have licenses available for off-premise sales (e.g. liquor stores) in major areas and continue to issue new ones. For example, at the writing of this paper, Connecticut had available licenses in 40 towns, including major ones like Hartford, Stamford, Bridgeport and New Haven. Similarly, Florida, which does not impose restrictions on wholesale pricing but has retail quotas, had available licenses in 30 counties. California issued new licenses as recently as 2023. Liquor license quotas appear to predominantly affect on-premise establishments, such as restaurants and bars, rather than off-premise ones like liquor stores. Nevertheless, the regression analyses control for the effect of these liquor license quotas. *See* Shirley Leung & Diti Kohli, *A Decade Ago, Boston Tried and Failed to Fix its Broken Liquor License System, Will this Time Be Different?*, BOSTON GLOBE (May 17, 2024), https://apps.bostonglobe.com/business/2024/05/liquor-licenses/; Johnny P. ElHachem, *2023 Florida Alcoholic Beverage Quota License Drawing Opens*, HOLLAND & KNIGHT (Aug. 21, 2023), https://www.hklaw.com/en/insights/publications/2023/08/2023-florida-alcoholic-beverage-quota-license-drawing-opens; *Package Store Permits Available in Each Town*, CONNECTICUT STATE, https://portal.ct.gov/dcp/liquor-control-division/package-store-permits-available-for-each-town (last accessed Apr. 30, 2024); *California Beverage Control to Issue New Liquor Licenses*, BUSINESS JOURNAL (Jul. 10, 2023), https://thebusinessjournal.com/california-beverage-control-to-issue-new-liquor-licenses/.

Figure 5 presents the average number of stores per 10,000 people across different legal regimes.[145] An observation is an urban county, where a county is categorized as urban if more than 50 percent of its total population is classified as such by the U.S. Census Bureau.[146] On the horizontal axis are the legal regimes and on the vertical axis is the number of stores per 10,000 people.

Among all legal regimes, UR states have the fewest stores per 10,000 people, at 0.93. In contrast, states that ban discriminatory pricing have a significantly higher number of retailers, with 1.80 stores per 10,000 people. This finding strongly supports the theory model's prediction that price discrimination leads to a reduced number of retailers. This reduction in retailers likely decreases competition and increases prices in UR States, as the model suggests.

Figure 6. NUMBER OF INDEPENDENT STORES PER 10,000 PEOPLE



[145] The analysis excludes those states that fall under different categories of legal regimes for liquor and wines. This measure is taken because Data Axle, the provider for retailer data, does not distinguish between wine retailers and liquor retailers. As a result, when the wholesale pricing regulations vary across different alcoholic beverages, the effect of different laws on store count can be confounded. The analysis further excludes states that impose additional restrictions on the number of liquor stores an individual or a firm can have.

[146] The data indicate that liquor chain stores tend to enter urban markets regardless of the legal regime.

Figure 6 illustrates the average number of independent stores per 10,000 people under various legal frameworks. Consistent with previous findings, UR states have the fewest independent stores per 10,000 people, with a count of 0.83. In contrast, states that prohibit discriminatory pricing, on average, have 1.68 independent stores per 10,000 people.

To formalize these effects, I regress the number of stores and number of independent stores per 10,000 people in each urban county on indicator variables for different legal regimes.[147] The estimating equation is given by

$$spc_m = \beta_0 + \sum_{r \in R} \beta_{r(m)} I_{r(m)} + \beta_p popden_m + \beta_u urb_m + \beta_i inc_m + \beta_a age_m + \beta_q I_{quota,s(m)} + \varepsilon_m,$$

where "spc" denotes the number of "stores per capita" or "independent stores per capita" in a county. In this specification, m indexes urban counties, s indexes states, and r indexes legal regimes. The indicator variable $I_{r(m)}$ takes the value one if county m is located in a state governed by legal regime r. The regression controls for county-level variables such as population density, per capita income, median age and the proportion of the total population residing in urban areas.[148] It also controls for state level liquor store quotas.[149] β_0 is the regression constant. All coefficients are benchmarked against a county in an UR State. The coefficient of interest is that for counties in RPA States (β_{RPA}).

Figures 7 and 8 display regression coefficients for the specifications where the dependent variables are the total number of stores and the total number of independent stores, respectively. The effect of being a county in

[147] To make statistical inference, I assume that the residuals for each county, obtained after controlling for the specified county and state level variables, are independently and identically distributed. *See* Section IX.

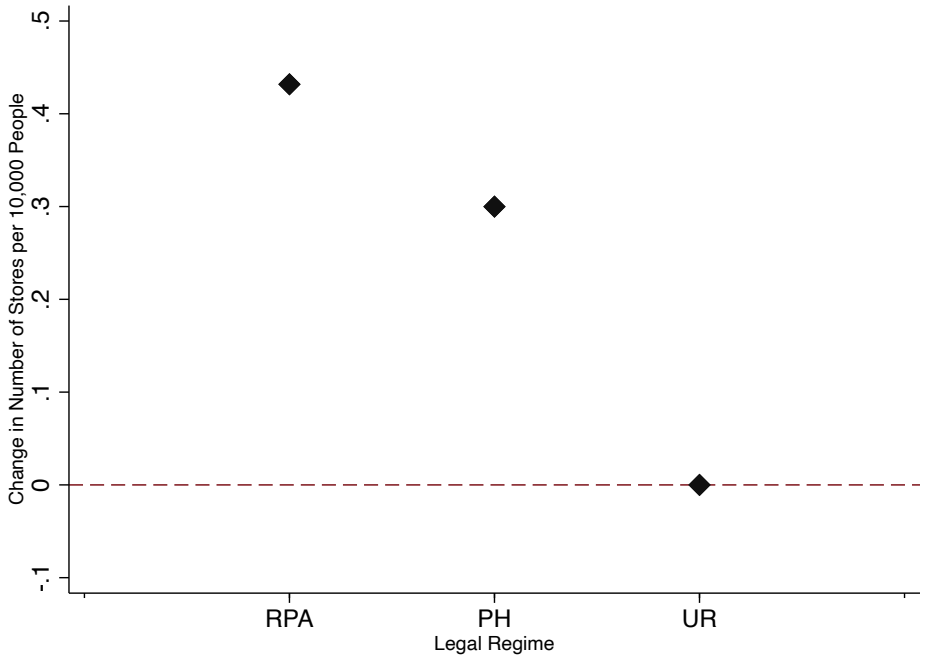
[148] County-level demographic and geographic data were obtained from the U.S. Census Bureau, and county-level per capita income was sourced from the U.S. Department of Commerce, Bureau of Economic Analysis. U.S. Census Bureau, *County-level Urban and Rural information for the 2020 Census*, CENSUS.GOV, https://www.census.gov/programs-surveys/geography/guidance/geo-areas/urban-rural.html (last visited June 1, 2024); U.S. Census Bureau, *Annual Estimates of the Resident Population for Counties: April 1, 2020 to July 1, 2023 (CO-EST2023-POP),* CENSUS.GOV, https://www.census.gov/data/tables/time-series/demo/popest/2020s-counties-total.html (last visited June 1, 2024); Bureau of Economic Analysis U.S. Department of Commerce, *Personal Income by County, Metro, and Other Areas*, BEA.GOV, https://www.bea.gov/data/income-saving/personal-income-county-metro-and-other-areas (last visited June 1, 2024).

[149] The coefficients on the quota indicator are 0.0503 and 0.0264. These coefficients are statistically insignificant.

an UR State is normalized to zero. The legal regimes are shown on the horizontal axis, and the change in the number of stores per 10,000 people is on the vertical axis. Regression results are available in tabular format in the Appendix.[150]

As shown in Figures 7 and 8, counties in RPA States have, on average, 0.43 more stores and 0.61 more independent stores per 10,000 people compared to those in UR States. These results are statistically significant at the 1 percent level. Further robustness checks detailed in the Appendix confirm that these results withstand variations in state-level zoning regulations and quotas on liquor retailers, as well as differences across states in the availability of liquor in grocery stores.[151]

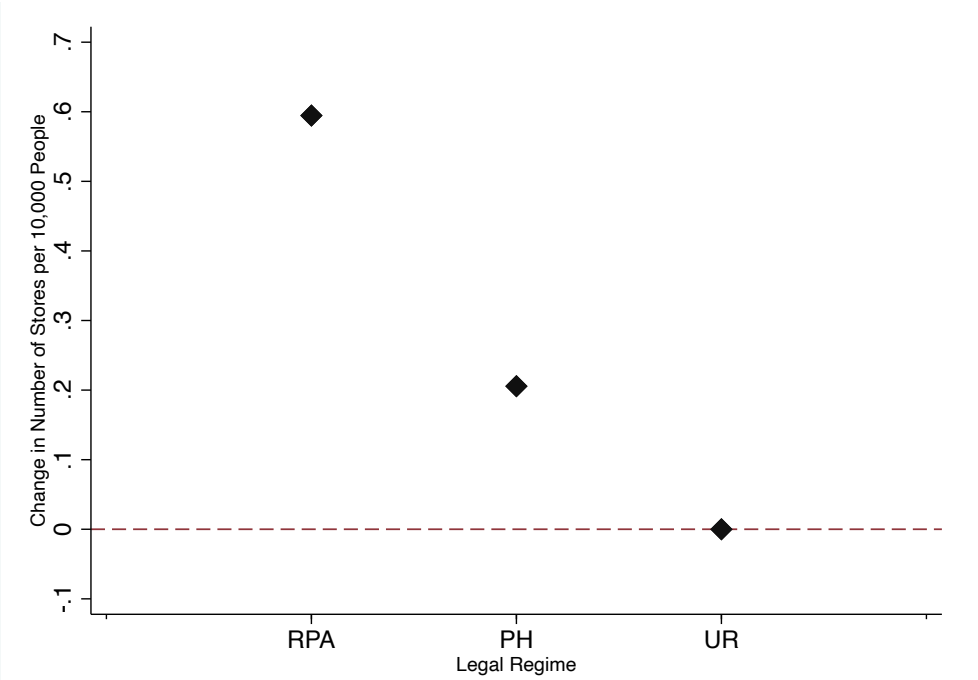
Figure 7. STORE COUNT REGRESSION COEFFICIENTS



[150] Regression results are presented in both tabular format and graphically with 95 percent confidence intervals in the Appendix. *See* the first and second columns of Table 6 and Figures 18 and 19 in Section X Subsection B.

[151] *See* discussion *infra* Section X Subsection B and Table 7.

Figure 8. INDEPENDENT STORE COUNT REGRESSION COEFFICIENTS

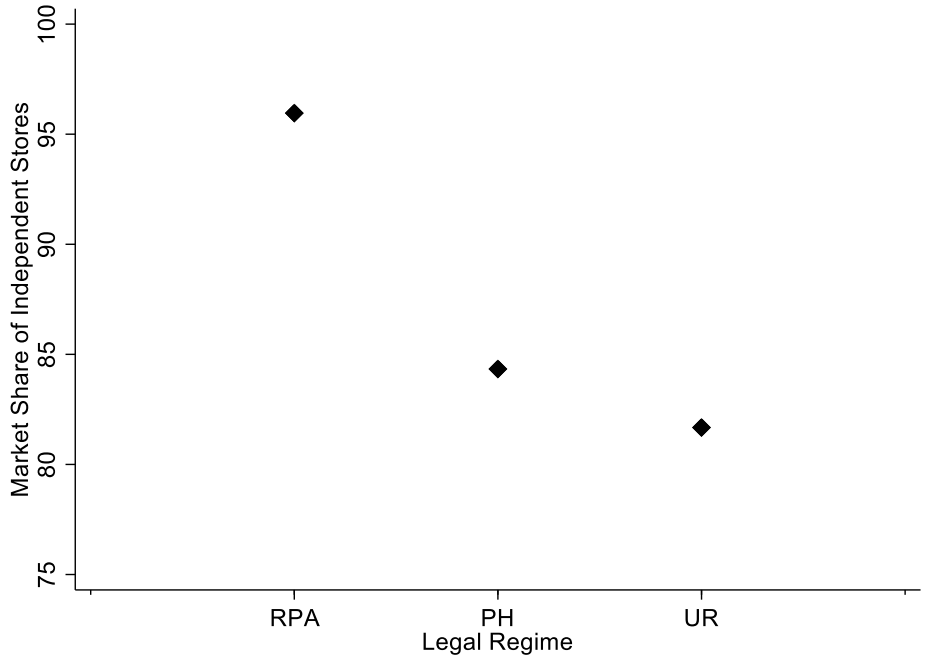


To further explore the effect of discriminatory pricing on market structure, Figure 9 plots the average total market share of independent stores under each legal regime. Recall that according to the theory model, price discrimination often leads to the exit of some independent stores, thus reducing their overall market share. Figure 9 confirms this prediction.

On the horizontal axis are the legal regimes, and on the vertical axis is the total market share of independent stores in a county, calculated based on the number of employees of each store. Diamonds represent the average across all urban counties in the dataset that implement each legal regime

Consistent with the predictions of the theory model, independent stores have a significantly larger market share in states that ban discriminatory pricing compared to states that allow this pricing practice. Specifically, independent retailers constitute on average 96.2 percent of the market in RPA states, while they represent 80.8 percent of the market in UR States.

Figure 9. MARKET SHARE OF INDEPENDENT STORES



To formalize these results, I regress the total market share of independent stores in each urban county on legal regime indicators.[152] The estimating equation is given by

$$mktshare_{ind_m} = \beta_0 + \sum_{r \in R} \beta_r I_{r(m)} + \beta_p pop_m + \beta_l land_m + \beta_u urb_m + \beta_a age_m + \beta_i inc_m + \varepsilon_m,$$

where m indexes counties, s indexes states, and r indexes legal regimes. The indicator variable $I_{r(m)}$ is equal to one if county m is governed by legal regime r. The regression includes controls for county-level population, per capita income, median age and the proportion of the total population residing in urban areas. β_0 is the regression constant. All coefficients are relative to a county in an UR State. The coefficient of interest is that for counties in RPA States (β_{RPA}).

[152] In the Appendix, robustness checks are conducted for this regression using alternative measures of market shares, such as those based on store count and sales volume. Qualitative results remain unchanged. *See* Table 8, and Figures 23 and 25 in Section X Subsection B. *See also supra* note 147.

Figure 10. INDEPENDENT STORE MARKET SHARE REGRESSION COEFFICIENTS

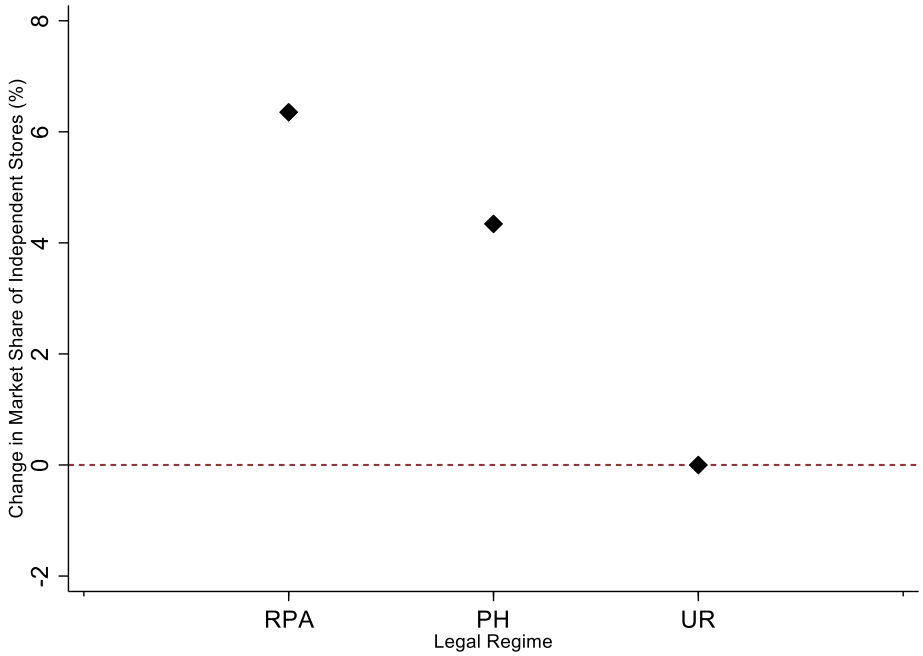


Figure 10 presents the regression coefficients. On the horizontal axis are the legal regimes, and on the vertical axis is the change in the aggregate market share of independent stores in a county, relative to those in UR States and measured in percentage points. The regression coefficients are provided in tabular format in the Appendix.[153]

The regression results further corroborate the hypothesis of the theory model. Specifically, the market share of independent stores in RPA States is approximately 6 percentage points higher than in UR States. This difference is statistically significant at the 10 percent level.[154]

F. *Model Calibration*

I calibrate the theory model presented in Section III to derive estimates for convenience parameters, bargaining parameters, consumers' price

[153] Regression results are presented in both tabular format and graphically with 95 percent confidence intervals in the Appendix. *See* Table 8 and Figure 21 in Section X Subsection B.

[154] The statistical significance of this result is higher when alternative measures of market share, such as those based on store count and sales volume, is employed. *See* Table 8, and Figures 23 and 25 in Section X Subsection B. *See also supra* note 147.

sensitivity, and marginal costs of operation. These estimates will be used to quantify the consumer welfare effects of wholesale price discrimination in the liquor industry.

In the calibration, I match the model to the average moments—characteristics of the data—observed in the U.S. liquor industry and obtain the parameter values that allow the model to closely mirror the observed data.[155] Table 3 presents the calibration results: the first column lists each market characteristic, the second column shows the actual values observed in the data, and the third column presents the model's predictions.

Table 3. ACTUAL VS. PREDICTED MARKET CHARACTERISTICS

Market Characteristics	*Actual*	*Model*
Independent Store Price (RPA)	$36.51	$36.51
Chain Store Price (RPA)	$33.71	$33.68
Independent Store Price (UR)	$40.00	$38.61
Chain Store Price (UR)	$31.15	$31.79
Ratio of Chain and Ind. Store Market Shares (UR – by revenue)	2.47	2.42
Number of Stores (RPA – per 55,000 people)	7.5	8
Number of Stores (UR – per 55,000 people)	5.2	5
Total Independent Store Share (RPA – by count)	97.1%	87.5%
Total Independent Store Share (UR – by count)	87.6%	80%
Chain Store Annual Profits (UR – per store)	$282,470	$328,756
Inside Share	52%	49%

The model closely matches all eleven market characteristics obtained from various sources. The Wine Searcher dataset, discussed earlier, indicates that the average retail price for liquor is $36.51 at independent stores and $33.71 at chain stores in RPA States. The model closely predicts these retail prices at $36.51 and $33.68, respectively. In UR States, the actual average prices are $40.00 at independent stores and $31.15 at chain stores, while the model predicts $38.61 and $31.79, respectively. Since these prices come from markets featuring both chain and independent stores, my analysis focuses on the composition and size of these markets.

Data from IBIS World, a leading global industry research firm, and BizBuySell, the largest online marketplace for buying and selling businesses, indicate that in Florida—a state without restrictions on liquor

[155] The underlying assumption behind this calibration exercise is that every market governed by a particular wholesale pricing regulation possesses the same characteristics as the average market within that regulatory framework. The specific empirical method used to obtain parameter estimates minimizes the distance between actual market characteristics observed in the data and the same characteristics predicted by the model. This technique is formally known as "Generalized Method of Moments (GMM)".

wholesale pricing—the ratio of chain and independent store revenue is approximately 2.47.[156] The model predicts similarly a ratio of 2.42 under wholesale price discrimination.[157]

According to DataAxle, there are approximately 7.5 stores per 55,000 people in RPA states, and 5.2 stores per 55,000 people in UR States. The model has 8 stores per 55,000 people under the RPA and 5 stores per 55,000 people when discriminatory pricing is permitted. Additionally, DataAxle reveals that independent stores constitute 97.1 percent of the market by count in RPA states and 87.6 percent of the market in UR States, compared to 87.5 percent and 80.0 percent in the model, respectively.

Data from IBIS World and news reports indicate that Total Wine has annual profits of around $282,470 per store from liquor sales.[158] The model mirrors this moment, predicting an annual profit of $328,756 per chain store in UR States.

Lastly, inside share refers to the proportion of potential liquor consumers who actually make a purchase. Using data from U.S. Census Bureau, Pew Research, and the Distilled Spirits Council, the actual inside

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[156] To determine the ratio of market shares between chain and independent stores, the analysis focused on chain stores operating exclusively in Florida. This exclusivity ensures that all chain revenues can be attributed to a legal framework permitting wholesale price discrimination. Other major chains, with presences in multiple states with varying wholesale pricing laws, present complexities in isolating revenues attributable to a specific legal regime. For this study, three prominent liquor chains in Florida were examined: ABC Fine Wine & Spirits, which operates 123 stores and had $373.1m in revenues; Mega Wine & Spirits, which operates 15 stores and generated annual revenues of $67.7 million, and Knightly Spirits, which has 5 stores earning $8.5 million in annual revenues, according to data from IBIS World. US COMPANY BENCHMARKING REPORT: ABC FINE WINE & SPIRITS, IBISWORLD (2024); US COMPANY BENCHMARKING REPORT: MEGA WINE & SPIRITS, IBISWORLD (2023); US COMPANY BENCHMARKING REPORT: KNIGHTLY SPIRITS, IBISWORLD (2022). On average, these chain retailers generated $3.05 million per store. In comparison, the average annual revenue for independent liquor stores in Florida, as listed in BizBuySell, is $1.23 million. (Data on file with the author.) Using these figures, the ratio of chain to independent store revenues in an unrestricted state is calculated at 2.47. (3.05/1.23 = 2.47) This assumes that the revenue ratio from liquor sales mirrors the ratio of total revenue between chain and independent stores.

[157] According to the calibrated model, under price discrimination, a chain store sells to 20.0% of consumers at a retail price of $31.79, while an independent store sells to 6.8% of consumers at a retail price of $38.61. Consequently, the revenue ratio of the chain store to the independent store under price discrimination is 2.42. (0.20*31.79)/(0.068*38.61)=2.42

[158] TW has 268 Stores in the U.S. and announced $229.4 million in profits. It is reported that TW earns 33 percent of its profits from liquor. These numbers yield annual profits of ($229.4m x 0.33)/268 = $282,470 per store. *See* Cyril Penn, *Total Wine & More Sharpens Focus on Winery Direct*, WINE BUSINESS (Mar. 22, 2018), https://www.winebusiness.com/news/article/197021;
GLOBAL SPIRITS MANUFACTURING INDUSTRY REPORT, IBISWORLD (2024).

share is calculated to be around 52 percent.[159] The inside share according to the model is 49 percent.[160]

The model estimates that an individual living in an urban county in an UR state experiences an annual welfare loss of $4.91.[161] The model further yields that a typical consumer spends approximately $422 on liquor annually.[162] For comparison, according to the IBIS World, the per capita expenditure in the U.S. on all types of alcoholic beverages—including beer,

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[159] According to the Census, there are 258.3 million adults (18 years or older) in the United States. It is assumed that no one below the age of 18 can consume alcohol. According to PEW Research, 62 percent of U.S. adults (people above the age 18) ever drink alcohol. Multiplying these two figures yields that 160.146 million people can potentially purchase liquor. According to the model, the average price for a bottle of liquor is $35.15, and a consumer who decides to buy liquor purchases 12 bottles per year. This results in an average yearly expenditure of $422 on liquor for a consumer who decides to make a purchase. Multiplying the number of people who could potentially purchase liquor (160.146 million) with annual spending on liquor per consumer conditional on making a purchase ($422) results in $67.55 billion in potential liquor sales. The Distilled Spirits Council reports that the actual revenues for the liquor industry in the U.S., excluding premixed cocktails, totaled $34.9 billion in 2023. Dividing this actual revenue ($34.9 billion) by the potential spending on liquor ($67.55 billion) yields that the industry captures about 52 percent of the potential market, which is taken as the inside share observed in the real world. Stella U. Ogunwole et al., *U.S. Adult Population Grew Faster Than Nation's Total Population From 2010 to 2020*, UNITED STATES CENSUS BUREAU, https://www.census.gov/library/stories/2021/08/united-states-adult-population-grew-faster-than-nations-total-population-from-2010-to-2020 (last accessed Apr. 30, 2024); Katherine Schaeffer & Drew Desilver, *10 Facts About Americans and Alcohol as "Dry January" Begins*, PEW RESEARCH CENTER (Jan. 3, 2024), https://www.pewresearch.org/short-reads/2024/01/03/10-facts-about-americans-and-alcohol-as-dry-january-begins/; *U.S. Spirits Revenues Maintain Market Share Lead of Total Beverage Alcohol Market in 2023*, DISTILLED SPIRITS COUNCIL OF THE UNITED STATES, https://www.distilledspirits.org/news/discus-aeb-u-s-spirits-revenues-maintain-market-share-lead-of-total-beverage-alcohol-market-in-2023/.

[160] The estimated inside share is calculated by summing the number of consumers—each assumed to have unit demand—to whom all retailers make sales. Under the RPA, retailers reach 50 percent of the population, while under price discrimination, this figure is 47 percent. The average of these two values is approximately 49 percent.

[161] This figure reflects the change in consumer welfare resulting from changes in prices. To obtain it, I first calculate the amount of money a consumer would need to reach the utility they get under each legal regime. To determine consumer welfare loss from discriminatory pricing, I then subtract the consumer welfare under discriminatory pricing from the consumer welfare under its ban. $\Delta CW = CW_{RPA} - CW_{UR}$. *See* discussion *infra* Section VIII for a formal description of the consumer welfare calculation.

[162] According to the model, the average price for a bottle of liquor is $35.15, and a consumer who decides to buy liquor purchases 12 bottles per year. This results in an average yearly expenditure of $422 on liquor for a consumer who decides to make a purchase.

wine, and liquor—was $1020 in 2023.[163] As a result, the estimated consumer welfare loss from price discrimination represents 1.16% of a typical consumer's annual expenditure on liquor.[164]

Collectively, consumers in UR states face an annual welfare loss of $529 million due to wholesale price discrimination.[165] The Distilled Spirits Council reports that in 2023, the liquor industry's annual revenue in the U.S. was $34.9 billion. Thus, this welfare loss amounts to 1.52% of the total spending on liquor. Discriminatory pricing is more advantageous under the total welfare standard, which includes both consumer welfare and retailer profits, as it increases total welfare by $81 million.[166]

Table 4 presents these model estimates and key supply and demand parameters derived from the calibration. The annual fixed cost of operation for an independent store is estimated at $68,554.[167] The mean market elasticity—defined as share of consumers who stop making a purchase when prices increase by one percent—is 2.86.[168] In other words, a 1 percent price increase results in a 2.86 percent decrease in the number of consumers purchasing liquor. A chain store is estimated to have 40 percent bargaining power against the wholesaler, whereas the independent stores appear to have no bargaining power.

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[163] GLOBAL SPIRITS MANUFACTURING INDUSTRY REPORT, IBISWORLD (2024).

[164] $4.91/$422 = 1.16%

[165] According to data from the U.S. Census Bureau and Data Axle, 107,670,232 people reside in urban counties with at least one chain store located in states that impose no restrictions on wholesale pricing. To estimate the total welfare loss, I first determine the annual expected welfare loss of a single individual arising from solely the difference in prices, which is $4.91. I then multiply this amount with the total population affected to find the annual aggregate consumer welfare loss.

[166] Total welfare includes both consumer surplus and retailer profits net of fixed cost. Under discriminatory pricing, incumbent firms experience increased profits, while firms exiting the market cease to incur fixed costs. As the model abstracts from unexpected supply and demand shocks, which generate complex dynamics, fixed costs are isomorphic to sunk costs.

[167] To obtain fixed cost intervals, I hypothetically introduce a new retailer into the market and recompute equilibrium prices, shares, and profits. To illustrate, suppose that we observe N retailers in the market, and each independent retailer earns $70,000. If we hypothetically add an independent retailer to the market, increasing the total to N+1, and if each retailer then earns $60,000, we can draw conclusions about the fixed cost. Specifically, if the fixed cost was below $60,000, we would expect to see at least N+1 retailers in the actual data. Conversely, if the fixed cost exceeded $70,000, we would observe fewer than N retailers in the data. Thus, in this example, the fixed cost must lie between $70,000 and $60,000. The average fixed cost is obtained by taking the mean of fixed costs across legal regimes.

[168] The average market elasticity is determined by artificially increasing the prices of all retailers in the model by 1% and computing the resultant decrease in equilibrium sales among all retailers.

Table 4. MODEL ESTIMATES AND PARAMETERS

Estimate/Parameter	*Value*
Annual Per Capita Consumer Welfare Loss from Price Disc.	$4.91
Annual Per Capita Spending on Liquor	$422
Annual Consumer Welfare Loss from Price Disc.	$529 million
Annual Total Welfare Gain from Price Disc.	$81 million
Independent Store Fixed Cost (Average)	$68,554
Independent Store Fixed Cost Interval (RPA)	$63,158 - $72,566
Independent Store Fixed Cost Interval (UR)	$61,301 - $77,189
Mean Market Elasticity	2.86
Chain Store Bargaining Parameter	0.40
Independent Store Bargaining Parameter	0
Price Coefficient	0.71

V. POLICY FRAMEWORK

A. *Implementation*

Two key market characteristics can aid an antitrust authority in assessing how discriminatory pricing affects consumer welfare in a particular market. The first characteristic is the disparity in bargaining power among retailers when negotiating with wholesalers. The second is the degree of similarity in the attributes of different retailers.

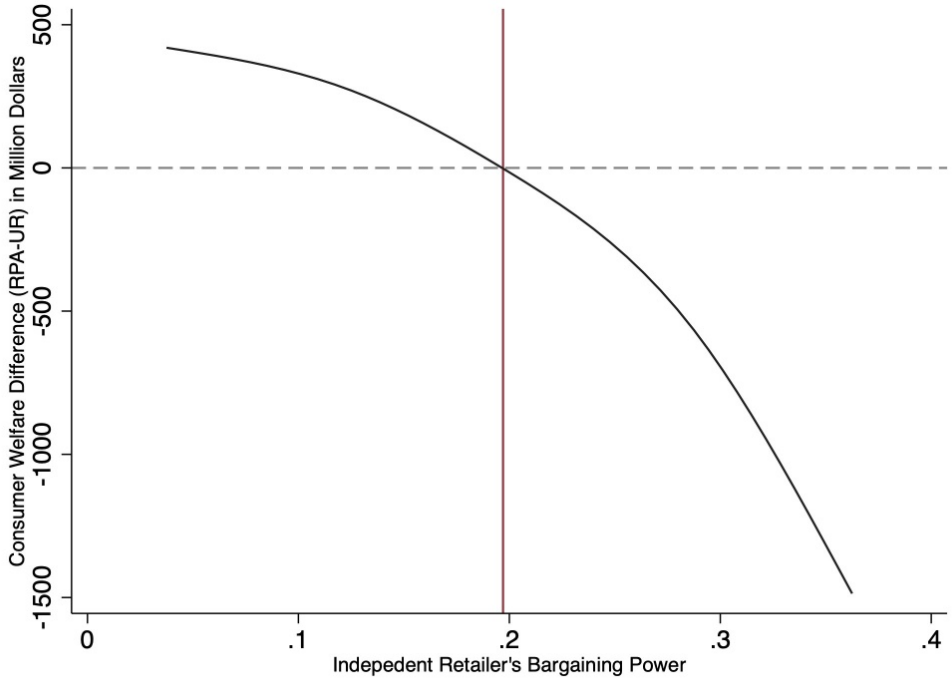
First, the difference in bargaining power among retailers significantly influences the effect of discriminatory pricing on consumer welfare. When smaller retailers have noticeable bargaining power in a given market, price discrimination can enhance consumer welfare by enabling numerous retailers, including smaller ones, to negotiate lower wholesale prices. In such a market, bargaining, which is permitted only under discriminatory pricing, allows many retailers to counteract the wholesalers' market power. Indeed, one reason the Department of Justice ceased enforcement of the RPA was the belief that cooperatives formed by independent retailers could offset the bargaining power of chain stores without resorting to the enforcement of the Act.[169] To test this intuition, I turn to the economic model and recompute the equilibrium for different values of independent store

[169] U.S. DEP'T OF JUSTICE, REPORT ON THE ROBINSON PATMAN ACT 247 (1977), https://babel.hathitrust.org/cgi/pt?id=pur1.32754060681834&seq=12.

bargaining power in the liquor industry.[170] Figure 11 reports the results.

On the horizontal axis is the bargaining power of an independent retailer against the wholesaler, ranging from zero to 0.4—the bargaining power of a chain store under the benchmark calibration within a unit interval.[171] On the vertical axis is the additional aggregate consumer welfare generated by the RPA compared to price discrimination, measured in million dollars.

Figure 11. BARGAINING POWER COUNTERFACTUAL ANALYSIS



Hence, positive values on the vertical axis indicate that a ban on price discrimination enhances consumer welfare, while negative values describe a market where discriminatory pricing is more advantageous for consumers. The dashed grey horizontal line marks a consumer welfare difference of zero, indicating that price discrimination and its prohibition yield the same consumer welfare. The red vertical line marks an independent store

[170] The counterfactual analyses use the parameter estimates reported in Table 4 and simulate the market equilibrium for different values of the independent store bargaining parameter, ranging from 0 to 0.4, under each legal regime. This exercise provides equilibrium retail prices and sales for independent and chain stores under the RPA and wholesale price discrimination for different values of independent store bargaining power. Consumer welfare under each regime and for each value of the independent store bargaining power is then calculated using these equilibrium prices and shares.

[171] The bargaining power of the wholesaler against an independent retailer is found by subtracting the independent retailer's bargaining power from 1.

bargaining power at approximately 0.2.

When independent stores' bargaining power is less than 0.2, a ban on price discrimination results in greater consumer welfare compared to discriminatory pricing. In contrast, when independent stores have bargaining power between 0.2 and 0.4, price discrimination results in higher consumer welfare. Therefore, if an agency or a court seeks to maximize consumer welfare in this particular market, it would be prudent to prohibit price discrimination when independent retailers have negligible bargaining power—as found in the benchmark calibration. Conversely, allowing discriminatory pricing would be advisable when independent stores possess bargaining power.

Second, the asymmetry in retailer attributes, aside from bargaining power, may impact the effect of discriminatory pricing on consumer welfare in a specific market. However, altering this aspect of the liquor market is unlikely to change the established qualitative conclusions because of the strength of the retailer market exit mechanism. Even if chain stores have the same attributes as the independent stores, they would still negotiate lower wholesale prices under discriminatory pricing, leading to the exit of some independents. These departures increase market concentration and likely harm consumers. To test this hypothesis, I conduct a counterfactual analysis where the chain store is assumed to have the same level of convenience as independent stores and also incurs the additional marginal cost of operation that independent stores face. Under these circumstances, discriminatory pricing leads to the exit of two out of seven incumbent retailers. Each consumer experiences an annual welfare loss of $7.08 under discriminatory pricing compared to a market where the RPA is enforced. Therefore, in this market, altering the asymmetry in retailer attributes does not change the qualitative conclusions about discriminatory pricing.

Additionally, parties can employ the economic model presented in this paper to conduct a thorough empirical analysis using price and sales data from the market under consideration. The empirical section of this paper uses the cross-sectional variation across different geographic markets to calibrate the economic model, necessitated by the lack of comprehensive public or commercially available proprietary liquor sales data.[172] However, parties involved a litigation, particularly government plaintiffs, can obtain such data through discovery. With access to sales data, parties can use more data-intensive and rigorous techniques to estimate the model and assess the effects of discriminatory pricing on consumer welfare. This approach,

[172] NielsenIQ Marketing provides the most comprehensive commercially available proprietary dataset on grocery and liquor retail sales. However, this dataset primarily features large grocery retailers and anonymizes all retailer identities, rendering it impossible to obtain information on independent liquor stores.

referred to as "structural econometric modeling," is frequently employed in other areas of antitrust law, such as merger analysis and investigations into collusive agreements.[173] Furthermore, if parties possess data on fixed costs of operation, along with price and quantity data—typically sourced from retailers' income statements or other business records—the need for cross-sectional variation across different geographic markets in the empirical analysis is eliminated. Alternatively, if parties can ascertain the onset and duration of discriminatory pricing, they can evaluate its effects on consumer welfare by analyzing the changes in the industry over time.

Overall, a court or an agency needs to assess the interaction between the three forces in a specific market to determine the impact of discriminatory pricing on consumer welfare. The aforementioned examples demonstrate that wholesale price discrimination should neither be categorically banned nor universally allowed, as its effect on consumer welfare intricately depends on the particular characteristics of the market.

B. *Timing*

Although the effect of price discrimination on consumer welfare depends on specific market conditions, it is more prudent and efficient to proactively identify any anticompetitive discriminatory pricing practices rather than addressing them retroactively. The argument in favor of preempting such practices parallels the current approach to anticompetitive mergers under Section 7 of the Clayton Act.[174] It is widely recognized that blocking an anticompetitive merger before it is finalized is less costly than seeking divestiture afterward. Once a merger is completed, undoing it becomes difficult, often likened to "unscrambling eggs."[175] By then, assets are

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[173] *See* Steven Berry, James Levinsohn & Ariel Pakes, *Automobile Prices in Market Equilibrium*, 63 ECONOMETRICA 841 (1995); Aviv Nevo, *Mergers with Differentiated Products: The Case of the Ready-to-Eat Cereal Industry*, 31 RAND J. ECON. 395 (2000); Katja Seim, *An Empirical Model of Firm Entry with Endogenous Product-Type* Choices, 37 RAND J. OF ECON 619 (2010); Amanda Starc & Thomas Wollmann, *Does Entry Remedy Collusion? Evidence from the Generic Prescription Drug Cartel*, AM. ECON. REV. (Forthcoming); ALI HORTACSU & JOONHWI JOO, STRUCTURAL ECONOMETRIC MODELING IN INDUSTRIAL ORGANIZATION AND QUANTITATIVE MARKETING: THEORY AND APPLICATIONS (1st ed. 2023). Estimating the economic model would further require specifying econometric methods for identification, which involves determining model parameters from the data.

[174] 15 U.S.C. §18 (2018).

[175] *See* H.R. REP. NO. 94-1373, at 8 (1976) ("'Unscrambling' the merger, and restoring the acquired firm to its former status as an independent competitor is difficult at best, and frequently impossible."); William J. Baer, *Reflections on 20 Years of Merger Enforcement Under the Hart-Scott-Rodino Act*, FTC (Oct. 31, 1996),

comingled and information is shared, making reversal not only challenging but sometimes impossible. Similarly, restoring competition in a market from which numerous retailers have already exited is difficult, as re-entry often involves prohibitively high costs. Therefore, a proactive approach to detecting price discrimination—akin to the scrutiny applied to potentially anticompetitive mergers under Section 7 of the Clayton Act—would more effectively prevent anticompetitive behavior compared to a reactive approach, like the challenges under Section 1 of the Sherman Act, which only occur after an anticompetitive agreement or conspiracy has been realized.

Indeed, this proactive approach is grounded in the statutory language of the RPA and supported by Supreme Court decisions. Notably, in its 1981 *Truett Payne* decision, the Court highlighted,

> By its terms, §2(a) [of the Robinson-Patman Act] is a prophylactic statute which is violated merely upon a showing that "the effect of such discrimination *may* be substantially to lessen competition." (Emphasis supplied.) As our cases have recognized, the statute does not "require that the discriminations must in fact have harmed competition."[176]

Thus, the statute authorizes antitrust agencies and courts to enjoin discriminatory pricing that could harm competition, even if the injury has not fully materialized.

C. *Detection*

Once an investigation into discriminatory pricing practices begins and the case progresses to the discovery stage, the plaintiff—especially if it is an antitrust agency—can obtain the necessary information and data to assess the consumer welfare effects of these practices. However, a major challenge in effectively enforcing the RPA is the initial detection of such pricing practices. Since the prices negotiated between private wholesalers and retailers are often proprietary, identifying instances of discriminatory pricing using publicly available information can be difficult. Two strategies could help mitigate this issue and enhance enforcement efforts. First, rigorous enforcement of the RPA could incentivize independent retailers to report instances of price discrimination to the antitrust agencies or to file private lawsuits. Second, agencies could start by identifying large, highly

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https://www.ftc.gov/news-events/news/speeches/reflections-20-years-merger-enforcement-under-hart-scott-rodino-act.

[176] J. Truett Payne Co. v. Chrysler Motors Corp., 451 U.S. 557, 561 (1981).

visible buyers and then investigate the specific product markets where these buyers may be receiving preferential wholesale prices.

VI. CONCLUSION

The renewed focus on the Robinson-Patman Act (RPA) signifies a major shift in antitrust enforcement against discriminatory pricing, which has largely gone unchecked by the agencies for decades. Recent FTC actions, including investigations in the soft drink and liquor industries, underscore the agency's commitment to tackling price discrimination that could harm competition.

This paper uses an economic model to identify three key forces that determine the consumer welfare effects of discriminatory pricing. The model demonstrates that while price discrimination allows chain stores to secure lower wholesale prices, it can reduce competition and harm consumer welfare by driving retailers out of the market. An empirical study of discriminatory pricing in the U.S. liquor industry reveals that this practice results in fewer retail outlets and higher retail prices at independent stores, leading to a $529 million loss in consumer welfare.

These findings highlight the need for a nuanced, case-by-case approach to enforcing the RPA, ensuring effective promotion of competition and protection of consumer interests.

VII. APPENDIX A: ECONOMIC MODEL

This section presents a generic model of a vertical market structure with three types of agents: a wholesaler, retailers, and consumers.[177] The model has two types of retailers: independent stores and chain stores.

Chronologically, the initial stage constitutes retailers' decision to enter/stay in or to exit the market. Next, the wholesaler sets the prices at which it sells products to retailers. The RPA affects how these wholesale prices are set. When there is an effective ban on price discrimination, every retailer is charged the same wholesale price. Without such a ban, the wholesale prices can vary for each retailer. The final stage includes stores setting their retail prices and consumers making their purchase decisions. To facilitate presentation, I explain the model in reverse order.

A. *Stage III: Consumer Demand and Retailer Pricing*

Consumers have three options: they can buy a single unit from an

[177] Throughout the model, store and retailer are used interchangeably.

independent store, purchase one from a chain store, or choose not to buy at all. Independent stores offer greater convenience but have higher marginal costs of operation. In contrast, chain stores are less convenient but have lower marginal costs of operation. Intuitively, consumers prefer not to pay high prices and favor shopping at convenient stores. However, willingness to pay for the store's convenience differs from person to person.

To formalize the process, I index consumers by i and retailers by j. The indirect utility consumer i obtains from buying the product at store j is given by

$$u(\beta_i, \gamma_j, p_j) = \beta_i \gamma_j - \alpha p_j + \varepsilon_{ij}.$$

γ_j captures the difference in convenience between two types of retailers. Since an independent store is assumed to be more convenient, it follows that $\gamma_{ind} > \gamma_{chain}$. Each consumer is assigned a particular multiplier β_i, reflecting their individual preference for convenience. The variation in consumers' willingness to pay for convenience arises from the distribution of this multiplier.[178] The term p_j denotes the retail price at store j, and α is the degree to which consumers dislike prices. Together, αp_j quantifies the magnitude of disutility a consumer experiences from paying the retail price set by store j. ε_{ij} is a consumer-retailer specific utility shock, which is unobserved by the econometrician.[179]

A consumer chooses the option that provides the highest utility. The probability that consumer i will choose retailer j, hereinafter referred to as "individual choice probability," is denoted by s_{ij}, and has the following closed form solution.[180]

$$s_{ij} = \frac{e^{\beta_i \gamma_j - \alpha p_j}}{1 + \sum_j e^{\beta_i \gamma_j - \alpha p_j}}.$$

The market share of retailer j among all consumers is found by taking the average of individual choice probabilities for that retailer. Retailer j's market share, denoted by s_j, is formally given by

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[178] I assume that β_i has an exponential distribution with a rate parameter of 1.25, unless specified otherwise.

[179] ε_{ij} are assumed to be distributed according to a Type I extreme-value distribution.

[180] When ε_{ij} are assumed to be distributed according to a Type I extreme-value distribution, the individual choice probability s_{ij} takes a closed form solution. The indirect utility of not making a purchase is normalized to zero, following the convention. As a result, the probability that consumer i does not make a purchase is found by replacing the numerator in the equation for s_{ij} with 1.

$$s_j = \frac{1}{N}\sum_{i=1}^{N} s_{ij}$$

where N is the number of consumers in the market.

The model provides a measure of consumer surplus, in terms of dollars. This allows for a comparison between consumer surplus under the RPA with that under a legal regime that permits discriminatory pricing.[181]

Stores set their retail prices to maximize profits. At this stage, entry costs are sunk and wholesale prices are already set.[182] As a result, a retailer's profit is given by

$$\pi_j = Ns_j[p_j - w_j - c_j],$$

where p_j denotes store j's retail price, w_j represents the wholesale price store j pays to the wholesaler, and c_j is store j's marginal cost of operation. I assume that a chain store has a lower marginal cost of operation than an independent store; therefore, $c_{ind} > c_{chain}$. The per unit profits of store j are found by subtracting its wholesale and operational costs from its retail price. To calculate the total profits of store j, the per unit profit margin is multiplied with its total sales volume, which is the product of the market size, denoted by N, and store j's market share, denoted by s_j.

Each store simultaneously sets the retail price that maximizes its profits, given the retail prices of other stores, wholesale prices and marginal costs of operation.[183] A unique Bertrand-Nash equilibrium emerges from this simultaneous price setting game.

B. *Stage II: Wholesale Pricing*

The determination of wholesale prices depends on the legal regime. When price discrimination is prohibited under the RPA, wholesalers must

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[181] Formally, under the distributional assumptions mentioned earlier, consumer i derives the following expected surplus, which is measured in dollars, from a given set of retail prices:

$$E[U_i] = \frac{1}{\alpha} ln(\sum_{j\in J} e^{\beta_i \gamma_j - \alpha p_j}),$$

where α is the marginal utility of income, and the division by α converts expected utility from utils to dollars. Consumer surplus for all individuals is simply found by summing each individual's surplus.

$$E[U] = \sum_i E[U_i]$$

[182] The regulatory framework through which wholesale prices are set is modeled in the next subsection. *See* discussion *infra* Section VII Subsection B.

[183] $p_j^* = \text{argmax}\, Ns_j[p_j - w_j - c_j]$.

charge the same price to all retailers, thereby making retailers price-takers in the wholesale market. The first subsection formalizes this scenario. Conversely, if price discrimination is permitted, each retailer may be charged a wholesale price specific to them. The second subsection presents a formal description of the market under this legal framework.

1. Wholesale Pricing under the Robinson-Patman Act

The RPA bans charging different prices to different buyers for the same product.[184] Hence, when the Act is effectively enforced, independent and chain stores must pay the same wholesale price. Formally, this is expressed as $w_{ind} = w_{chain} = \widehat{w}$, where $\widehat{w}$ denotes the uniform wholesale price charged to all retailers.

With a uniform wholesale price, the wholesaler's profit function becomes,

$$\pi_w^{RPA} = N[\sum_j s_j\ ]\ [\widehat{w} - c_w].$$

In this specification, $\widehat{w}$ is the uniform wholesale price, and c_w is the wholesaler's marginal cost. The wholesaler's per unit profits are calculated by subtracting its marginal cost from the wholesale price. To determine the wholesaler's total profits, this per unit profit is multiplied by the total number of products sold. It is assumed that every product the wholesaler sells to retailers is then sold by the retailers to consumers, implying that the wholesaler's sales volume is equal to the total products sold by all retailers. This total sales volume is found by adding the retail market shares of all stores and multiplying this sum by the number of consumers, denoted by N. The wholesaler sets the uniform price that maximizes its profits.[185]

2. Discriminatory Pricing without Wholesaler-Retailer Bargaining

When price discrimination is permitted, the wholesaler sets retailer-specific prices. In this subsection, I momentarily abstract away from wholesaler-retailer bargaining. Without bargaining, the wholesaler's profit

[184] The Robinson-Patman Act permits price differences that "make only due allowance for differences in the cost of manufacture, sale, or delivery resulting from the different methods or quantities" in which the commodities are "sold or delivered." 15 U.S.C. §13(a) (2018). To capture the welfare effects of the Act's ban on price discrimination, I abstract away from these cost differences. I assume that the wholesaler incurs the same cost when servicing independent and chain stores.

[185] Formally, the first order condition for the wholesaler's profit function yields this optimal uniform wholesale price, which is denoted by $\widehat{w}^*$: $\widehat{w}^* = \operatorname{argmax} \pi_w^{RPA}$.

in the presence of discriminatory pricing is given by,

$$\pi_w = N[\sum_{j\epsilon J_{chain}} s_j\,][w_{chain} - c_w] + N[\sum_{j\epsilon J_{ind}} s_j\,][w_{ind} - c_w].$$

In this specification, w_{chain} and w_{ind} denote the wholesale prices charged to chain stores and independent stores, respectively. The wholesaler's marginal cost, denoted by c_w, remains the same across different types of retailers. The first part of the equation gives the wholesaler's profit from chain stores. This profit is calculated by multiplying the profit margin—the difference between the wholesale price for chain stores and the marginal cost—by the total units sold to chain stores. Sales to chain stores are found by multiplying the total market share of chain stores, given by $\sum_{j\epsilon J_{chain}} s_j$, with the number of consumers in the market, denoted by N. A similar approach is used to compute the wholesaler's profit from independent stores, which constitutes the second part of the equation. The sum of the profits from two types of retailers yields the wholesaler's total profits. In the absence of bargaining, the wholesaler sets prices for each retailer type to maximize this profit function.[186]

3. Discriminatory Pricing with Wholesaler-Retailer Bargaining

Discriminatory pricing allows retailers to negotiate for lower wholesale prices. This negotiation process is formalized using the "Nash-in-Nash" bargaining model, as outlined in the influential works of Kate Ho and Robin Lee from 2017 and 2019.[187]

Within this framework, each retailer separately and simultaneously bargains with the wholesaler. Both parties in a negotiation strive to maximize their own utilities while taking into account the preferences and

[186] These prices are found by separately setting the first-order conditions of the profit function with respect to the wholesale prices charged to each retailer type to zero. This approach ensures that the equilibrium wholesale prices maximize the wholesaler's profits with respect to each type of retailer.

[187] Kate Ho & Robin S. Lee, *Insurer Competition in Health Care Markets*, 85 ECONOMETRICA 379 (2017); Kate Ho & Robin S. Lee, *Equilibrium Provider Networks: Bargaining and Exclusion in Health Care Markets*, 109 AM. ECON. REV. 473 (2019). *See also* Allan Collard-Wexler, Gautam Gowrisankaran & Robin S. Lee, *"Nash-in-Nash" Bargaining: A Microfoundation for Applied Work*, 127 J. POL. ECON. 163 (2019); Gautam Gowrisankaran, Aviv Nevo & Robert Town, *Mergers When Prices are Negotiated: Evidence from the Hospital Industry*, 105 AM. ECON. REV. 172 (2015); Gregory S. Crawford & Ali Yurukoglu, *The Welfare Effects of Bundling in Multichannel Television Markets*, 102 AM. ECON. REV. 643 (2012); Michaela Draganska, Daniel Klapper & Sofia Villas-Boas, *A Larger Slice or a Larger Pie? An Empirical Investigation of Bargaining Power in the Distribution Channel*, 29 MKTG. SCI. 57 (2010).

constraints of the other. The bargaining concludes when they reach a consensus on a wholesale price that optimally distributes the "gains-from-trade," ensuring that neither party could improve its position on its own.

To calculate a retailer's gains from trade, first consider its gains from reaching an agreement with the wholesaler. In this case, the retailer sells the wholesaler's products to consumers and earns

$$\pi_j = Ns_j[p_j - w_j - c_j].$$

Now consider the scenario where the retailer fails to reach an agreement with the wholesaler. In this case, the retailer would not be able to sell any products in the downstream market, resulting in zero profits. Hence, retailer j's "gains-from-trade," denoted by GFT_j, from reaching an agreement with the wholesaler are its profits from reselling the wholesaler's product to consumers:

$$GFT_j = \pi_j .$$

To determine the wholesaler's gains from trade when it reaches an agreement with a retailer, first consider the profit the wholesaler earns from selling to all retailers, including retailer j. This profit is given by

$$\pi_w^{j,j'} = Ns_j[w_j - c_w] + N\sum_{j\prime \in J\setminus j} s_{j\prime}\,[w_{j\prime} - c_w].$$

Next, consider the scenario where the wholesaler does not reach an agreement with retailer j. In this case, the wholesaler continues to sell to all other retailers, denoted as j', where j' belongs to the set J of all retailers excluding j ($i.e. j' \in J\setminus j$). With the retailer j out of the market, the market shares of the remaining retailers adjust accordingly, and are denoted by $s_{j\prime}^{-j}$. The profit that the wholesaler makes from selling to these remaining retailers when there is no agreement with retailer j is given by,

$$\pi_w^{j'} = N\sum_{j\prime \in J\setminus j} s_{j\prime}^{-j}\,[w_{j\prime} - c_w].$$

The wholesaler's gains-from-trade from reaching an agreement with retailer j, denoted by GFT_w, are the difference between the former and the latter profits:

$$GFT_w = \pi_w^{j,j'} - \pi_w^{j'}.$$

The negotiation process yields a wholesale price that maximizes the combined profits of the bargaining parties. Formally, the equilibrium wholesale price maximizes the Nash product of each party's gains from

trade, given by

$$w_j^* = \text{argmax}_{w_j}[GFT_j(\text{w}_j)]^{\tau_j}[\text{GFT}_w(\text{w}_j)]^{1-\tau_j},$$

subject to the constraint that at the optimal wholesale price, both parties have nonnegative gains-from-trade, that is $GFT_j(w_j^*) \geq 0$ and $GFT_w(w_j^*) \geq 0$. In this specification, τ_j denotes the weight given to retailer j's profits when determining the optimal wholesale price, which is often called the "Nash Bargaining Parameter." This parameter measures retailer j's bargaining power vis-à-vis the wholesaler and ranges from zero to one ($\tau_j \in [0,1]$). Conversely, the wholesaler's bargaining power against retailer j is denoted by $1 - \tau_j$.

At the one end of the spectrum, if $\tau_j = 0$, retailer j has no bargaining power against the wholesaler, which allows the wholesaler to dictate the terms of the deal with a take-it-or-leave-it offer. At the other end of the spectrum, if $\tau_j = 1$, retailer j holds all the bargaining power, allowing it to negotiate a wholesale price that merely covers the wholesaler's costs.

C. *Stage I: Retailer Entry and Exit*

Each retailer incurs a fixed cost for running its store each period. A retailer will continue operating if it expects that the profits from sales will cover this fixed cost. However, if expected profits do not meet this fixed cost, the retailer will exit the market.

The condition for retailer j to be in the market is formally expressed with the equation

$$\pi_j \geq k_j,$$

where k_j denotes retailer j's fixed cost of operation.

VIII. Appendix B: Consumer Welfare Calculation

To compute consumer welfare based solely on price levels under a legal regime, I use the concept of "compensating variation." This measures the amount of money a consumer would need to achieve their original level of utility following a change in prices.

Formally, the expected utility of a consumer who can purchase from one of the J retailers or make no purchase is given by

$$E[U_i] = \sum_{j \in J} s_{i,j}\, \tilde{u}_{i,j} + s_{i,0}\tilde{u}_{i,0},$$

where $\tilde{u}_{ij}$ is the indirect utility consumer i derives from shopping at retailer j excluding the logit error. $\tilde{u}_{ij}$ is given by

$$\tilde{u}_{i,j}(\beta_i, \gamma_j, p_j) = \beta_i \gamma_j - \alpha p_j.$$

Excluding the logit error allows for the computation of utility derived solely from the change in prices. $\tilde{u}_{i,0}$ is the indirect utility of not making a purchase and is normalized to zero. s_{ij} denotes the individual choice probability of consumer i for retailer j, and is given by

$$s_{ij} = \frac{e^{\beta_i \gamma_j - \alpha p_j}}{1 + \sum_j e^{\beta_i \gamma_j - \alpha p_j}}.$$

The average per capita consumer surplus equals,

$$\text{CS} = \frac{1}{N} \sum_i E[U_i],$$

where N denotes the number of consumers in the market. This analysis treats all consumers as a single group and abstracts away from the distributional consequences across different consumer segments.

IX. APPENDIX C: EMPIRICAL STRATEGY

My interpretation of the estimates reported in the regression analyses requires an independence assumption.[188] This assumption posits that, conditional on controls, restrictions on price discrimination are independent of any other factors affecting price and market entry. This condition ensures that, but for the local wholesale laws, liquor retail prices and market structures would be on average observationally equivalent across different states, conditional on the controls included in the estimating equations.

To support this independence assumption, I examine the retail prices of wine and liquor in Michigan, a state that applies different regulatory frameworks to the wholesale of these products. Michigan sets wholesale liquor prices administratively but does not similarly regulate the wholesale prices of wine. In the case of wine, the state solely prohibits price discrimination. Figures 12 and 13 present the average retail prices for liquor and wine, respectively, for the same group of states. Should factors other than wholesale pricing statutes be responsible for the observed retail pricing patterns, one would expect similar retail pricing behaviors for both wine

[188] JEFFREY M. WOOLDRIDGE, ECONOMETRIC ANALYSIS OF CROSS SECTION AND PANEL DATA §4.1.

and liquor in Michigan. In contrast, I find that retail price patterns for liquor and wine in Michigan are different and closely correspond to the state's respective wholesale pricing statutes.

Figure 12. RETAIL LIQUOR PRICES

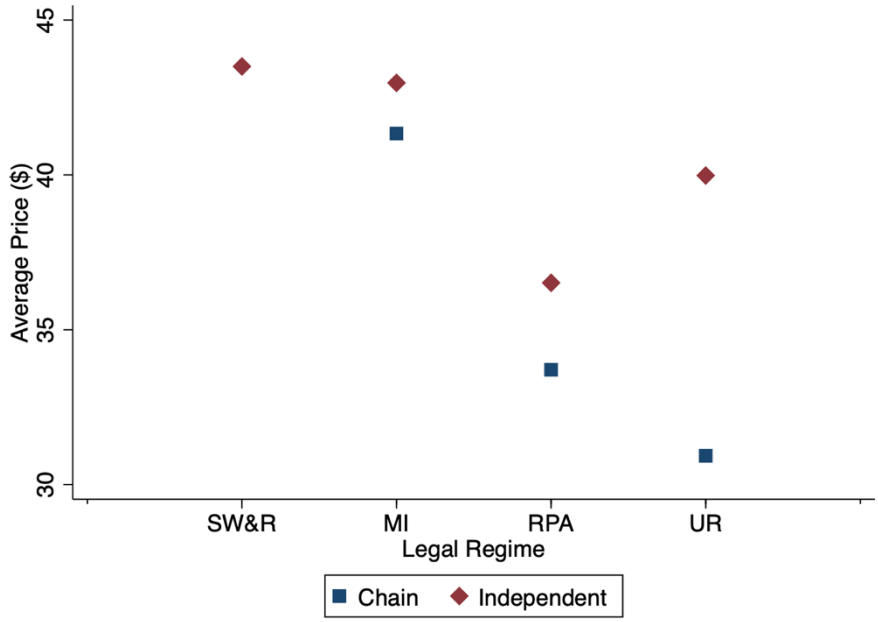
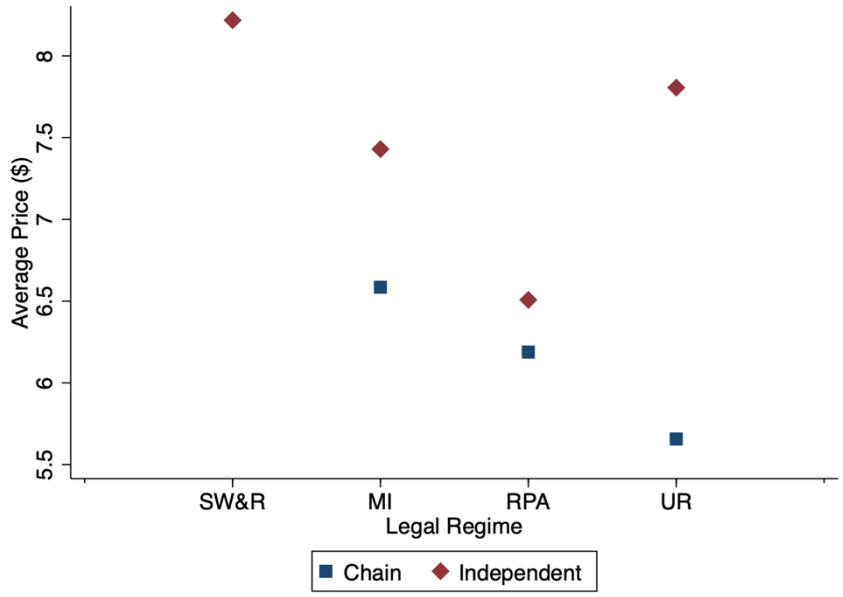
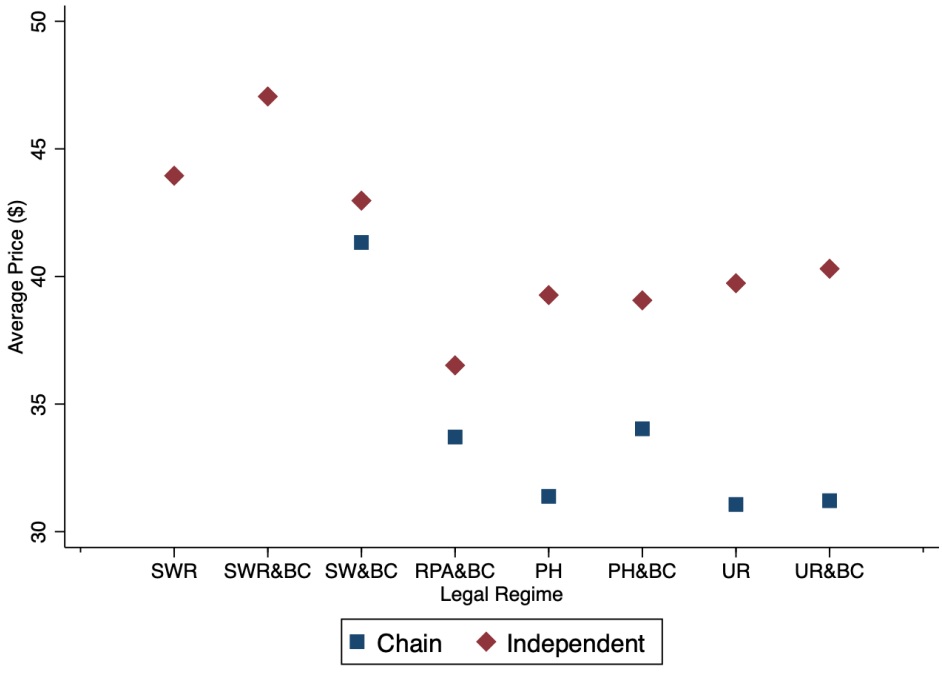


Figure 13. RETAIL WINE PRICES



In theory, the independence assumption might be compromised if the observed effects were driven by a different set of regulations omitted from the regression analyses. In particular, state laws prohibiting below-cost pricing, which prevent stores from charging less than their costs of doing business, could be relevant as these regulations directly govern retail prices. I empirically evaluate the impact of state laws prohibiting below-cost pricing by analyzing the average retail prices of liquor in states both with and without these laws, under the condition that they enforce identical wholesale pricing regulations. Figure 14 illustrates the findings. The horizontal axis categorizes states according to different combinations of wholesale and retail pricing laws, where "BC" denotes states with laws prohibiting below-cost retail pricing. The vertical axis has the average retail liquor prices. Despite the variation in states' approach to below-cost retail pricing, my analysis indicates that these laws have no significant impact on the observed pricing patterns. Retail prices remain consistently similar across states, regardless of the presence or absence of below-cost pricing laws, provided that the same wholesale pricing statutes are enforced.

Figure 14. STATE BELOW-COST RETAIL PRICING STATUTES



The standard errors I report also require a distributional assumption.[189] More precisely, with respect to the price regressions, I require that observations are correlated within clusters of state, but observations across states are independently and identically distributed after controlling for certain local features. Because the number of clusters is large relative to cluster sizes, the clustered-standard error approach corrects for the presence of within-cluster correlation.[190] The fact that the dependent variable is at the state-product-store type level increases the number of observations available for inference. Analogously, with respect to market structure regressions, I require that observations across counties are independently and identically distributed once I control for a set of local factors. In these regressions, the dependent variable is at the county level, which yields a sufficiently large sample.

Finally, both sets of estimates implicitly assume a linear relationship between state wholesale pricing laws and market outcomes. However, both prices and market entry are complicated equilibrium objects. Hence, equilibrium market outcomes are better explained by structural models that capture the complex interactions between market characteristics and outcomes. Despite this, linear regressions provide a useful approximation to the statistical relationships between state regulations and market outcomes, serving as an initial step toward developing a structural model.

X. APPENDIX D: REGRESSION RESULTS

A. *Retail Price Regressions*

Table 5 reports regression results for retail liquor prices. The first column displays the regression results for average prices at the product-state-store type level, with legal regime indicators as the independent variables. This specification controls for different state characteristics, such as per capita income, population, and various measures of the cost of doing business—including rent, gas prices, and average wages in businesses employing fewer than five and between five to nine employees. The estimating equation is given by

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[189] JEFFREY M. WOOLDRIDGE, ECONOMETRIC ANALYSIS OF CROSS SECTION AND PANEL DATA §4.2.

[190] *Id.* at §6.3.4.

$$price_{ksj} = \beta_0 + \beta_c I_{c(k)} + \beta_j I_j + \sum_{r \in R} \beta_{r(s)} I_{r(s)} + \sum_{r \in R} \beta_{c(k),r(s)} I_{c(k),r(s)} + \beta_{inc} ln(inc_s) + \beta_{pop} ln(pop_s) + \beta_{rent} ln(rent_s) + \beta_{gas} ln(gas\_price_s) + \beta_{wage5} ln(wage\_5_s) + \beta_{wage10} ln(wage\_10_s) + \sum_{j \in J} \beta_j I_j + \varepsilon_{ksj}.$$

where k indexes retailer type, j indexes products, and s indexes states. The variable c indexes chain stores, with $I_{c(k)}$ denoting chain store indicator variables. The variable r indexes legal regimes. The indicator variable $I_{r(s)}$ takes the value one if state s is under legal regime r, and $I_{c(k),r(s)}$ takes the value one if the retailer type k is a chain store located in a state with legal regime r. The regression includes controls for state-level per capita income, population, various measures of the cost of doing business, and product fixed effects. β_0 is the regression constant.

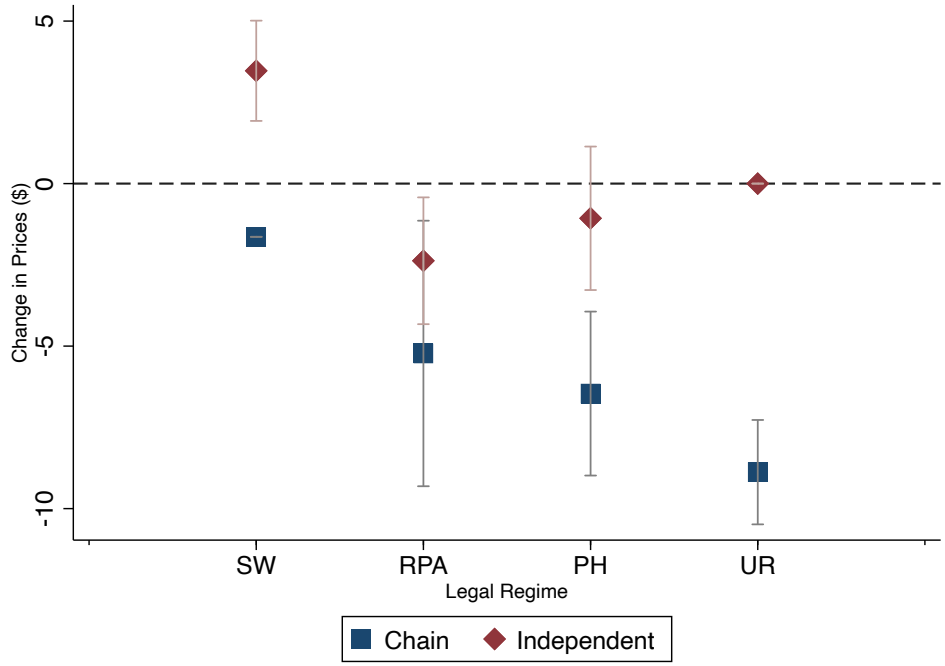
Figure 15 presents regression coefficients, with the price effect for an independent store in an UR State set as the reference point and normalized to zero. On the horizontal axis are legal regimes, and on the vertical axis is the change in price, measured in dollars. Squares denote coefficients for chain stores, while diamonds represent those for independent stores. Vertical lines around squares and diamonds indicate the 95 percent confidence intervals for each coefficient.

Table 5. PRICE REGRESSION RESULTS

Variable	(1) Avg. Price. (State-Store Type-Product)	(2) Store-Product Price	(3) Avg. Price. (State-Product)
Chain	-8.878***	-9.505***	
	(0.770)	(0.848)	
RPA	-2.374**	-2.278**	-3.589**
	(0.935)	(1.135)	(1.717)
RPA x Chain	3.652*	1.927	
	(1.801)	(1.757)	
PH	-1.067	0.606	1.204
	(1.058)	(1.008)	(1.425)
PH x Chain	2.419	4.856***	
	(1.433)	(1.367)	
SW	3.471***	2.421**	6.840***
	(0.740)	(0.934)	(0.636)
SW x Chain	7.241***	7.977***	
	(0.770)	(0.854)	
ln(income)	4.798	22.241***	9.870
	(10.29)	(10.881)	(11.28)
ln(population)	-0.00120	2.259	0.748
	(0.798)	(0.716)	(0.973)
ln(rent)	3.591	2.336	1.195
	(3.820)	(3.769)	(6.353)
ln(wage_5)	0.794	19.067**	-10.44**
	(7.801)	(9.152)	(3.866)
ln(wage_10)	-7.675	-45.121**	-0.121
	(17.96)	(19.809)	(10.11)
ln(gas_price)	-3.386	-6.678	-2.988
	(3.774)	(3.854)	(22.28)
constant	13.31	-77.267	-60.34
	(51.80)	(56.535)	(58.60)
Observations	504	14,752	252
R-squared	0.929	0.787	0.944

Robust standard errors in parentheses
*** $p<0.01$, ** $p<0.05$, * $p<0.1$

Figure 15. PRICE REGRESSION COEFFICIENTS



The regression reported in the second column of Table 5 has the price of a specific product at a particular store as the dependent variable. The estimating equation is given by

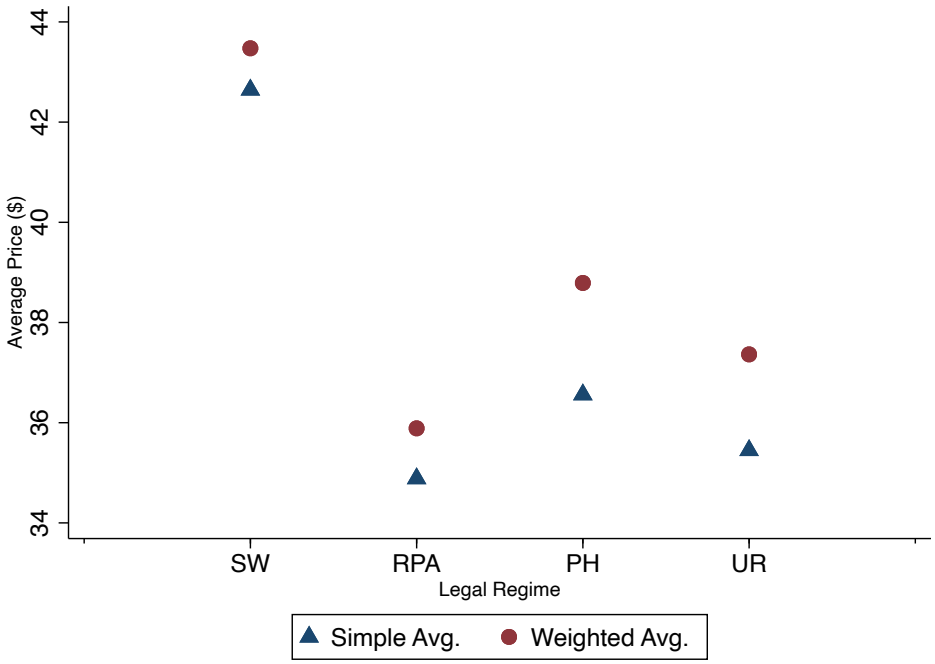
$$price_{lj} = \beta_0 + \beta_c I_{c(l)} + \beta_j I_j + \sum_{r \in R} \beta_{r(l)} I_{r(l)} + \sum_{r \in R} \beta_{c(l),r(l)} I_{c(l),r(l)} + \beta_{inc} ln(inc_{s(l)}) + \beta_{pop} ln(pop_{s(l)}) + \beta_{rent} ln(rent_{s(l)}) + \beta_{gas} ln(gas\_price_{s(l)}) + \beta_{wage5} ln(wage\_5_{s(l)}) + \beta_{wage10} ln(wage\_10_{s(l)}) + \sum_{j \in J} \beta_j I_j + \varepsilon_{lj}.$$

where l indexes retailer and j indexes products. The variable c indexes chain stores, with $I_{c(l)}$ takes the value one if store l belongs to a chain. The variable r indexes legal regimes. The indicator variable $I_{r(l)}$ takes the value one if retailer l is located in a state under legal regime r, and $I_{c(l),r(l)}$ takes the value one if retailer l is a chain store located in a state with legal regime r. This specification accounts for various relevant state characteristics, including per capita income, population, and multiple cost of doing business

metrics—such as rent, gas prices, and average wages in businesses employing fewer than five and between five to nine employees. Additionally, the regression includes product fixed effects. β_0 is the regression constant.

I further examine the average liquor retail prices across different legal regimes. For this analysis, I employ two methodologies to compute the mean liquor retail price in each state. First, I calculate the simple mean by equally weighting the average prices from both chain and independent stores in each state. Second, I compute the weighted average, where the average prices from chain and independent stores are weighted according to the total sales volume of each store type within the state. The results of this analysis are presented in Figure 16. The weighted averages exhibit the same pattern across different legal regimes as the simple averages do. However, weighted averages are typically higher than simple averages because independent retailers collectively sell higher volumes and charge higher prices than chain stores.

Figure 16. STATE AVERAGE LIQUOR RETAIL PRICES



To formalize these findings, I regress the average price of a product in a state on indicators for different legal regimes.[191] The estimating equation is given by

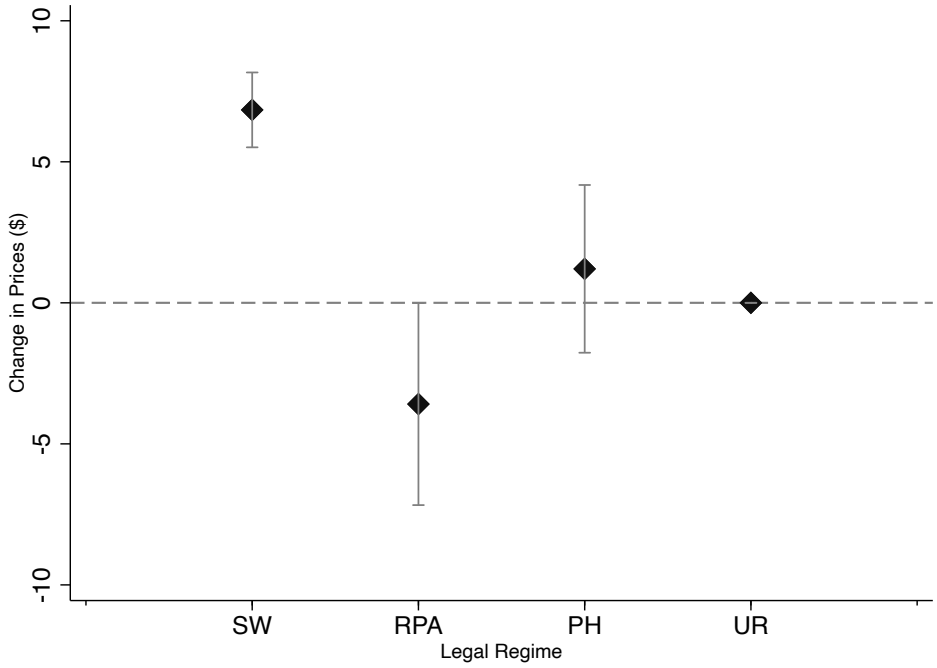
$$price_{js} = \beta_0 + \beta_j I_j + \sum_{r \in R} \beta_{r(s)} I_{r(s)} + \beta_{inc} ln(inc_s) + \beta_{pop} ln(pop_s) + \beta_{rent} ln(rent_s) + \beta_{gas} ln(gas\_price_s) + \beta_{wage5} ln(wage\_5_s) + \beta_{wage10} ln(wage\_10_s) + \sum_{j \in J} \beta_j I_j + \varepsilon_{js}.$$

In this specification, j indexes products, s indexes states, and r indexes legal regimes. The indicator variable $I_{r(s)}$ is set to one if state s implements legal regime r. The regression controls for state level per capita income, population, rent, gas prices, and average wages in businesses employing fewer than five and between five to nine employees, and includes product fixed effects. β_0 is the regression constant. All coefficients are relative to the average liquor price in an UR State, with errors clustered at the state level. The coefficient of interest is that for RPA States (β_{RPA}).

Figure 17 and the third column of Table 5 report the results. In Figure 17, on the horizontal axis is the legal regime, and on the vertical axis is the average liquor price in dollars. Grey vertical lines indicate 95 percent confidence intervals for regression coefficients.

[191] For this exercise, I begin by calculating the average price of a product in both independent and chain stores within a state. Then, I take the mean price in each state for each product, equally weighing average chain and independent store prices. The dataset is balanced with respect to brands at the state and store type level.

Figure 17. STATE AVERAGE LIQUOR PRICE REGRESSION COEFFICIENTS



B. *Market Structure Regressions*

To study market structure, I first regress the number of stores and number of independent stores per 10,000 people in each urban county on indicator variables for different legal regimes. The benchmark estimating equation is given by

$$spc_m = \beta_0 + \sum_{r \in R} \beta_{r(m)} I_{r(m)} + \beta_p popden_m + \beta_u urb_m + \beta_i inc_m + \beta_a age_m + \beta_q I_{quota,s(m)} + \varepsilon_m,$$

where spc_m refers to the number of "stores per capita" or "independent stores per capita" in county m. In this specification, m indexes counties, s indexes states, and r indexes legal regimes. The indicator variable $I_{r(m)}$ takes the value one if county m is located in a state governed by legal regime r. The regression controls for county-level variables such as population density, per capita income, median age, and proportion of the total population residing in urban areas. It also controls for state level liquor store quotas. All coefficients are benchmarked against a county in an UR State.

Table 6 reports regression results and Figures 18 and 19 display

regression coefficients, where the effect of being a county in an UR State is normalized to zero. The legal regimes are shown on the horizontal axis, while the change in the number of stores per 10,000 people is on the vertical axis. The grey vertical lines indicate 95 percent confidence intervals for the coefficients.

Table 6. STORES PER CAPITA BENCHMARK REGRESSION RESULTS

Variable	(1) storesper10000	(2) indstoresper10000
RPA	0.432***	0.610***
	(0.140)	(0.135)
PH	0.300***	0.207**
	(0.106)	(0.102)
popden	97.23	125.9*
	(71.56)	(68.95)
inc	8.01e-07	1.25e-06
	(2.50e-06)	(2.41e-06)
urban	-0.850***	-1.211***
	(0.306)	(0.295)
age	8.51e-04	-6.09e-03
	(7.96e-03)	(7.67e-03)
quota	0.0136	0.0125
	(0.0881)	(0.0849)
constant	1.483***	1.862***
	(0.397)	(0.382)
obs.	493	493
R^2	0.120	0.166

Standard errors in parentheses
*** $p<0.01$, ** $p<0.05$, * $p<0.1$

Figure 18. STORE COUNT REGRESSION COEFFICIENTS

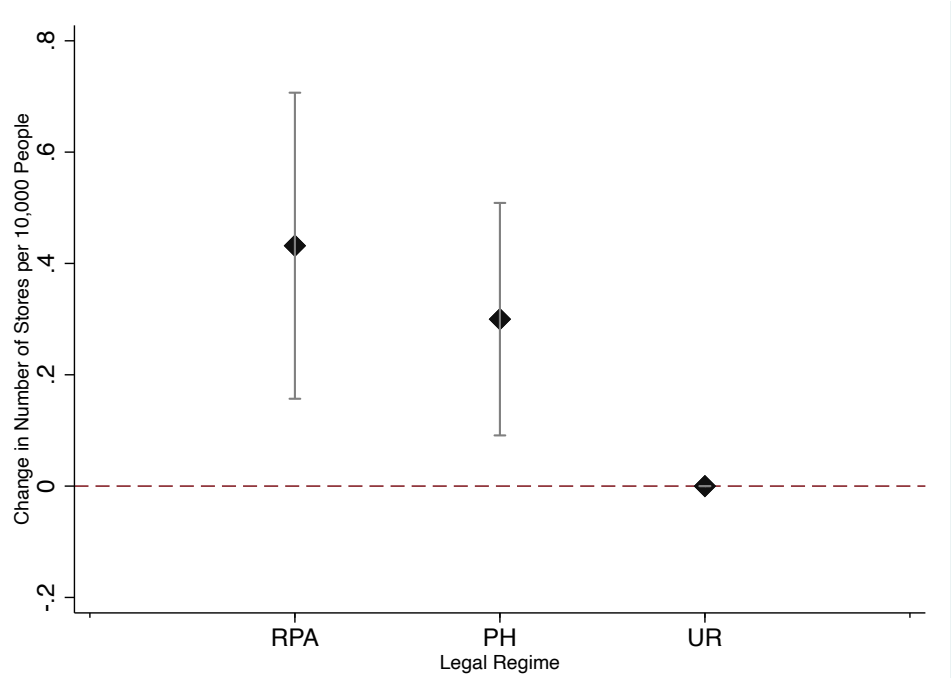
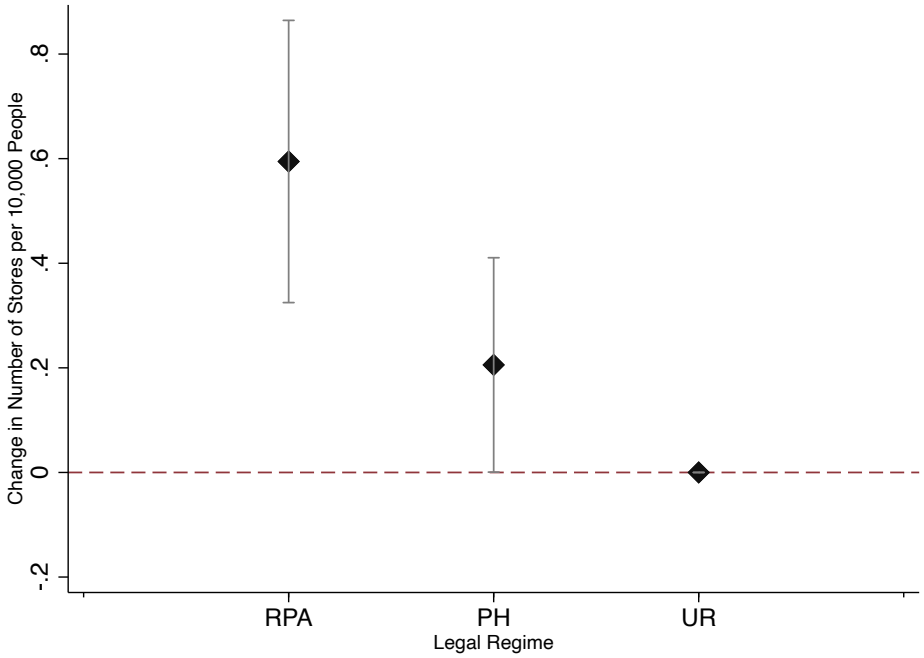


Figure 19. INDEPENDENT STORE COUNT REGRESSION COEFFICIENTS



To affirm the robustness of these results to various state zoning regulations and quotas on liquor retailers, I regress the number of stores and the number of independent stores per 10,000 people in each urban county on a more granular set of controls. The estimating equation is given by

$$\begin{aligned} spc_m = \beta_0 + \sum_{r \in R} \beta_{r(m)} I_{r(m)} + \beta_p popden_m + \beta_u urb_m + \beta_i inc_m + \beta_a age_m \\ + \beta_{poprest} I_{poprest,s(m)} \\ + \beta_{quotarest} I_{quotarest,s(m)} + \beta_{distrest} I_{distrest,s(m)} \\ + \beta_{popxden} I_{poprest,s(m)} popden_m \\ + \beta_{quotaxden} I_{quotarest,s(m)} popden_m \\ + \beta_{distxden} I_{distrest,s(m)} land_m + \beta_{abc} I_{abc,s(m)} \\ + \beta_{schools} I_{schools,s(m)} + \varepsilon_m, \end{aligned}$$

where spc_m refers to the number of "stores per capita" or "independent stores per capita" in county m. In this specification, m indexes counties, s indexes states, and r indexes legal regimes. The indicator variable $I_{r(m)}$ takes the value one if county m is located in a state governed by legal regime r. The regression controls for county-level variables such as population density, per capita income, median age, and proportion of the total population residing in urban areas. Additionally, the regression includes controls for state regulations that restrict the number of liquor stores based on population density, enforce quotas, regulate the proximity between liquor stores, determine the distance of liquor stores from schools, and delegate liquor store permits to the discretion of the Alcoholic Beverage Control (ABC) Boards. The controls for population-based restrictions and quotas are further interacted with the population density of counties, while the control for distance-based restrictions is interacted with the land area of the county.[192] These interactions help determine whether the effects of these regulations on market structure vary with the demographic and geographic characteristics of the counties. All coefficients are benchmarked against a county in an UR State. The first two columns of Table 7 report the regression results.

[192] Katie H. Michel, et al., *Overview of State Laws Restricting Alcohol Outlet Density in the United States*, 30 J. PUB. HEALTH MGMT. AND PRACTICE 558 (2024); *Distance Limitations Applied to New Alcohol Outlets Near Universities, Colleges, and Primary and Secondary Schools*, in 2022 STATE PERFORMANCE & BEST PRACTICES FOR THE PREVENTION AND REDUCTION OF UNDERAGE DRINKING (2022), https://www.stopalcoholabuse.gov/media/ReportToCongress/2022/profile_summaries/distance_limitations_applied_to_new_alcohol_outlets.pdf.

Table 7. STORES PER CAPITA REGRESSION RESULTS

Variable	(1) stores	(2) indstores	(3) stores (exc. grocery)	(4) indstores (exc. grocery)
RPA	0.386**	0.614**	0.698**	0.749**
	(0.193)	(0.185)	(0.307)	(0.292)
PH	0.386**	0.217	0.430	0.414
	(0.165)	(0.158)	(0.355)	(0.318)
popden	-112.1	-71.64	-818.6*	-666.1
	(171.0)	(164.1)	(427.6)	(405.8)
inc	7.65e-07	3.42e-07	2.01e-07	8.88e-07
	(2.62e-06)	(2.51e-06)	(3.99e-06)	(3.79e-06)
urban	-0.699**	-0.946***	-0.990**	-1.303***
	(0.306)	(0.303)	(0.496)	(0.471)
age	2.92e-03	-1.27e-03	4.34e-03	-5.08e-03
	(8.28e-03)	(7.95e-03)	(1.16e-02)	(1.10e-02)
poprest	-0.0495	-0.129	-0.103	0.148
	(0.123)	(0.118)	(0.179)	(0.170)
quotarest	-0.0321	-0.218	0.226	0.388
	(0.223)	(0.214)	(0.405)	(0.384)
distrest	-0.484*	-0.432*	4.489*	3.968*
	(0.259)	(0.249)	(2.148)	(2.038)
poprest x popden	222.7	215.3	918.2*	783.8*
	(166.4)	(159.7)	(436.4)	(414.1)
quotarest x popden	167.6	112.3	-102.9	-137.6
	(154.9)	(148.7)	(234.3)	(222.4)
distrest x land	2.70e-12	2.56e-12		
	(1.40e-11)	(1.34e-11)		
abc_disc	0.486**	0.502***		
	(0.187)	(0.179)		
nearschools	-0.122	0.0362	-0.180	-0.0129
	(0.0910)	(0.0873)	(0.201)	(0.191)
constant	1.358***	1.527***	1.691***	2.119***
	(0.404)	(0.387)	(0.563)	(0.534)
obs.	493	493	253	253
R^2	0.141	0.192	0.230	0.324

Standard errors in parentheses
*** $p<0.01$, ** $p<0.05$, * $p<0.1$

In certain states, grocery stores are permitted to sell liquor. To determine the robustness of the empirical findings with respect to this market characteristic, I exclude states that allow grocery store liquor sales and rerun the aforementioned specification. The results of this revised analysis are detailed in the third and fourth columns of Table 7.

Furthermore, I regress the total market share of independent stores in each urban county on legal regime indicators. The market shares and sizes are measured using three alternative metrics. Figures 20, 22, and 24 depict the average market share of all independent stores in a county under each legal regime, calculated based on the number of employees, sales and the number of stores, respectively.

Table 8 reports the coefficients obtained from regressing the total market share of independent stores in each urban county, calculated using three alternative measures, on legal regime indicators. The estimating equation is given by

$$mktshare_{ind_m} = \beta_0 + \sum_{r \in R} \beta_r I_{r(m)} + \beta_p pop_m + \beta_l land_m + \beta_u urb_m + \beta_i inc_m + \beta_a age_m + \varepsilon_m,$$

where m indexes counties, s indexes states, and r indexes legal regimes. The indicator variable $I_{r(m)}$ is equal to one if county m is governed by legal regime r. The regression includes controls for county-level population, land area, per capita income, median age, and proportion of the total population residing in urban areas. All coefficients are relative to a county in an UR State.

Figures 21, 23, and 25 present the regression coefficients, where market shares are measured using the number of employees, sales and number of stores, respectively. On the horizontal axis are the legal regimes, and on the vertical axis is the change in the aggregate market share of independent stores in a county, relative to those in UR States and measured in percentage points. The grey vertical lines mark the 95 percent confidence intervals for the coefficients.

Table 8. MARKET SHARE REGRESSION RESULTS

Variable	(1) share (emp)	(2) share (sales)	(3) share (count)
RPA	6.353*	7.405**	6.635***
	(3.295)	(3.109)	(2.472)
PH	4.342*	1.588	0.155
	(2.604)	(2.459)	(1.954)
pop	-2.80e-06*	-3.14e-06**	-1.19e-10
	(1.45e-06)	(1.36e-06)	(1.09e-06)
inc	6.78e-05	-3.98e-05	8.42e-05*
	(5.95e-05)	(5.59e-05)	(4.47e-05)
land	3.89e-10**	2.71e-10	3.14e-10**
	(1.78e-10)	(1.67e-10)	(1.33e-10)
urban	-56.59***	-42.19***	-35.19***
	(7.606)	(7.153)	(5.707)
age	-0.937***	-0.321*	-0.687***
	(0.187)	(0.176)	(0.140)
constant	157.7***	132.2***	136.6***
	(9.409)	(8.843)	(7.060)
obs.	488	483	488
R2	0.230	0.190	0.153

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Figure 20. MARKET SHARE OF INDEPENDENT STORES (BY EMPLOYEES)

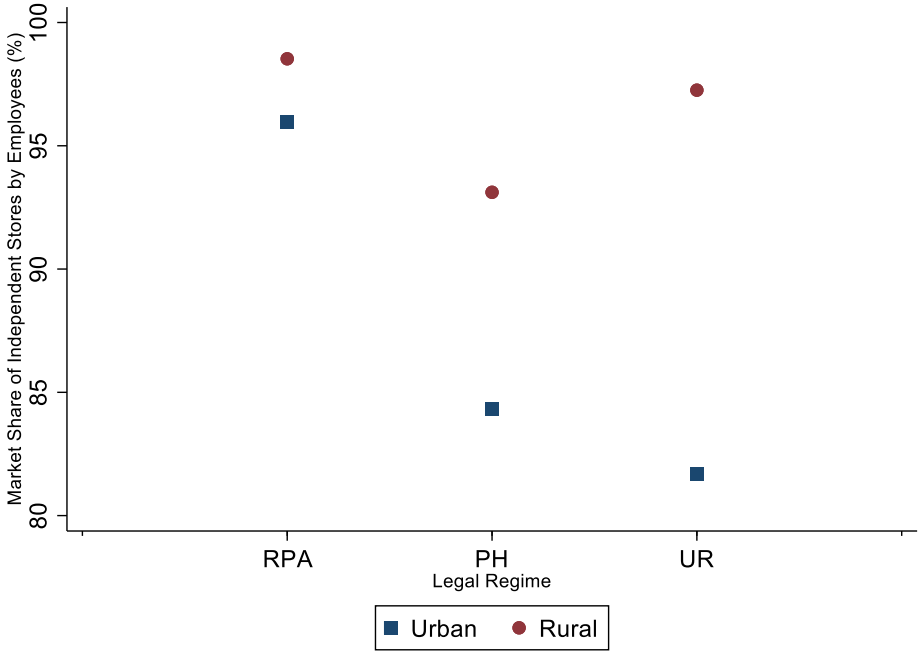


Figure 21. IND. STORE MARKET SHARE REGRESSION COEFFICIENTS

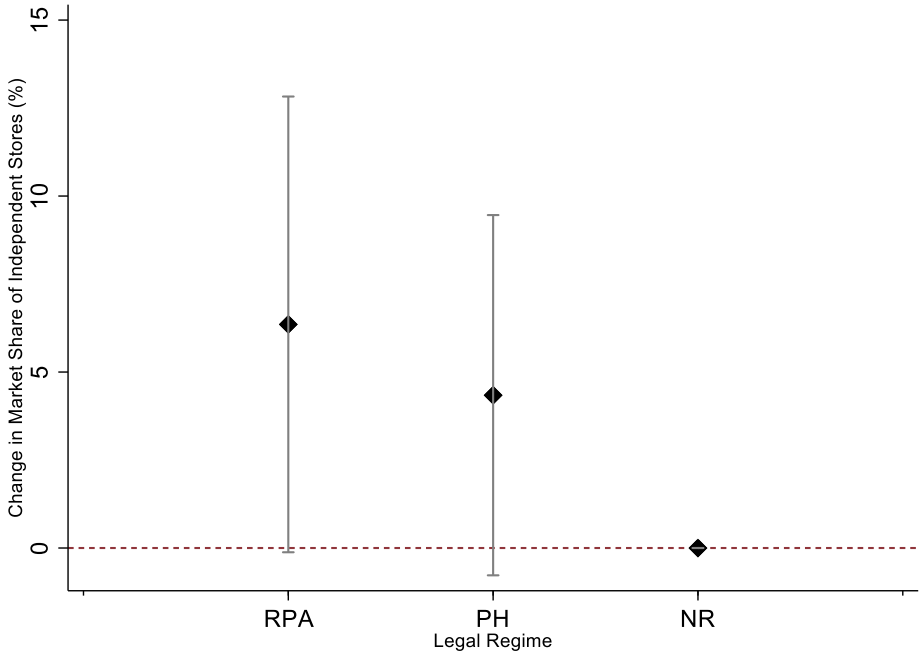


Figure 22. MARKET SHARE OF INDEPENDENT STORES (BY SALES)

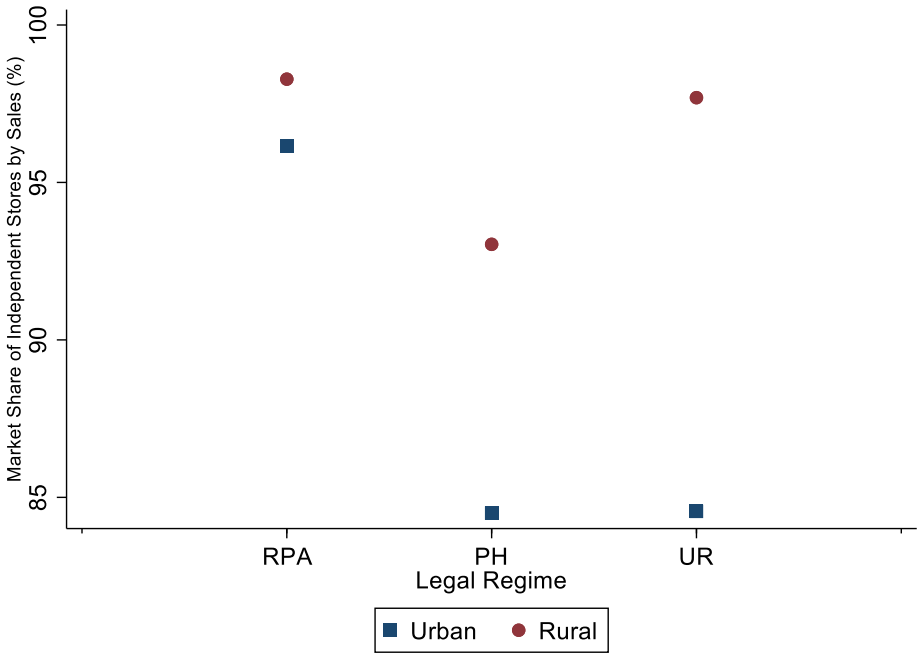


Figure 23. IND. STORE MARKET SHARE (BY SALES) REG. COEFFICIENTS

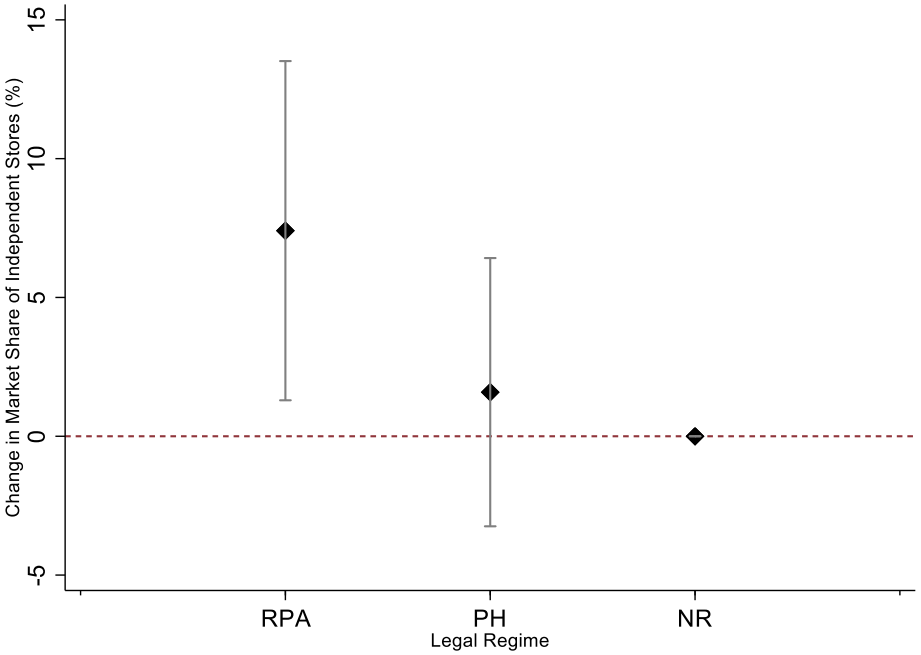


Figure 24. MARKET SHARE OF INDEPENDENT STORES (BY COUNT)

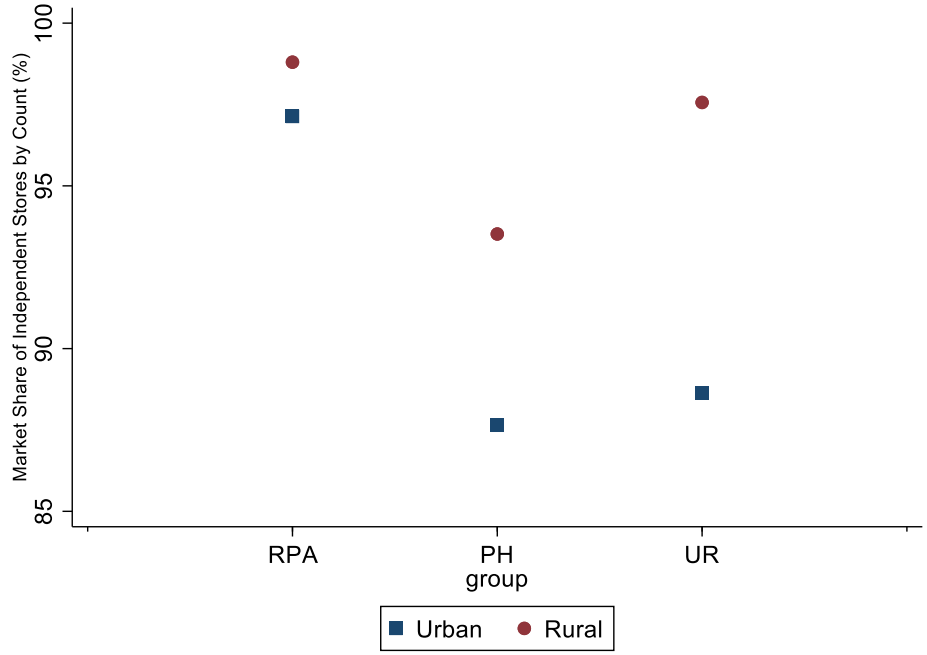
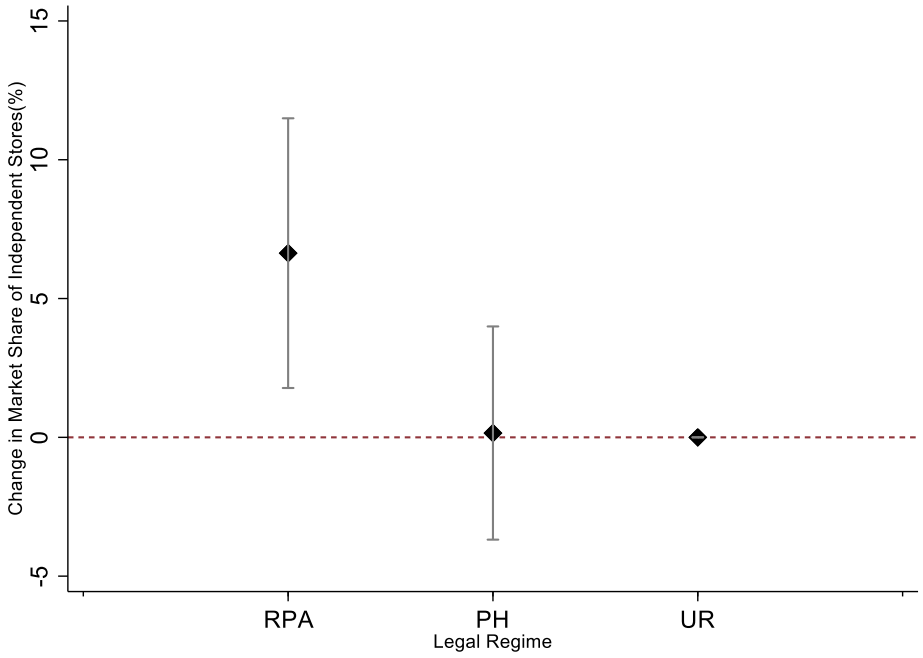


Figure 25. IND. STORE MARKET SHARE (BY COUNT) REG. COEFFICIENTS



XI. APPENDIX E: STATE WHOLESALE LIQUOR LAWS

Figure 26 provides a comprehensive overview of state laws governing liquor wholesale prices. The category "State Wholesale" consists of states where liquor wholesale prices are set administratively. "Uniform Wholesale Pricing" refers to states that ban discriminatory pricing. "Post and Hold States (PH)" are those where liquor wholesalers must publicly disclose prices and maintain them for a brief period. "Minimum-Markup and Maximum-Discount Laws (MMMD)" require that wholesalers apply a minimum markup or a maximum discount on each product. Finally, "Unrestricted States" impose no restrictions on liquor wholesale pricing.

Figure 26. STATE LAWS GOVERNING LIQUOR WHOLESALE PRICES