Business is Hopping: The Effects of Deregulation on Southern Craft Beer

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Abstract

Utilizing a novel data set, we examine market entry of craft brewers in the southern United States given changes in alcohol regulation. Since 2010, many southern states have increased sales access of brewers to customers, allowed for greater volumes of alcohol to be sold, and raised alcoholic content limits for beer. We empirically investigate the effects of state policy changes using annual data for the number of microbreweries and brewpubs in operation by state from 2000-2018. We conclude that the deregulation of the craft beer industry in these southern states has encouraged new brewers to enter the market.

1 Introduction

The experience of ordering beer at a bar or restaurant today is markedly different from that of twenty years ago. Many consumers of beer now take for granted an expanded array of options include craft/micro-brewed beverages such as local wheat ales, coffee stouts, or mosaic IPAs. This differs from the past experience where products from multinational, large-scale corporations such as Budweiser, Coors, or Michelob essentially represented the opportunity set for consumers. Indeed, the growth and variety of locally produced beer in the United States has been a trend that has expanded beyond initially "known-for-beer" states like Vermont, North Carolina, and Colorado to include representation from all fifty states. According to the US-based Brewers Association and data from its membership, the number of craft brewers operating in the country has grown from 637 in 1994 to 9,124 by the end of 2021, with craft brewers comprising just over 13% of total industry volume and nearly 27% of industry revenue (Brewers Association, 2022c).

This expansion of the craft beer market has been profoundly influenced by evolutionary changes to state policy and regulation. Generally speaking, we can consider historical beer and alcohol regulation from the scope of the public interest consistent with Stigler (1971) where "regulation is instituted primarily for the protection and benefit of the public at large." As such, states have in the past intervened with what could be described as a Prohibition era-inspired, paternalistic, regulatory regime in the interest of public health and safety (i.e. discouraging overconsumption, drinking and driving home from the local brewpub, etc.). This attitude has moderated with more recent arguments in favor of deregulation, including the provision of better quality, price, and diversity of offerings as competition amongst craft brewers is enhanced and market differentiation is sought through the development of novel flavors and variations upon established categories of beer. In addition, microbreweries may encourage tourism and spark interest in others local businesses (Alonso and Sakellarias, 2016; Murray and Kline, 2015). Many of the southern states in particular have successfully passed legislation to loosen prior restrictions, or to outright deregulate since 2010. South Carolina, for example, legalized the direct sale of pints by microbreweries and brewpubs to consumers without the requirement of a wholesale beer distributor in 2013 (Bristow, 2017). Georgia followed suit in 2017 by

allowing consumers direct access to the breweries.[1] As noted by Joskow (2009), deregulation involves the relaxation of government controls over prices and entry, which, amongst other factors, can have a dramatic impact upon the number and operation of firms in that environment. Specifically, loosening distribution rules allowing breweries to directly interact with their customers, as well as to produce beer of higher alcohol content and volume, may have supported new entrants to the craft brewing industry.

The literature concerning the craft beer industry has been primarily focused on price and income elasticities towards beer (Hogarty and Elzinga, 1972; Toro-González et al., 2014) as well as vertical constraints on the industry (Burgdorf, 2016). Some of the studies directly address the regulatory environment as an explanatory variable relating to brewery formation (Malone and Lusk, 2016), including some that utilize state-level data (Gohmann, 2016). That said, studies in this area suffer from incomplete data regarding brewery formation as they tend to utilize counts provided by local brewers guild, Brewers Almanac and/or the Brewers Association, which for reasons we later delineate, systematically undercounts the number of brewers in a given state, particularly those that are newly formed. Furthermore, prior papers tend to highlight microbreweries vaguely without noting their distinction from brewpubs.

We therefore endeavor to extend the existing literature in this area by directly analyzing the impact of state-level regulatory changes upon new entrants to the industry using an original data set. The comparatively recent and prominently changing nature of the alcohol/beer regulatory environment within many of the southern U.S. states provides a natural experiment for this analysis. As such, the purpose of this paper is to (1) historically identify regulatory practices in states towards alcohol laws, (2) create a novel data set on the number of microbreweries and brewpubs by states over time, and (3) empirically measure the impact of the state regulatory environment and specific regulatory changes on alcohol. Accordingly, we run a fixed-effects panel from 2000-2018 for eleven Southern states.[2] Summarizing our econometric findings, we conclude that the growth of brewers is moderated in an economically and statistically significant manner by more flexible state policies towards craft beer and the regulatory environment towards businesses generally. This paper both contributes to and opens a new avenue of research within the economic literature concerning the craft brewing industry. Our research is the first, to our knowledge, to utilize a new and extensive data set to analyze the effects of regulatory changes upon the number of business startups in the industry by state. In addition, we document the changes in the alcohol regulatory regime by southern state and explore both the effects of overall levels of alcoholic freedom as well as specific changes relating to production (alcohol content restrictions), sales volume limits and self-distribution upon the number of craft brewers in a state. Finally, we contribute to the broader body of research exploring the relationship between economic freedom and entrepreneurship (Hall and Lawson, 2014).

2 Background

Prior to empirically testing the effects of deregulation on the market for craft beer, we first want to think about the roots behind the growth of microbreweries. This will serve as an opportunity to explore past literature in the field, highlighting national trends towards craft beer. We then turn to consider what alcohol regulations exist in states and how their steady policy changes have shaped the industry.

2.1 The Rise of Craft Breweries

Over the past few decades, craft breweries have emerged, expanding consumer choice with differentiated products and addressing new markets beyond those of the larger mass-producing brewers (Howard, 2017). By definition, a microbrewery "produces less than 15,000 barrels . . . of beer per year with 75 percent or more of its beer sold off-site" (Brewers Association, 2022b). A brewpub, in contrast, chooses to sell more of its products directly to consumers and frequently serves food, such as through a connecting restaurant. It is these small-scale firms that often make small-batch and seasonal drinks in direct connection to their

[1] All of the specific regulations and changes to alcohol policy will be noted in Section 2.3 of this paper through state subsections.

[2] These are Alabama, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, South Carolina, Tennessee, Virginia, and West Virginia.

surrounding area. Bastian et al. (1999) present the case, based on survey data, that craft brewers serve a "niche" market through their usage of better quality malt, a crucial ingredient in the brewing process. Related to the quality of inputs and technology in the brewing process, we see the emergence of demand towards varying beers (Garavaglia and Swinnen, 2017).

Baginski and Bell (2011) assert that, in contrast to other states, southern states in particular are constrained greater in their "ability to support craft breweries." These findings however are based upon data collected from the Brewers Association, a national organization formed to represent the interests of member-brewers. Though joining that national organization or a state one *may* contribute to legitimacy and branding, many brewers may choose to opt out.[3] For instance, if a North Carolina craft brewer produces 100 barrels annually in comparison to the 25,000 barrel limit in place now, the estimated annual membership fee to the Brewers Association is $195 (Brewers Association, 2022a). Given the expense of joining this organization, many may just limit their involvement in the organizations. So when local guilds and the Brewers Association report on the number of craft brewers, their numbers reflect only a proportion of the true number active in a state.

2.2 Literature Review

Economic freedom, and its relationship to prosperity (i.e. employment levels, income growth, and business formation), has been a well-worn topic of economic scholarship, particularly during the past twenty-five years since Gwartney et al. (1996) produced and began to update the Economic Freedom of the World (EFW) index. Since that publication, the preponderance of articles exploring this relationship across nations have found a positive relationship between economic freedom and growth across a number of dimensions (Dawson, 1998; de Haan and Sturm, 2000; Faria and Montesinos, 2009; Gwartney et al., 2004). Hall and Lawson (2014), in a meta-analysis analyzing the state of research to that point, find that of the academic articles utilizing the EFW as an independent variable, roughly two-thirds support a relationship between higher levels of national economic freedom and positive economic outcomes such as income growth and employment (only four percent of these studies actually depict an outright negative relationship).

This relationship has also been explored at a regional, versus international, level with several studies, for example, utilizing economic freedom indices specific to the states and provinces within North America (Karabegovic et al., 2003) and/or the United States specifically (Ruger and Sorens, 2009) to analyze disparities across different states or metropolitan areas. Consistent with the international evidence, the majority of U.S.-oriented studies also support a positive relationship between state/local levels of economic freedom and desirable economic results such as growth of state gross domestic product (Compton et al., 2011), employment (Barnatchez and Lester, 2017; Garrett and Rhine, 2011; Heller and Stephenson, 2014), and labor migration (Cebula, 2014; Arif et al., 2020).

Specific to economic freedom and its effect upon entrepreneurship and new business formation, which is the primary stream of research that we build upon within our paper, several studies evaluate various proxies and sub-categories of economic freedom and their relationship to levels of entrepreneurship across states or other U.S. locales. Kreft and Sobel (2005), for example, find that states with lower tax burdens, lower levels of regulation, and stronger property rights experience higher relative levels of entrepreneurial activity, as represented by the growth rate in sole proprietorships. Similarly, consistent with the Schumpeterian viewpoint, Campbell et al. (2007) find that U.S. states with favorable (lighter touch) regulatory frameworks, legal institutions, and tax policies demonstrate higher numbers of new business births and deaths. Bennett (2021), comparing 40 years of data on firm and job creation across nearly 300 U.S. metropolitan areas, finds that economic freedom, in reducing entry barriers and transaction costs, acts as an *external enabler* that more readily facilitates the creation of new firms and jobs.

Specific to the craft beer industry, prior research points to a relationship between regulation and craft brewery formation. Friske and Zachary (2019) find that state-level brewery regulations, specifically taxes and sales restrictions, have small adverse effects on new brewery formation while tax credits and exemptions have positive effects. Burgdorf (2019), examining the impact of Wisconsin mandating exclusive wholesaler

[3]Microbreweries also have the option of joining their state brewing guild. For example, the South Carolina Brewers Guild and Georgia Craft Brewers Guild operate on a more local level.

territories in the state, finds that the mandates increased prices, reduced quantity of craft beer, and reduced competition in the brewing industry. Specific to southern states, Gohmann (2016) suggests that an implicit alliance between alcohol bootleggers and Baptists, both of whom (for very different reasons) seek to restrict the number of brewers in the region through the maintenance of "blue laws" and other more onerous regulations around alcohol, is responsible for relatively small numbers of brewers versus other regions. Malone and Hall (2017) find that the liberalization of craft beer distribution laws in West Virginia led to higher tourism-related wage levels. Malone and Lusk (2016) find that states that have laws restricting craft brewers from self-distribution have significantly fewer brewers than states allowing direct distribution. It is this stream of research that we seek to extend by analyzing state-level regulatory environments across south both in terms of broad attitudes towards alcohol regulation as well as specific regulatory changes impacting the volume of beer sales permitted, liberalizing distribution laws, and permitted alcohol content.

2.3 State Alcohol (De)Regulation

In considering how the craft industry is growing, we must also evaluate how regulation has evolved and state policies towards alcohol production. Though Tremblay et al. (2005) claim that growth in microbreweries will slow, they do note that minimal barriers to entry in the industry will encourage lasting competition. In effect, the strength of state regulations that potentially restrict market entry matter. This supports the case of deregulation. Williams (2017), through a case study of Charlotte, North Carolina, also assesses how legislation plays a role on breweries. To expand on the importance of the regulatory environment, we characterize the policy analysis on a state level. This decision not only accentuates the unique measures for state deregulation, but also it can be used for further inspecting the data, appearing in Figures A1 and A2 in the Appendix. Table 1 highlights any state changes to alcohol policy deregulation with distribution to consumers, volume, and alcohol content limit.

Table 1: State Alcohol Policy Changes

Year	Distribution to Consumers	Volume	Alcohol Content Limit
2000			
2001			
2002			
2003			
2004			
2005			
2006			
2007			South Carolina
2008			
2009			Alabama
2010		South Carolina	
2011		Alabama	
2012	Virginia	Alabama*	Mississippi
2013	South Carolina		
2014	South Carolina*		
2015		Louisiana	
2016			
2017	Georgia, Mississippi, West Virginia		Tennessee
2018		Kentucky	

* identifies states with subsequent deregulatory policy changes beyond initial

2.3.1 Alabama

In the state of Alabama, there has steadily been more and more deregulation in the craft beer industry. Starting in 2009, the state enacted the Free the Hops' Gourmet Beer Bill, raising the alcohol content of beers from 6% to 13.9% (Berry, 2022). The Brewery Modernization Act followed in 2011, enabling for

greater volumes of beer to be sold in the form of 22oz "bombers." While the Alabama Brewers Guild largely supported the bill, the Alabama Wholesale Beer Association failed to oppose the legislation (Finch II, 2015). This is especially interesting as wholesalers would be expected to challenge the growth of microbreweries, often selling directly to customers as opposed to through a distribution network. Finally, the Gourmet Bottle Bill in 2012 again increased the legal size of bottles to 25.4oz in volume (Berry, 2022). Of note is that Alabama is the only state in the South for which there is more than a single change to state policy on beer volume. As to why previous legislation restricted the amount and content percentage of alcohol sold to customers, it is argued out of public interest. But as tastes and preferences have shifted towards locally-produced beer, we see the evolution of Alabama code.

To currently apply for an alcohol manufacturing license, there is a $500 fee for a microbrewery yet a $1000 for a brewpub (Alabama ABC Board, 2022). This higher cost for brewpubs is reflected with fewer open relative to microbreweries.

2.3.2 Florida

Whereas Florida had relatively few microbreweries in operation in the early 2000s in contrast to other Southern states, it now has the second highest number in operation in the South. In terms of management of craft breweries, Florida operates under a multi-tier system, requiring beer producers to distribute rather than sell directly (Elliott, 2015). After a brewery manufactures a craft beverage, it must interact with a distributor to have it sold in shops. This hinders the formation of a direct relationship between the producer and consumer. However, there is a possible way around this setup. As it stands, a microbrewery is allowed to sell directly to customers on the grounds of tourism (Florida Trend, 2014). Since the business is encouraging entertainment and interest in a surrounding area, a microbrewery can operate outside of the distribution network. This may reflect the increased number of brewpubs in Florida relative to other states.

Florida has also experienced relatively little in the way of deregulation in contrast to other Southern states. It is also the earliest state in the South to deregulate alcohol policy towards microbreweries by nearly a decade. The single change, in 2001, that we see enacted is the sale of non-standardized amounts of alcohol up to 32 ounces (Florida Trend, 2014). For example, if a craft brewer wanted to sell a 11.9oz bottle of beer, this would have previously been barred given the unusual volume. This policy change increases flexibility with the beer production and bottling process for brewers.

2.3.3 Georgia

For Georgia, state policy towards deregulation has only occurred recently. In 2017, it was passed by the state to allow consumers to directly purchase from local microbreweries (Fuhrmeister, 2017). Similar to the Brewery Modernization Act in Alabama, it lessens the role of wholesalers to distribute to consumers. Overall, consumers benefit from this decision because of more direct access to the brewers and potentially lower prices for beer purchases, because of the removal of the "middleman" wholesaler. This is because the rents previously funneled towards the the distributor are recaptured by the consumers. This shifts in Georgia in 2017 also is reflected with Mississippi and West Virginia similarly adapting policy affecting alcohol distribution and sales.

2.3.4 Kentucky

Kentucky has only experienced alcohol policy deregulation as of 2018. This is similar to Georgia and West Virginia in enacting changes later relative to other Southern states. In a 68-15 vote, Kentucky successfully increased the volume cap from a case of 12oz beer cans to roughly 2 kegs that could be sold from a microbrewery to a consumer (Schreiner, 2018). Not surprisingly, while the decision to deregulate was largely supported by the Kentucky Guild of Brewers, it was not by state wholesalers.

As for the licensing process in Kentucky, a license for a microbrewery producing up to 50,000 barrels annually is $1040. However, if a microbrewery chooses to serve food or sell pints directly over-the-counter, there are supplemental fees that multiply the cost of opening (Commonwealth of Kentucky Department

of Alcoholic Beverage Control, 2018). This is perhaps related to why we see fairly stagnant numbers of brewpubs in Kentucky's data yet observe a sharp increase in the number of microbreweries.

2.3.5 Louisiana

Much like Florida, Louisiana maintains a multi-tier network for the sale of craft beer (Wyatt, 2016; Jacobs, 2018). Since a microbrewery registers with a wholesaler to distribute and sell its product, it limits the ability of brewers to interact with — and develop a relationship with — their customers. This partially explains the relatively low level of breweries until recent policy changes in 2015. Then, it became legalized with H.B. 232 for craft breweries to "not exceed 10% of the total amount of product brewed monthly or 250 barrels or whichever is greater" in direct sale to customers (Johnson, 2015).

The other explanation as to why Louisiana faces lower craft breweries is Hurricane Katrina. Since craft breweries require access to clean water, and the startup costs for equipment serve as a barrier to entry, this delays the reopening of businesses following the storm in 2007. It is not until 2009 essentially that we see the revival and formation of new microbreweries in Louisiana. From the data it is also shown that Louisiana's number of microbreweries in operation is most similar to Alabama, for which the two states exhibit similar population sizes.

2.3.6 Mississippi

Mississippi most clearly mirrors South Carolina with its changes in state policy. In 2012, it was enabled for the sale of higher alcohol content beers. "The law allows beer with 8 percent alcohol by weight, or 10 percent by volume, to be sold in Mississippi" (Associated Press, 2012). While existing breweries experience heightened ability to experiment with new beer styles, the legislation also affects new brewers who may only start production if they can brew heavier beverages. Further in 2017, it was approved with House Bill 1322 for the direct sale of microbrewed beverages to customers, bypassing a distributor (Burns, 2017). This again encourages the entry of new firms.

Part of the reason why Mississippi has been regulated is resistance from earlier Prohibition. "As of May 2017 . . . 32 counties in Mississippi are still considered 'dry'" (Lusk, 2018). This is also supported by the general stagnation of microbreweries in the state, seen in the data. The slowly evolving institutional landscape of Mississippi, and largely the other states in the South as well, is why we may see the growth of Southern craft breweries only now in comparison to other regions in the U.S.

2.3.7 North Carolina

When we tend to think about the state of North Carolina, it serves as a haven for microbreweries. As of 2018, there are 207 microbreweries in North Carolina and 72 brewpubs. But as it stands, brewers are limited to producing 25,000 barrels annually. This follows a "three-tier system . . . created after Prohibition in the 1930s" (Dalesio, 2018). While advantageous for wholesalers and commercial breweries to remain included in this setup, brewers are expected to resist. Despite no change having occurred as of yet, the state experiences relatively little regulation in contrast to other states. This institutional environment may contribute to why North Carolina has the most microbreweries relative to any other Southern state.

While this partially explains the high number of craft breweries in operation relative to other Southern states, North Carolina also has access to fresh, clean water for the beer-production process. Situated next to the Appalachian Mountains and the Blue Ridge, North Carolina's mountain water enables for brewers to use higher quality ingredients. This, in turn, affects the final product quality outputted to market.

2.3.8 South Carolina

South Carolina has experienced some of the most significant changes in alcohol deregulation. South Carolina is the only state in the South for which it has changed policy on distribution to customers, volume, and alcohol content. In 2007, COAST Beer of Charleston lobbied for higher alcohol content beers with the successful Pop the Cap Bill (CHS Today, 2018). Again in the public interest, more alcoholic beer poses a

risk, which serves as reasoning towards why the initial legislation existed. In 2010, the Tour and Taste Bill capped customers to just a single pint daily, expanded to three pints in 2013 under the Pint Law (Bristow, 2017). South Carolina is further the only state in the South for which there have been additional policy changes affecting distribution or sale to consumers directly. Finally in 2014 with the Stone Bill, brewpubs serving food would no longer be restricted in the amount of alcohol sold to customers (CHS Today, 2018). So long as individuals are eating rather than drinking on empty stomachs, then this promotes safer drinking.

The South Carolina Brewers Guild rallied both for the Pint Bill and the Stone Bill. With aim to expand the number of microbreweries in the state — and possible membership-paying firms — the Guild continues to support a deregulated craft market.

2.3.9 Tennessee

Much like Kentucky and Georgia, Tennessee has only recently experienced changes to its alcohol law. In 2017, it legalized the sale of beer from 6.3% in volume to 10.1% in volume. This effort was done in attempt to foster craft growth surrounding Knoxville (Hardnett, 2017). This shift encourages not only market entry of heavier-beer-producing firms like COAST in South Carolina, but also it could allow Tennessee to compete with other states through a distribution network, which would be supported by wholesalers.

In contrast to the other states, Tennessee displays fairly stable and steady growth of microbreweries in operation. Whereas West Virginia and Alabama face situations of brewpubs closing, Tennessee encounters growth over time in microbreweries and brewpubs.

2.3.10 Virginia

Virginia's growth of microbreweries closely mirrors that of its neighbor, North Carolina. In 2012, Virginia legalized the direct sale of pints to customers (Blackwell, 2012). This promotes the formation of microbrewery locations, serving guests in tasting rooms outside of a distribution network. This closely resembles the policy change in 2013 in South Carolina.

2.3.11 West Virginia

West Virginia, like Mississippi, had no microbreweries operating in the state in the year 2000. In 2015, West Virginia "gave small breweries lower license fees and more operational flexibility, in addition to authorizing retailers to sell growlers" (Bockway, 2015). Growlers, or beer jugs, enable consumers to fill from a tap (at a microbrewery) and take beer home. In particular, the reduction of licensing fees in West Virginia serves as a major effort to deregulate by reducing barriers to entry. Microbrewers previously indecisive over whether to enter the market or not may decide to open in response, benefiting consumers with not only greater selection and variety of beer, but also expected competitive prices from existing craft brewers in the state.

In terms of its craft history, West Virginia has experienced tremendous increases in microbreweries since 2015, evidenced in the data. This is in support to the policy changes and deregulation.

3 Data

Rather than treat all craft brewers the same and aggregate them in research, this project distinguishes them into one of two classes: microbreweries and brewpubs This distinction helps in thinking about how different types of firms respond to changes in state policy over time. While Carroll and Swaminathan (2000) investigate mortality and survival rates of these types of breweries, they do not look at impacts of the regulatory environment on their market entry and operation at the state level. Meanwhile, Elzinga et al. (2015) explore how state taxes and brewpub legality has impacted total craft production, again not looking at specific regulatory policies. That is what this paper contributes to existing literature: assessing deregulation and a state's regulatory environment in connection to classifications of craft breweries.

3.1 Research Methodology

In collecting data on the number of craft brewers operating in a state in a given year, it is important to consider whether a brewery may have shut down. Since this information is not readily compiled or released, this led to searching guild membership lists, reviews of beers, or any available websites online.[4] The Brewers Association only reports, as a current cross-section, breweries that are currently in operation, not ones that may have shut down or since stopped producing craft beer. For instance, the Lake Norman Brewing Company of Charlotte, North Carolina was operational from 2014-2017 before shutting down, thereafter removed from the calculation of microbreweries still open.[5] But microbreweries such as this one can be evaluated as to how they have responded to changes in regulatory policies in past years. This approach produces a more comprehensive, robust data set of craft brewers.

In creating the data set, we do not consider the existence of breweries with multiple locations in a state. For instance, if Microbrewery 1A opens a joint location 1B, and it still brews at just a single source, it would not be treated as two separate entities; both are still tied to the same brewery. This also leads to removing chain brewpubs from consideration in which beverages are brewed off-site.

3.2 Variables and Sources

Aside from variables quantifying microbreweries and brewpubs in a state per year, other data collected include indices for economic freedom, alcohol freedom, and regulatory policies. Every year, the CATO Institute indexes states by economic freedom, regulatory policies, fiscal policies, and individual liberties. Taking into perspective simple changes to alcohol and business regulation, startup firms and existing firms in the market must decide whether to operate. So the rationale behind these variables included in the study is to characterize the overarching environment faced by firms. All of the data collected towards variables is summarized in Table 2.

Further, novel policy measurements of alcohol deregulation are created in connection to changes outlined above in Section 2.3. For example, if the state of South Carolina increases access in 2013 of customers to microbreweries for purchasing beer, this would be captured in 2013 and all years post. Likewise, if Mississippi legalizes the production of higher-alcohol-content beer, then this would be captured in all years post.

3.3 Descriptive Statistics

In surveying the summary statistics of the variables in our data set, we observe that the algebraic sign of the majority of observations from 2000–2018 for economic freedom and regulation are positive. Alcohol freedom, though rather close to 0 for both the mean and median, is negative. We also find that the data is roughly normally distributed for each of the variables of interest, with slight skew existing for microbreweries and population. To account for this, we apply logarithms to each of these variables for empirical modeling. The descriptive statistics for our data are shown in Table 3.

We also evaluate potential correlation between our variables of interest, noting that are no statistically strong relationships present. In past research, Staples et al. (2021) find evidence of a positive relationship between the quantity of regulations and breweries. However, our paper focuses on the qualitative nature of public policies as well as changes in them, not just the levels of them. We next proceed with the base models for empirical analysis.

[4]BeerAdvocate, RateBeer, TripAdvisor, Untappd, Facebook, and Yelp are the primary sources. There, we see ratings of beers and breweries in all states, regardless of whether that brewer pays membership into a guild. This is what increases the scope of data produced by state guilds or the Brewers Association. A final source used, if it was unclear when a brewery opened, was with a telephone call to the business.

[5]For example, RateBeer identifies scores of beers for Lake Norman Brewing Company from 2014–2017. In the absence of any notes from other sources that the Lake Norman Brewing Company was open after this point, we identify it as in operation in our data from 2014–2017. It is then removed from the in-operation count of microbreweries.

Table 2: Variables, Descriptions, and Sources of Data Collected

Variable	Description	Source
Microbreweries	the number of microbreweries open during a calendar year	self-generated using RateBeer, Untappd, Yelp, Facebook, and BeerAdvocate
Brewpubs	the number of brewpubs open during a calendar year	self-generated using RateBeer, Untappd, Yelp, Facebook, and BeerAdvocate
Volume	a policy binomial variable recognizing if the amount of alcohol that could be sold was increased (0 if no change, 1 if increase and for all years after)	self-created
Direct	a policy binomial variable recognizing if there was policy change allowing the sale of alcohol directly to consumers (0 if no change, 1 if legalized and for all years after)	self-created
Alcohol Content	a policy binomial variable recognizing if there was an increase in the alcohol limit allowed of produced beer (0 if no change, 1 if increased and for all years after)	self-created
Economic Freedom	index for state economic freedom	Freedom in the 50 States, CATO Institute
Regulation	index for state regulatory policies	Freedom in the 50 States, CATO Institute
Alcohol Freedom	index for alcohol-related liberties	Freedom in the 50 States, Cato Institute
Population	population (in thousands of persons)	U.S. Census Bureau

Table 3: Descriptive Statistics for Variables

Variable	Minimum	Median	Maximum	Mean	Standard Deviation
Microbreweries	0	7	207	18.895	33.511
Brewpubs	0	8	114	12.569	16.443
Volume Policy	0	0	1	0.191	0.394
Direct Policy	0	0	1	0.091	0.288
Alc. Content Policy	0	0	1	0.148	0.356
Econ. Freedom	-0.281	0.082	0.439	0.101	0.157
Regulation	-0.172	0.089	0.201	0.068	0.093
Alc. Freedom	-0.026	-0.005	0.016	-0.002	0.009
Population	1801.481	4830.081	21244.320	6765.215	4481.965

4 Modeling and Empirical Analysis

For our base empirical model, we first consider the growth in microbreweries only given changes in policy binomial variables for states. This gives us the model:

$$log(Microbreweries)_{it} = \beta_0 + \beta_1 VolumePolicy_{it} + \beta_2 DirectPolicy_{it} + \beta_3 Alc.ContentPolicy_{it} + \epsilon_{it}, \quad (1)$$

where i denotes a state and t denotes the year of observation. We use a state level analysis, which is consistent with Gohmann (2016), Friske and Zachary (2019), Burgdorf (2019), Malone and Lusk (2016) as well as Malone and Hall (2017). Model (2) includes measures for economic freedom, regulation, and population growth as additional explanatory variables, shown below:

$$\begin{aligned} log(Microbreweries)_{it} = \beta_0 + \beta_1 VolumePolicy_{it} + \beta_2 DirectPolicy_{it} + \beta_3 Alc.ContentPolicy_{it} + \\ \beta_4 Econ.Freedom_{it} + \beta_5 Regulation_{it} + \beta_6 log(Population)_{it} + \epsilon_{it}. \end{aligned} \quad (2)$$

We first consider microbreweries separately or independently of brewpubs. We then consider them jointly

for the remaining models (3)–(5), encompassing craft brewing. These models also later consider an alternative measure to the previous policy binomial variables through alcohol freedom:

$$log(Microbreweries + Brewpubs)_{it} = \beta_0 + \beta_1 VolumePolicy_{it} + \beta_2 DirectPolicy_{it} + \beta_3 Alc.ContentPolicy_{it} + \beta_4 Econ.Freedom_{it} + \beta_5 Regulation_{it} + \beta_6 log(Population)_{it} + \epsilon_{it} \quad (3)$$

$$log(Microbreweries + Brewpubs)_{it} = \beta_0 + \beta_1 Alc.Freedom_{it} + \epsilon_{it} \quad (4)$$

$$log(Microbreweries + Brewpubs)_{it} = \beta_0 + \beta_1 Alc.Freedom_{it} + \beta_2 Regulation_{it} + \beta_3 log(Population)_{it} + \epsilon_{it} \quad (5)$$

Table 4 includes the regression results for models (1) and (2). Table 5 subsequently provides the regression results for models (3)–(5). The coefficients for variables in the models are reported alongside their respective standard errors.

Table 4: Regressions (1) and (2) on the Change in Microbreweries

Variables	(1)	(2)
Volume Policy	0.5454 **	-0.1277
	(0.2282)	(0.0969)
Direct Policy	1.5776 ***	-0.1775 *
	(0.2971)	(0.0933)
Alc. Content Policy	-0.0246	0.3332 ***
	(0.2583)	(0.0995)
Alc. Freedom		
Economic Freedom		0.1535
		(0.8610)
Regulation		4.8562 **
		(1.9257)
log(Population)		4.4475
		(1.1324)
constant	1.8545 ***	-37.5764 ***
	(0.1007)	(9.6470)
Robust Std Errors?	No	Yes
State-Fixed Effects?	No	Yes
Year-Fixed Effects?	No	Yes
R^2	0.168	0.931
F-Stat	12.84	121.98
Observations	195	195

Note: * p<.10, ** p <.05, *** p<.01 in 2-tailed t-test for difference in means.

Regression (1) serves as the base model, only considering the policy binomial variables and without state or year fixed effects. To check for any possible existence of heteroscedasticity, we perform robustness checks and note that the model does not exhibit heteroscedasticity. We find that both deregulation of volume policy and policy allowing direct sales from microbreweries to statistically, positively impact the growth of microbreweries. Though deregulation of alcohol content policy produces a negative effect, it is not statistically significant at the 10% level of significance.

In regression (2), we additionally consider economic freedom, regulation, and log(population) along with state fixed effects and year fixed effects. We still find that policy deregulation allowing for direct sales of microbreweries is statistically significant as well as alcohol content policy deregulation now positive and statistically significant. We also find that our more general measure of the regulation is statistically significant, reflecting that a less regulatory environment results in an increase in the growth of microbreweries. Though

not statistically significant, the algebraic sign on the coefficient for economic freedom is positive, supportive of the findings in Hall and Lawson (2014). Including both state and year fixed effects also drastically increases the explanatory power of the model with an R^2 of 0.93.

Regressions (3)–(5) consider the combination of both microbreweries and brewpubs. With the only difference between regressions (2) and (3) being the inclusion of brewpubs alongside microbreweries, we now find that there is statistical significance of the log(population) at the 10% level. There is also greater explanatory power of our regressors towards brewpubs also being included in the dependent variable construction. Regression (4) considers alcohol freedom instead of the previous combination of policy binomial variables. Alcohol freedom, measured continuously rather than discretely, allows for greater variation in evaluating the change in microbreweries and brewpubs. We find that alcohol freedom produces a positive and statistically significant impact on the growth rate of craft brewers. Also with just a single explanatory variable in the model (with state fixed effects and year fixed effects), we find an R^2 of roughly 0.96. By standardizing the coefficient for alcohol freedom in regression (4), we conclude that a 1 standard deviation change in alcohol freedom results in a 0.173 standard deviation change in the growth of breweries. Finally, regression (5) evaluates the impact of regulation generally and the log(population) alongside alcohol freedom. Though we find that these variables have positive algebraic coefficients, neither regulation nor the log(population) statistically impacts the change in craft brewers.

Table 5: Regressions (3)–(5) on the Change in Microbreweries and Brewpubs

Variables	(3)	(4)	(5)
Volume Policy	-0.0568		
	(0.0814)		
Direct Policy	-0.1213 *		
	(0.0677)		
Alc. Content Policy	0.2982 ***		
	(0.1011)		
Alc. Freedom		24.8209 **	23.1435 *
		(11.7032)	(12.3169)
Economic Freedom	-1.0996 **		
	(0.5264)		
Regulation	1.9167 *		0.2299
	(1.1027)		(0.9160)
log(Population)	1.5019 *		0.5959
	(0.7829)		(0.8356)
constant	-11.9268 *	1.3697 ***	-3.6861
	(6.5038)	(0.2731)	(7.0377)
Robust Std Errors?	Yes	Yes	Yes
State-Fixed Effects?	Yes	Yes	Yes
Year-Fixed Effects?	Yes	Yes	Yes
R^2	0.9597	0.9560	0.9562
F-stat	135.59	140.47	147.75
Observations	206	206	206

Note: * p<.10, ** p <.05, *** p<.01 in 2-tailed t-test for difference in means.

5 Conclusion and Discussion

In this study, using a unique data set for the annual change in the number of craft breweries by state, we construct a model to examine the moderating role of state regulatory environments upon new business formation within the craft brewing space in several southern states. We find evidence supporting a role for state alcohol regulations as an impactful factor in encouraging new entrants to the industry. Specifically, a

more permissive state regulatory environment in terms of how alcoholic beverages are produced, distributed and consumed is found to positively influence the number of breweries in operation over time, consistent with the broad concept of economic freedom as an external enabler facilitating new business formation (Bennett, 2021).

We begin with the most parsimonious model (1), only considering the log of microbreweries as our dependent variable of interest. It also includes binomial policy variables reflecting alcohol volume, content, and distribution wholesaler requirements (or being able to sell directly). While we see significant effects for some of these policy variables within the model, there is a marked improvement in explanatory power within model (2), where fixed effects are controlled for and additional explanatory variables are added, most notably an index representing the overall regulatory permissiveness within a state, which is found to be economically and statistically significant. Model (3) includes brewpubs as well as microbreweries, modestly improving explanatory power. Taken together, these models (1)–(3) suggest a role for alcohol regulatory policy specifically, as well as the broader business regulatory environment generally, in impacting the number of craft brewers in operation within a state. It is likely though that we are failing to capture additional relevant policies through just the policy variables. We therefore include the broader index for alcohol freedom as an overall proxy for the level of state deregulation within the dimensions of alcoholic beverage production, distribution, and consumption within models (4) and (5). In addition to being a continuous, rather than categorical variable, alcohol freedom may also capture more of the industry-specific policies relevant to the decision-making processes for potential new entrants. In fact, we find economic and statistical significance for alcohol freedom without any real change to overall explanatory power within both model (4), without control variables, and within model (5), where controls for the overall state regulatory environment (Regulation), and state population (log Population) are included along with fixed effects. This is clearly supportive of a role for the level of deregulation relative to alcohol in moderating new craft brewer business formation within a state.

There are undoubtedly a myriad of critical factors entrepreneurs must consider in deciding whether and where to introduce a new business, and state policies impacting the milieu of an industry can certainly be one of those factors. By demonstrating that the level of permissiveness within the state regulatory environment for alcohol may explain a significant portion of the variance in new entrants to the craft brewing industry, we provide additional evidence linking the concept of economic freedom to levels of entrepreneurial activity. That said, there remains additional work to do in this area. Looking ahead into areas for additional research, it may be worthwhile to seek out greater levels of granularity with regard to which specific state policies are most impactful to the willingness to start a new craft brewery within one state versus others, as well as whether there are any interaction effects with other measures of state economic freedom and whether it is the level or rate of change that matters.

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Appendix

Figure A1: Microbreweries in Operation

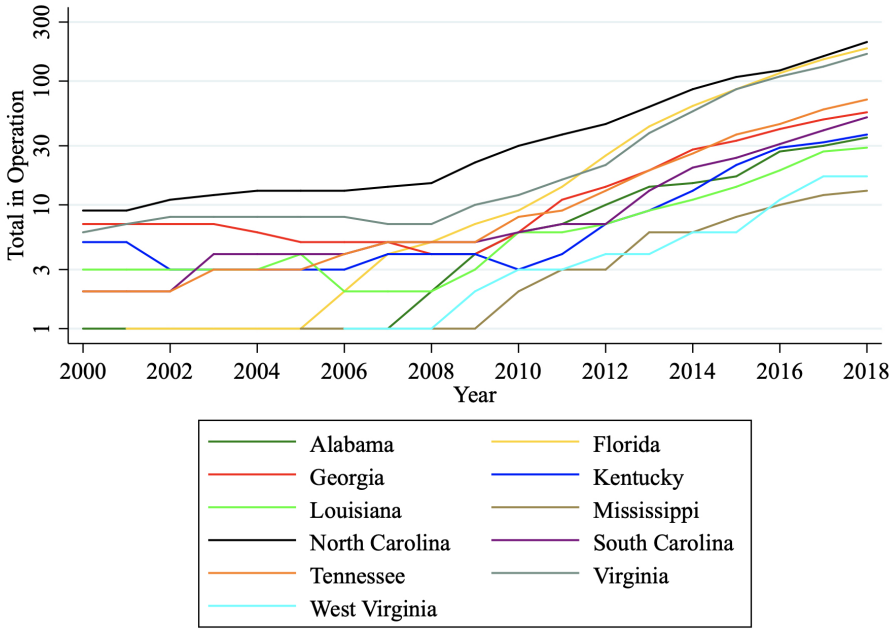

Figure A2: Brewpubs in Operation