

ARTICLE

# Apples to advocacy: Evaluating consumer preferences for hard cider policies

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## Abstract

Hard cider is a sector of a maturing craft beverage industry that continues to experience growth in the United States. Cider is also experiencing challenges, however, such as competition from other alcohol markets, changing consumer preferences, the supply chain, and inflationary pressures. National policy changes may help promote more optimal outcomes for this sector, but public support is important to policy formation. This study uses survey data from a best-worst scaling experiment of consumers in four leading cider-producing states (Michigan, Washington, Wisconsin, and Vermont) to understand preferences toward ten broad cider policy initiatives. The results of multinomial logistic modeling reveal that consumers prefer policies mandating ingredients, nutrition facts, and allergen labeling across all ciders. The least preferred policy initiatives include allowing producers to use vintage on labeling and funding regional cider development. These results have important implications for stakeholders across the industry, including the benefits of labeling disclosures in marketing and the need to improve public awareness of barriers to cider industry development.

**Keywords:** best-worst scaling; hard cider; policy preferences; regulations

**JEL classifications:** L66; Q18

## 1. Introduction

Hard cider has burst on the craft beverage scene, with the number of U.S. producers increasing 600% over the past decade (Milkovich, 2023). While many of the largest hard cider producers have experienced stagnant or declining sales over the past few years, local and regional brands (i.e., brands that do not have national distribution) have seen

sales increase by 20% from 2018 to 2021 (Berg, 2022). Now, these smaller producers account for more than half of all U.S. hard cider sales (NielsenIQ, 2023). Growth in cider sales may have positive economic impacts throughout the supply chain, not only for cider makers but also for distributors, retailers, and consumers. In addition, growth may create new markets for apple growers, particularly for cider-specific varieties that currently garner higher prices than fresh or “dessert” apples (Ostrom et al., 2022). However, fluctuating consumer demand, competition from other craft beverage markets, and supply chain disruptions are limiting the hard cider market potential (American Cider Association, 2022; Lee-Weitz, 2023; NielsenIQ, 2023).

Hard cider is also a highly regulated industry in the United States, with a complex legal landscape shaped by the end of Prohibition in 1933. These regulations and their enforcement can shape industry trajectories—when regulations are numerous and complex, for example, they may impede growth, particularly for small firms (Malone and Lusk, 2016; Pesavento, 2022). The complexity and variability of taxation and regulation of hard cider exist at the federal and state levels. For example, hard cider is subject to different federal tax rates and definitions depending on its alcohol content, carbonation level, and ingredients (Miles et al., 2020), and these may differ significantly from other alcoholic beverages, such as beer and wine. Additionally, regulations frequently vary across state lines, hampering consistent distribution, marketing, and consumer messaging strategies. Producers and their wholesale customers may be constrained in their ability to market or sell cider if regulations close off preferred supply chain pathways or if the time and expenses of compliance are beyond their resources.

The challenges noted previously may affect hard cider consumers differently, depending on their preferences, expectations, and willingness to pay. Some possible effects include: (a) consumers who prefer local hard cider may have to pay higher prices to reflect higher production costs and/or tax rates and fewer direct and indirect subsidies in comparison to nationally distributed products; (b) consumers may face limited availability or variety of local ciders due to barriers to entry in distribution and retail segments of the supply chain; (c) consumers may be concerned about ingredients, origin, or manufacturing processes that are not currently required to be disclosed—or even prohibited from disclosure—on cider; and (d) they may be disappointed in the quality of the most widely accessible ciders, which are often described as sweet and low in the tannins that provide depth, complexity and balance.

Policy changes could support the maturing cider industry in overcoming these challenges, but passing policy requires public support and engagement. However, little is known about cider consumers understanding of policies that shape markets and their preferences for policy changes that would affect the industry. Consumer preferences may influence the success or failure of industry efforts to change policies. To address this gap, we surveyed frequent cider consumers in four states and assessed their relative preferences for ten policy alternatives. [Section II](#) details the methods and data, which includes an overview of the best-worst scaling experimental design, the policy selection process, and the multinomial logistic modeling used in estimation. [Section III](#) presents the results, which reveal that consumers prioritize labeling policies over industry development. [Section IV](#) discusses the implications of our findings across the hard cider supply chain. [Section V](#) concludes that improving understanding of how policies

shape markets may help consumers discern which policies support their interests and those of the cider industry.

## II. Methods and data

### A. Experimental design

This study uses Case I (object-case) best-worst scaling (BWS) to understand consumer preferences for various hard cider policies (Finn and Louviere, 1992; Louviere, Flynn, and Marley, 2015).<sup>1</sup> In BWS experiments, respondents are presented with several alternatives and asked to select their most preferred (best) and least preferred (worst) options. BWS has become common in the food and beverage economics literature (e.g., Bazzani *et al.*, 2018; Caputo and Lusk, 2020; Smith *et al.*, 2021) because it overcomes traditional shortcomings associated with Likert scale questions (Louviere, Flynn, and Marley, 2015). More specifically, BWS forces respondents to consider trade-offs between alternatives, reduces respondent cognitive fatigue, and limits scale-use bias (Baumgartner and Steenkamp, 2001; Scarpa *et al.*, 2011; Caputo and Scarpa, 2022).

In this experiment, consumers consider ten hard cider policies. A survey of apple growers (Ostrom *et al.*, 2022) informed this policy list, as did focus groups with cider producers, key informant interviews with industry stakeholders, and suggestions from the American Cider Association. A U.S. Department of the Treasury report (2022) evaluating recent alcohol consolidation and competition concerns was another important source since it contained views expressed by cider industry stakeholders. Table 1 presents the complete list of policies included in the BWS.

The first four policies are tied to the current regulatory structure of alcohol markets and considerations made in the recent Treasury report on competition in the U.S. alcohol market. The report was the product of Executive Order 14036 (Promoting Competition in the American Economy, 2021). It discusses recent trends in the industry, highlights potential areas for regulatory reform, and offers recommendations for boosting opportunities for smaller businesses and entrepreneurs. Informed by this report, we include policies that harmonize regulations across different alcohol sectors (i.e., beer, wine, and spirits), harmonize state-by-state alcohol regulations, ease interstate distribution, and enable retail partnerships. A policy to harmonize regulations across alcohol types is included because there is substantial variation in policies for beer, wine, and distilled spirits. For example, some states only allow beer sales at grocery stores, while others allow beer and wine (and distilled spirits) sales (e.g., Rickard, Costanigro, and Garg, 2013). Further, alcohol regulations also vary across state lines (Staples, Chambers, and Malone, 2022), and this heterogeneity can lead to differences in entrepreneurial and market outcomes in the craft beverage space (Anderson, Meloni, and Swinnen, 2018; Malone and Lusk, 2016). Thus, it is worth considering how consumers feel about creating similar policies across alcohol types and state lines. Easing interstate distribution laws is included because of the growing interest in direct-to-consumer sales through e-commerce markets. Lawmakers and industry groups have debated the policies contributing to competitive barriers in wine

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<sup>1</sup>For the remainder of the article, we use the acronym BWS to refer to the object-case design.

**Table 1.** Policies included in the best-worst scaling experiment

| #   | Policy   |
|-----|--|
| 1.  | <b>Harmonize cider, beer, and wine regulations:</b> Harmonize/have the same regulations for cider, beer, and wine rather than having different regulations for each product.                       |
| 2.  | <b>Harmonize state-by-state cider regulations:</b> Harmonize/have the same regulations for cider in all states rather than different regulations for each state.                                   |
| 3.  | <b>Ease interstate distribution:</b> Revise laws to make it easier to distribute ciders across state borders.  |
| 4.  | <b>Allow retail partnerships:</b> Revise regulations to allow cider makers to develop promotions with specific retailers.  |
| 5.  | <b>Label allergens:</b> Require labeling of potential allergens.   |
| 6.  | <b>Label nutrition facts:</b> Require labeling of nutrition facts, such as calories and nutrients, similar to non-alcoholic beverages.   |
| 7.  | <b>Label ingredients:</b> Require labeling of ingredients similar to non-alcoholic beverages.  |
| 8.  | <b>Label the use of concentrated juice:</b> Require labeling when juice concentrates are used in cider production.   |
| 9.  | <b>Allow vintage on the label:</b> Revise regulations to allow the year of apple harvest to be included on the label.  |
| 10. | <b>Fund regional cider development:</b> Increase funding efforts to develop unique-tasting ciders based on soil type, apple varieties, and growing conditions in specific apple-producing regions. |

e-commerce sales since at least the early 2000s (FTC, 2003), as limiting interstate distribution restricts consumers from accessing out-of-state products. However, there is a renewed interest in policy reform due to advances in e-commerce platforms, evolving direct-to-consumer laws, and growth in small and regional producers. Similarly, a question focused on enabling retail partnerships is included in our list because the American Cider Association notes that tied-house laws disadvantage small producers who may work with single retailers and are currently prohibited from promoting these locations (U.S. Department of the Treasury, 2022). While these policy changes are not direct recommendations from the report, we determined that evaluating these topics within the report warranted further investigation.

Next, four different types of labeling policies are considered, including allergen disclosure, nutrition facts, ingredients, and the use of concentrated juice. Alcohol labeling in the United States is complex, and requirements for one beverage category may not apply to others.<sup>2</sup> Consumers have indicated support for labeling food and non-alcoholic beverages—in a 2019 survey, for example, the U.S. Food and Drug Administration (Lando, Verrill, and Wu, 2021) found that 87% of U.S. adults use nutrition labels when making food purchases, 80% report using other label information on the front of packaging, and 14% indicate that they have food allergies.

<sup>2</sup>For example, ciders (and wines with less than 7% ABV) fall under the jurisdiction of the Food and Drug Administration (FDA), while other alcohols are monitored by the Alcohol and Tobacco Tax and Trade Bureau (TTB). There have been recent attempts to harmonize policies across all types of alcoholic beverages (TTB, 2022).

Sulfites are the most common type of potential allergen for the cider industry (TTB Alcohol Labeling and Formulation Division, 2023), used as preservatives to help wine and cider stop fermentation and slow chemical reactions. A nutrition facts panel would standardize the mandatory labeling information across all ciders, including information such as calories per serving. Labeling ingredients is another potential change and would likely require producers to list each ingredient used in production, including food, color additives, and flavorings (TTB, 2022). Lastly, there is debate in the cider industry on labeling concentrated juice. Concentrated juice refers to the syrup-like liquid created from the heating, extraction, and filtration of the fruit. The process strips much of the flavors and aromas from the input, and its use can require additional ingredients, such as malic acid and caramel color, during the production process to restore the desired cider characteristics. The process provides large producers with a steady supply of inputs year-round. However, smaller orchard-based producers may argue that ciders manufactured with concentrated juice should be labeled as such to assist with product differentiation (Alworth, 2019). Two-thirds of the apple juice supply in the United States includes concentrate imported from China (Gale, Huang, and Gu, 2010), and imported juice comprises a substantial portion of hard cider produced in the United States (Miles *et al.*, 2020).

The last two policies considered in the experimental design relate to broad and regional industry development. We assessed consumers' relative preferences for allowing cider producers to mark vintage (or harvest date) on the label, as well as for increasing funding efforts for regional cider development. Vintage is well-known in the wine industry (Ashenfelter, 2010; Storchmann, 2012), serving as a proxy for quality and a potential marketing mechanism for producers. The cider industry has developed an interest in vintage due to the recent growth in imperial ciders, or ciders with 8.0%+ alcohol by volume (ABV) (Shreeves, 2022). These products are well-suited for aging and could provide producers with a niche marketing opportunity to offer products that fetch a premium price. Our final question assesses support for increasing funding for regional cider development. NielsenIQ (2023) reports that regional and local brands now account for approximately 54% of cider sales in the United States. With a budding interest in local beverage value chains, government support (e.g., grants) could be provided to establish and expand these local markets through infrastructure, R&D, and other forms of support.

As BWS relies on repeated choices and trade-offs between policy sets, respondents were presented with six groups of policy choices. Each question had five of the ten policies generated using an incomplete block design (Bazzani *et al.*, 2018), where the alternatives were randomly assigned (Boyle *et al.*, 2001; Lusk and Norwood, 2005). In each of the six tasks, they were to select their most and least preferred option.

### ***B. Survey instrument and sampling strategy***

The BWS experiment was embedded in an online survey designed and distributed through Qualtrics to a panel of cider consumers across four states: Michigan, Vermont, Washington, and Wisconsin. These states were selected because they were among the top 12 in the number of cider producers per capita (Conway, 2020), and therefore, residents were more likely to have access to local and craft cider options. For example,

Vermont has the highest number of cider producers per capita, and Washington and Michigan combine to account for more than 70% of total U.S. apple production (USApple, 2021). These states were also the focus of a larger project exploring the potential for cider-specific varieties to improve economic outcomes for small and medium-scale orchardists (Ostrom et al., 2022). Respondents were above the legal

**Table 2.** Sample demographics, cider consumption habits, and preferences

| Characteristic   | % of sample<br>(n = 688) |
|--|--------------------------|
| <b>Gender</b>  |                          |
| Male   | 45.8                     |
| Female   | 52.9                     |
| Non-binary or prefer not to answer                     | 1.3                      |
| <b>Age</b>   |                          |
| 21–24  | 11.3                     |
| 25–34  | 20.4                     |
| 35–44  | 26.2                     |
| 45–54  | 18.8                     |
| 55–64  | 14.2                     |
| 65 or older  | 9.2                      |
| <b>Income</b>  |                          |
| Less than \$25K  | 14.0                     |
| \$25K–\$49K  | 26.7                     |
| \$50K–\$74K  | 23.3                     |
| \$75K–\$99K  | 11.9                     |
| \$100K or more   | 24.1                     |
| <b>State</b>   |                          |
| Michigan (MI)  | 30.5                     |
| Vermont (VT)   | 8.9                      |
| Washington (WA)  | 30.4                     |
| Wisconsin (WI)   | 30.2                     |
| <b>Relative consumption of cider to other alcohols</b> |                          |
| More frequently  | 23.7                     |
| About the same   | 37.9                     |
| Less frequently  | 36.8                     |
| Unsure   | 1.6                      |
| <b>Preference for cans or bottles</b>                  |                          |
| Cans   | 22.0                     |
| Bottles  | 53.6                     |
| No preference  | 24.4                     |

Please choose **one** policy as most preferred and **one** policy as least preferred from the list below.

| Best                  | Policy                                     | Worst                 |
|-----------------------|--|-----------------------|
| <input type="radio"/> | Ease interstate distribution               | <input type="radio"/> |
| <input type="radio"/> | Fund regional cider development            | <input type="radio"/> |
| <input type="radio"/> | Harmonize state-by-state cider regulations | <input type="radio"/> |
| <input type="radio"/> | Label ingredients                          | <input type="radio"/> |
| <input type="radio"/> | Allow vintage on label                     | <input type="radio"/> |

**Figure 1.** Example best-worst scaling (BWS) task.

drinking age (21+) and had consumed cider in the past month. The data were collected from February 7 to February 23, 2023, with 688 cider consumers completing the study. [Table 2](#) presents the summary statistics of the sample.<sup>3</sup>

The survey began with several demographic questions and questions regarding cider consumption habits. This included questions on the frequency of consumption relative to other alcohols and the characteristics of cider that were important and unimportant to them when purchasing cider.<sup>4</sup> Respondents then completed the main portion of the study: the six BWS choice tasks. They were told there would be six questions about their preferences for different government policies and programs related to hard cider production. In each question, they would choose the policy they most preferred and least preferred out of five options. [Figure 1](#) presents an example BWS question.

### C. Estimation procedures

BWS estimation lies in random utility theory (McFadden, 1974), where respondent  $i$  receives indirect utility  $U_{ipt}$  from selecting policy pair  $p$  in choice task  $t$ . In each choice task, the respondent is assumed to consider all potential policy pairs and choose the one that maximizes their utility. In other words, their selection maximizes the difference between their most preferred and least preferred policy. If  $J$  denotes the total number of policy alternatives in each choice task, then there are  $J(J - 1)$  policy pairs each respondent must consider for each of the six questions. In our setting, with five policies per

<sup>3</sup>It is worth noting that the sample was not expected to be representative of the U.S. population. That is, the demographics of cider consumers (particularly across just four states) are different than the demographics of U.S. adults.

<sup>4</sup>Specifically, they were presented with a list of nine attributes and could classify each as important, unimportant, or neither important nor unimportant. The list includes factors such as price, availability, and a variety of extrinsic attributes (e.g., labeling, organic, regionally produced) and was informed by conversations with cider producers. These are factors thought to be important to the cider purchasing decision within the industry. The order in which these were presented was randomized to prevent ordering effects. The primary objective of this section of the survey is to serve as supporting information in explaining BWS results. [Figure A1](#) of the Appendix presents the results. Taste (78%), availability (63%), and price (53%) ranked as the top three most important attributes. Regionally produced ranked among the least important attributes, with just 32% of respondents saying it was important to their cider-purchasing decisions.

choice task, there are 20 possible policy pairs. We thus estimate the multinomial logit (MNL) model:

$$U_{ipt} = \beta_j - \beta_k + \epsilon_{ipt}, \quad (1)$$

where  $\beta_j$  and  $\beta_k$  are parameter estimates for best policy  $j$  and worst policy  $k$ , respectively. These parameter estimates are relative to a baseline policy normalized to zero. Then,  $\epsilon_{ipt}$  is an independent and identically distributed (IID) and type I extreme value error term.

Since indirect utility is random, we can only model the unconditional probability that a given combination maximizes the difference in utility among the  $J(J - 1)$  pairs (Lusk and Briggeman, 2009). When alternative  $j$  is the best and  $k$  is the worst, this is formally defined as the closed-form, logit choice probability:

$$Prob_i(j \text{ is best and } k \text{ is worst}) = \frac{\exp(\beta_j - \beta_k)}{\sum_{l=1}^J \sum_{m=1}^J \exp[(\beta_l - \beta_m) - J]}. \quad (2)$$

The MNL output provides marginal utility parameters for each policy alternative, where the sign suggests whether, on average, consumers prefer the policy relative to the baseline. However, an alternative and more informative approach to analyzing the output is to analyze the preference share ( $Y_j$ ) of each policy. Preference shares are a way to normalize the model output as a measure of relative importance and are calculated as follows:

$$Y_j = \frac{\exp(\widehat{\beta}_j)}{\sum_{l=1}^J \exp(\widehat{\beta}_l)}. \quad (3)$$

By construction, the preference shares are bounded between zero and one and sum to one across the ten policies. The larger the preference share is for a given policy, the more important it is, on average. Thus, comparisons can be drawn across all policy alternatives, including the baseline.

### III. Results

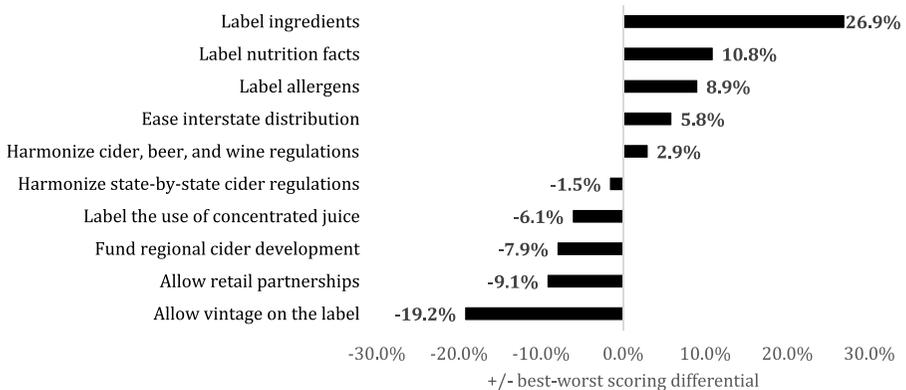
#### A. Descriptive summary of results

Table 3 presents the percentage of times that each policy was selected as the best or worst when presented to participants. Additionally, Figure 2 displays the best-worst differential, taking the rate at which each policy is selected as the best policy and subtracting the percentage it is chosen as the worst. Policies with a positive best-worst differential are more frequently selected as the best than the worst, and those with a negative point differential are more often chosen as the worst.

Three of the four policies calling for additional labeling rank highest in the likelihood of being selected as the best policy. For example, mandatory labeling of ingredients was chosen as the best policy more than one-third of the time when presented to the consumer. Labeling nutrition facts and allergens were each selected nearly a quarter

**Table 3.** The percentage of times each policy was selected as best and worst when present

| Policy                                      | % Selected when present |       |
|---|-------------------------|-------|
|   | Best                    | Worst |
| Harmonize cider, beer, and wine regulations | 22.4                    | 19.5  |
| Harmonize state-by-state cider regulations  | 19.9                    | 21.5  |
| Ease interstate distribution                | 22.0                    | 16.2  |
| Allow retail partnerships                   | 13.4                    | 22.6  |
| Label allergens                             | 23.5                    | 14.5  |
| Label nutrition facts                       | 26.4                    | 15.5  |
| Label ingredients                           | 36.0                    | 9.2   |
| Label the use of concentrated juice         | 16.5                    | 22.6  |
| Allow vintage on the label                  | 10.5                    | 29.7  |
| Fund regional cider development             | 15.0                    | 22.9  |

**Figure 2.** Best-worst scaling (BWS) summary statistics on voting differential.

of the time when present. These three policies also rank as the top three in the best-worst differential, suggesting that they were infrequently selected as the worst policy when present. For example, mandatory ingredient labeling is chosen as the worst policy less than 10% of the time when presented to the respondents. The only exception to the apparent preference for mandatory labeling is the result of concentrated juice labeling. This policy was more frequently selected as the worst policy (23%) when present than the best (17%).

The only other policies more commonly selected as best than worst when present include harmonizing regulations across different alcohol categories and easing interstate distribution. However, the best-worst differential for these policies is smaller than for labeling ingredients, nutrition facts, and allergens. All other policies were more frequently selected as the worst than the best. The policies with the most negative best-worst differentials include allowing the vintage on the label (-19%), allowing producer and retail partnerships (-9%), and funding regional cider development (-8%).

## B. Multinomial logit output

Table 4 presents the results of the MNL, where funding regional cider development serves as the baseline group. Figure 3 then displays the preference shares using the MNL parameter estimates. The results here align with the descriptive statistics presented previously.

Consumers generally prefer mandatory ingredients, nutrition facts, and allergens labeling to policies funding regional cider development. The parameter estimates for these three policies are statistically significant at the 1% level. Looking at the mean preference shares, these three policies rank highest in terms of relative importance. Labeling ingredients ranks first with nearly an 18% preference share, while labeling nutrition facts and allergens have roughly 12% each. This implies that, on average, labeling ingredients is the most pressing policy concern among the included policy

Table 4. Multinomial logit (MNL) output

| Policy                                      | Coef.     | Std. err. |
|---|-----------|-----------|
| Harmonize cider, beer, and wine regulations | 0.257***  | 0.062     |
| Harmonize state-by-state cider regulations  | 0.155**   | 0.063     |
| Ease interstate distribution                | 0.054     | 0.058     |
| Allow retail partnerships                   | -0.028    | 0.058     |
| Label allergens                             | 0.400***  | 0.070     |
| Label nutrition facts                       | 0.442***  | 0.070     |
| Label ingredients                           | 0.814***  | 0.069     |
| Label the use of concentrated juice         | 0.043     | 0.063     |
| Allow vintage on the label                  | -0.260*** | 0.063     |
| Fund regional cider development             | —         | —         |
| N   |           | 82,560    |
| Log-likelihood                              |           | -12,004.2 |

Note: Superscripts \*\*\*, \*\*, and \* denote statistical significance at the 1, 5, and 10% levels, respectively.

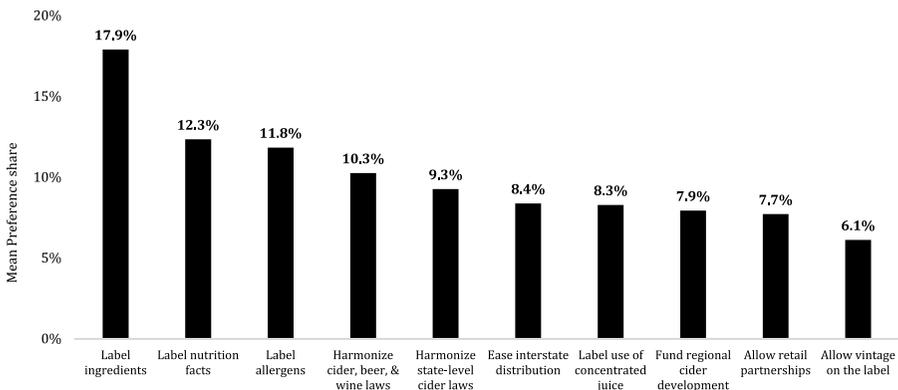


Figure 3. Mean preference shares for each policy

options, followed by labeling nutrition facts and allergens. Consumers also prefer policies that harmonize regulations across alcohol types and state lines, on average. These estimates are statistically significant at the 1 and 5% level, respectively. Both policies have approximately 10% preference share.

The parameter estimates for easing interstate distribution, allowing retail partnerships, and labeling the use of concentrated juice are not statistically different from zero. In other words, the 95% confidence interval overlaps with zero, and we cannot say that average preferences for these policies are statistically different from the parameter for funding regional cider development. As such, preference shares for these four policies all hover around 8%.

The only policy we can definitively say that consumers prefer less than funding regional cider development is allowing producers to use vintage on the label. The parameter estimate is negative and statistically significant at the 1% level, and the 6% preference share ranks last among the ten policies.

#### IV. Discussion and implications

Fluctuating consumer demand, competition from other beverage markets, inflationary pressures, and regulatory barriers affect the market trajectory for hard cider (American Cider Association, 2022; Lee-Weitz, 2023; NielsenIQ, 2023). After several years of sales growth, many of the largest national cider producers are experiencing declining sales. Smaller local and regional producers have grown and now account for over half of all cider sales, but overall industry sales are down 6% over the past two years (NielsenIQ, 2023). If hard cider markets are to develop further, it is important to consider policy initiatives encouraging competition and small business success (U.S. Department of the Treasury, 2022). This study gauges consumer preferences for hard cider policies using a BWS experiment.

As might be expected, given consumer familiarity with labeling, the results suggest that consumers prioritize labeling policies over those aimed at industry development. For example, the BWS results reveal that mandating ingredients, nutrition facts, and allergens across all hard ciders are the most preferred policies. The least preferred initiatives are policies that allow producers to use vintage on the label, enabling partnerships between producers and retailers, and funding regional cider development. In other words, consumers' most preferred initiatives mandate producer behavior, while the least preferred policies would reduce restrictions on producer behavior and potentially enable more marketing opportunities.

This study has implications that extend across the agri-beverage supply chain. For example, it was interesting to see the low preference share for funding regional cider development. Consumers oftentimes prefer locally-produced beverages (e.g., Farris *et al.*, 2019; Hart, 2018; Jensen *et al.*, 2021; Smith *et al.*, 2021), and local beverage markets can boost state economies through job creation, tourism, etc. (Miller *et al.*, 2019). Similarly, adding vintage information to the label allows cider makers to differentiate their products, although consumers rank it low. Stakeholders and policymakers are interested in expanding these value chains, yet creating these markets requires investment (e.g., infrastructure, logistics, R&D), and consumers do not prioritize these policies.

When entering the cider market, producers must determine whether their inputs will come from their farm, someone else's farm, or a combination of both. Establishing a commercial cider orchard can take six or more years (Ostrom et al., 2022), and fruit quality could suffer in non-traditional growing regions for various reasons. Thus, the feasibility of purchasing local or non-local apple juice and other inputs may depend on location and is vital for determining a company's market strategy, target consumer, etc. Indeed, the American Cider Association estimates that just 51% of hard cider producers grow all or some of their apples (American Cider Association, 2022). The rest rely on fresh apples, fresh juice, or concentrated juice from other farms. As taste and other intrinsic attributes are the best predictors of consumer willingness to pay and repeat purchasing behavior (Grunert, 2002), producers should not sacrifice taste for localness (Staples, Malone, and Sirrine, 2021).

Another intriguing takeaway is that requiring concentrated juice labeling ranks well below the other labeling policies (ingredients, nutrition facts, and allergens). The limited preference for labeling concentrated juice may stem from a lack of consumer knowledge about the differences between freshly used apples and apple juice concentrate. If fresh juice is typically superior to concentrated juice, then this labeling attribute could more easily identify higher-quality cider.

A final implication is the limited support for allowing vintage on the label. Vintage is a standard marketing mechanism in the wine industry (Ashenfelter, 2010), and cider producers could benefit from using it in branding and promotion to further differentiate their products. This is particularly true for imperial ciders, among the fastest-growing cider segments (American Cider Association, 2022; Shreeves, 2022) that are well-suited for aging. Considering the general consumer preference for more transparent product information, this result is puzzling. Some possible explanations for this response include that the target market for high-end "vintage" ciders is relatively small or that consumers may not prioritize the potential benefits of vintage labeling to the industry. Cider makers in this segment could consider information campaigns for the target market since they are more likely to advocate for this change.

When considering BWS data, it is also important to remember that the results are relative to the alternatives included in the design. That is the main appeal of BWS: respondents are forced to make tradeoffs between alternatives. However, this means we cannot say whether a consumer is entirely for or against a policy. In other words, while the policies for vintage and funding regional cider development were ranked as the least preferred alternatives, we cannot say that consumers are against these policies. Instead, the results suggest they are the least preferred alternatives among the ten policies included in this design.

The primary limitation of this study is that it is constrained in geographic scope. The present study only evaluates the policy preferences of consumers in Michigan, Vermont, Washington, and Wisconsin. This was done to ensure that participants resided in states with high numbers of craft cider makers per capita, and it focused on consumers who already drink cider rather than potential cider drinkers. While this could limit the generalizability of the findings to the broader U.S. population, the results provide important insights into the policy preferences of a non-trivial subsample of the cider-drinking population.

## V. Conclusion

This study uses BWS scaling to understand consumer policy preferences in the hard cider industry. The results reveal that consumers currently place greater importance on policies requiring labeling of ingredients, nutrition facts, and allergens. They place less importance on policies that would lower barriers to industry development. Informing cider consumers about systemic barriers that cider makers face and the benefits drinkers and makers may realize from actively reforming the system may accelerate market reforms. A more general message to support regional cider development paired with a targeted campaign to a particular sector of drinkers (i.e., those interested in vintage labeling) may engage and activate consumers. It may also create opportunities to inform consumers about more complex issues, such as harmonizing federal and state regulations. More active consumer participation and support of cider makers promise several benefits, such as better cider quality, greater cider variety, improved cider retail access, and boosting local economies via job creation, tourism, and other sources of revenue.

Future research could consider different policy alternatives and experimental approaches. For example, it is possible that a policy aimed at state-level cider development could garner more interest than a policy for regional cider development or that consumers in some states and regions may be more supportive than others. From an experimental design perspective, a discrete choice experiment could evaluate whether consumers use nutrition facts in their alcohol purchasing decisions to the degree that they report for other foods and beverages. Another avenue for future research could explore policy preferences across different alcohol types and different consumer preferences. Given the lack of harmonization in regulations, it could be interesting to see how consumers view beer or wine regulations compared to distilled spirits.

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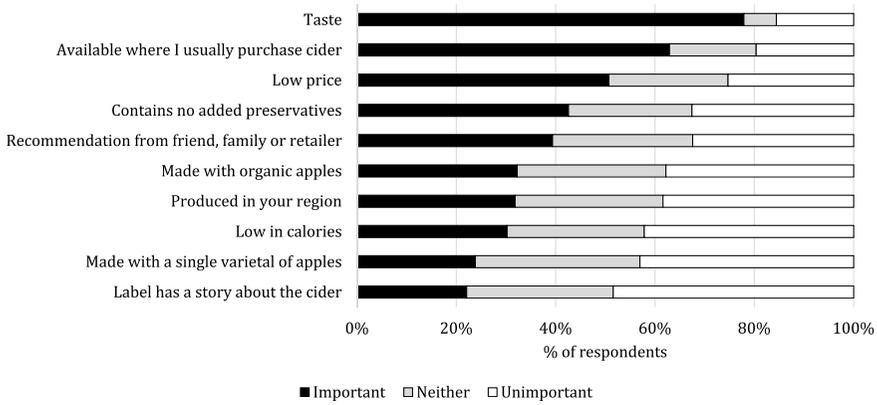
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## Appendix



**Figure A1.** Consumer response to whether various attributes are important or unimportant when deciding which cider to purchase.