

What Drives Acquisitions in the U.S. Craft Beer Industry?

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Motivation

- Retrospective analyses of mergers and acquisitions provide valuable insight into mergers' effects on prices, innovation, and product characteristics.
- But firms are not acquired randomly. Such analyses must deal with this selection.
- This paper: what characteristics drive selection?
- Characteristics targeted depend on firms' strategic incentives for acquisition:
 - Acquire to eliminate a close competitor?
 - Or acquire to expand into new geographic markets and/or product space?

U.S. Craft Beer Industry

- We study acquisitions of craft breweries by macrobreweries in the U.S. beer industry
 - 23 acquisitions from 2008 - 2017
- Craft breweries drive product variety in the U.S. beer industry
 - From 2008 - 2017, unique beers available increased by 241%, just 3% attributable to macrobreweries.
- Market share of craft breweries increased from 4% to 13% from 2008 - 2017

Goals of this Paper

- Estimate the impact on acquisition probability of
 - ① Product portfolio similarity
 - ② Market overlap between firms
- Use Nielsen Retail Scanner data from 2008 - 2017
 - Combine with product characteristic data from BeerAdvocate.com
- Explore how portfolio similarity and market overlap evolve post-acquisition using event studies

Related Literature

- Acquisition motives and target characteristics in the banking industry
 - Hannan and Rhoades (1987), Hannan and Pilloff (2009), Katsafados et al. (2021)
 - Evidence that acquisitions are driven by poor managerial quality, low profits, low capital-asset ratios, high market share, urbanness, and negative sentiment in annual reports.
- Geography and acquisition probability
 - Ragozzino and Reuer (2011), Charkrabarti and Mitchell (2013), Chen et al. (2017)
 - Evidence that geographic proximity between acquirer and target improves the flow of information and resources, increasing acquisition probability.
 - Target characteristics including firm size and venture capital backing mediate this effect.

Related Literature

- Firm complementarity and acquisition probability
 - Yu et al. (2019), Kavusan et al. (2022)
 - Evidence that firms select targets with similar R&D pipelines but complementary product portfolios and production technology
- Post-merger product repositioning
 - Berry and Waldfogel (2001), Sweeting (2010), Fan and Yang (2022)
 - Mergers lead to a decrease in number of products and greater product differentiation among merging firms
- Novel contribution: we investigate whether geographic overlap and product similarity motives are driven by intensity of competition between acquirer and target.

Industry Details

- Three-tier system put in place at the end of prohibition restricts vertical integration of beer producers, distributors, and retailers.
- Starting in the 1970s, craft breweries with production below 2m barrels were allowed to directly distribute and sell within state (Malone and Lusk, 2016).
- Prevalence of exclusive dealing between alcohol distributors and macrobreweries (Chen and Shieh, 2016).
- These features create a significant barrier to out-of-state distribution for craft breweries.
 - In 2017, the average craft brewery distributed to 50 counties, while the average macrobrewer distributed to 584 counties.

Data

- Nielsen Retail Scanner data
 - Weekly retailer-product-level data on prices and units sold from 2008 - 2017
 - 35,000 distinct retailers, 19,000 unique products in the beer segment
 - Provides data on geographic availability and revenue shares for each product and firm
- BeerAdvocate.com review platform
 - 15,602 breweries and 340,000 unique beers.
 - Provides product characteristic data (i.e. style of each beer)
 - Merge with Nielsen data to identify the firm that produces each UPC - 96% match success!
- We compile a catalog of all mergers and acquisitions among breweries since 2008.
 - We combine information from beer websites and news articles to determine the time of the merger announcement.
 - 147 total mergers and acquisitions, 23 U.S. acquisitions of craft breweries by macrobreweries

Summary Statistics

	Non-Acquired (1)	Acquired Matches (2)	Acquired No Match (3)
Firm Overlap	0.009 (0.042)	0.030 (0.049)	0.030 (0.047)
HHI	2.222 (0.492)	2.270 (0.419)	2.264 (0.409)
Cosine	0.249 (0.264)	0.227 (0.318)	0.253 (0.310)
Market Size	4.970 (8.435)	10.378 (11.534)	10.348 (11.418)
Free State	0.408 (0.492)	0.609 (0.499)	0.609 (0.490)
Craft Market Size	1.760 (2.825)	3.501 (3.802)	3.496 (3.751)
<i>N</i>	3,942	23	115

Notes: The table shows pre-acquisition means with standard deviations in parentheses. Column (1) displays pairs of macrobreweries with non-acquired craft breweries; column (2) displays pairs of macrobreweries with their acquired craft breweries; column (3) displays pairs of macrobreweries with craft breweries acquired by other macrobreweries.

Logit Estimation

- The latent profits of potential target i following acquisition by parent company j during our sample period is given by

$$\Pi_{i,j} = \alpha_0 + \alpha_1 \text{CosineSimilarity}_{i,j} + \alpha_2 \text{FirmOverlap}_{i,j} + X'_{i,j} \kappa + \delta_j + \varepsilon_{i,j}$$

- $\text{CosineSimilarity}_{i,j}$ is the revenue-weighted cosine similarity of the two firms' product portfolios.
- $\text{FirmOverlap}_{i,j}$ is the log of the total revenues of firm i in the geographic markets in which both firms i and j operate.
- δ_j are parent company fixed effects.
- $X'_{i,j}$ are controls for total market size, market concentration (HHI), and whether the state where firm i is located has restrictive beer distribution laws.

Logit Estimation: Characteristics of Acquisition

	(1)	(2)	(3)	(4)
	b/se/me	b/se/me	b/se/me	b/se/me
Cosine Similarity	-0.414 (0.831) [-0.002]	-0.240 (0.942) [-0.001]	12.536** (6.043) [-0.004]	11.592* (5.956) [-0.002]
FirmOverlap	0.338* (0.200) [0.002]	0.359* (0.205) [0.002]	0.485** (0.204) [0.002]	0.487** (0.212) [0.002]
log(Market Size)	0.222 (0.275) [0.001]	-0.063 (2.100) [-0.000]	0.225 (0.257) [0.001]	0.013 (2.021) [0.000]
FirmOverlap×Cosine			-0.701** (0.328)	-0.640* (0.328)
Acquirer FEs	-	Y	-	Y
Market Controls	-	Y	-	Y
<i>N</i>	4,080	4,080	4,080	4,080
pseudo <i>R</i> ²	0.070	0.127	0.082	0.137

Notes: Standard errors in parentheses and are clustered at the state-level to account for market or regulatory shocks that would impact firm *i*. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Average marginal effects are displayed in brackets.

Summary of Logit Results

- Likelihood of firm i 's acquisition is increasing in geographic market overlap.
 - Suggests macrobreweries target craft breweries they view as regional competitors.
- Increased similarity of product portfolios of firms i and j generates a net decrease in the likelihood of acquisition.
 - Acquisition probability is increasing in portfolio similarity for parent-target pairs with low firm overlap.
 - Negative interaction term dominates as firm overlap increases.
 - Taken together, results suggest that macrobreweries target craft breweries that can expand their regional product portfolios.
- No additional statistically significant effect of total market size in which both firms i and j operate.

What happens after acquisition?

- Given that firm overlap and product portfolio similarity influence the likelihood of acquisition, we next explore how market concentration and portfolio similarity evolve after acquisition.
- Utilize a difference-in-differences (DID) analysis to examine the effect of acquisition on:
 - ① HHI in markets served by the acquired and parent firms
 - ② Cosine similarity of the acquired and parent firms' product portfolios
- In related work, Blundell and Wilson (2023) find that acquired firms increase distribution into new markets but decrease the variety of product offerings in pre-merger markets.

DID Estimation

$$Y_{i,j,t} = \beta_0 + \beta_1 \cdot 1\{Acquired_{i,j,t}\} + \gamma_i + \phi_t + \nu_{i,j,t}$$

- Two possible outcomes for $Y_{i,j,t}$: portfolio similarity and the market HHI for firms i and j in year t .
- $1\{Acquired_{i,j,t}\}$ is an indicator equal to one for observations after firms i and j merge.
- γ_i and ϕ_t are firm and year fixed effects, and $\nu_{i,j,t}$ is an idiosyncratic firm-potential parent-year level shock.
- We use a control group of the combination of acquired firms i and other potential parent firms j that were not realized.

DID Estimation: Portfolio Similarity and Market Concentration

	(1)	(2)
	HHI	Cosine Similarity
Acquired	53.027* (30.679)	-0.054* (0.030)
<i>N</i>	1,092	1,092
Firm FEs	Y	Y
Year FEs	Y	Y

Notes: Robust Standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

- Following acquisition, market concentration increases relative to the areas where firm i and other potential parent firms j operate.
- Following acquisition, the similarity in product portfolios between firms i and j decreases relative to the portfolio similarity between firm i and its other potential acquirers.

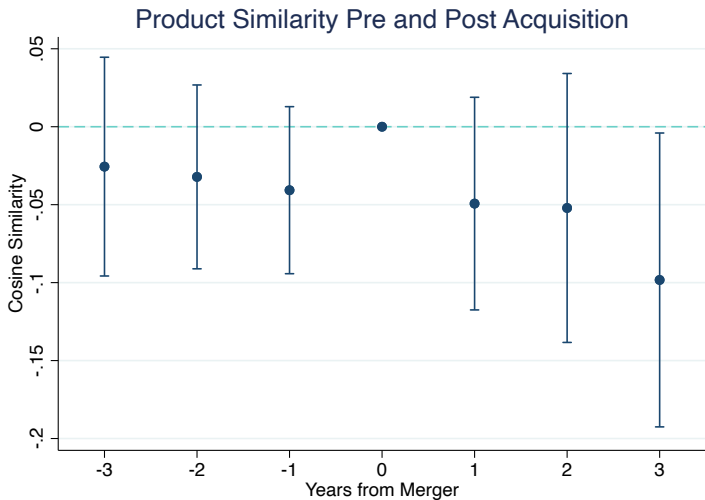
Identification and Event Study

- DID identification requires an assumption that treated and control firm-parent combinations would have parallel trends in the outcome variable in the absence of acquisition.
 - Not directly testable can be supported with an event study.

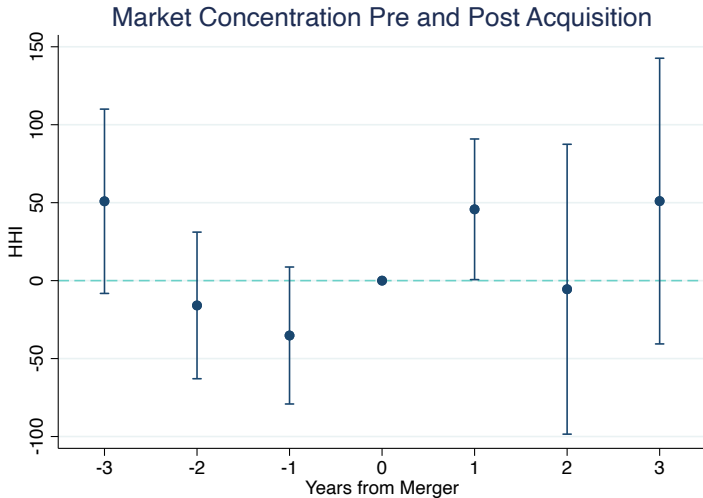
$$Y_{i,j,t} = \rho_0 + \sum_{\tau \in [-3,3]} \eta_{\tau} \cdot \mathbb{1}(t = \tau) \cdot \mathbb{1}\{Acquired_{i,j,t}\} + \omega_i + \lambda_t + u_{i,j,t}$$

- Normalize $\eta_0 = 0$, recognizing that the acquisition may begin to affect firm behavior starting after announcement.
- All specifications include firm and quarter fixed effects, denoted by ω_i and λ_t

Event Study: Product Similarity



Event Study: Market Concentration



Summary of Event Study Results

- Evidence of parallel pre-trends for both outcomes, portfolio similarity and market concentration.
 - Relative to changes in these outcomes observed for the control firm-parent combinations, no differential change prior to acquisition among the merged group.
- Following acquisition, market concentration increases and product portfolio similarity decreases.
 - A positive and statistically significant increase in HHI is observed in the first year after merger announcement. Impact remains large three years post-merger, but becomes marginally insignificant.
 - A negative impact on portfolio similarity is observed immediately following acquisition. Divergence in product portfolios between the acquired firm and parent increases throughout the post-merger period, becoming statistically significant three years post-merger.

Future Work

- Alternate measure of firms' market overlap.
 - Current measure captures: how large is a craft brewery in markets in which parent firm operates?
 - Consider instead capturing: does a craft brewery have a large market share in markets in which parent firm also has a large market share?
 - Ratio of two firms' market shares
 - Cosine similarity between vectors of market revenues
- Does predicted change in HHI for a potential acquisition impact merger probability?
- How does the cosine similarity of newly created products change after acquisition?