The Carroll-Swaminathan Brewery FIVE Data

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first in the list of data set authors, along with the word FIVE. For example, if Joe Campus added product performance characteristics, the data set would be called the "Carroll-Swaminathan-Campus Brewery FIVE Data." If you merge two or more FIVE data sets, the new name of the data set must include the names of all of the original data set authors and the word FIVE.

2. Data Set Authors

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3. Data Set Summary

This report documents a public-use data set on the life histories of all known American breweries operating from 1633 to late 1988. The data were coded from a variety of sources, including especially Bull et al.'s (1984) *American Breweries*. The data collection effort described here was supported in part by the Institute of Industrial Relations, U.C., Berkeley, and the Center for Research in Management, U.C., Berkeley.

File 1: Industry Data

File name: Carroll-Swaminathan_timebrew_FIVEdata
This data set includes annual time-series data on environmental and industry variables. This file contains one observation per year. Each record contains 54 variables itemized in Section 9 below. The file contains 356 records, one each for the years 1633 to 1988.

File 2: Firm Data

File name: Carroll-Swaminathan_expbrew_FIVEdata
This data set includes the life histories of the population of U.S. breweries from 1633 to 1988. This file contains one observation per brewing firm for each year of its existence. Each record contains thirteen variables, itemized in Section 10 below. The file contains 124,064 records, representing the firm-years of 7667 brewing firms.

4. Author's Research Using This Data Set and Extensions Thereof

Carroll G and Hannan M. 1989. Density delay in the evolution of organizational population. *Administrative Science Quarterly* 34: 411-431.

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Carroll G, Preisendorfer P, Swaminathan A, and Wiedenmayer G. 1993. Brewery and brauerei: the organizational ecology of brewing. *Organization Studies* 14: 155-188.

Carroll G., and Wade, J.B. 1991. Density dependence in the organizational evolution of the American brewing industry across levels of analysis. *Social Science Research* 20: 271-302.

Swaminathan, A. 1996. Environmental conditions at founding and organizational mortality: A trial-by-fire model. *Academy of Management Journal* 39: 1350-1377.

Swaminathan, A. 1998. Entry into new market segments in mature industries: Endogenous and exogenous segmentation in the U.S. brewing industry. *Strategic Management Journal* 19: 389-404.

Wade, J.B., Swaminathan, A., and Saxon, M.S. 1998. Normative and resource flow consequences of local regulations in the American brewing industry, 1845-1918. *Administrative Science Quarterly* 43: 905-935.

5. Additional References

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Bull D, Friedrich M and Gottschalk R. 1984. *American Breweries*. Trumball CT: Bullworks.

BCD. Various years. *Business Conditions Digest*. Washington, D.C.: Department of Commerce, Bureau of Economic Analysis.

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David P and Solar P. 1977. "A bicentenary contribution to the history of the cost of living in America," *Research in Economic History* 2:1-80.

ERP. 1988. *Economic Report of the President*. Washington, D.C.: U.S. Government Printing Office.

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HS. 1975. *Historical Statistics of the United States Colonial Times to 1970, Part 1 and 2.* Washington D.C.: U.S. Department of Commerce.

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Modern Brewery Age. Various years. *Modern Brewery Age Bluebook*. Norwalk CT: Modern Brewery Age.

SA. Various years. *Statistical Abstract of the United States*. Washington, D.C.: Bureau of the Census.

Trembly V and Tremblay C. 1988. "The development of acquisition: evidence from the U.S. brewing industry." *Journal of Industrial Economics* 37:21-46.

Tuma N. 1981. *Invoking RATE*. Menlo Park CA: SRI International.

6. Data Set Sources

Bull, Friedrich and Gottschalk's (1984) *American Breweries* constitutes the primary source of data. Bull et al. claim to have recorded information on all American beer *producers*, a definition which excludes companies that sell beer produced under contract by others (so-called contract brewers).

7. Data Description

The preface to the Bull et al. volume remarks that "a tremendous amount of research has gone into compiling *American Breweries*. Experts in various areas of the country have contributed their knowledge, which was coordinated by long-time brewery historian Robert Gottschalk" (p. 3). The data entries are described as follows: "In each listing, we have attempted to find the founding company name and address. The first listing under each numerical entry reflects the founding year after the name. This is followed by the year the company went out of business or changed name or address" (p. 3). Several entries in Bull et al. (1984) were changed in the coding process because one of its authors indicated to us that new information had been uncovered and the printed volume had inadvertently omitted some breweries (Gottschalk, personal communication).

Because the listings in the Bull et al. volume pertain to plants (breweries) rather than to firms, we aggregated the histories for all plants belonging to the same firm. That is, the data now record firm-level event histories on foundings and closures. We also extended the coverage up to the autumn of 1988. These tasks

were accomplished with the aid of the *Modern Brewery Age Bluebooks* (Modern Brewery Age, various years), Tremblay and Tremblay (1988) and the *Microbrewery Resource Handbooks* (Institute of Fermentation and Brewing Studies, various years). We also talked with individual brewers when appropriate.

Figure 1 shows the number of firms in the American brewing industry from 1633 to 1988. The common organizational population pattern of slow initial growth, then rapid growth (to a peak of about 2800), followed by very sharp decline, is evident. The decline phase is interrupted by the Federal Prohibition from 1920 to 1933.

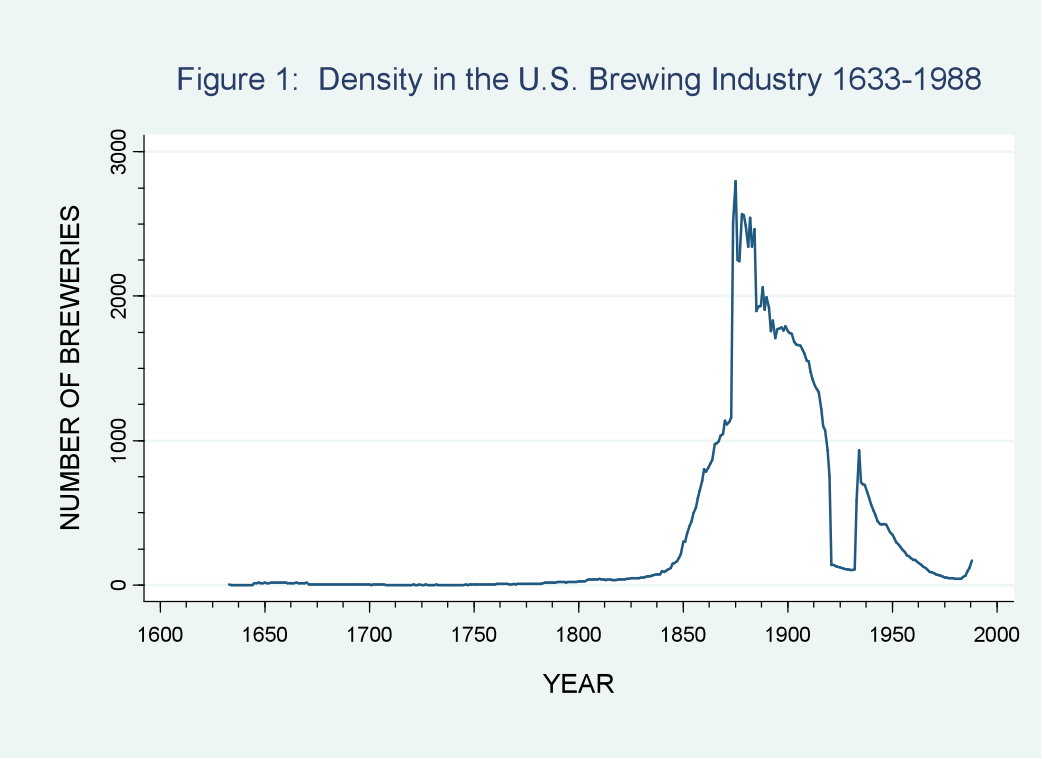

Figure 2 shows a typical page from the Bull et al. volume. A number of assumptions were made about these entries and these are reflected in the file available for analysis. We also transformed the data in certain ways to make it amenable to analysis. This section lists these transformations.

We deleted all cases with extremely indefinite dates of founding and closure. For example, some entries in Bull et al. listed dates as "1870's". These cases were excluded entirely.

We have ignored the intermediate "stages" for each firm in constructing an event history file. For example, in Figure 2, the four stages AL 1a to 1d are treated as a single firm, one that is founded in 1891 and dies in 1907.

Figure 2: Alabama: Listing of Page from "American Breweries"

Birmingham				
AL	1a	Birmingham Brewing Co. (Ave. D & 22nd St.)		1889-1891
	1b	Adler, Morris & Co.		1891-1893
	1c	Isidore Newman		1893-1897
	1d	Alabama Brewing Co.		1897-1907
AL	2a	Philip Schillinger (Ave. E Btw. 21st & 22nd Sts.)		1884-1888
	2b	Philip Schillinger Brewing Co.		1888-1908
Brownsville				
AL	3	Willauer & Koenneker		1885-1885
Cullman				
AL	4	Frank Anthe		1874-1875
Huntsville				
AL	5	Christ. Fromm		1874-1875
Mobile				
AL	6	Bienville Brewing Co. aka Bienville Brewery (St. Joseph & Bloodgood Sts.)		1901-1908
AL	7	Charles W. Gelbke		1874-1884
AL	8a	Mobile Brewing (Adams & 331 Waters Sts.)		1890-1893
	8b	Mobile Brewing Co.		1893-1896
	8c	Mobile Brewery		1896-1915
	8d	Mobile Brewery (330 N. Water St.)	NP	1934-1934
AL	9	Carl Thomas		1874-1875
Montgomery				
AL	10a	Montgomery Brewing Co. (Hull St.)		1888-1896
	10b	Montgomery Brewery		1896-1903
	10c	Capitol Brewing and Ice Co.		1903-1915
Phoenix City				
AL	11a	Chattahoochee Brewing Co.		1890-1896
	11b	Dixie Brewery		1896-1901
Sheffield				
AL	12	Sheffield Brewing and Ice Co.		1902-1906
		ALASKA		
Anchorage				
AK	1	Prinz Brau Alaska, Inc.		1976-1979
Circle				
AK	2	E. Hegner		1899-1900
AK	3	C. S. Levante		1899-1900
AK	4	G. Rieffenstein		1899-1900
Dawson City				
AK	5	Klondike Brewery		c1916
Douglas				
AK	6	Ernest Beihl		1899-1899
AK	7	John Egan		1898-1900
AK	8a	Douglas City Brewery		1902- ?
	8b	Douglas City Brewing Co.		? -1904
	8c	Douglas City Brewery		1904-1906
AK	9	John Kreuzner		1896-1897
Dyea				
AK	10	Alaska Brewing Co.		1898-1899
AK	11	Dabszinsky & Babler		1898-1898
AK	12	Geo. L. Rice & Co.		1898-1904
Eagle				
AK	13	Eagle Brewing Co.		1902-1903

If the starting year for the first stage is missing or is coded as a "?" in the original record, we have assumed the ending year of that particular stage as the starting year, e.g., in Figure 2, AK5 Klondike Brewery is assumed to have been founded in 1916.

A similar assumption was made to treat missing values for the ending year of the last stage, i.e., it takes the value of the starting year of the last stage.

The data in the source are recorded at the plant level. We have included only one case per firm, i.e., multi-plant operations have been excluded. We have tried to keep the original brewery as the focal record.

We have coded 3 types of ending events:

- Dissolution: Indicates the disappearance and closure of a brewing firm.
- Acquisition: For the post-World War II period, this has been coded from Tremblay and Tremblay (1988), and for the earlier period, we had to rely on inference, i.e., we assumed that a firm was acquired at the end of the previous stage when the data entry for the next stage identified it as a branch operation.
- Suspension: This event refers to suspension of operations. For example, in Figure 2, AL 8c suspended operations in 1915. Most, but not all, suspensions occurred as a result of prohibition either at the state or national level.

We also coded two types of founding events, new foundings and "restarts." For example, in Figure 2, AL 8a to 8c is treated as a firm with a founding date 1890 and AL 8d is treated as another firm with a founding date 1934. The second founding is classified as a restart.

For example, in Figure 2, AL 8 would be coded as follows:

ybirth	*tf*	*sf*	*oybirth*	*nrestart*	*lastgap*	*cumgap*
1890	1915	3	1890	0	0	0
1934	1934	1	1890	1	19	19

ybirth	Year of birth
tf	Year in which ending event occurs (time of finish)
sf	Ending event (state at finish): 1 Dissolution 2 Acquisition 3 Suspension 0 Alive in 1988
oybirth	Original year of birth (year of original founding)
nrestart	1 to 6 for the first to the sixth restart for any particular firm
lastgap	Number of years between the previous suspension and the time of restart
cumgap	Number of years lost cumulatively as a result of suspensions

We have deleted all years of state and national prohibition. We have also constructed two dummy variables, *begpro* for any year in which a spell of prohibition was imposed and *endpro* for the first year after the repeal of any prohibition. Prohibition years differ from state to state as can be found in Friedrich and Bull (1976).

After having completed the above-mentioned manipulations, we expanded the event histories into one year spells.

8. Tables

8.1. Descriptive Statistics, File 1: Carroll-Swaminathan_timebrew_FIVEdata

Variable	Obs	Mean	Std. Dev.	Min	Max
year	356	1810.5	102.9126	1633	1988
totres	197	80757.85	70397.71	3929	241078
totrur	197	34996.77	19615.01	3728	63211
forborn	137	10015.47	3554.828	2245	17696
gerborn	137	1551.044	640.4694	584	2785
ukborn	137	937.3504	260.5424	379	1403
landarea	197	2640.924	770.5409	868	3541
gerimm	167	42.10479	47.45413	.1	250.6
ukimm	167	29.96527	26.54718	.9	108.7
ireimm	167	28.39281	35.5282	0	221.3
ireborn	137	1046.35	613.9969	172	1872
malepop	167	46796.89	33283.51	4897	117360
catholic	95	27051.85	14486.47	8277	52655
protest	35	68203.63	7230.462	52162	79287
relmemb	96	75387.66	39515.63	21699	142926
gnp	118	306.1305	308.3948	23.1	1145.9
unemp	97	7.110309	5.101031	1.2	24.9
failrate	119	79.20168	39.37361	4	242
busform	39	107.4385	14.61608	87.9	138.3
cpifood	34	157.8471	94.6625	68.9	360.1
recess	133	.3684211	.4842001	0	1
trough	133	.2330827	.4243929	0	1
peak	133	.2255639	.4195333	0	1
deflate1	82	56.57195	31.54329	21.7	135.2
deflate2	50	42.418	29.12711	11.2	114.1
prohvote	21	130345.7	88786.03	10305	264133
popvote	3	65552	45961.45	29100	117183
wdrawal	122	6.03e+07	5.25e+07	1765827	1.96e+08
undefined	108	6.37e+07	4.69e+07	1765827	1.78e+08
fedtax	109	4.529358	3.641995	.6	9
wpibeer	22	134.4636	38.43366	97.3	210.5
rpibeer	22	139.9045	44.72997	95.1	230.4
totemp	44	59724.16	15386.07	22872	84849
totpay	44	493429.1	318559.2	38815	1307900
prodemp	45	42430.4	11229.76	18551	63668

Variable	Obs	Mean	Std. Dev.	Min	Max
manhrs	35	85414.03	22512.77	57500	142001
wages	45	321016.6	221145.8	25776	883500
valueadd	45	1436429	1026764	67034	4534800
costofml	45	1631870	1780213	51598	6669700
valuship	45	3059384	2771118	122050	1.12e+07
newcapex	28	259038.4	210806.3	60028	665700
totest	18	621.1667	481.0527	109	1530
gt20est	7	159.8571	70.02007	74	266
firm4	9	39.66667	21.62175	11	78
firm8	9	54.55556	24.79471	17	94
firm20	8	78.375	19.46379	44	99
firm50	6	96.33333	4.589844	88	100
gt21pop	87	92046.97	34138.77	40879	167087
totimm	167	317.4731	263.7756	6.4	1285.3
allcpi	201	169.0249	93.70258	89	589
unskwage	201	438.9353	762.3043	31	4059
nbirth	356	21.53652	88.15614	0	1398
ndeath	356	21.08146	64.13855	0	615
dens	356	348.4944	636.9728	1	2798

8.2. Descriptive Statistics, File 2:

Carroll-Swaminathan_expbrew_FIVEdata

Distribution of brewing firms by origin and destination states.

Origin State

Nrestart	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	6318	82.41	6318	82.41
1	1111	14.49	7429	96.90
2	193	2.52	7622	99.41
3	35	0.46	7657	99.87
4	6	0.08	7663	99.95
5	2	0.03	7665	99.97
6	2	0.03	7667	100.00

Destination State

Sfend	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0 (Alive)	162	2.11	162	2.11
1 (Dissolved)	5911	77.10	6073	79.21
2 (Acquired)	245	3.20	6318	82.41
3 (Suspended)	1349	17.59	7667	100.00

9. Variable List and Definitions:

File 1: Carroll-Swaminathan_timebrew_FIVEdata

This file contains a record for each year from 1633h to 1988. It contains 54 variables. Missing values are coded as blanks for all variables.

9.1. Year of Observation

Year
[Variable name: *year*]: Calendar year. Sources: HS, SA.

9.2. Other Variables

In order of appearance, the additional variables are:

Variable Name	Description	Sources
totres	U.S. Resident Population in 000's	HS, SA
totrur	U.S. Rural Population in 000's	" "
forborn	Foreign Born Population in 000's	" "
gerborn	German Born Population in 000's	" "
ukborn	U.K. Born Population in 000's	" "
landarea	U.S. Land Area	" "
gerimm	German Immigrants in 000's	" "
ukimm	U.K. Immigrants in 000's	" "
ireimm	Irish Immigrants in 000's	" "

Variable Name	Description	Sources
ireborn	Irish Born Population in 000's	" "
malepop	U.S. Male Population in 000's	" "
catholic	Roman Catholic Population in 000's	" "
protest	Protestant Population in 000's	" "
relmemb	Membership in Religious Bodies in 000's	" "
gnp	GNP at 1958 Prices in Billions of $	" "
unemp	Unemployment Rate in Civilian. Pop.	" "
failrate	Business Failures/10000 Firms	" "
busform	Index of Net Business Formation	" "
cpifood	CPI (BLS) For Food Away from Home	" "
recess	Years of Recession	BCD
trough	Trough Year in Economic Cycle	"
peak	Peak Year in Economic Cycle	"
deflate1	GNP Price Deflator Base 1958	HS, SA
deflate2	GNP Price Deflator Base 1982	ERP
prohvote	Prohibition Party Vote Count	HS, SA
popvote	Peoples' Party Vote Count	HS, SA
wdrawal	Tax-Paid Withdrawals in Barrels	BA, CM
undefined	Variable definition unknown	
fedtax	Federal Excise Tax on Beer in $/Barrel	" "
wpibeer	Wholesale Price Index for Malt Bevs.	" "
rpibeer	Retail Price Index for Malt Bevs.	" "
totemp	Total No. of All Employees in Malt Bev. Industry	" "
totpay	Total Payroll All Employees in MBI ($000's)	" "
prodemp	Number of Production Workers in MBI	" "
manhrs	Man-Hours for Production Workers (000's)	" "
wages	Wages for Production Workers ($000) in MBI	" "
valueadd	Value Added by Manufacturers ($000) in MBI	" "
costofml	Cost of Materials ($1000) in MBI	" "
valuship	Value of Shipments ($1000) in MBI	" "
newcapex	New Capital Exp. ($1000) in MBI	" "
totest	Total No. of Establishments in MBI	" "

Variable Name	Description	Sources
gt20est	Establishments with more than 20 Employees in MBI	" "
firm4	4-Firm Concentration Ratio in MBI	CM
firm8	8-Firm Concentration Ratio in MBI	"
firm20	20-Firm Concentration Ratio in MBI	"
firm50	50-Firm Concentration Ratio in MBI	"
gt21pop	Population Greater than 21 years in 000's	HS, SA
totimm	Immigration from All Countries in 000's	" "
allcpi	Index of Consumer Prices	David and Solar
unskwage	Index of Money Wage Rates Unskilled Labor	"
nbirth	Number of Brewery Foundings	CarrollSwaminathanexpbrewFIVEdata
ndeath	Number of Brewery Failures	"
dens	Existing Number of Breweries	"

10. Variable List and Definitions:

File 2: Carroll-Swaminathan_expbrew_FIVEdata

This file contains a record for each firm-year of a brewery's existence. It contains 13 variables. There are no missing values; they are already eliminated from the file.

10.1. Year of Observation

Time of Start
[Variable name: *ts*]: Historical year at which the firm-year of observation begins.

Time of Finish
[Variable name: *tf*]: Historical year at which the firm-year of observation ends.

10.2. Firm Identifiers

Data Set Firm ID (firm identifier assigned in the original data set)

[Variable name: *cumid*]: This variable gives a unique identification code created by the data set authors for each brewing firm. (Because the firms are not identified by name, this data set does not include FIVE Firm IDs.) "Restarting" firms retain their previous identification number. Each firm ID indicates the state in which the brewery was located (according to the code table that follows) and a brewery number by state.

Code	State
01	Alabama
02	Alaska
03	Arizona
04	Arkansas
05	California
06	Colorado
07	Connecticut
08	Delaware
09	District of Columbia
10	Florida
11	Georgia
12	Hawaii
13	Idaho
14	Illinois
15	Indiana
16	Iowa
17	Kansas
18	Kentucky
19	Louisiana
20	Maine
21	Maryland
22	Massachusetts
23	Michigan
24	Minnesota
25	Missouri
26	Montana
27	Nebraska
28	Nevada

Code	State
29	New Hampshire
30	New Jersey
31	New Mexico
32	New York
33	North Carolina
34	North Dakota
35	Ohio
36	Oklahoma
37	Oregon
38	Pennsylvania
39	Rhode Island
40	South Carolina
41	South Dakota
42	Tennessee
43	Texas
44	Utah
45	Vermont
46	Virginia
47	Washington
48	West Virginia
49	Wisconsin
50	Wyoming

10.3. Entry/Exit Variables

Original Year of Birth
[Variable name: *oybirth*]: Original year of birth for the firm (the year that the firm was originally founded).

Year of Birth
[Variable name: *ybirth*]: This variable gives the date at which the firm was either founded (original year of birth, *oybirth*) or resumed operation after suspension.

Restarted after Suspension
[Variable name: *nrestart*]: Variable that indicates the number of times this firm has been suspended in previous operations.

Number of Years of Suspension for Firms Restarting Operations
[Variable name: *lastgap*]: Counts only time elapsed between last suspension and restart time.

Total Number of Years of Suspension for Firms Restarting Operations
[Variable name: *cumgap*]: Counts time elapsed in all suspensions prior to restart time.

State at Finish
[Variable name: *sfend*]: Gives mortality-defined destination state at end of firm-year of observation (*tf*). Coded as follows:

0	Censored (no mortality event)
1	Death by dissolution
2	Death by acquisition
3	Death by suspension

Approximate Event History
[Variable name: *appeh*]: Dummy variable that indicates firms for which only approximate event histories were available. Birth and death years were randomly generated for the decades in which the firms were reported to be in existence.

The distribution of events by type (*nrestart* and *sfend*) is listed in the Tables section above.

10.4. Other Variables

Beginning of Prohibition Period
[Variable name: *begpro*]: Dummy variable that takes the value of one when *tf* is a year in which a state or federal prohibition begins, and zero otherwise. State prohibitions are considered only for breweries operating in the state.

Ending of Prohibition Period
[Variable name: *endpro*]: Dummy variable that takes the value of one when *ts* is a year in which a state or federal prohibition ends and zero otherwise. State prohibitions are considered only for breweries operating in the state.

Dummy for 1874 Birth Year
[Variable name: *dumf1874*]: Dummy variable that takes the value of one when *ybirth* equals 1874 and zero otherwise.

