

First Mover and First Developer Advantages During Shakeout in the U.S. Brewing Industry

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Abstract

This study examines 38 years of data on the U.S. Brewing Industry to investigate which brewers survived the lengthy shakeout and why. Theories regarding first mover and capabilities are discussed and tested. Surprisingly, results indicate that first mover *dis*advantages existed in the industry. Brewers that entered just after prohibition were less likely to survive than later entrants. However, brewers that developed higher levels of two critical capabilities, geographic scope of distribution and manufacturing efficiency, were more likely to survive than brewers with lower levels of these capabilities. Furthermore, first-movers were not more likely to develop the critical capabilities. The results indicate that capabilities theory and not first mover advantage theory predicts survival during this period of the brewing industry.

INTRODUCTION

Which firms are more likely to survive an industry shakeout – those that were first to enter the industry or those that developed higher levels of competitively critical capabilities? First mover advantage research has long considered whether or not firms that are early to enter a market are more likely to survive or attain performance advantages. The result of first mover research indicates that in some industries, such as consumer packages goods, early entrants are likely to gain the advantage, particularly if they can attain a position of technological leadership, build in switching costs for consumers or gain control of scarce resources. But the empirical evidence is not always consistent, and it appears that in some other industries, followers are more likely to be the ultimate survivors. The conflicting evidence has prompted scholars to call for investigation of the relationship between capabilities and mover advantages (Suarez and Lanzolla 2007).

In response to this call for research, we compare how capabilities development first mover advantages explain survival during industry shake-out. Previous research has found that in industries with high levels of product or technological change, first movers are more likely to survive shakeout because they tend to have higher innovation capabilities (Klepper and Simons 2005). However, it is unknown if these results are generalizable to other kinds of capabilities such as manufacturing, or to industries which have relatively fewer opportunities for innovation because products are more stable and processes are simpler.

In this study, therefore, we investigate an industry with these characteristics - the U.S. Brewing Industry from 1938, just after prohibition to 1976. During this period of almost years, the industry experienced severe shakeout despite the fact that beer was a relatively stable product and process innovations were mostly incremental in nature. We also focused on the development of capabilities, which we define as an organizational ability to perform a process or a coordinated set of tasks with a specific purpose (Hatten and Rosenthal 1999; Eisenhardt and Martin 2000; Helfat and Peteraf 2003). This definition is sufficiently broad to include geographic scope of distribution and manufacturing as well as innovation capabilities. By focusing on different kinds of capabilities and a different type of industry, than previous research studies, we were able to test the limits of the theory regarding the influence of capabilities on first mover advantages.

This report begins with a justification of the choice of context for this study, the U.S. Brewing Industry from 1938 to 1976. It then continues with a review of capabilities and first mover advantages theories, and the development of 3 sets of hypotheses. The hypotheses are then tested on data from the U.S. Brewing Industry spanning the years 1938-1976. Results show that first movers had significant *dis*advantages. In contrast, firms that were early to develop high levels of critical capabilities enjoyed significant survival advantages. Only those first movers that successfully developed high levels of the critical capabilities were more likely to succeed.

CONTEXT - THE U.S. BREWING INDUSTRY

The brewing industry is a particularly suitable setting for the study of first mover and first developer advantages for a number of reasons. First, the industry has undergone a great shakeout period; from 1938 to 1980, the number of mass producing brewers declined from 353 to 14 , and the industry transmogrified from a highly competitive economic environment into to a group of tight-knit oligopolies by the late 1990s (Greer 1998). Second, the industry was predominately populated with firms that were active only in that one industry; therefore, separating corporate from business effects is not a concern. Third, due to the fact that brewers were subject to federal taxes based on the number of barrels sold, sales data has been collected and recorded since 1938.

Fourth, this industry differs in important ways from industries in which previous first mover advantage research has been conducted. The majority of first mover advantage work has been done in industries facing significant technological challenges such as the television and automobile industries (Klepper and Simons 2005), but little work has been done in industries such as brewing, which has had to cope with relatively few technological challenges. The difference between the brewing industry and industries studied in the past is apparent when we compare the number of patents produced in these industries. Between 1950 and 2000, the brewing industry produced only 99 patents. Even when the 61 patents awarded to the bottling industry are considered, the total for the two industries is only 160. In comparison, during that time, the television industry was awarded 9,762 patents and the automobile industry generated 7,517. Investigating first mover advantages in the brewing industry provides an opportunity to understand how well received theory applies in this different context.

Fifth, unlike products considered in other first-mover advantage studies, the product in the brewing industry was relatively stable during the shakeout period described above. Beer had been brewed in the United States since the first recorded brewery was built in New Amsterdam in 1612 (Tremblay and Tremblay 2005). By the late 1800s, Americans showed a preference for lighter lagers, similar to those that are still brewed by the mass-producing brewers today. While the brewers produced many different brands, research has found that they are so similar that most consumers can not tell the difference (Allison and Uhl 1964). Changes to the product have been minimal.

Finally, a tremendous amount of historical research indicates that the critical competitive capabilities changed dramatically during the time period under investigation. There is consistent evidence in the literature that suggests two separate waves of creative destruction (Schumpeter, 1934) occurred in the U. S. brewing industry, each fueled by a different critical capability. One was a massive increase in geographic scope of distribution and the other a huge leap in manufacturing efficiency (Greer 1970; Hatten, Schendel et al. 1978; McGahan 1991; Sutton 1991; Tremblay and Tremblay 2005). (Hatten 1974; Ackoff and Emshoff 1975; Hatten and Hatten 1987; McGahan 1991; Tremblay and Tremblay 2005). **FIX THIS.**

FIRST MOVER ADVANTAGE THEORY

The central tenet of this theory is that firms that enter a market early accrue advantages that make these firms more likely to reap excess rents and more likely to survive subsequent industry shakeouts. This is such a popular theory that 187 different

articles pop up when the terms “first mover advantage” are searched in the ABI Inform scholarly journals database. Despite the attention to the theory, there is still a great deal of uncertainty regarding when firms gain first mover advantages because the empirical evidence supporting this theory has been mixed. In some studies evidence has been found to support the theory (Robinson and Min 2002), but others report a lack of support (Schnaars 1986; Lilien and Yoon 1990; Golder and Tellis 1993). These conflicting reports have prompted further investigations to identify the factors that could impact the first mover effect.

Factors that have been considered as potential influencers of first mover advantages include product and industry characteristics, the lead time until competitors enter, whether the advantage shows up as excess rents or longer term survival, and whether isolating mechanisms are important. We will now discuss the potential these factors have in impacting first mover advantages in the brewing industry. The goal is to predict whether or not we will find evidence in support of this theory.

With respect to product and industry characteristics, first mover advantages appear to be more closely associated with consumer packaged goods (Suarez and Lanzolla 2007) (Porter). **FIX THIS** Although beer is a food product rather than a consumer packaged good, there are many similarities between these two types of industries, such as their unit costs, frequency of purchase and lack of product differentiation that suggest first mover advantages should exist in the brewing industry.

Regarding lead times, first mover advantages have more often been found in industries where there is a long lead time between first movers and later entrants **NEED CITE HERE**. In this study, for practical purposes, we assume that the brewing industry

began in 1933, at the end of prohibition. By 1938, there were 353 brewers in the United States. After that point in time, brewers continued to enter the market in a fairly steady stream until 1944, when the number dropped off dramatically, as can be seen in figure 1. By 1947, 331 new brewers were in operation but between 1957 and 1959 only 3 entered. The lead times between first entrants and later entrants appears to be low, brewers continued to enter for about 15 years after prohibition, but after that, new entry was rare. Thus, we can not expect a first mover advantage due to long lead times between first movers and followers.

With respect to type of advantage, first mover advantages have more often been found to surface as excess rents rather than length of survival. As we are studying survival here, this indicates that first mover advantages will not exist.

Finally, what do theories on the role of isolating mechanisms tell us about first mover advantages in the brewing industry? Lieberman and Montgomery (1988) classify isolating mechanisms into three categories: technological leadership, preemption of scarce resources and switching costs or buyer choice under uncertainty. Despite the fact that this industry experienced a relatively low number of technological challenges, in the early days just after prohibition, there were some technological challenges around shipping beer long distances and bottling. Brewers that had developed capabilities around these technologies before prohibition by bottling and shipping similar products such as medicine and soft drinks during prohibition had some technological advantages when prohibition was lifted. Schlitz, Blatz and Anheuser-Busch are prime examples of such brewers (Cochran 1948; Krebs and Orthwein 1953; Plavchan 1969). With respect

to the other isolating mechanisms, scarcity of resources and switching costs are not known to have been issues in the brewing industry.

In sum, there are two reasons why we can expect first mover advantages in the brewing industry. First, the industry is somewhat similar to packaged goods industries, a context in which evidence of first mover advantages had been found and there is some reason to suspect that technology leadership in distribution and manufacturing may have acted as an isolating mechanism. This leads to our first hypothesis:

H1: Brewers that were in business in 1938 will be more likely to still be in business during the years 1939 through 1976 than brewers that were not in business in 1938.

CAPABILITIES THEORY AND SURVIVAL

The resource-based view of the firm argues that firms differ with respect to the resources and capabilities in important ways that can determine competitive advantage (e.g. Teece, Pisano and Shuen, 1997). Capabilities are developed with both intellectual and capital input, and are the product of design (Baldwin and Clark 1997). They also are shaped by the knowledge possessed by organizational members, which is acted upon and improved upon in pursuit of the firm's objectives (Kogut and Zander 1992). The fact that capabilities have been recognized as a source of competitive advantage suggests that having the right level of a critical capability at the right point in time during the evolution of an industry, can be key to survival. Furthermore, the development of a

critical capability by one firm may even trigger a shakeout period as customers flock from the less innovative firm to the firm with the new capability.

A number of researchers have looked at the role that one type of capability, innovation, may play in determining advantages. This research stream seeks to understand if firms that produce radical innovations, or jump on the radical innovation bandwagon quickly are more likely to accrue advantages than other firms (Jovanovic and McDonald 1994). Radical innovations, by definition, involve new engineering or scientific principles and often opens up new markets and potential applications (Henderson and Clark 1990). In this type of research, innovation is typically measured as patent count. A similar stream of investigation argues that innovators or early adopters of dominant product designs are more likely to gain advantages (Utterback and Suarez 1993). . However, the theories focusing on innovation as a capability have limited applicability here because as mentioned earlier, when the level of innovation in the brewing industry during shakeout is measured as patent count and compared to the level of innovation in the other industries studied by this stream of researchers; we find that innovation in brewing was relatively low.

Historical accounts of the brewing industry indicate that there were two critical capabilities In the U.S. Brewing Industry during the period of our investigation. During the earlier period, from 1938 to 1955, geographic scope of distribution became a critical capability. After this point in time, manufacturing efficiency was critical. We now present a historical account of the industry during this time to motivate our hypotheses regarding capabilities and survival.

The post-prohibition era, a time for geographical expansion

The period after prohibition was marked by the emergence of two types of brewers, those that shipped their product along rail lines and those that relied on local relationships with saloon owners to sell their beer (McGahan 1991). Once WWII was over, the demand for beer in the US finally returned to pre-prohibition levels. At this time, brewers with shipping capabilities moved aggressively to cover the nation.

Customers were happy to pay higher prices for shipped beer because it was sold in new, convenient non-returnable containers (Sellinger 1974). The brands they bought were same brands that WWII veterans had enjoyed while in the service (Stack 2003). For example, in 1954, Anheuser-Busch brewed Budweiser in St. Louis, and charged a 25.6 per cent premium for the beer in New York and a 29.7 per cent premium in Los Angeles (Trembaly and Tremblay, 2005). By 1962, the first year for which state sales data are available, Anheuser-Busch, Miller, Schlitz and Pabst were all selling beer on a national scale.

During this post-prohibition period, advances in manufacturing efficiencies were minimal as can be seen in Table 1 and marketing was quite immature. However, as the shipping brewers expanded across the nation, many local and regional brewers were forced out of business. At the end of World War II, there were about 375 brewers operating in the United States but by 1955, when this wave of geographical expansion was complete, the number had fallen to 225.

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Insert Table 1 about here

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Interviews with three industry experts, Robert Weinberg, Brewing Industry consultant, Peter Reid, editor of *Modern Brewery Age* magazine for more than 15 years, and Phil Katz, former statistician and vice president of the Beer Institute, the brewing industry lobbying group further refined this argument. They noted that brewers which had not developed a relatively high level of geographic scope of distribution capability by 1955, were unlikely to do so later. These experts also indicated that most of these brewers supported their distribution capability by building plants in more than one state. Two exceptions were Blatz and Coors, who expanded aggressively without building additional plants. Thus, we present our second hypothesis:

H2: Brewers with a high level of distribution capability, indicated by brewing plants in multiple states or aggressive national expansion by 1955, were more likely to succeed than brewers that did not achieve a high level of distribution capability.

The manufacturing decades, 1955-1975

The shipping brewers used the profits they had reaped from their successful market expansion to develop new, advanced, manufacturing techniques. As can be seen in Table 1, the minimum efficient scale of a brewery grew more than ten-fold, from .1 millions barrels in 1957 to 4.5 million barrels per year in 1973.

Note that few advances in efficiency were made in the brewing process itself, which essentially consists of moving liquid from one big vat to another. However, incremental advances were made in increasing the throughput of bottling and canning lines but these high-speed lines required large amounts of beer to be fully utilized. This

change left many regional and local brewers that operated smaller plants at a cost disadvantage. As can be seen in Figure 2, by 1964, some of the brewers had tremendously expanded their average capacity by building new, large scale plants. This motivates our third hypothesis.

H3: Brewers with a high level of manufacturing capability, indicated by an average manufacturing plant capacity of 1.5 million barrels by 1964, were more likely to succeed than brewers that did not have as high a level of manufacturing capability at this point in time.

CAPABILITIES AND FIRST MOVER ADVANTAGES

This stream of research seeks to understand how first movers may have advantages in developing particular capabilities that insure competitive advantage or survival. A relevant theory on innovation and first mover advantages, which has been labeled the *competitive advantage first mover* theory **cite**, is based on the assumption that larger firms benefit more from R&D because they can spread the cost over more products. For this reason, as industries evolve, it becomes harder and harder for new entrants to succeed as the necessary level of R&D capability becomes higher (Klepper 2002). Evidence in support of this theory has been found in the automobile, tire, penicillin and television industries where first movers gained advantages because they were able to continuously meet the technological challenges presented by their industries. It is unlikely that this theory is directly applicable to the brewing industry due to the relatively low levels of R&D spending in this industry.

While it is known that the development of capabilities other than R&D may play a critical role in determining survival, it is not known if the competitive advantage first mover theory on innovation can be extended to include other kinds of capabilities. We argue that it is extendable because the same basic underlying principle, economies of scale, holds for distribution as well as manufacturing. In fact, the minimum efficient scale for brewing plants rose dramatically during the shakeout period as can be seen in Table 1. This leads to our fourth and fifth sets of hypotheses:

H4a: Brewers that were in business by 1938 are more likely to have an extensive geographic scope by 1955.

H4b: Brewers that were in business by 1938 are more likely to have extensive manufacturing efficiency by 1964.

H5a: Brewers that were both in business by 1938 and had an extensive geographic scope by 1955 were more likely to survive the shakeout than brewers that either were not in business by 1938 or had not developed an extensive geographic scope by 1955.

H5b: Brewers that were both in business by 1938 and had an extensive manufacturing efficiency by 1964 were more likely to survive the shakeout than brewers that either were not in business by 1938 or had not developed an extensive geographic scope by 1955.

METHODS

Sample: The sample used for this study included the 462 mass producing brewers that were in operation at some point in time between 1938 and 1976. Most of the brewers

were not in operation the entire time. For example, in 1976, there were only 18 brewers in operation. The data mainly came from Darleen Waterstreet's (1989) report of sales by brewer by year which is believed by at least one industry expert, Peter Reid, *Editor of Modern Brewery Age*, to be the most complete listing of brewers in operation by year because it was compiled from multiple sources. Of the 565 brewers in the study, 353 were in operation in 1938 and 212 operated at some time between 1939 and 1976.

Analysis: Chi-squared tests were performed to test all of the hypotheses.

Results: The first hypothesis suggested that brewers in business in 1938 will be more likely to still be in business during the years 1939 through 1976 than brewers that were not in business in 1938. The results of the chi-square tests shown in Table 2 indicate that there were either first mover *dis*advantages or no first mover advantages during the years of our investigation. Thus, there is no support for hypothesis 1.

The second hypothesis argued that brewers with high levels of geographic scope of distribution capabilities would be more likely to survive. The results for brewers operating plants in more than one state or exhibiting aggressive national expansion by 1955, are shown in Table 3. These results reveal that the brewers that developed such high levels of the capability were, in fact, more likely at the .05 level to be in business for a period of six years from 1959 to 1964. For example, in 1962, 95 percent of the brewers that had high levels of geographic scope were still in business, but only 61 percent of the brewers with lower levels were still operating. Beginning in 1965, the results are less consistent; the likelihood that brewers were in business in 1965

approaches significance at the .07 level, and it is highly significant again at the .02 level in 1967. In 1966, these brewers were not more likely to be in business. These results overall provide strong support for Hypothesis 2.

The third hypothesis predicted that brewers with high levels of manufacturing efficiency capabilities indicated by average plant capacities above 1.5 million barrels by 1964 would be more likely to survive the shakeout. Chi-square test results shown in Table 4 indicate that having an average capacity of 1.5 million barrels or more in 1964 did not affect survival in 1966 or 1967. However, firms that did have an average capacity of 1.5 million barrels by 1964 were much more likely to be in business at the .02 significance level or better, in the years 1968 through 1976, except for in 1973, when the likelihood approaches significant at the .09 level. In fact, in 1970, 83% of the firms that had an average capacity of 1.5 million barrels in 1964 were still in operation, whereas only 47% of the firms with less capacity were still in business. Thus, Hypothesis 3 is supported.

The fourth set of hypotheses predicted that brewers in business by 1938 would be more likely to develop high levels of geographic scope of distribution and manufacturing capabilities. There was no support for either of these hypotheses.

Finally, the fifth set of hypotheses suggested that brewers who had both first mover and first developer advantages would be more likely to survive than those brewers that had only one or neither advantage. The results fully support the hypotheses for both geographic scope and manufacturing capabilities.

CONCLUSION AND DISCUSSION

The results of this study indicate that first movers were not more likely to survive the shakeout in the U.S. Brewing Industry which lasted from approximately 1938 to 1980. In addition, first movers were not more likely to be early developers of the high levels of geographic scope of distribution and manufacturing efficiency which were demonstrated to be critical to survival in this industry. In fact, while 18 of the 353 brewers that were first movers were still in operation in 1976, only 7 developed the critical levels of geographic scope of distribution and 11 manufacturing expertise.

The results show once again that first mover theory is complicated and not straight forward as early researchers in the field had suggested. While first movers appear to be better at one capability, innovation, in industries with high levels of technological change, first movers are not necessarily better at developing the critical capabilities in industries with less technological change. The results also provide strong support for capabilities theory. In this industry, capabilities development shielded brewers from failure. However, this research needs to be verified in other industries before generalizations can be made.

APPENDIX

Figure 1 – Number of new brewers / year 1939 – 1947

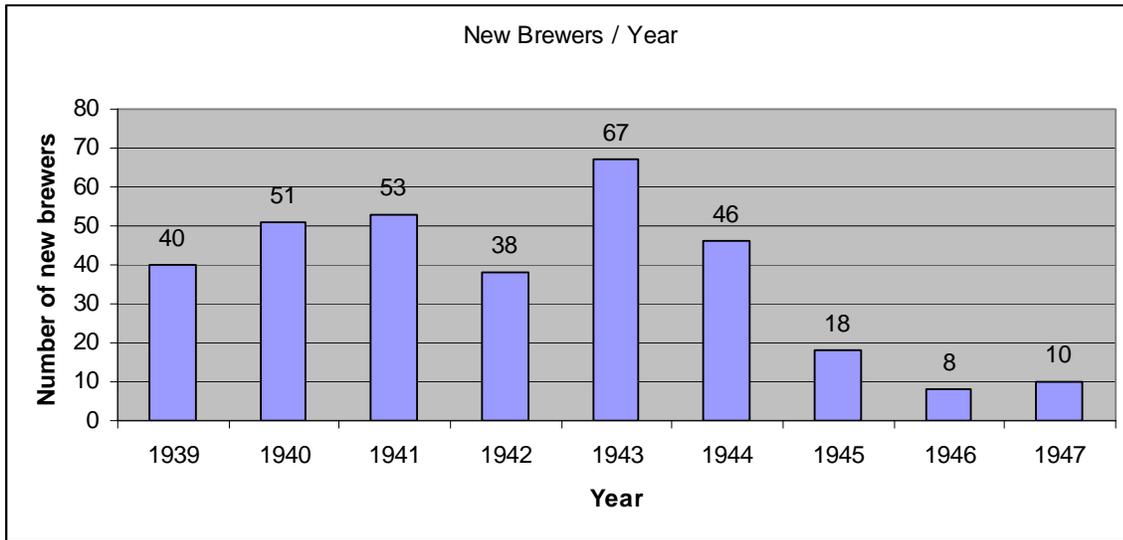


Figure 2 – U.S. Brewers Average Capacity

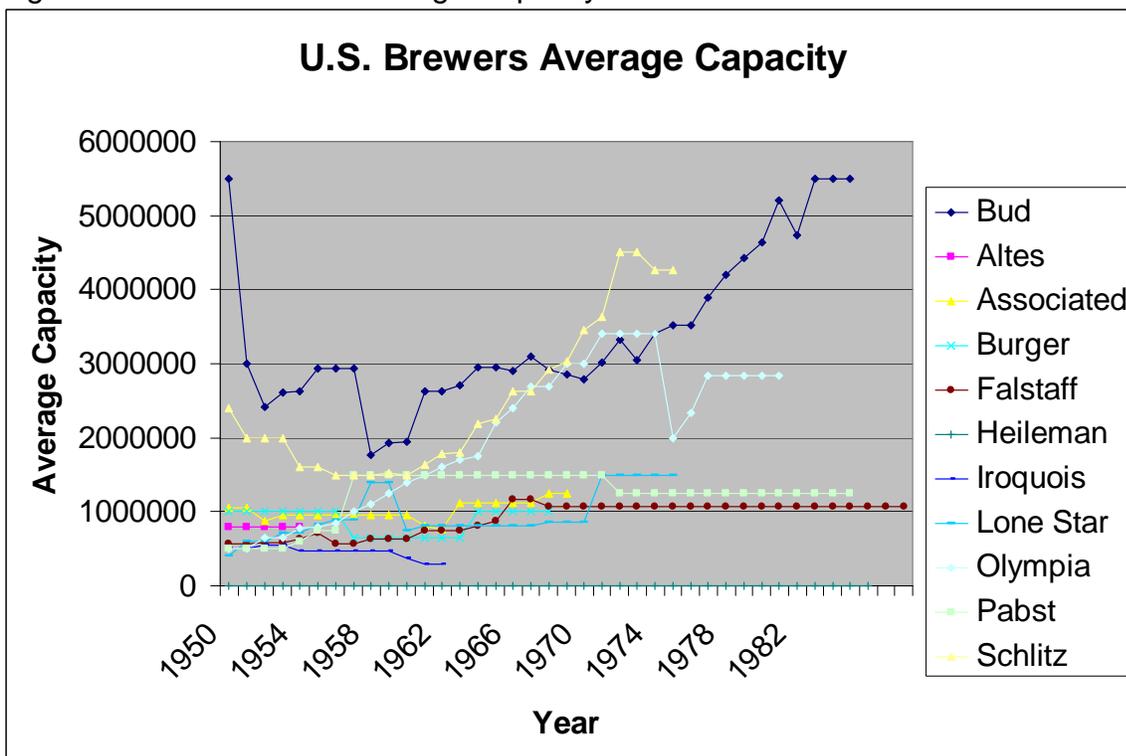


Table 1 - Minimum efficient scale. Source: Tremblay & Tremblay 2005 pg. 30.

Year	Minimum efficient scale of manufacturing in millions of barrels
1935	0.1
1957	0.1
1963	1.0
1967	1.0
1968	1.0
1973	4.5
1982	4.5
1990	>4.5

Table 2 – Results of chi-square tests

Year / Test	p-value	Accept / Reject	Advantage?
1939	.00	Reject	Disadvantage
1940	.00	Reject	Disadvantage
1941	.00	Reject	Disadvantage
1942	.00	Reject	Disadvantage
1943	.00	Reject	Disadvantage
1944	.16	Accept	No
1945	.40	Accept	No
1946	.69	Accept	No
1947	.00	Reject	Disadvantage
1951	.00	Reject	Disadvantage
1955	.39	Accept	No
1957	.00	Reject	Disadvantage
1959	.01	Reject	Disadvantage
1961	.01	Reject	Disadvantage
1963	.04	Reject	Disadvantage
1965	.08	Accept	No (disadvantage at .9)
1967	.01	Reject	Disadvantage
1968	.10	Accept	No
1969	.06	Accept	No (disadvantage at .9)
1970	.33	Accept	No
1972	.88	Accept	No
1974	.76	Accept	No
1976	.89	Accept	No
If alive in 1938 was the brewer more likely to do GS?	.48	Accept	No
If alive in 1938, was the brewer more likely to do mfg?	.41	Accept	No
If alive in 1938 & GS, was the brewer more likely to be alive in 1976?	.00	Reject	Advantage
If alive in 1938 & mfg., was the brewer more likely to be alive in 1976?	.00	Reject	Advantage
If alive in 1938 & GS and Mfg was the brewer more likely to be alive in 1976?	.00	Reject	Advantage

Table 3 - Chi-squared survival tests results for geographic scope

Brewers still in business / year	Brewers pursuing geographic scope capability	Brewers <u>not</u> pursuing geographic scope capability	Results
Yes 1957	19	170	Chi ² = 2.98 P= .08
No 1957	0	27	
Yes 1958	18	161	Chi ² =2.07 p=.15
No 1958	1	36	
Yes 1959	18	145	Chi ² = 4.18 p= .041
No 1959	1	52	
Yes 1960	18	139	Chi ² =5.10 p=.02
No 1960	1	58	
Yes 1961	17	132	Chi ² = 4.09 p= .04
No 1961	2	65	
Yes 1962	18	121	Chi ² =8.38 p=.00
No 1962	1	76	
Yes 1963	16	111	Chi ² = 5.55 p= .02
No 1963	3	86	
Yes 1964	15	100	Chi ² = 5.53 p= .02
No 1964	4	97	
Yes 1965	13	92	Chi ² = 3.31 p= .07
No 1965	6	105	
Yes 1966	12	87	Chi ² = 2.52 p= .11
No 1966	7	110	
Yes 1967	12	72	Chi ² = 5.162 p= .023
No 1967	7	125	

Table 4 - Chi-squared survival tests results for average capacity capability

Brewers still in business/ year	Brewers that developed manufacturing efficiency capability	Brewers that did <u>not</u> pursue manufacturing efficiency capability	Results
Yes 1966	20	85	Chi ² = 0.00 p= 1.0
No 1966	4	17	
Yes 1967	20	71	Chi ² = 1.82 p= .18
No 1967	4	31	
Yes 1968	20	58	Chi ² = 5.77 p= .02
No 1968	4	44	
Yes 1969	20	55	Chi ² = 6.98 p= .01
No 1969	4	47	
Yes 1970	20	48	Chi ² = 10.29 p= .00
No 1970	4	54	
Yes 1971	20	48	Chi ² = 10.29 p= .00
No 1971	4	54	
Yes 1972	18	45	Chi ² = 7.41 p= .01
No 1972	6	57	
Yes 1973	15	44	Chi ² = 2.93 p= .09
No 1973	9	58	
Yes 1974	15	11	Chi ² = 31.73 p= .00
No 1974	9	91	
Yes 1975	12	12	Chi ² = 38.54 p= .00
No 1975	12	90	
Yes 1976	12	6	Chi ² = 30.88 p= .00
No 1976	12	96	

REFERENCES

- Ackoff, R. L. and J. R. Emshoff (1975). "Advertising research at Anheuser-Busch, Inc. (1968-1974)." Sloan Management Review **16**(3): 1.
- Ackoff, R. L. and J. Enshoff (1975). "Advertising research at Anheuser-Busch Inc. (1963-1968)." Sloan Management Review **16**(2): 1-15.
- Allison, R. and H. Uhl (1964). "Influence of beer brand identification on taste perception." Journal of Marketing Research **1**(3): 36-39.
- Baldwin, C. Y. and K. B. Clark (1997). "Managing in an age of modularity." Harvard Business Review **75**(5): 84.
- Cochran, T. (1948). Pabst Brewing Company: The History of an American Business. New York, New York University Press.
- Eisenhardt, K. M. and J. A. Martin (2000). "Dynamic capabilities: What are they?" Strategic Management Journal **21**(10/11): 1105.
- Golder, P. N. and G. J. Tellis (1993). "Pioneer advantage: Marketing logic or marketing legend?" Journal of Marketing Research **30**: 158-170.
- Greer, D. F. (1970). "Product differentiation and concentration in the brewing industry." Journal of Industrial Economics(18): 201-219.
- Greer, D. F. (1998). Beer causes structural change. Industry Studies. L. Duetsch, Sharpe.
- Hatten, K. (1974). Strategic models in the brewing industry, Purdue University.
- Hatten, K. and S. Rosenthal (1999). "Managing the process-centered enterprise." Long Range Planning **32**: 293-310.
- Hatten, K. J. and M. L. Hatten (1987). "Strategic Groups, Asymmetrical Mobility Barriers and Contestability." Strategic Management Journal **8**(4): 329.
- Hatten, K. J., D. E. Schendel, et al. (1978). "A strategic model of the U.S. brewing industry: 1952-1971." Academy of Management Journal (pre-1986) **21**(4): 592.
- Helfat, C. E. and M. A. Peteraf (2003). "The dynamic resource-based view: Capability lifecycles." Strategic Management Journal **24**(10): 997.
- Henderson, R. M. and K. B. Clark (1990). "Architectural Innovation: The Reconfiguration Of Existing." Administrative Science Quarterly **35**(1): 9.

- Jovananovic, B. and G. McDonald (1994). "The life cycle of a competitive industry." Journal of Political Economy **102**(2): 322-347.
- Klepper, S. (2002). "Firm survival and the evolution of oligopoly." RAND Journal of Economics **33**(1): 37-61.
- Klepper, S. and K. L. Simons (2005). "Industry shakeouts and technological change." International Journal of Industrial Organization **23**: 23-43.
- Kogut, B. and U. Zander (1992). "Knowledge of the firm, combinative capabilities and the replication of technology." Organization Science **3**(3): 383-397.
- Krebs, R. and P. Orthwein (1953). Making Friends Is Our Business: 100 Years of Anheuser-Busch. St. Louis, Self-published.
- Lieberman, M. B. and D. B. Montgomery (1988). "First-mover advantages." Strategic Management Journal **9**: 41-58.
- Lilien, G. and L. Yoon (1990). "The timing of competitive market entry: An exploratory study of new industrial products." Management Science **36**: 568-585.
- McGahan, A. M. (1991). "The Emergence of the National Brewing Oligopoly: Competition in the American Market, 1933-1958." Business History Review **65**(2): 229.
- Plavchan, R. (1969). A History of Anheuser-Busch, 1852-1933. St. Louis, St. Louis University.
- Robinson, W. T. and S. Min (2002). "Is the first to market the first to fail? Empirical evidence for industrial goods businesses." Journal of Marketing Research **39**: 120-128.
- Schnaars, S. P. (1986). "When entering growth markets, are pioneers better than poachers?" Business Horizons **29**(2): 349-365.
- Sellinger, F. J. (1974). Statement by Frank J. Sellinger Group Vice President for Anheuser-Busch, Inc. P. o. m. p. o. t. s. o. e. p. o. t. c. o. p. w. U. S. Senate.
- Stack, M. H. (2003). "A concise history of America's Brewing Industry." from <http://eh.net/encyclopedia/article/stack.brewing.industry.history.us>.
- Suarez, F. F. and G. Lanzolla (2007). "The role of environmental dynamics in building a theory of first mover advantages." Academy of Management Review **32**(2).
- Sutton, J. (1991). Sunk Costs and Market Structure. Cambridge, MA, MIT Press.

Tremblay, V. and C. H. Tremblay (2005). The U.S. Brewing Industry. Cambridge, MA, MIT Press.

Utterback, J. and F. Suarez (1993). "Dominant designs and the survival of firms." Research Policy **22**(1-21).

Waterstreet, D. (1989). "Beer sales by brewery, chronological report 1938-1987." Milwaukee, WI, Badger Infosearch.