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# Markets
# Beer in Germany and the United States

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This feature explores the operation of individual markets. Patterns of behavior in markets for specific goods and services offer lessons about the determinants and effects of supply and demand, market structure, strategic behavior, and government regulation. Suggestions for future columns and comments on past ones should be sent to James R. Hines Jr., c/o *Journal of Economic Perspectives*, Department of Economics, University of Michigan, 611 Tappan Street, Ann Arbor, Michigan 48109-1220.

## The Puzzle

Between 1950 and 2000, the four-firm producer-concentration ratio for beer increased from 22 to 95 in the United States; and Anheuser-Busch's share of domestic output ballooned from 6 to 54 percent (columns 1 and 4 of Table 1). This metamorphosis has attracted considerable attention (Elzinga, 2005; Greer, 2002; Scherer, 1996; Sutton, 1991; Tremblay and Tremblay, 2005), and a Consensus Interpretation has emerged: During the third quarter of the twentieth century, technological progress enabled the automation of brewing and the acceleration of packaging (Keithahn, 1978; Scherer et al., 1975). The scale-augmenting properties of this progress induced a shakeout, in which a few national brewers grew while most regional and local brewers disappeared. The success of the nationals resulted from their advantages in television advertising (Greer, 2002; Porter, 1976). After their triumph, the national brewers were largely invulnerable to entry and mobility because large sunk investments in television advertising created large advantages

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*Table 1*
**Producer-Concentration in the Beer Industry, Germany and the United States**

| | 1950 | | 1958 | | | | 2000 | | | | 2005 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | USA (1) | | USA (2) | | Germany (3) | | USA (4) | | Germany (5) | | Germany (6) | |
| *Rank* | *Share* | *Firm* | *Share* | *Firm* | *Share* | *Firm* | *Share* | *Firm* | *Share* | *Firm* | *Share* | *Firm* |
| 1 | 6 | Schlitz | 8 | A-B | 3 | DUB | 54 | A-B | 9 | Holsten | 17 | Oetker |
| 2 | 6 | A-B | 7 | Schlitz | 3 | Oetker | 22 | Miller | 9 | Binding | 15 | InBev |
| 3 | 5 | Ballantine | 5 | Falstaff | 3 | Schultheiss | 12 | Coors | 6 | B&B | 9 | Carlsberg |
| 4 | 5 | Pabst | 5 | Ballantine | 2 | Dresdner | 6 | Pabst | 5 | Beck | 8 | Schörghuber |
| 5 | 3 | Rheingold | 4 | Carling | 2 | Hypo-Bank | 1 | Boston | 5 | Warsteiner | 5 | Warsteiner |
| 6 | 3 | Schaefer | 4 | Hamm | 2 | DAB | 1 | Genesee | 5 | Bitburger | 5 | Bitburger |
| 7 | 3 | Falstaff | 3 | Rheingold | 2 | Carl Funke | 1 | Latrobe | 4 | Krombacher | 4 | Krombacher |
| 8 | 3 | Miller | 3 | Schaefer | 2 | Holsten | 1 | Yuengling | 4 | BBH | 4 | Oettinger |
| Top 4 | 22 | | 25 | | 12 | | 95 | | 29 | | 49 | |
| Top 8 | 34 | | 40 | | 20 | | 97 | | 48 | | 67 | |

*Sources:* Columns 1, 2 and 4: Tremblay and Tremblay (2005, Appendices A, A.1). Column 3: Schwalbach and Müller (1984, Table 4). Column 5: DBB (2001, Table 4). Column 6: DBB (2003, Table 4), Dun and Bradstreet (2003/04), company websites, ⟨www.ratebeer.com/beer/breweries/brewers-directory-0-79.htm⟩, ⟨www.calsky.com/lexikon/de/txt/l/li/liste_von_brauereien.php⟩, ⟨amadeus.bvdep.com/ip⟩.
*Notes:* "Share" is percentage of domestic shipments, measured by volume. A "firm" is all affiliated companies, as determined by the source in columns 1–5 and by the author in column 6. A-B = Anheuser-Busch, BBH = Bayerische BrauHolding, B&B = Brau und Brunnen, DAB = Dortmunder Actien Brauerei, Dresdner = Dresdner Bank, DUB = Dortmunder Union Brauerei. In column 6: company affiliations on November 1, 2005; shipments data for 2002; Schörghuber includes all of Brau Holding International and Karlsberger, even though both are controlled jointly by Schörghuber and Heineken; the parent companies are Dr. August Oetker KG, InBev SA (Belgium), Carlsberg A/S (Denmark), Schörghuber Stiftung & Co. Holding KG, Warsteiner Brauerei Haus Cramer KG, Bitburger Getränke Verwaltungsgeselschaft mbH, Krombacher Brauerei Bernhard Schadeberg GmbH & Co. KG and Oettinger Brauerei GmbH.

for first-movers (Sutton, 1991). The subsequent proliferation of microbreweries has not reduced concentration significantly at the national level.

How relevant is the Consensus Interpretation to other countries? In Germany, concentration has risen, but it remains low (columns 3, 5 and 6 of Table 1).[1] In 2000, the four-firm producer-concentration ratio was just 29; and the *eight*-firm ratio in Germany was smaller than the *one*-firm ratio in the United States. In 2005, after five years of important mergers involving big brewers, the German beer industry was still much less concentrated than its American counterpart.

Within Germany itself, the Consensus Interpretation faces another challenge: The scale of breweries and the concentration of brewing are much greater in the north than in the south. In 2000, Bavaria had 12.2 million inhabitants and 667 breweries, while North Rhine–Westphalia had 18.0 million inhabitants and 114 breweries. Clearly, minimum efficient scale and market size are not the only determinants of Germany's beer landscape.

In this article, I discuss several candidate explanations for the failure of

[1] International comparisons of concentration can be quite misleading. In many countries, government data ignore corporate affiliations, so true concentration is understated (Adams, 1980).

producer-concentration to rise as much in Germany as in the United States: the relevance of the new technologies to German brewers, the preferences of German consumers, the rules for advertising on German television and other factors, largely absent from the Consensus Interpretation of American experience. I find that market structure depends on a remarkably broad range of factors, extending well beyond the technological opportunity and market size emphasized by Bain (1966).

## Technological Change in Brewing and Packaging

Product mix, packaging mix and transport costs can affect technological choice. Can they explain the differences in scale between German and American brewers?

### Product Mix

Beer is a physically heterogeneous product. The individual raw materials, the recipes and the production process are all differentiated; so beers differ in appearance, odor and taste (Jackson, 1998). Customarily, beers are classified as bottom-fermented lagers or top-fermented ales. Pilsener (dry and hoppy) and Export (less hoppy, more alcohol) are two lagers. Alt (dark amber and hoppy), Kölsch (pale and hoppy) and Weizen (wheat beer) are traditionally top-fermented. In both countries, the leading seller is Pilsener; but other beers appear more commonly in Germany than in the United States (Tremblay and Tremblay, 2005, p. 132; Sutton, 1991, p. 521; DBB, 2001, pp. 70–71). Currently, devotees distinguish between "craft" and "mass" beers. "Craft" connotes both "small-scale" and "high-quality," with "quality" usually meaning no "adjuncts" (like rice or corn) and no artificial ingredients; but scale and quality are not synonymous. Sam Adams and Pete's Wicked Ale, two American beers of craft quality (Van Munching, 1997, pp. 152, 259; Tremblay and Tremblay, 2005, p. 120) are produced under contract in large breweries; and every domestic lager in Germany, however large the brewery that produced it, is free of adjuncts and artificial ingredients.

The new scale economies affect packaging more than brewing, so national-level differences in product mix shouldn't affect technological choices. Also relevant, however, are firm-level differences in breadth of product line. If setup costs are large, then firms producing many different beers, and packing them in many different types and sizes of container, might not gain much from adopting the new technologies. According to Scherer et al. (1975, pp. 51, 305), setup costs are not especially important in brewing, but they can be significant in packaging. Thus, the product-mix explanation of technological choice boils down to the claim that, at the firm level, product mix is broader in Germany, and a broader product mix entails a broader packaging mix.

### Packaging Mix

In 2000, beer consumed in the United States was packaged 51 percent in aluminum cans, 40 percent in glass bottles and 9 percent in half-barrels or kegs

(Tremblay and Tremblay, 2005, p. 4). That same year, beer produced in Germany was packaged 20 percent in cans, 60 percent in bottles and 20 percent in barrels or kegs (DBB, 2003, Table 26). Bottling and kegging are faster today than in 1950, but canning has accelerated even more. Bottle lines can now fill 1,100 containers per minute, while can lines can fill 2,000 containers per minute (Elzinga, 2005, pp. 81–82). The German-American difference in brewery scale is qualitatively consistent with the German-American difference in packaging mix.

**Transport Costs**

Beer is quite costly to transport (Scherer, 1996, p. 394), but is it more costly to transport in Germany than in the United States? Germany has higher population density, smaller distances between major cities and not-worse systems of freight transport. As a result, one might surmise that the ratio of transport to production cost is lower in Germany than in the United States. Nevertheless, high transport-like costs might have discouraged German brewers from building large breweries.

First, the United States allows beers to contain preservatives, while Germany prohibits lagers produced and sold domestically from containing any ingredients other than malted barley, yeast, hops and water (BMF, 1993a, 1993b). One effect of Germany's "purity" requirements is to increase the perishability of domestic beer—increasing the cost of transport and counteracting the cost advantages of large-scale brewing.

Second, recall that American beer is sold primarily in cans, while German beer is sold primarily in bottles. Bottled beer is the more costly to transport, especially when the bottles are reusable and returned to the brewery for refilling. In the United States, the disposal of used containers is regulated by the states. Overall, the system induces the recycling of cans, not the reuse of bottles (Porter, 2002, pp. 31–37, 92–101). In Germany, the relevant national rules (BMU, 1998) date from 1991, and the relevant rules of the European Union (EPC, 1994, 2004) date from 1994. Between 1982 and 2002, the importance of cans grew dramatically—from 5 to 29 percent of all beer sold in food and liquor stores (DBB, various editions); but Germany's rules ultimately tilted its beer container mix back toward reusables—the containers most costly to transport and hence least conducive to adoption of the new scale-augmenting technologies.

Implementation of the German rules constitutes a fascinating story of political economy. Rather than accept the German legislation and plan a deposit-return system for non-reusable containers, firms in the beer supply chain challenged the German rules in German court. During the legal proceedings, neither the firms nor the government developed the necessary infrastructure for handling returned containers and transferring deposit money from net receivers of deposits to net payers of refunds. As a result, when the legal challenge failed (in 2002) and the compulsory deposit system for non-reusable containers took effect (January 1, 2003), many stores refused to refund a deposit unless the consumer could prove that the beverage had been purchased in that very shop. Sales of canned beer decreased by 70 percent that year! Meanwhile, foreign beverage producers and the

European Commission complained that the German system discriminated de facto against non-reusable containers and hence against imported beverages. After two adverse judgments of the European Court of Justice (ECJ, 2004a, 2004b), Germany amended its packaging rules (BMU, 2005). Still unknown is how much the new rules will weaken the incentive to package beer locally and hence how much they will strengthen the incentive to adopt scale-augmenting technologies.[2]

## Preferences

Is the preference for "local" beer stronger in Germany than in the United States?[3] If so, then small, locally oriented German brewers might have survived the appearance of scale-augmenting technologies even if their American counterparts did not.

One indication that Germans prefer local beers is the variation across Germany in the types of beer consumed. In 2000, for example, Pilsener accounted for 33 percent of "Off"[4] sales in Bavaria, but 67 percent in North Rhine–Westphalia; Alt accounted for 0.2 percent in Bavaria, but 11 percent in North Rhine–Westphalia; Weizen accounted for 18 percent in Bavaria, but 3 percent in North Rhine–Westphalia (DBB, 2001, Table 26). Major differences exist within German states as well (DBB, 2001, Table 21).

Consumer *choices* should not be equated with consumer *preferences*, though. Given the importance of transport costs (discussed above), local beers might be chosen for their prices rather than their attributes.

One way to disentangle the effects of tastes from those of transport costs is to ask the experts. Germany's competition authority has argued that German beer markets are smaller than national in scope, largely because German preferences are local in nature (BKA, 2000). The European Union's competition authority concurs, observing (European Commission, 2002a, paragraph 12): "The large majority of

[2] An obligation to reuse containers does not necessarily blunt the incentive to adopt scale-augmenting technologies. If secondary markets exist for used (but refillable) bottles, then such containers need not be transported back to the original packaging plant. Moreover, in principle, distant brewers can enlist local licensees to produce and package their beers. In Germany, however, licensing can be problematic, even though many German brewers suffer from chronic excess capacity. First, since 1987, Germany allows a beer that is produced and sold legally in another country to be sold in Germany, even if the beer fails to satisfy Germany's "purity" rules; but Germany still requires domestically produced beers to be "pure." Most foreign beers fail to satisfy the German rules, so they cannot be supplied to the German market from breweries inside Germany. Second, many German brand names include the town or area in which the brand is traditionally produced. Warsteiner was sued for misleading labeling when it shifted some production of "Warsteiner Pils" from its brewery in Warstein to its (own) brewery in Paderborn, just 40 kilometers away (ECJ, 2000).

[3] Does "local" mean 1) brewed from local raw materials? 2) brewed in a local brewery? 3) packaged in a local plant? 4) brewed and packaged by a locally owned company? 5) associated by name or advertising with a particular locale? For many German beers, these criteria yield conflicting geographic classifications.

[4] "Off" and "On" refer to where the beer is consumed—off or on the premises of the retailer.

German beers are 'Pilsner' beers and other possible regroupings vary considerably according to German regional preferences." Academic experts also agree. After studying the beer industry in six countries, Scherer et al. (1975, p. 142) concluded: "Whatever the causes, strong brand loyalties permit hundreds of small [German] breweries to survive serving very limited local markets and simultaneously make penetration by regional and national brewers difficult."

Even if many German consumers behave today as if they prefer local beers, an understanding of how market structure evolves over time requires an understanding of how preferences are formed.

The preference for local beer depends partly on exposure to beers associated with "other" places. The European Court of Justice (1980, 1983, 1987) believes in the importance of such exposure, contending that the integration of European markets for alcoholic beverages will augment consumer valuations of foreign products. The Court's arguments apply when goods move freely and when consumers travel frequently. What about the changes in tastes that might result from permanent changes in residential location? After all, the Third Reich and the Cold War occasioned two major reshufflings of the German population.

During the mid-1940s, large numbers of refugees converged on West Germany from the east. In addition, many uprooted individuals migrated from one West German state to another. Thus, in the population census of 1950, 24 percent of all West Germans reported that their place of residence in 1938 was outside their state of residence in 1950 (STBA, 1952, Table 7a). The experiences of these migrants served sometimes to preserve their pre-existing tastes and sometimes to develop new ones. Favoring the preservation of tastes was the spatial and social isolation of the displaced (Berghoff, 1996, pp. 41, 42): "Housing estates for refugees were deliberately built well outside existing residential areas, and for quite some time their inhabitants felt somewhat out of place." Unsurprisingly, the resulting ". . . state of mind led . . . to a . . . reluctance to . . . make a genuine effort to integrate. Instead many . . . socialized primarily with people from their own native region, and intensified the maintenance . . . of their traditions and customs." On the other hand (p. 49), ". . . the integration of millions of expellees and refugees contributed to the decline of traditional attitudes and lifestyles as well as to the dissolution of hermetically closed milieux."

During this period, several German regions experienced heightened demand for nontraditional beers. One example involved sweet beer (Sußbier) in Bavaria (Speckle, 2001, pp. 67, 91, 203). Recipes for sweet beer complied with Germany's "purity" requirements but failed to satisfy the stricter Bavarian requirements. From 1949 until 1965, the Bavarian Brewers Association frequented both the corridors of state government and the courts to militate against the production and sale of sweet beer inside Bavaria. In response, brewers associations in other states, individual brewers and even the government of Berlin complained to the federal government and challenged Bavaria in court. One brewery deliberately violated the Bavarian ban by shipping sweet beer into Bavaria from its facilities near Frankfurt. Ultimately, Germany's Federal Court of Justice held that sweet beer could be sold in

Bavaria, but not as "beer." By that time, the provocative brewery was calling its beverage a "nutritional" drink.

The residential dislocations of this period affected northern brewers, too. During the 1950s, North Rhine–Westphalia experienced increased demand for Pilsener. Given the traditional local taste for beers like Alt, Export and Kölsch, the region's largest brewers dismissed this demand as transitory and allowed the pubs they controlled to buy Pilseners from any brewer (Kemmer, 1984). This gave Warsteiner its start. In 1950, Warsteiner produced just 18,000 hectoliters of beer; today, it is the fifth largest brewer in Germany, producing 5.7 million hectoliters in 2002.

When the Iron Curtain rose, Germany experienced another population shift and new disturbances in the beer market. For example, during the 1990s, a brewery in the former East Germany was initially denied the right to call its beverage "beer," even though it was using a centuries-old recipe. Ultimately, the Federal Administrative Court decided in its favor, but on a technicality (BVerwG, 2005). In addition to battling before administrative authorities and courts in various German states, the brewery in eastern Germany had to contend with "fellow" brewers who sided with the authorities and wanted to expel it from a trade association (Fritsche, 2004). The brewery also had to fend off a suit initiated by a small brewer in Bavaria, who argued that the eastern brewery was engaging in unfair competition.

Four final clues regarding German tastes.[5] Each runs counter to expectations based on conventional descriptions of German preferences. First, Pilsener-style beer is growing in popularity throughout the country. Between 1981 and 2002, its share of "Off" sales increased from 49 to 69 percent (DBB, various editions). German Pilseners are not perfect substitutes, but the rise of Pilsener marks the decline of physical heterogeneity and hence the decline of an important source of local preference. Second, private-label beer sells better in Germany (Winston, Spielman and Schäufele, 2002, p. 9) than in the United States (Elzinga, 2005, p. 88). Third, at the brand level, German consumers (Winston, Spielman and Schäufele, 2002, p. 7), like American consumers (Elzinga, 2005, p. 75), are price sensitive. Fourth, individual German consumers tend to consume multiple brands of beer. In 2001, among 25 heavily advertised consumer goods, beer ranked *last* in terms of consumer loyalty to a few brands; moreover, between 1993 and 2001, brand loyalty declined more for beer than for any sample product except yoghurt (Bauer Media, 2001).

[5] In the United States, scientifically designed blind tastings show: 1) perceived brand quality and actual brand price are not highly correlated, and 2) brands are difficult to identify by taste (Greer, 2002; Tremblay and Tremblay, 2005). For Germany, I have seen neither experimental nor econometric evidence on brand loyalty.

## Television

In the United States, regional and local brewers were done in by national television advertisements. Large national brewers bought exclusive network rights to major sporting events (Van Munching, 1997, p. 67), and local spots entailed significant cost disadvantages in comparison with national spots (Scherer, 1996, pp. 408–409). Was television as lethal a weapon in the German beer market as it was in the American?

Before 1990, German television (Humphreys, 1994) was unlikely to advantage national brewers vis-à-vis local brewers. First, television was not an attractive advertising medium (RStV, 1991). Commercial time was scarce and inelastically supplied (small number of channels, limited amount of time per channel). Little if any commercial time was available during evenings, Sundays and holidays—and most of it was available only within large groupings of advertisements. Thus, television advertising was expensive, poorly suited to reaching drinking males and unlikely to leave a lasting impression. Second, German television did not offer decisive advantages to national advertisers. Until 1984, only two channels showed advertisements; and, commercially speaking, one of them operated more as a collection of regional stations than as a network. Between 1984 and 1990, the number of national cable channels was small, cable packages were unavailable in many parts of the country, and few households subscribed.

By 1990, however, the situation was changing; and many of the changes favored national brewers. Most advertising is now shown on truly national channels. Several of these channels attract large national audiences, while others target national audiences of special interest to brewers. Given the (relative) latitude of private channels regarding quantity and timing of commercials (European Council, 1989; EPC, 1997), the appeal of television to national advertisers is now considerable. But given the paucity of regional spot time on the national channels (currently, none of the leading private channels offers regional spots), the price of commercial time per potential customer is unlikely to be attractive to regional brewers.[6]

This change is apparent in how brewers advertise. In 1990, German brewers allocated less than one-third of their advertising budgets to television (Bauer Media, 2005a); but during the 1990s, the importance of television to the brewers grew dramatically. By 1999, when television accounted for 26 percent of all advertising spending in Germany (WARC, 2004, p. 129), it accounted for two-thirds of all advertising spending on beer (Bauer Media, 2005a). Large brewers invested dis-

[6] On the other hand, the European Commission (2005) has endeavored to ensure that professional soccer would be available on many channels and in multiple formats. This makes it difficult for a few brewers to lock up all soccer advertising. It also contrasts sharply with American policy. Van Munching (1997, pp. 66–67) describes a 1980s exclusivity contract, between Anheuser-Busch and ESPN, that affected "everything the network covered. Though such a contract would seem like restraint of trade, the Justice Department rejected the 1985 challenge to exclusivity clauses brought by Stroh."

proportionately heavily in television (Bauer Media, 2005b). In 2000, for example, when television accounted for 65 percent of all beer advertising in Germany, it accounted for 84 percent of advertising by the top ten advertisers of beer. These ten companies accounted for 76 percent of all beer advertising on German television. Smaller brewers tend to rely on media other than television. In 2000, radio, daily newspapers and billboards accounted for 10 percent of the advertising of the top ten beer advertisers but 58 percent of the advertising of other beer advertisers.

In sum, only since 1990 has television advertising become an important commercial weapon of Germany's largest brewers. The timing of the decline in brand loyalty (Bauer Media, 2001) is quite consistent with the chronology of commercial television, but I have not seen any systematic, brand-level calculations of advertising elasticities of demand or market-share instabilities. Until they appear, remember that television became an important advertising medium under very different circumstances in these two countries. In the United States, it occurred during the golden age of triopolistic network television. In Germany, it occurred contemporaneously with the proliferation of channels on cable and satellite. The fact that concentration and mean output per brewery remain low in Germany—even by European standards and even though national brewers have tilted their media mix heavily toward television—might reflect the declining importance of television in a shakeout. Or it might simply reflect the newness of commercial television in Germany.

## Other Shakeout Scenarios

In this section, I consider several other possible explanations of why concentration has risen less in Germany than in the United States.

### Horizontal Collusion and Merger

The rigor of competition policy might affect the reactions of existing sellers to scale-augmenting technological change. For example, if horizontal collusion is tolerated (and barriers to entry exist), then established sellers might adopt a live-and-let-live pattern of conduct, retarding the rise of concentration. The effects of horizontal merger policy are less clear-cut: On the one hand, tolerance of mergers could speed concentration insofar as mergers facilitate the sharing between brewers of the gains from closing inefficiently small facilities. On the other hand, prohibition of mergers could speed concentration insofar as it hastens a bellicose shakeout.

During the relevant period, American antitrust authorities attacked horizontal collusion forcefully, and they prevented several important mergers between brewers (Elzinga and Swisher, 2005; Tremblay and Tremblay, 2005, pp. 234–247 and Table C1). In Germany, brewers are subject to both German and European Union rules of competition. The European Commission (2004b) has uncovered and attacked collusion in several European beer markets, but it has never alleged collusion in the German beer market. On the other hand, both Germany and the European Union are quite tolerant of mergers affecting the German beer market (BKA, 2000; European Commission, 2001a, 2001b, 2002a, 2002b, 2003b, 2004a), and German brewers have grown primarily by acquisition (Brouwer, 1988, p. 165; Müller, 1976; Schwalbach and Müller, 1984).

**Vertical Integration and Restraints**

The evolution of concentration might depend on whether or not some brewers have privileged access to wholesalers and retailers.

One might think that all brewers have good access to distributors in the United States. After all, most American states prohibit brewers from integrating forward, by ownership or subsidy, into wholesaling and retailing (Elzinga, 2005, p. 88). Nevertheless, wholesaling is concentrated (Elzinga, 2005, p. 88; Scherer, 1996, p. 409), exclusive dealing contracts between wholesalers and the largest brewers are apparently compatible with antitrust law (Van Munching, 1997, pp. 256–257; Tremblay and Tremblay, 2005, pp. 248–250) and space-constrained distributors are naturally reluctant to stock all of the brands proffered by brewers. No wonder Redhook, a microbrewery based in Seattle, was willing to become 25 percent owned by Anheuser Busch (Tremblay and Tremblay, 2005, pp. 74–75): Redhook performs its own brewing, packaging and promotion; but it relies on Anheuser-Busch's wholesalers to distribute its beer. More generally, the high level of concentration in American brewing is quite consistent with the difficulties experienced by small and new brewers in attracting and retaining distributors.

In Germany, too, wholesaling is concentrated and distributors are space-constrained. In addition, however, German brewers are allowed to integrate forward into distribution. One might think, therefore, that large national brewers enjoy at least as many distribution advantages in Germany as they do in the United States. Historically, however, the German distribution system has offered one important advantage to regional brewers, and this advantage has probably reduced the likelihood of an American-style shakeout. The distribution of beer to some of Germany's "On" retailers involves a "tied-house" system (Brouwer, 1988; Dumez and Jeunemaître, 1994; Slade, 1998): The brewer supplies the retailer with commercial equipment and/or financial credit at below-market prices. In return, the retailer buys beer almost exclusively from that brewer. In most American states, the tied-house system disappeared by law after Prohibition was repealed. Under the German legislation in effect before 1984, exclusive purchasing contracts between retailers and brewers could last as long as 20 years. Under European Union legislation, the maximum duration of the tie (before it must come up for renewal) has been shortened in stages (European Commission, 1967, 1983, 1999). Since 1999, it is normally five years.

To a large regional brewery in Germany, the tied-house system offers an alternative to television as a means of burnishing its brands. Many of Germany's most prominent and popular "On" retailers are tied to established local brewers.

The signs, glassware, beer mats and ambiance of these tied retailers all reinforce the images associated with the brewer's beers. As long as consumers buy beers promoted in this manner, the local brewers usually succeed in getting local "Off" retailers to stock their brands as well (MMC, 1989, p. 19). In sum, the tied-house system might help local and regional brewers to attract and retain distributors—not merely by foreclosure in the short run (which definitely occurs; see European Commission, 2003c) but by development of brand image for the medium and long run.

**The Profit Motive**

Most American breweries, including those associated with particular families, have enough outside owners to guarantee a preoccupation with profit. In Germany, as recently as 2000, limited partnerships (KGs) accounted for half of all beer sales; and limited liability corporations (GmbHs), which are usually closely held, accounted for another 12 percent (DBB, 2003, Table 30). Although most of Germany's so-called abbey breweries (Klosterbrauerei) now belong to commercial brewers, a few remain authentically insulated from extramonastery motives. Given their history, organizational form and current ownership structure, some German breweries might be managed with objectives other than profitability in mind. In a shakeout, these breweries might not exit quickly, even if they lose money regularly (Brouwer, 1988, p. 172).

**Excise Taxes**

In both Germany and the United States, beer is subject to excise taxes. If their rates depend on brewer size, such taxes might affect market structure.

In the United States, in 1977, the federal excise tax on beer was $7.67 per hectoliter. Between 1977 and 1991, brewers producing less than 2.35 million hectoliters paid only $5.97 per hectoliter on the first 70,400 hectoliters of output. In 1991, the standard rate doubled to $15.34 per hectoliter, while the treatment of small brewers remained unchanged. The birth rate for small breweries displays an unmistakable uptick right after the change (Tremblay and Tremblay, 2005, Figure 5.6).

In Germany, the excise tax on beer is governed primarily by two Directives of the European Union (European Council, 1992a, 1992b; see also BMF, 1993a, 1993b, 1994). These allow a country to reduce its tax rate by up to 50 percent for breweries producing less than 200,000 hectoliters per year. Germany offers a reduction of 25 to 50 percent, depending inversely on brewer size (DBB, 2003, p. 147). In 2002, 61 percent of all German breweries qualified for the maximum reduction, and only the largest 6 percent qualified for no reduction (DBB, 2003, Table 2). The advantage to the small brewer is limited, though. Among European Union countries, Germany has the lowest "standard" rate of excise tax on beer (DBB, 2003, Table 86).

## Lessons

What are the ultimate determinants of market structure? Neoclassicists emphasize production technologies and consumer preferences, while institutionalists emphasize community cultures and public policies. What are the lessons of this enquiry for studies of market structure in other industries and countries?

First, regarding technological determinism: Most observers of the American beer industry attach great importance to brewing and packaging technologies. In the U.S. setting, scale-augmenting technological change boosted concentration substantially. In Germany, it did not. Nevertheless, beer in Germany *is* partly a technological story. The technology in question, however, involves the transmission of television signals. Germany experimented with commercial television only after new satellite and cable technologies made it very difficult, politically if not technologically,[7] to impede German households from receiving foreign signals.

Second, regarding tastes: Most observers of the German beer industry attach great importance to the local nature of consumer preferences, but the significance of this geographic specificity must be clarified. Bavarian brewers have been fighting for more than a century to ban certain types of German beer from their region, and they have tried to impose Bavaria's own, relatively stringent "purity" rules on the whole country (BBB, 2005). Would these efforts have been worth the trouble if Bavarian consumers shunned the beers produced elsewhere in Germany? Beer in Germany *is* partly a story of preferences, but the story differs from the one usually told. The demographic dislocations of the Third Reich and the Iron Curtain would not have created new patterns of demand at the regional level if all migrants had abandoned quickly the preferences typical of the places they had left. In a mobile society, locally formed preferences cannot explain by themselves the survival of small breweries and spatially fragmented markets.

Third, the importance of seemingly unrelated public policies: Beer market structure is influenced by a remarkably broad array of public policies, administered by a multiplicity of public authorities. Given the lags, interdependencies and political economy, it can be tricky to identify the effects of individual policies on market structure.

Fourth, the distinction between policy mandates and policy impacts: Many policies are fashioned by courts, and courts often lack the authority and/or willingness to deploy the carrots and sticks that alter market behavior (Rosenberg, 1991). In 1987, the European Court of Justice told Germany to open its borders to beers produced and marketed legally in other European Union countries. Germany complied, but the French brewer who had triggered this legally successful proceeding failed to collect damages in German court (BGH, 1996; see also ECJ, 1996). The brewer was then acquired by Heineken (CC, 1996); and, to this day, imported beers have been unable to increase their share of the German market.

[7] West Germany would not have wanted to confer legitimacy on the political signal jamming in East Germany.

## Convergent Market Structures after All?

In the United States, two strategic groups (in the sense of Newman, 1978) occupy the seller's side of the beer market: mass brewers, who sell nationwide and differentiate their products primarily by advertising on television; and craft brewers, who sell locally or regionally and differentiate their products primarily with raw materials. After World War II, craft production nearly disappeared. Since the mid-1980s, however, it has rebounded. In 2003, craft production (the output of brewers producing less than 17,600 hectoliters annually) accounted for just 3.2 percent of domestic output (Tremblay and Tremblay, 2005, Table A-1); but unlike their mass-production counterpart, the craft group is growing—in membership, in output and in share of domestic shipments. Meanwhile, mass producers have consolidated their position vis-à-vis a third, virtually extinct group: regional brewers who lacked the physical products to rival craft brewers and the television advertising to rival mass brewers.

In Germany, craft brewing never approached extinction, but it has waned (DBB, various years). By 1992, small breweries (producing no more than 20,000 hectoliters annually) accounted for just 3.2 percent of domestic shipments—the very share associated with American craft brewing in 2003!

The most important differences between Germany and the United States do not involve craft brewers. Large regional brewers have virtually disappeared in the United States, but not in Germany. The survival of such brewers in Germany might be attributable to the later introduction of nationwide commercial television, the later weakening of the tied-house system and/or the stronger policy penchant for reusable bottles. If so, recent German policy changes in these areas might presage attrition in this group. The current tolerance of beer mergers in Germany might facilitate such attrition, but the German market for corporate control is dampened by the scarcity of broadly held companies (Winston, Spielman and Schäufele, 2002).

More interesting is the difference within mass brewing. In the United States, mass production is now a triopoly, dominated increasingly by Anheuser-Busch; Germany's mass brewers are scaled more symmetrically (as shown in Table 1). Now that television is available as a weapon, Germany's mass producers might engage in warfare similar to the 1970s hostilities between Anheuser-Busch and Miller. Those hostilities caused considerable collateral damage to regional mass producers in the United States.

If the German and American beer industries do converge, with a small group of mass producers and a large group of craft producers in each, then the vigor of competition in both countries will depend importantly on the structure of distribution (CC, 2004, 2005; OFT, 2000, p. 36). In the United States (Sass and Saurman, 1993, 1996), since Prohibition, many states have mandated both a "three-tier" system of distribution (which requires brewers to sell only to wholesalers and wholesalers to sell only to retailers) and a system of exclusive territories for wholesalers (inside a specified geographic area, a brewer's beers are available from only one wholesaler). In *Granholm v. Heald* (2005), however, the Supreme Court challenged the protected position of the wholesalers. Specifically, it held that a state cannot prohibit Internet purchases of wine from out-of-state wineries (which bypass in-state wholesalers) if it authorizes such purchases from in-state wineries. In his majority opinion, Justice Kennedy mentions concentration in wholesaling—the challenges it poses for small out-of-state wineries as they attempt to attract wholesalers. He also mentions the cost disadvantage of out-of-state wineries when, unlike in-state wineries, they must use the three-tier system of distribution. These are precisely the distribution difficulties confronting craft brewers. Insofar as *Granholm* applies de facto to beer, the Supreme Court might have laid the groundwork for increased competition in beer distribution—but only if the political clout and monopsony power of the new mass retailers (like Wal-Mart and Costco) is also controlled. Big mass retailers already figure prominently in the distribution of German beer, so the future structure of the beer market may be surprisingly similar in Germany and the United States.

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