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Abstract

We study persistence in the geographic variation in market shares of branded goods in consumer packaged goods industries across 50 U.S. city-markets. We match scanner data on local market shares and survey data on local quality perceptions for the largest brands in 34 consumer packaged goods industries. These data are then matched with historic information on the year and US city-market in which each brand was first launched. We find that these consumer brands have persistently higher market shares in markets closest to their respective cities-of-origin than in markets farthest from their respective cities-of-origin, where they were typically launched later. For 6 of the 34 industries, we collected more complete historic entry data with which we can determine the local order of entry among the top brands in each of the 50 U.S. city-markets. We find a persistent effect from differences in the order-of-entry of competing brands on their current relative brand shares and quality perceptions across US cities. The historic order of entry also appears to correlate with the current rank-order of brand shares across cities, leading to large asymmetries across markets in brand shares and in quality perceptions. This persistence is particularly striking since many of the brands studied herein originated during the mid-to-late 19th and early 20th centuries, roughly a century prior to the sample period of the market share and quality perception data.

JEL classification: L11, L66, M30, M37, R12

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I Introduction

Branding constitutes one of the central elements to the study and practice of product marketing. Despite a substantial literature documenting the impact of brands on consumer preferences, remarkably little is known about the economic implications of branding and the organization of markets characterized by heavy branding investments. Our interest herein is to document several stylized facts regarding persistence in the market structure of Consumer Packaged Goods (CPG) industries, arguably one of the most important sectors characterized by large advertising outlays and branding investments. We exploit geographic variation in brand origins to establish a connection between current cross-market patterns in demand and brand history. In this respect, we investigate the role of CPG brand history in the determination of current market structure.

CPG industries provide a unique opportunity for researchers to study the economic implications of branding because information on most of the marketing investments and the resulting brand sales performance are available for a wide cross-section of product categories and local U.S. markets. Many CPG products are differentiated primarily by their brand identity. In some cases, consumers cannot distinguish between competing CPG products in blind tests (Keller 2003, p.62 and Allison and Uhl 1964). Finally, the overall food industry reached roughly \$950 billion in 2004, with almost 50% deriving from retail sales, making consumer packaged goods a branding case study of considerable economic importance.¹

We collect a unique and comprehensive database for the purpose of describing industrial market structure in CPG industries. Our main data, covering 34 CPG industries, come from AC Nielsen and Information Resources Inc. (IRI). The typical CPG industry in our database consists of longitudinal scanner marketing data for all the brands covering 36-39 months for a cross section of 50 large market areas, as designated by either AC Nielsen or IRI. We supplement these data with Young and Rubicam Brands' survey-based information on geographic variation in brand quality perceptions and brand attitudes. Finally, and perhaps most notably, we collected manually the historic launch patterns for the largest brands in 6 of the CPG industries across the 50 geographic markets in our database. Consulting various sources including company archives, history books, and published company histories, we trace the entry patterns (i.e. the year a brand entered a local market) across our geographic cross-section of markets.

¹"Food Retailing in the 21st Century – Riding a Consumer Revolution," The Food Marketing Institute, <http://www.fmi.org/media/bg/FoodRetailing.pdf>

Our empirical analysis builds on the finding of geographic variation in the market shares of branded goods documented in Bronnenberg et al. (2007). Herein, we establish the persistence of these patterns, even for CPG brands that exhibit very little physical product differentiation (e.g. different brands of ground coffee and mayonnaise). The short temporal length, at best a few years, of most widely-available CPG scanner samples makes them inadequate for establishing persistence. Therefore, we match the scanner data with manually-collected historic entry data, enabling us to focus on a much longer time horizon than 2 or 3 years. In the cases documented in this paper, CPG brands typically launched more than a century ago, during the middle-to-late 19th and early 20th centuries.

We report the results of two tests for historic persistence in the geographic variation in market shares. The first test relates current brand shares to proximity to the brand's city-of-origin, i.e. the city in which the brand first launched and, hence, where it has operated the longest. Across 49 current leading national CPG brands, dating back to the late 1800's and early 1900's, we find that the current share in markets close to the city-of-origin is, on average, 12 share (i.e. percentage) points higher than the national average of 22%. Most brands in the sample launched much later in markets most distant from their city-of-origin. We find that the current share in the markets most distant from the city-of-origin is 5 share points lower than the national average of 22%. These findings imply that a brand's market shares are systematically higher in markets that were entered relatively early versus markets entered relatively late. The results further suggest that proximity to the city-of-origin, the location where a brand entered earliest and has therefore operated the longest, generates geographic variation in a brand's market share.

The second test relates the brands' shares for a given industry to the order-of-entry in each of the 50 geographic markets in our sample. Therefore, in addition to collecting the date and city-of-origin for a brand, we also collected the more complete geographic diffusion of entry across all 50 geographic markets. These data were obtained for the leading brands in 6 of our industries.

The empirical identification of this "early-mover effect" requires a distinction between the impact of early entry ("state dependence") and differences in the relative marketing competencies of firms ("heterogeneity"), a problem analogous to the incidental parameters problem (Heckman 1981). The extant literature on the "pioneering advantage" has documented early-mover effects across a wide range of industries. Typically, this literature uses a single time-series within an industry (see Golder and Tellis 1993 for a historical analysis, and Kalyanaram, Robinson and Urban 1995 for a

detailed literature survey).² In contrast, our identification strategy uses the observed variation in the identities of the early-movers across markets within a given industry. By focusing on CPG industries with origins dating back to the 19th century, we can safely rule-out a coordinated national brand roll-out strategy. One can therefore think of our 50 geographic markets roughly as 50 independent replications of the underlying game generating our data.

For the 6 industries in which we obtained the complete historic entry data across all the geographic markets, the historic order-of-entry appears to be a good predictor of a brand’s current market share levels across geographic markets. The order of entry also appears to be a good predictor of the identity of the current market-share leader in a given market. We also use the brand quality measures to show a comparable correlation between entry and perceived brand quality levels across geographic areas. Thus, early entrants in a geographic market tend to be perceived as higher quality brands in our current data. Even though our data collection effort limits us to documenting the entry effect in 6 of the industries, we nevertheless observe comparable geographic variance in market shares and quality perceptions for all 34 industries.

To confirm the importance of entry patterns in explaining the geographic variance in brand market shares, we also investigate several alternative economic sources of asymmetry. These explanations include local cost advantages based on proximity to a brand’s production facilities and relationships with large national supermarket chains. Several of these features could be inherently driven by historic entry. For example, a firm might build its plant closest to its largest market, which in turn may just be its city-of-origin. Similarly, a firm might form the deepest relationships with retailers in those markets where it has operated the longest. In spite of these arguments, the effect of early entry on brand shares is found to be robust to these alternative sources of brand asymmetry across markets. None of these sources predicts the observed geographic asymmetries in brand shares better than early entry. Moreover, the effect of early entry is significant even after controlling for these other factors.

The relationship between historic entry and brand share is consistent with the aforementioned literature on pioneering advantage. However, our analysis makes several novel contributions in this area, including our identification strategy based on historic national diffusion and our use of

²An exception is Brown and Lattin (1994), who use a similar multi-market approach to studying entry effects for an industry that launched during the late 1980s. However, they observe the same first entrant in 37 out of 40 markets analyzed. Furthermore, it is much harder to justify the cross-market independence of launch in the latter 20th century given the prevalence of national roll-outs with nationally-coordinated television advertising campaigns.

brand quality information in addition to market shares. The persistence of the early-mover effect on current shares is also related to the recent findings of persistence in dominance of manufacturers across a large cross-section of Japanese manufacturing sectors by Sutton (2007). Our findings of important geographic differences in market structure also contribute to a growing literature on the economics of geography (c.f. Krugman 1991, Ellison and Glaeser 1997, 1999). In this regard, we demonstrate the persistent effect of historic brand entry on the geographic variation in current CPG brand market shares. To the best of our knowledge, we are the first to link historic entry patterns to the spatial variation of market shares across large US city markets.

The remainder of this paper is organized as follows. In section two, we describe our data and document several regularities in the market shares of the leading brands in our 31 industries. In section three, we test for a relationship between historic order-of-entry and relative brand shares. Section four explores several alternative explanations for these geographic patterns. Section five concludes and discusses several directions for future research.

II Data and Geographic Patterns in Market Shares

A The Data

Our primary data source is AC Nielsen scanner data for 31 CPG food industries in the 50 largest AC Nielsen-designated Scantracks as in Dhar and Hoch (1997). These are large CPG industries representing a wide range of both edible grocery and dairy products, with collective annual national revenues of roughly \$26 Billion. We treat the 50 Scantracks as independent markets, as is typically done in practice by large CPG manufacturers who use AC Nielsen scanner data for market analysis and strategic-planning.³ The data are sampled at four-week intervals between June 1992 and May 1995. For each market, time period and industry, we observe sales, prices, and promotional activity levels for each of the brands. Brand sales are measured in "equivalent units", which are scaled measures of unit sales provided by AC Nielsen to adjust for different package sizes across products.

For the longitudinal analysis in section B, we compute a brand i 's market share in industry c and market m during month t by dividing its sales (in equivalent units) by the total industry sales

³Each Scantrack covers a designated number of counties, with an average of 30 and a range of 1 to 68. All markets include central city, suburban and rural areas. This practice also has a legal precedent in the merger trial against Coca-Cola and Dr. Pepper, during which the courts ruled that Scantracks represent a legally valid market definition (F.T.C. v. Coca-Cola Co., 641 F. Supp. 1128 1986). The geographic areas encompassed by a Scantrack are also roughly consistent with the supermarket distribution regions designated in Ellickson (2004).

(in equivalent units) :

$$\text{Share}_{icmt} = \frac{\text{Sales}_{icmt}}{\text{Total Sales}_{cmt}}.$$

For the cross-sectional analysis in section III, we compute a brand i 's cross-time market share in market m as follows:

$$\text{Share}_{icm} = \frac{\sum_t (\text{Sales}_{icmt})}{\sum_t (\text{Total Sales}_{cmt})}$$

The promotion data partition the total equivalent unit sales of a brand by the promotional conditions under which they were sold (i.e. on in-aisle display and/or feature ad and/or temporary discount). We construct a promotion variable by computing the fraction of a brand's sales that was sold under any form of in-store promotion. For the 31 industries from AC Nielsen, analogous sales and marketing data are also reported at the retailer account level for those retailers in each market with local annual revenues exceeding \$2MM. Account level data encompass all stores in the retail chain for the geographic market. There are 67 such retailers in the data, which jointly cover 48 of the 50 Nielsen markets.

Table 1 lists the CPG food industries covered, along with each of the geographic markets and retailers in the database. In the analysis below, we report results across the 31 industries. We report a 9-group classification to identify the industries. For example, the bread industry is included in the "Bread and Bakery" group, the candy industry is included in the "Candy and Gum" group, the butter and cream cheese industries are contained in the "Dairy Products" group, the pizza industry is contained in the "Frozen Entrees/Side Dishes" group, the frozen toppings industry is contained in the "Frozen/Refrigerated Desserts" industry, the juices and coffee industries are contained in the "Non-Alcoholic Beverages" group, the pasta industry is contained in the "Packaged Dry Groceries" group, the mayonnaise and fruit spreads industries are contained in the "Processed Canned/Bottled Foods" group, and dinner sausages are contained in the "Refrigerated Meats" group.

————— INSERT TABLE 1 HERE —————

For the historic analysis reported in section III, we supplement these 31 industries with analogous scanner data for 3 additional CPG industries: beer, ketchup, and softdrinks. These data span a more recent time horizon and cover a slightly different set of geographic markets and do not contain the retailer-level information.⁴ However, these additional industries enable us to extend our city-of-origin analysis to 34 industries, and our historic entry analysis to 6, rather than 3, industries.

⁴Two data sets (beer and ketchup) are from Information Resources, Inc (IRI) and cover demand data for 3 years

In the data, a "brand" encompasses all the stock-keeping units (SKUs) sold bearing a given brand name. For instance, in the ground coffee category, the Folgers brand aggregates all the SKUs with the Folgers label which embodies a wide array of can sizes. Even though many of the brands are jointly owned by a small number of large food conglomerates, we examine each brand in our database as a separate entity. For instance, Folgers is now owned by P&G – a large brand conglomerate, but has its own separate management team responsible for its marketing. Similarly, according to the company website, Ben & Jerry's continues to operate "to a large extent independently" and "separately from Unilever's current U.S. ice cream business" even after its acquisition by Unilever.⁵ Table 2 provides descriptive statistics for the largest brands in those six industries for which we will also provide details on entry data, as discussed below.⁶

———— INSERT TABLE 2 HERE ————

To explore the sources of persistence in the geographic brand share patterns, we supplement the Nielsen data with information on the city-of-origin of a brand. Focusing on the top 2 brands in each of the 34 industries, based on their share of national equivalent unit sales, we successfully identified the city-of-origin and year of entry for 49 of the 68 top brands. The data were collected by consulting various sources including the Internet, company relations agents, and business history books. We list the market of origin for each of these brands in Table 3. We can see that CPG brand launches vary widely across the 19th and 20th centuries, with the average launch date in 1919; but with a standard deviation of 34.3 years.

———— INSERT TABLE 3 HERE ————

To dig deeper into the sources of persistence in geographic patterns, we also collected manually data on the exact year a brand launched in each of our 50 markets. Since such data are not readily available, we are only able to conduct this entry analysis for six of the 34 industries: beer, ground coffee, ketchup, mayonnaise, softdrinks, and yogurt. These data were obtained from a large number of sources. The beer entry data were assembled from a combination of published business histories

(2001-2003). The softdrinks data cover the entire year 2005. There are slight differences in the set of markets covered in these 3 industries. The ketchup data span 50 IRI city markets (not the Nielsen city markets). The beer data span 47 IRI city markets, because in 3 of the 50 markets, beer is not sold through supermarkets. The softdrinks data span the 50 Nielsen Scantracks. To avoid unnecessary repetition of detail, we will refer to the share data of the 31 plus 3 industries as all covering a cross-section of 50 markets.

⁵For additional documentation, see http://www.benjerry.com/our_company/press_center/press/join-forces.html.

⁶Comparable descriptive statistics for the remaining 28 categories are available upon request.

(Plavachan 1975 and John 2005) as well as the generous provision of access to company archives by Budweiser and Miller.⁷ For ground coffee, the entry data were obtained from historic publications (e.g. Encyclopedia of Brands, the Gale Group, 1993, and Pendergrast 1999), the trade press, the manufacturers themselves and the Internet, mainly at manufacturer websites. In addition, we consulted the "Hills Bros Coffee Company" archives at the National Museum of American History, Washington D.C., which contain marketing and sales records from the 19th and early 20th centuries.⁸ The ketchup data were assembled primarily from two very thorough business histories of the Heinz family (Koehn 2001 and Alberts 1973).⁹ For the mayonnaise industry, entry data were collected mainly through industry contacts and from available histories on company websites and are available only at a regional level. The softdrink entry data were obtained from several published business histories (Pendergrast 1993 and Rodengen 1995), the Coca Cola company archives and the public Dr. Pepper archives at the Dr. Pepper Museum in Waco Texas.¹⁰ Finally, the yogurt data were obtained from industry contacts.¹¹ In some instances, an exact entry date would need to be inferred, for example by interpolation based on geographically "close" markets. For this reason, our entry analysis will focus on whether a firm entered first instead of using the exact entry date of a brand.

For the same 6 industries in which we collected entry data, we also collected information on the exact geographic location of the manufacturing plants for the brands. The plant locations provide a measure of a brand-specific cost asymmetry based on the distance from a given geographic market to the plant. The plant locations were obtained from interviews with managers, websites and other secondary data sources.

Finally, to look at a more intrinsic measure of a brand's performance other than its market share, we also obtained measures of perceived brand quality from the 2004 Brand Asset Valuator (BAV),

⁷We are grateful to Tracey Lauer and Michael Bulthaus at Anheuser-Busch and to David Herrewig at Miller Brewing for their assistance using company records.

⁸We thank the librarians of the National Museum of American History for their assistance with the archival data on coffee.

⁹Complete historic entry data for Hunts and Del Monte were unavailable primarily since their historic records have all been lost or destroyed due to various changes in ownership since their launches. We can nevertheless easily infer Heinz's early entry in most of our geographic markets due to its earlier launch and due to the availability of launch dates for Hunts and Del Monte in their respective cities-of-origin.

¹⁰We are grateful to Tom Barber, Harriet Grossman, and Phil Mooney for their assistance using company records from the Coca-Cola Company and Joy Summar-Smith and Mary-Beth Webster for their assistance using the company history and Dr Pepper bottlers' history at the Dr Pepper archives. We also gratefully acknowledge the help of Bob Stoddard, an expert on the history of Pepsi Cola for his time and for several discussions on the origins of the success of Pepsi.

¹¹We thank Avtar Bhatoey at the University of Chicago and Robert Francis Waldron at General Mills for their help in constructing these data.

an annual survey conducted by Young and Rubicam (Y&R), a multinational advertising agency.¹² The brand value measures constructed by Y&R are used by many large national consumer goods manufacturers to assess brand performance and brand equity. Consumers are surveyed by Y&R on a large number of yes/no brand characteristics such as whether a particular brand is "high quality," "good value," and "best brand in category." Responses to these ratings are tallied and reported by Y&R as fractions of the sample at the Census sub region level.¹³ For each brand and sub region we use the average across the three quality measures as a proxy for perceived quality.

B The Geographic Patterns in Current Market Shares

In this section, we briefly discuss the geographic patterns in market shares, using the 31 AC Nielsen industries. Due to differences in timing and market definitions, we do not include the 3 industries with IRI data in this analysis; however, we find analogous geographic patterns therein. For each industry, we focus on the two largest brands based on their respective shares of national equivalent unit sales, generating a sample with 2 brands, 50 geographic markets and 36 months for each of the 31 industries.

A simple analysis of the pooled variance in market shares across time and markets for each of the 62 top-two national brands reveals the important role of geography (Bronnenberg et al. 2007). The geographic variance is considerably larger than time-series variation. Across the 62 brands, the distribution of R^2 for market fixed-effects had a minimum of 50% and a mean of over 80%. The two right-side panels of Figure 1 illustrate a typical example of the relative importance of geography versus time using the top two brands in the mayonnaise industry. The variation in each of the brands' shares between the two markets is considerably larger than the variation over time within each market.

———— INSERT FIGURE 1 HERE ————

We also observe variation across markets in the identity of an industry's brand-share leader. Within an industry, a local leader dominates a maximum of 64% of the markets, on average. In only three of the 31 industries do we observe a single consistent share-leader across all markets: Cereals,

¹²Although the brand quality data are sampled roughly 10 years later than brand share data, this difference seems small compared to the timing of historic entry. Therefore, we do not think this slight discrepancy will invalidate the comparison of the entry effect on share versus on brand quality.

¹³These regions divide the continental U.S. into 9 regions that consist of clusters of adjacent states, e.g., New England, Pacific, etc.

Cream Cheese and Frozen Toppings. In some of the more fragmented industries, we see even more variation in brand leadership if we expand our focus to all top-two brands in each geographic market. Across industries, we see an average of 8 different brands that are a local share-leader in at least one market, with a range of 1 to 20 (i.e. the dinner sausage industry has 20 different brands that are a local leader in at least one market). Therefore, the identity of the leading brand in an industry varies from market to market. This variation creates a striking degree of asymmetry in brand shares across markets.

Figure 2 illustrates the cross-market asymmetry in brand shares in the coffee industry by plotting the shares of the two top national brands, Folgers and Maxwell House, on a map of the United States. Each circle pertains to one of the 50 markets in our data and the circle’s area is proportional to the size of the brand’s cross-time market share in that market. Folgers’ market share ranges from 0.16 in New York City to 0.59 in Des Moines. Maxwell House’s market share ranges from 0.04 in Seattle to 0.46 in Pittsburgh. More interesting is the variation in the relative shares of these two brands across US cities. Maxwell House shares are largest in the northeast, precisely where Folgers shares are smallest. In general, Folgers clearly dominates the ground coffee industry in the west and north central markets. But, Maxwell House dominates the East Coast.

——— INSERT FIGURE 2 HERE ———

III The Persistence of CPG Brand Shares

In this section, we tie the geographic patterns in market shares to a persistent effect of historic brand entry. We begin with anecdotal discussion of some of these industries to motivate the potential persistence of historic entry timing.

As seen in Table 3, many of the current leading brands originated during the latter 19th and early 20th centuries. Typically, the current leading brands in an industry originated in different parts of the US. For instance, in ground coffee, Folgers launched in San Francisco in 1872,¹⁴ whereas Maxwell House launched in Nashville in 1892. Similarly, Heinz Ketchup originated in Pittsburgh in 1876, whereas Hunts Ketchup originated in Santa Rosa Valley in 1890, just south of San Francisco. Most of these brands continue to be the share leaders in their respective cities-of-origin.

¹⁴Taken from the Folgers website (<http://www.folgers.com/pressroom/history.shtml>). Pendergrast (1999, p.56ff) lists an earlier date which for the purpose of our analysis is equivalent.

We can also find examples of markets that are not the city-of-origin of any of the current top brands, but where an early entrant nevertheless currently has the highest market share. In ground coffee, Folgers has the largest share of national equivalent unit sales. But, in Chicago for example, Folgers is ranked 3rd. Interestingly, Folgers did not enter the Chicago market until 1958, more than 25 years later than Hills Brothers, the leading brand. In the beer industry, Budweiser is the top brand at the national level and in the majority of the 50 cities in our database. However, Budweiser is ranked 2nd in Chicago where it entered in 1878. Even before the launch of its Budweiser brand, Anheuser-Busch had decided as early as 1865 to relinquish Chicago to the Milwaukee brewers and to focus on the Southwest (Ogle 2006). Miller had been selling in Chicago since 1856 (one year after its launch) and it established a permanent sales agency in 1873 (John 2005). It is still ranked first there today.

Some of the variation in the identity of the early entrant stems from the slow diffusion of a brand across the United States. During the mid to late 19th century, when many of these brands diffused, the technology to coordinate a national product launch was not widely-available (e.g. this period pre-dates national radio and national television advertising campaigns). In ground coffee, for instance, it took more than a century for Folgers to achieve true national distribution. In 1978, it finally entered New England following a halt to an FTC consent decree from 1971, when Folgers was acquired by Procter and Gamble. Similarly, Miller Beer launched in Milwaukee in 1855; but it did not enter many south western markets until just after the turn of the century, fifty years later.

It is important to note that in most of our industries, the current set of top brands does not consist of the true first-entrants per se. For example, Heinz was not the first seller of ketchup,¹⁵ Budweiser was not the first commercial brewer of beer and Folgers was not the first vendor of coffee. Technically speaking, our analysis focuses on the survivors, rather than the first-entrants (see Golder 2000 for a discussion of potential survivor bias). However, as business historians will attest, the entrepreneurs who launched these survivor brands were nevertheless pioneers in their aggressive use of grassroots marketing to build their brands both locally and, eventually, nationally. We view these survivors as first-movers in the creation of branded food in their respective industries (Koehn 2001 and Keller 2003). Similarly, these entrepreneurs were quick to adopt the latest technology for distribution. Busch, son-in-law and eventual president of Anheuser-Busch, was the first to use Pasteurization and refrigerated rail technology commercially for the purposes of distributing keg

¹⁵Tomato ketchup existed as early as 1801 (a recipe for tomato ketchup was printed in an American cookbook, the Sugar House Book, <http://en.wikipedia.org/wiki/Ketchup>), 75 years prior to Heinz started selling it.

beer across the US (Plavachan 1973).

This anecdotal discussion highlights several important features of the entry data that will help us with our tests below. First, most current leading brands in an industry originated in different parts of the US and then diffused slowly across geographic markets. This means that there is variation in how long a brand operated within a market, allowing us to test for share differences between markets where a brand has operated relatively long and markets where it has operated relatively short. There is also variation in the identity of early entrants across markets within an industry, allowing us to test early-mover effects versus brand heterogeneity. Finally, even though we focus on the set of surviving brands, we nevertheless consider them the true pioneers since they were typically the first to invest in serious marketing and brand-building.

A The City-of-Origin Effect on Market Shares

In this section, we test for persistence in a brand’s share by looking at the relative shares in markets closest to the city-of-origin, versus in markets more distant from the city-of-origin. Since the city-of-origin represents the geographic area in which a brand has operated the longest, it is also the area with the highest probability that the brand was an early entrant. Due to the long geographic diffusion of most CPG brands, we conjecture that markets more distant from the city-of-origin would also represent the areas where the brand entered more recently and, hence, where the brand is less likely to have been an early entrant. Because the analysis uses only the location of brand origin, we were able to collect the necessary data for this test for a large cross-section of brands and industries. Specifically, our analysis uses 49 brands from the set of 68 top-two national brands in each of the 34 industries. These brands are listed in Table 3.

To allow for non-linearity in the effect of distance to city-of-origin on shares we use a step-function approximation. The distances between a local market and a brand’s city-of-origin, which range from 0 to 2702 miles, are partitioned into 11 intervals each covering 250 miles. For each interval, we create a dummy variable, Dist_{icm}^k , indicating whether the distance from market m to brand i ’s city-of-origin falls into interval k . A separate dummy variable, Dist_{icm}^0 , is used to indicate whether market m is the city-of-origin. The number of observations in each distance interval ranges from 42 (2500 to 2750 miles) to 490 (750 to 1000 miles). To test for an effect of distance from

city-of-origin on brand shares, we run the following regression:

$$(1) \quad \text{Share}_{icm} = \alpha_i + \sum_{k=0}^{11} \delta_k \text{Dist}_{icm}^k + \epsilon_{im}$$

where Share_{icm} is the market share of brand i in industry c and market m and α_i is a brand fixed-effect.

We report the distance results from (1) graphically in Figure 3. We graph the distance effects, δ_k , against their respective distance intervals. We can see that, net of the brand-specific effects α_i , a brand's market share falls as we move to markets that are increasingly distant from its city-of-origin. In particular, we see an approximately 20 share-point difference between the market share in the city-of-origin versus in a market more than 2500 miles away. In the graph, we also report 95% confidence bands to indicate that these effects are statistically significant. Given that the overall average market share for these 49 brands is roughly 22%, the differences between close versus distant markets are quite substantial.

We conclude that close proximity to a brand's city-of-origin correlates positively with the brand's current market share. In view of the fact that the average launch year of these brands is 1919, we also conclude that the difference in market shares between markets entered early versus markets entered later is persistent. This persistence is remarkable given that the industries studied typically consist of fairly physically undifferentiated products that tend to be available in most of the geographic markets. Using these findings alone, it is difficult to assess a specific source for the persistence. There are other potential explanations for why a brand would have a higher market share closer to its city-of-origin. In the next section, we explore the role of order-of-entry among the current largest surviving brands in 6 of 34 the industries. We also explore several alternative sources of geographic brand asymmetry that could also introduce persistence.

————— INSERT FIGURE 3 HERE —————

B The Order-of-Entry Effect on Market Shares

In this section, we run a second test for persistence in 6 separate industries using variation in the order-of-entry of the current top brands. With the exception of ketchup, where we only have a complete national history for Heinz, in each industry we have entry data on more than one brand

and typically use the union of all top 2-3 brands from each of the 50 cities. Hence, in beer we look at Budweiser and Miller; in ground coffee we look at Folgers, Maxwell House and Hills Brothers; in ketchup we look at Heinz; in mayonnaise we look at Kraft and Unilever (Hellmann's/Best Foods);¹⁶ in softdrinks we look at Coca Cola, Pepsi and Dr. Pepper; and in yogurt we look at Dannon and Yoplait.

Before moving to a regression analysis, it is helpful to look at the joint geographic distribution of market shares and entry. Referring back to Figure 2, we map this distribution for the ground coffee industry. Shaded circles indicate those markets in which a brand entered before the other. For example, Folgers started in the west and moved east whereas Maxwell House started in the east and moved west. The maps reveal a strong positive correlation between a brand's share level and its early entry status in both industries.

We now test this relationship more formally. For each industry, we run several regressions using the within-market mean share for each brand as the dependent variable. Our regressors consist of brand fixed-effects and "EarlyEntry," an indicator for whether a brand was the early entrant in a market:

$$\text{EarlyEntry}_{icm} = \begin{cases} 1, & \text{if brand } i \text{ entered market } m \text{ earlier} \\ 0, & \text{else} \end{cases}.$$

We report the results from our market share regressions in Table 4. In each industry, we run three regressions. The first conditions only on EarlyEntry, the second conditions on the brand identities, and the third conditions on both. The entry effect is statistically significant in all 6 industries, even after controlling for brand fixed-effects. It is helpful to look first at the regressions with brand effects only to understand the magnitude of the EarlyEntry effect. With the exception of the ketchup industry, for which we could only obtain data for the leading brand, we routinely find evidence of asymmetries in the average brand shares across markets. But, after conditioning on EarlyEntry, we find that the magnitude of the EarlyEntry effect exceeds the brand effects. This result is suggestive that early entry determines the rank order of brand shares even in the softdrinks (at least for Coca Cola and Pepsi) and yogurt industries, where the EarlyEntry effect is relatively small compared to coffee and mayonnaise. According to our point estimates, EarlyEntry accounts for the majority of the predicted share differential in each industry except for Ketchup. For example,

¹⁶In mayonnaise, we exclude Duke's and Blue Plate because they operate in too few markets to separate heterogeneity and state-dependence. However, we use the information on their entry to determine those markets where neither Unilever nor Kraft entered first.

in coffee, the rank order of brands across markets is associated with EarlyEntry.

In several instances, the definition of EarlyEntry was problematic. In a separate Appendix, we check the robustness of our regression results to alternative definitions of the EarlyEntry variable. Our findings herein are qualitatively the same under these alternative definitions.

———— INSERT TABLE 4 HERE ————

C The Entry Effect on Perceived Brand Qualities

In this section, we look at the effect of EarlyEntry on perceived brand quality differences across markets. Given that the leading brands in each of the 6 industries invest heavily in national television advertising, one might expect to observe more uniformity in consumers' perceptions of the brand qualities. In Table 5, we report the results for each industry of the analogous three regressions used in the last section with the brand quality data. Since the brand quality is measured on an ordinal scale, it is hard to assign any quantitative meaning to the coefficients. The effect of early entry is positive, statistically significant, with the exception of the beer industry, and has a fair amount of explanatory power in all the industries. Thus, the effect of entry, often during the 19th and early 20th centuries, continues to persist in the geographic differences of current brand quality perceptions.

———— INSERT TABLE 5 HERE ————

IV Alternative Explanations for the Geographic Variance in Shares

In the previous section, we found that entry appears to have a fairly strong and persistent effect on current market shares. We now explore several alternative supply-side sources of firm and market heterogeneity that could also potentially contribute to the observed geographic variation in market shares. Since several of these sources could also be a result of early entry, it is interesting to see whether our entry effects are mitigated by these additional controls. First, we consider geographic cost advantages based on a brand's proximity to its production plant (Greenhut, Greenhut, and Li 1980). Second, we test for relationships with specific multi-market retailers. For example, manufacturers frequently pay slotting allowances to retailers to obtain premium shelf space for their products (Federal Trade Commission 2001, Israilevich 2004, Sudhir et al. 2004). Third, we

look for parent company effects whereby a large food company might possess regional advantages that are passed on to each of its brands. We also look at the potential role of trade promotions, such as price discounts and other point-of-purchase merchandising that could also potentially influence a brand’s market share.

A Costs and Promotions

Focusing again on the 6 industries for which we have entry data, Table 6 contrasts the entry effect with two other sources of firm heterogeneity across markets: location of plants and local differences in promotional intensity. In the last column, we report a regression that reports the entry effect after controlling for both these alternative sources of geographic variation. Column one, titled “Brand Effects,” provides a baseline with only the brand effects for an industry.

Column two, titled “Distance Effects,” adds the effect of the distance from a given market to a brand’s geographically closest manufacturing plant. There are two reasons why proximity to production plant might depend on or be confounded with entry. First, firms may tend to have their plants in their oldest markets where they first began operations and, hence, where they were more likely to have been the early entrant. Second, if there is an entry effect on market share, firms might subsequently build new plants closest to these markets if they prefer to invest near their largest markets. In either case, cost would likely appear to have a large effect and, if so, could potentially offer an explanation for the entry effects documented in the previous section. For most of the industries, the effect is found to be insignificant, suggesting that cost advantages are not the driving force of the geographic patterns in those industries. Nevertheless, proximity to plant is found to be negative and significant for the beer and ketchup industries. Thus, in these industries, a brand’s share appears to decline in markets further from production facilities. In spite of this finding, we see that the entry effect remains positive and significant in both industries, suggesting that the effect of entry is robust to the effects of proximity to plant.

Column three, titled “Promotion Effects,” instead adds promotional intensity (i.e. share of equivalent unit sales sold on promotion). A potential concern is that the promotion variable is confounded with the entry effect, which could indeed arise if firms systematically target higher promotional effort to their largest-share markets. Many CPG firms do use what is termed a “high-BDI” allocation rule for promotional budgets. BDI refers to the Brand Development Index and the

rule implies that promotions are allocated to markets where the brand is strong as a defensive tactic (Blattberg and Neslin 1991). In half of the industries, the correlation between market share and promotions is very small and insignificant. Nevertheless, the correlation is positive and significant in the beer, cola and yogurt industries. Clearly one must be cautious in interpreting these effects due to the potential simultaneity of promotions and shares. In spite of this limitation, it is surprising to observe relatively little correlation between promotion levels and the cross-section of shares in the industries.¹⁷ Column 4 adds the entry variable to the regression with the distance and local promotion effects concurrently. With the exception of yogurt, the entry effect remains positive and significant in all the industries even after controlling for promotions and plant locations.

—————INSERT TABLE 6 HERE—————

B Relationships with Retail Chains

Another potential source of geographic variation in market shares is the impact of retail intermediaries. The practice of slotting-fees could enable a manufacturer to establish a relationships with specific multi-market (or national) retail chains, which could in turn generate regional advantages in distribution. The conventional wisdom is that slotting fees are paid to the corporate headquarters of a large chain and not to individual store managers (Alexander 2003). In spite of the entry effects documented earlier, such relationships with retailers might nevertheless be the main driving force of the geographic patterns in our data. We can test this effect by checking whether brand share variation exhibits a retail account component in the retail account level data. A retail account roughly corresponds to the set of stores for a retail chain located in a specific geographic market which may consist of multiple city-markets.

We exploit the retail account level information for the top two brands in each of the 31 industries for which we use AC Nielsen data. We re-compute the analysis of variance in shares, as in section B, except that we now study the role of retail account in addition to time and geographic market. A separate regression is run for each industry. Although not reported, the R^2 from retail account fixed-effects are very small compared to market fixed-effects. Across all industries, the retail component

¹⁷In contrast, promotions are more correlated with shares in market-specific the time-series. A separate regression of shares on promotions for each of the top two brands was run for each industry and each of the 50 markets. That is, we ran 100 regressions per industry (2 brands and 50 markets). On average, the R^2 of a linear regression using price promotions and display promotions to explain market share is 0.38. As before, we cannot establish a causal relationship from these results. However, it is interesting to observe such a strong correlation between promotions and shares over time within a market versus no or weak correlation across markets.

accounts for 20% of share variation, on average, whereas the market component accounts for more than 51%. For a few of the smaller industries, retailer effects are larger due to the fact that not all retailers carry them (e.g. refrigerated pasta) or that private labels are strong in some chains and not others. The left panels of Figure 1 illustrate these findings by plotting the market share history of the top brands in the mayonnaise industry in two separate large retail accounts: Albertsons in Los Angeles and Albertsons in Denver. By comparing these plots with the right-side panels, with time-series plots at the city level, we can see that the market-specific component of the share histories is considerably more influential than the retailer component. In summary, the evidence suggests that retailers are not the driving force of the geographic variation in market shares. Note that we can only focus this analysis on those chains with operations in at least two distinct geographic markets (e.g. Albertsons, Safeway and Krogers) as we cannot separately identify a retailer and a market effect for single-market retailers. Thus, we cannot rule-out that single-market chains sell a higher share of the local leading brand due to slotting fees.

V Conclusions and Discussion

A simple descriptive analysis of CPG brand shares in Bronnenberg et al. (2007) reveals that market shares of national CPG brands are strikingly different across geography. Herein, we study the persistence of these geographic differences in brand shares over time. In particular, we find a city-of-origin effect for the leading brands across 49 brands covering almost all the industries studied. National brands have larger market shares in markets that are geographically close to their city-of-origin and smaller market shares in markets far away from the city-of-origin, where they were typically launched later. We conjecture this city-of-origin effect is due to the fact that most current surviving brands were early-entrants in their markets-of-origin. To test the early-entry effect more carefully, we exploit the geographic variation in the identity of the early entrants amongst the top surviving brands for 6 of the industries. In all 6 industries, we find not only that early entry correlates significantly with brand shares, it also correlates with quality perceptions and with the rank-order of brand shares. These findings are found to be robust to several alternative economic sources of asymmetry across markets.

Thus, we conclude that for the industries studied, the historic entry patterns of brands have left their mark on the current market shares and quality perceptions of brands of physically very

similar products. Given these findings, we can foresee at least two interesting directions for future research.

First, one might consider trying to understand the underlying economic forces that sustained the persistence geographic patterns for over a century. There are at least two possible economic explanations for the persistence. One line of argumentation arises from the endogenous sunk costs (ESC) theory developed and tested in Sutton (1991). Sutton provides empirical support for the role of endogenous fixed and sunk advertising costs in the determination of industrial market structure for food industries across several European countries. Bronnenberg et al. (2008) also provide supporting evidence for the ESC theory using the CPG industries and US geographic markets studied herein. With regards to the entry patterns and geographic effects, stylized versions of the ESC model can be extended to accommodate sequential entry in a multi-period game. This extension introduces a strategic pre-emptive motive whereby an early entrant invests more aggressively in advertising than subsequent entrants, thereby enabling the former to establish higher perceived quality brands (Lehmann-Grube 1997). The order of entry can, for some specifications, predict which firm secures the share leadership position. Dorazleski and Markovitch (2008) derive an analogous result for a persistent (long-run) early advantage in an infinite horizon version of the ESC game with ongoing marketing investments over time. While the entry-related predictions of these dynamic ESC games are less robust to model specification, they nevertheless conform with our empirical findings of covariance between order-of-entry and market structure in our data.

An alternative line of argumentation is that persistence arises from inertia in brand preferences. That is, consumers form brand buying habits which create an early-mover effect. Schmalensee (1982) suggests that consumer learning could theoretically give early entrants an advantage, even in the absence of any advertising or other marketing investments. Alternatively, over a much shorter horizon (i.e. a couple of years), several studies have documented brand inertia empirically using analogous CPG marketing data (c.f. Erdem 1996, Keane 1997, Shum 2004 and Dubé et al. 2008). However, none of these studies have made a connection between inertia and any initial advantages (such as entry) for a given brand and its market share. Testing this theory against the ESC with sequential entry is beyond the scope of the data used herein.

A second avenue for future research is to ask whether the persistent historic effects in an industry can be re-initialized, or analogously, to study what constitutes “early entry.” Anecdotally, innovations to a product or to its packaging might constitute sufficiently disruptive events in an industry

to re-initialize it. For example, Digiorno’s radical launch of rising-crust pizza permanently altered the market structure of the frozen pizza industry (Bronnenberg and Mela, 2004). In terms of packaging, in the coffee market, Hills Brothers was the first to introduce vacuum sealed cans of coffee, a technology it rolled out in conjunction with a massive free-samples campaign during the early 1930s in Chicago (Wilson 1969), where it remains the largest brand in terms of market share in our data. Similarly, last year Procter & Gamble (Maxwell House) launched a patent-infringement suit against Kraft (Folgers) for the latter’s adoption of the vacuum plastic coffee container. In the Ketchup industry, Heinz successful launch of the new “Easy Squeeze” inverted ketchup bottle, in 2002, was immediately countered by Hunts with its competing “Perfect Squeeze” inverted bottle.¹⁸ These examples anecdotally support the strategic importance that CPG firms associate with packaging and product innovation. Testing the ability of such innovations to reinitialize an industry’s market structure (i.e. breaking the persistence) could be an interesting opportunity for future research.

¹⁸“Heinz, Hunts turn ketchup wars upside down,” *Packaging Digest*, July 2002, pg. 4.

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A Robustness Checks for the Order of Entry Effect

In some instances, the exact definition of EarlyEntry was difficult and required a judgement call. We briefly explore the robustness of the precise way we defined EarlyEntry in certain industries to confirm that our findings are robust.

In the ketchup industry, we only observe the entry dates for Heinz, and we define EarlyEntry to be 1 if Heinz entered a market before 1890, which is the initial launch year for its main rival, Hunts.

In the mayonnaise industry, it was not always possible to determine the exact year for each city but only for a broader geographic region. In section B, we assumed that Kraft was the early entrant in the midwest and southern markets for which we could not locate an exact date. Two alternative, and possibly more conservative, approaches would be to assume Unilever was the early entrant in these markets or, simply, to re-estimate the model dropping the problematic markets entirely. In Table 7, we report the results from the market share regressions for these two alternative approaches. EarlyEntry is found to be positive and significant under both alternative definitions.

In the softdrink industry, we faced a different issue. Unlike Coke and Dr. Pepper, Pepsi was never the first brand to roll out in any of the 50 cities in the data. Technically, Coca-Cola was the first to enter the North East even though Pepsi is the current share leader in that region. According to Bob Stoddard, a leading brand historian with expertise in the soft drinks industry, Pepsi intentionally re-launched with aggressive marketing in the North East during the early 1930's precisely because of the lack of major marketing effort by incumbents.¹⁹ In section B, we defined Pepsi as the Early Entrant in the North East. In Table 7, we re-run the market share regression defining Coca-Cola as the early entrant in the North East. We find that the entry effect is robust to this alternative definition and that most of the parameters do not change qualitatively.

Finally, in the beer industry, Miller was first to launch in the Chicago market (John 2005, Ogle 2006). However, Miller company records track entry based on the year a permanent bottling operation was established in a market. Miller did not establish a permanent bottling operation in Chicago until after Budweiser. In section B, we defined Miller as the early entrant in Chicago. In Table 7, we re-run the market share regression defining Budweiser as the early entrant. The EarlyEntry parameter is still found to be positive and significant.

¹⁹See also Stoddard (1997, page 69ff)

Industry Groupings	Bread and Bakery, Candy and Gum, Dairy Products, Frozen Entrees and Side Dishes, Frozen and Refrigerated Desserts, Non-alcoholic Beverages, Packaged Dry Groceries, Processed Canned and Bottled Foods, Refrigerated Meats ^a
Markets	Albany, Atlanta, Baltimore, Birmingham, Boston, Buffalo, Charlotte, Chicago, Cincinnati, Cleveland, Columbus, Dallas, Denver, Detroit, Des Moines, Grand Rapids, Harrisburg, Houston, Indianapolis, Jacksonville, Kansas City, Los Angeles, Louisville, Little Rock, Memphis, Miami, Milwaukee, Minneapolis, Nashville, New Orleans/Mobile, New York, Oklahoma City/Tulsa, Omaha, Orlando, Philadelphia, Phoenix, Pittsburg, Portland, Raleigh/Durham, Richmond/Norfolk, Sacramento, San Antonio, San Diego, Seattle, San Francisco, St. Louis, Syracuse, Tampa, Washington
Retailers	A & P, Super Fresh, ABCO, ACME, Albertson's, Almac's, AWG, BiLo, Big Bear, Bruno's, Del Champs, Demoulas Market Basket, Dominick's, Eagle Food Centers, Farm Fresh, Farmer Jack, Fiesta Mart Inc., Food4Less, Food Lion, Food Mart, Fred Meyer, Gerland's, Giant, Giant Eagle, Grand Union, Great American, H.E.B., Harris Teeter, Harvest Foods, Homeland Food Stores, Hughes Market, Hy Vee Foods, Jewel Food Stores, Kash N Karry, King Soopers, Kohl's, Lucky, Lucky Stores, Minyard Food Stores, National, Omni, P&C, Pathmark, Publix, Purity Markets, Raley's, Ralphs, Randall's, Riser Foods Inc., Safeway, Save Mart, Schnuck's, Schwegmann, Sentry Markets, Shaw's, Shoprite, Smith's Food and Drug Centers, Smitty's, Star Market, Stop and Shop, Super Fresh, Kroger, Tom Thumb, Tops Markets, Vons, Waldbaum's, Wegman's Food Markets, Winn Dixie

^aWe classify the 31 industries from AC Nielsen into 9 groupings

Table 1: The structure of the main data set

Industry	Brand	Share	Perceived Quality	Promotion ^a	Minimum Distance ^b
Beer	Budweiser	0.267	21.037	0.552	0.219
Beer	Miller	0.149	15.169	0.501	0.295
Coffee	Folgers	0.310	26.170	0.343	0.704
Coffee	Maxwell House	0.256	21.874	0.407	0.571
Coffee	Hills Bros	0.059	15.623	0.510	0.578
Ketchup	Heinz	0.432	35.831	0.464	0.399
Mayonnaise	Kraft	0.497	37.080	0.328	0.714
Mayonnaise	BestFoods/Hellmanns	0.292	29.982	0.264	0.738
Softdrinks	Coca-Cola	0.273	33.794	0.630	0.286
Softdrinks	Pepsi Cola	0.223	27.610	0.633	2.115
Softdrinks	Dr Pepper	0.062	21.722	0.271	0.499
Yogurt	Dannon	0.307	23.484	0.215	0.427
Yogurt	Yoplait	0.162	22.685	0.209	0.587

^aPromotion is the percentage of sales volume sold on promotion,

^bMinimum Distance is the average distance to the closest manufacturing facility in 1000 miles.

Table 2: Average descriptive statistics by brand across geographic markets.

Industry	Brand	City of Origin	Year of Launch
Bagels	Lender's	New Haven, CT	1927
Bagels	Sara Lee	Greenville, SC	1985
Beer	Budweiser	St. Louis, MO	1876
Beer	Miller	Milwaukee, WI	1855
Bread	Wonder	Indianapolis, IN	1921
Bread	Sunbeam	Philadelphia, PA	1942
Breakfast Sausage	Jimmy Dean	Plainview, TX	1969
Breakfast Sausage	Bob Evans Farm	Gallipolis, OH	1948
Butter	Landolakes	Saint Paul, MN	1924
Butter	Challenge	Los Angeles, CA	1911
Cereal	Kellogg's	Battlecreek, MI	1906
Cereal	General Mills	Minneapolis, MN	1924
Chunk Cheese	Kraft	Chicago, IL	1903
Coffee	Folgers	San Francisco, CA	1872
Coffee	Maxwell House	Nashville, TN	1892
Cottage Cheese	Knudsen	San Diego, CA	1919
Cream Cheese	Philadelphia	Chester, NY	1880
Cream Cheese	Temptee	Louisville, KY	1927
Dinner Sausage	Thorn Apple Valley	Detroit, MI	1969
Dinner Sausage	Eckrich	Fort Wayne, IN	1894
Dried Rice	Uncle Bens	Beaumont, TX	1943
Dried Rice	Mahatma	Abbeville, LA	1911
Frozen Topping	Cool Whip	Avon, NY	1967
Frozen Topping	Reddi Wip	St. Louis, MO	1948
Fruit Spreads	Smuckers	Orrville, OH	1897
Fruit Spreads	Welch's	Concord, MA	1869
Hot Dogs	Oscar Mayer	Chicago, IL	1900
Hot Dogs	Hygrade	Southfield, MI	1957
Ketchup	Heinz	Pittsburgh, PA	1876
Ketchup	Hunts	Santa Rosa Valley, CA	1890
Marshmallows	Campfire	Elk Grove Village, IL	1917
Mayonnaise	Kraft	Salem, IL	1931
Mayonnaise	Best Foods/ Hellsmann's	New York City, NY	1905
Mustard	Frenchs	Rochester, MO	1904
Mustard	Guldens	New York City, NY	1867
Pickles	Vlasic	Imlay City, MI	1930
Pickles	Claussen	Chicago, IL	1870
Pizza	Tombstone	Medford, WI	1970
Pizza	Totinos	Minneapolis, MN	1960
Pizza Bread	Boboli	San Raphael, CA	1986
Pizza Sauce	Contadina	San Jose, CA	1918
Pourables/Salad Dressing	Kraft	Salem, IL	1931
Pourables/Salad Dressing	Wishbone	Kansas City, MO	1940
Refrigerated Pasta	Contadina	San Jose, CA	1918
Sauces	Heinz	Pittsburgh, PA	1869
Soft drinks	Coca Cola	Atlanta, GA	1886
Soft drinks	Pepsi Cola	New Bern, NC	1896
Yoghurt	Dannon	New York, NY	1943
Yoghurt	Yoplait	Detroit, MI	1974

Table 3: Market-of-origin for 49 of the Top 2 Brands Across the 34 CPG Industries

	variable	Entry Effect		Brand Effects		Entry and Brand Effects	
		coefficient	std.err.	coefficient	std.err.	coefficient	std.err.
Beer ($N = 94$)	Intercept	0.141	0.010	0.149	0.011	0.139	0.010
	Budweiser			0.118	0.016	0.020	0.026
	Miller						
	EarlyEntry	0.134	0.014			0.117	0.026
	R^2	0.483		0.372		0.487	
Coffee ($N = 150$)	Intercept	0.139	0.011	0.059	0.014	0.052	0.010
	Folgers			0.251	0.020	0.206	0.015
	Maxwell House			0.197	0.020	0.088	0.017
	Hills' Bros						
	EarlyEntry	0.208	0.019			0.175	0.015
	R^2	0.440		0.533		0.755	
Ketchup ($N = 50$)	Intercept					0.388	0.019
	Heinz						
	EarlyEntry					0.072	0.024
	R^2					0.149	
Mayonnaise ($N = 100$)	Intercept	0.248	0.019	0.292	0.027	0.189	0.019
	Kraft			0.205	0.038	0.144	0.025
	Unilever						
	EarlyEntry	0.332	0.029			0.303	0.025
	R^2	0.576		0.222		0.682	
Softdrinks ($N = 106$)	Intercept	0.144	0.009	0.062	0.009	0.058	0.008
	Coca-Cola			0.211	0.012	0.171	0.015
	Pepsi Cola			0.161	0.012	0.158	0.012
	Dr Pepper						
	EarlyEntry	0.126	0.016			0.056	0.014
	R^2	0.295		0.682		0.713	
Yogurt ($N = 100$)	Intercept	0.171	0.014	0.162	0.013	0.154	0.014
	Dannon			0.145	0.019	0.111	0.025
	Yoplait						
	EarlyEntry	0.126	0.020			0.051	0.025
	R^2	0.286		0.379		0.404	

Table 4: Early entry and market share

	variables	Entry Effect		Brand Effects		Entry and Brand Effects	
		coefficient	std.err.	coefficient	std.err.	coefficient	std.err.
Beer ($N = 94$)	Intercept	15.461	0.421	15.169	0.378	15.055	0.382
	Budweiser			5.868	0.534	4.765	0.947
	Miller						
	EarlyEntry	5.284	0.595			1.330	0.947
	R^2	0.456		0.562		0.571	
Coffee ($N = 150$)	Intercept	19.385	0.500	15.623	0.511	15.455	0.454
	Folgers			10.547	0.722	9.456	0.663
	Maxwell House			6.251	0.722	3.648	0.760
	Hills' Bros						
	EarlyEntry	5.513	0.867			4.198	0.659
	R^2	0.212		0.590		0.677	
Ketchup ($N = 50$)	Intercept					33.634	0.686
	Heinz						
	EarlyEntry					3.544	0.871
	R^2					0.249	
Mayonnaise ($N = 100$)	Intercept	30.240	0.589	29.982	0.643	27.842	0.530
	Kraft			7.098	0.909	5.839	0.686
	Unilever						
	EarlyEntry	7.481	0.888			6.296	0.691
	R^2	0.415		0.379		0.661	
Softdrinks ($N = 106$)	Intercept	24.920	0.508	21.722	0.590	21.450	0.570
	Coca-Cola			12.072	0.834	9.555	1.047
	Pepsi Cola			5.888	0.834	5.684	0.801
	Dr Pepper						
	EarlyEntry	8.366	0.880			3.537	0.949
	R^2	0.367		0.573		0.608	
Yogurt ($N = 100$)	Intercept	22.002	0.390	22.685	0.415	22.202	0.403
	Dannon			0.799	0.588	-1.253	0.742
	Yoplait						
	EarlyEntry	2.166	0.552			3.018	0.742
	R^2	0.133		0.018		0.158	

Table 5: Early entry and perceived quality

		Brand effects		Distance effects		Promotion Effects		All	
		coeff.	std.err.	coeff.	std.err.	coeff.	std.err.	coeff.	std.err.
Beer ($N = 94$)	Intercept	0.149	0.011	0.182	0.015	0.234	0.024	0.239	0.024
	Budweiser	0.118	0.016	0.109	0.015	0.105	0.015	0.021	0.023
	Miller								
	Early Entry							0.096	0.024
	Min.Dist.Plant			-0.112	0.037			-0.086	0.032
	log(Promo)					0.118	0.030	0.101	0.027
	R^2	0.372		0.428		0.459		0.584	
Coffee ($N = 150$)	Intercept	0.059	0.014	0.065	0.020	0.077	0.030	0.087	0.026
	Folgers	0.251	0.020	0.253	0.020	0.262	0.026	0.217	0.019
	Maxwell House	0.197	0.020	0.197	0.020	0.203	0.022	0.090	0.019
	Hills' Bros								
	EarlyEntry							0.179	0.015
	Min.Dist.Plant			-0.011	0.024			-0.039	0.018
	log(Promo)					0.027	0.039	0.019	0.028
Ketchup ($N = 50$)	R^2	0.533		0.534		0.535		0.762	
	Intercept	0.432	0.013	0.510	0.025	0.486	0.070	0.486	0.067
	Heinz								
	EarlyEntry							0.050	0.024
	Min.Dist.Plant			-0.194	0.056			-0.154	0.056
	log(Promo)					0.069	0.089	0.030	0.077
	R^2	0.000		0.196		0.012		0.266	
Mayonnaise ($N = 100$)	Intercept	0.292	0.027	0.310	0.040	0.294	0.110	0.315	0.073
	Kraft	0.205	0.038	0.204	0.038	0.204	0.042	0.126	0.027
	Unilever								
	EarlyEntry							0.307	0.025
	Min.Dist.Plant			-0.024	0.040			-0.031	0.025
	log(Promo)					0.002	0.081	0.079	0.051
	R^2	0.222		0.225		0.222		0.693	
Softdrinks ($N = 106$)	Intercept	0.062	0.009	0.070	0.010	0.157	0.024	0.138	0.023
	CocaCola	0.211	0.012	0.207	0.012	0.146	0.019	0.126	0.019
	PepsiCola	0.161	0.012	0.189	0.020	0.097	0.019	0.117	0.026
	Dr Pepper								
	EarlyEntry							0.045	0.013
	Min.Dist.Plant			-0.017	0.010			-0.006	0.010
	log(Promo)					0.067	0.016	0.054	0.016
Yogurt ($N = 100$)	R^2	0.682		0.687		0.716		0.736	
	Intercept	0.162	0.013	0.189	0.024	0.277	0.035	0.275	0.039
	Dannon	0.145	0.019	0.138	0.019	0.136	0.018	0.107	0.024
	Yoplait								
	EarlyEntry							0.038	0.024
	Min.Dist.Plant			-0.047	0.035			-0.021	0.034
	log(Promo)					0.069	0.019	0.065	0.019
	R^2	0.379		0.390		0.449		0.468	

Table 6: Alternative Explanations for the Geographic Patterns in Market Shares

		Entry and Brand Effects	
		coefficient	std.err.
Beer ($N = 94$)	Intercept	0.144	0.011
	Budweiser	0.043	0.031
	Miller		
	EarlyEntry	0.085	0.031
	R^2	0.419	
Mayonnaise (A) ($N = 100$)	Intercept	0.193	0.029
	Kraft	0.304	0.037
	Unilever		
	EarlyEntry	0.292	0.049
	R^2	0.426	
Mayonnaise (B) ($N = 100$)	Intercept	0.146	0.077
	Kraft	0.351	0.081
	Unilever		
	EarlyEntry	0.166	0.082
	R^2	0.253	
Softdrinks ($N = 106$)	Intercept	0.059	0.009
	Coca-Cola	0.175	0.022
	Pepsi Cola	0.164	0.012
	Dr Pepper		
	EarlyEntry	0.042	0.022
	R^2	0.689	

Table 7: Robustness of the Entry effect. Alternative assumptions for EarlyEntry are different from the ones in the main text as follows: Beer – Budweiser is assumed to enter Chicago prior to Miller. Mayonnaise (A) – Unilever leads in North East (Hellmann’s) and West (Best Foods), except in markets where Duke’s and Blue Plate were likely first, Kraft is not first anywhere. Mayonnaise (B) – Unilever leads everywhere except in markets where Duke’s and Blue Plate were likely first, Softdrinks – Dr Pepper enters the Texan markets first, Coca-Cola is first everywhere else.

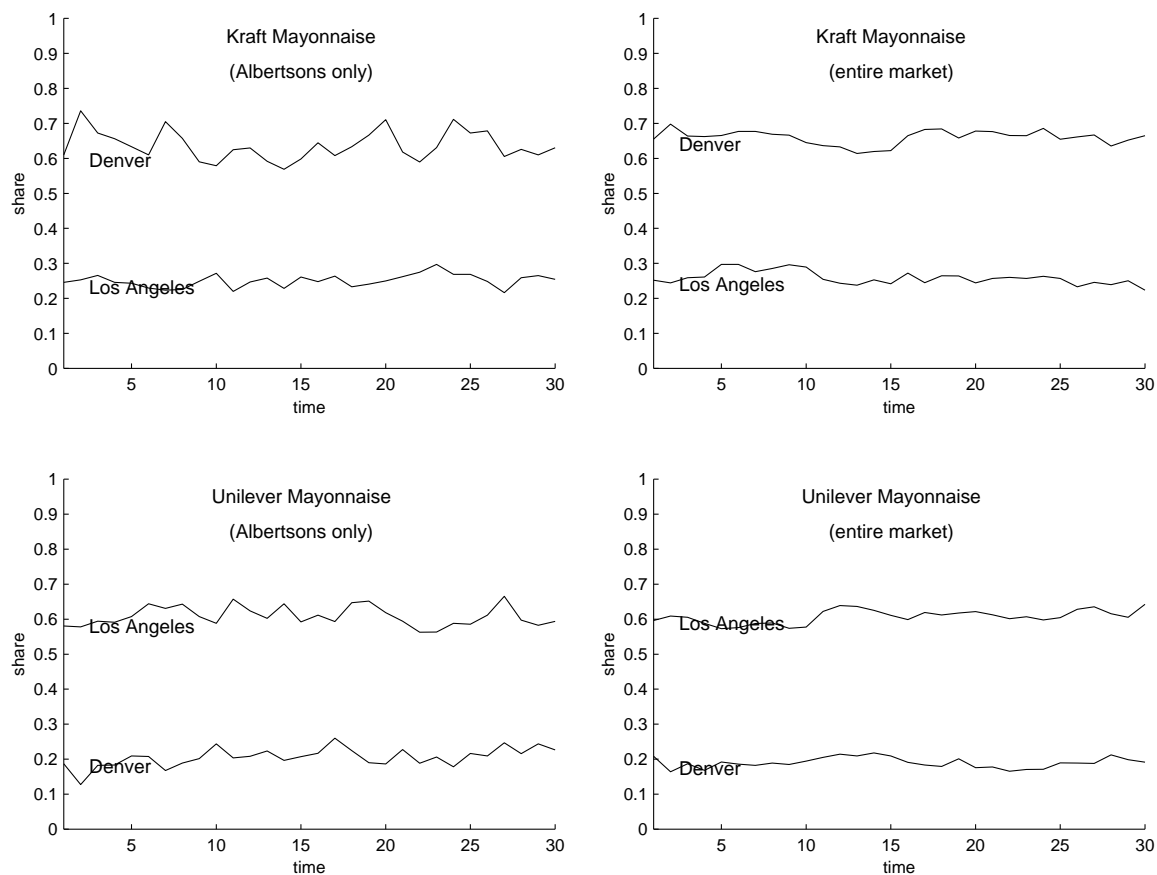


Figure 1: Brand shares in the mayonnaise industry with retailers and in markets (time is measured in 4-week intervals)

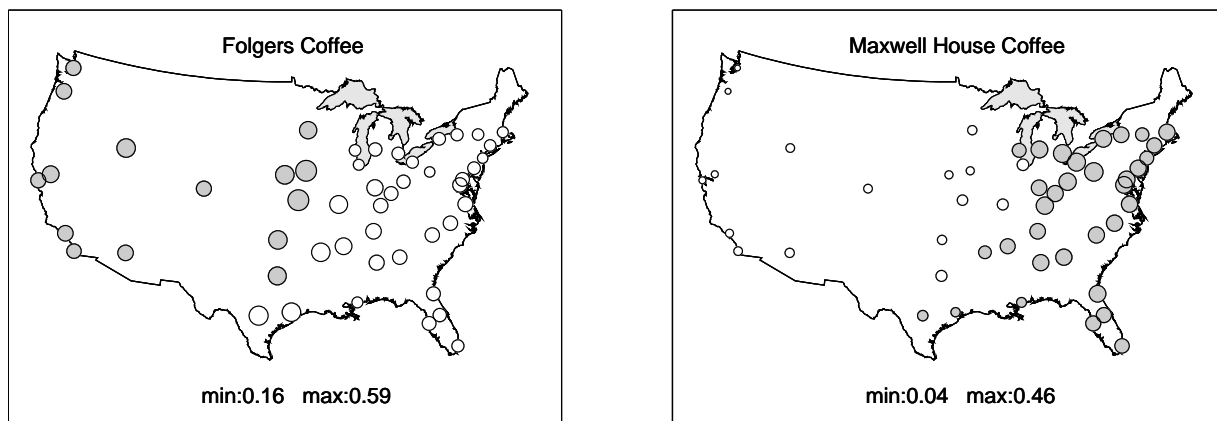


Figure 2: The joint geographic distribution of share levels and early entry across US markets in ground coffee. The areas of the circles are proportional to share levels. Shaded circles indicate a brand locally moved first.

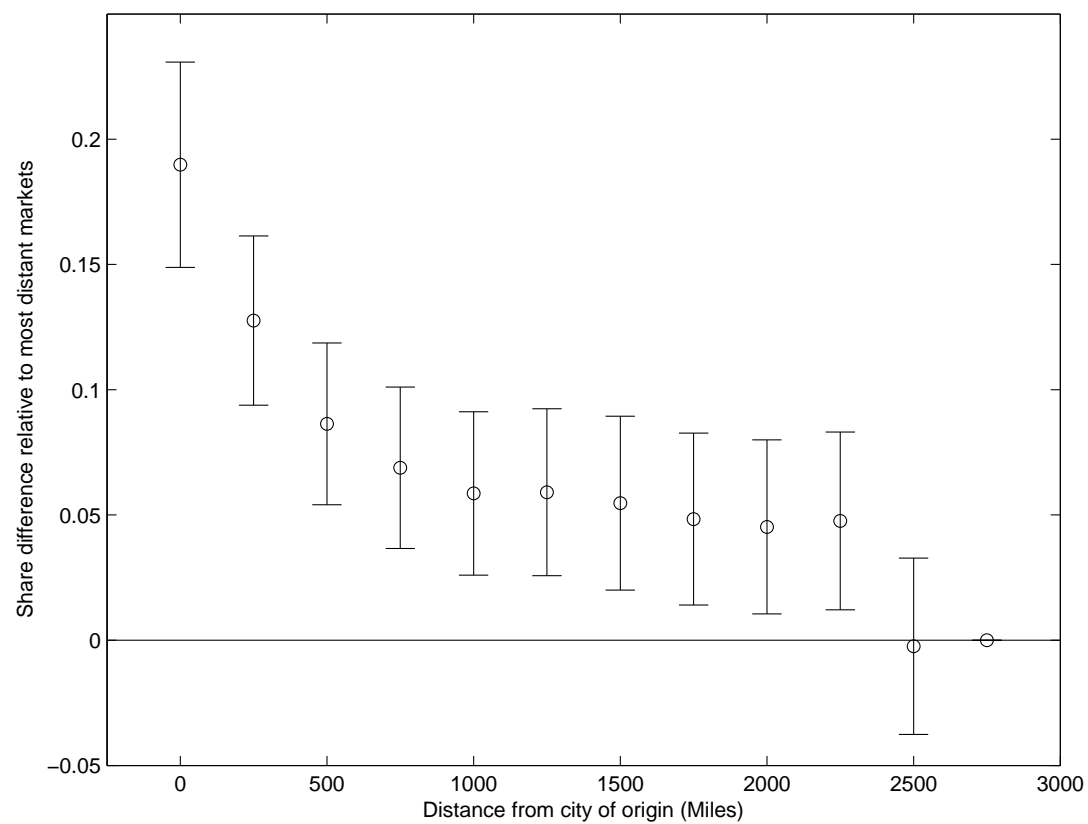


Figure 3: Effect of distance from city-of-origin on market share (net of brand-specific fixed-effects). Whiskers indicate 95% confidence intervals.