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What is This?

Why Restaurants Fail? Part IV: The Relationship between Restaurant Failures and Demographic Factors

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Abstract

Although location is a significant factor in a restaurant's survival chances, contrary to the commonly held belief, the presence of nearby homes did not help in lowering failure rates between 2000 and 2010 for restaurants in Boulder, Colorado. Instead, having a substantial population of apartment dwellers and transient residents (notably, university students) enhanced the restaurants' success, as did the presence of people aged eighteen to twenty-four, those with higher educational levels, non-household families, and low- to middle-income families. Larger restaurants and those with chain affiliation had a greater probability of success than small, quick-service operations. Among the factors that had little effect on restaurant success or failure were unemployment rates, the nature of nearby residents' profession, and the geographical presence of families with children under eighteen. The study's results also support the long-held industry perception regarding avoiding locations where restaurants have already failed. When a location had experienced three ownership turnovers, the study found that the location generally ceased to host restaurants as tenants. As explained further in this article, this is the fourth in a series of examinations of the elements of restaurant success and failure.

The purpose of this study is to examine the connection between certain demographic factors in a market and the failure rates of restaurants in that market—in this case, Boulder, Colorado. This study will build on the three previous studies on restaurant failure rates (e.g., Parsa et al. 2005) that have debunked the myth that nine out of ten restaurants fail in the first year (among other findings).[1] Our purpose was to study restaurants as small businesses, and in that connection we discovered that the definition of small business varies as widely as the reasons for wanting to know that definition. Although the preponderance of restaurants is small by any measure, we conducted a literature review to confirm the definition of small businesses. Peterson, Albaum, and Kozmetsky (1986) surveyed over 900 U.S. citizens who defined a small business as a family-owned entity with only a single outlet in operation. Their findings also indicated that the consumers viewed small businesses as having an average of 10.2 employees, with annual sales of no more than $10 million (and a median of $100,000).

Crutzen (2008) distinguished a small business as having the "power" or ownership in the hands of one person, with many of the business's activities being based on the personality and business acumen of this individual. In this view,

the business's managerial structure is relatively simple and informal, and the owner or CEO has sole responsibility for managing all operational aspects.

Similar to Peterson, Albaum, and Kozmetsky's (1986) consumers, the U.S. Small Business Administration (SBA) bases its definition of a small business on the number of employees and sales levels. Those limits for most non-manufacturing businesses are no more than 500 and sales of $7 million (Summary of size standards by industry, n.d.). Although these size limitations are the controlling factors, the SBA definition also includes the concept that a small business is basically independently owned and operated, is organized for profit, and is not dominant in its field (What

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is SBA's definition of a small business concern? n.d.). Based on the number of employees, the SBA's definition covers the vast majority of U.S. businesses. For example, in Colorado, approximately 98 percent of businesses have fewer than 100 employees, 90 percent have fewer than 20 employees, and 60 percent have from 1 to 4 employees. Nearly 80 percent of the state's wages come from businesses with fewer than 500 employees (Draper 2012).

In summary, the definition of small business used in this study is as follows: it is independently owned and operated, ownership can be viewed as having a "mom and pop" feel, it employs less than 500 employees, and it earns less than $7 million dollars annually. Most restaurants fit this category, because 93 percent of them employ no more than 50 people.

Importance of Small Businesses

As is the case with other small businesses, restaurants play a vital role in job creation and economic growth. The National Restaurant Association's (2012b) *2012 Restaurant Industry Forecast* estimated that total restaurant-industry sales would reach a record high of $631.8 billion in 2012, with 970,000 food-service operations employing over 12.9 million people nationwide. On average, the National Restaurant Association estimated industry sales to be $1.7 billion on a typical day in 2012. In addition, it is expected that 1.4 million jobs in the restaurant industry will be added in the next decade (Facts at a Glance, n.d.). In Colorado, restaurant sales were expected to reach $8.9 billion in 2012, which is a 3.5 percent increase from 2011. In addition, it is expected that restaurant jobs will increase by 12.5 percent over the next decade (National Restaurant Association 2012a). By the same token, because restaurants are small businesses, they are subject to the vicissitudes of the U.S. economy. Just as small businesses experience a large number of job losses during tough economic times (SBA Office of Advocacy 2010), so are they also a driving force in a recovering economy (Dun & Bradstreet 2011).

Definition of Success and Failure

We considered many possible definitions of success and failure for this study, although we eventually adopted the definition used in a previous study on this topic. One set of definitions of failure involves a business's decline (e.g., Weitzel and Jonsson 1989), whereas many include closure or bankruptcy. The challenge in many definitions of failure is that most definitions do not distinguish between business failure and an outright business closure. Watson and Everett (1996b) created five categories to assist with this clarification that include discontinuance of a business for any reason, discontinuance of ownership, bankruptcy or loss to creditors, disposal to prevent further losses, and failure to

"make a go" of it. In a later study, Watson and Everett (1999) determined that failing to "make a go" of it was essentially a neutral or midrange definition that was least likely to exhibit bias based on specific industry segments.

The definitions of success involve similar issues. From one perspective, Ibrahim and Goodwin (1986, 42) stated, "Success in business is defined in terms of rate of return on sales, and age or longevity of the firm." From another perspective, Jennings and Beaver (1997) take into account the intangible goals of the small business owners in defining success. They defined success as "the sustained satisfaction . . . [and] the attainment of certain pre-defined objectives which satisfy stakeholder aspirations" (Jennings and Beaver 1997, para. 20). In a study performed to distinguish between closure and failure, Headd (2003) concluded that even if a firm may fit the profile of a business likely to close and does so, the owner(s) of that business may not see that as a failure.

Looking specifically at restaurants, bankruptcy reports are not a good gauge, because most of the business failures in restaurant franchise systems are never reported out of the fear of brand dilution and potential negative impact on a franchise system. Rather than risk a record of failure, franchisers take a proactive stance and either buy back troubling franchises or resell them to another franchisee without ever reporting to a bankruptcy court system (MauMau 2009). As a result, most of the business failures in the restaurant industry are underreported in official legal documents of the bankruptcy courts. Thus, to overcome the limitations of the many definitions of success and failure, we have used the definition that was successfully used by earlier studies on this topic, where a business failure is defined as a change in business ownership of an existing business irrespective of the reasons behind the ownership turnover. This definition was adapted from the earlier studies on this topic by Watson and Everett (1996b), Parsa et al. (2005), Parsa et al. (2011), and other studies where business failure was defined as change in ownership as reported in local health department records. This countenances, for example, the situation of a restaurateur who is adept at starting a business, but may not be able to run the restaurant once it is launched.

Reasons for Business Failure

Headd's (2003) study investigated the contributing factors to failure, and found that firms with starting capital of $50,000 or more had lower closure rates than those with no starting capital. Headd (2003, 56) also determined that "'success rates generally increased with owner age, number of owners, and previous experience as the owner of another business."

The SBA has compiled a list of factors that purport to explain small business success or failure, based on the publications by Michaels Ames and Gustav Berle (n.d.). These

researchers propose ten top reasons for failure, categorized as follows : lack of experience, insufficient capital, poor location, poor inventory management, over-investment in fixed assets, poor credit arrangement and poor credit management, personal use of business funds, unexpected growth, competition, and low sales (Ames and Berle, n.d.). These results could be compared with a study performed by Lussier (1996), which surveyed 100 entrepreneurs regarding why they failed. The ten most common reasons they gave were undercapitalization and high fixed cost, slow economic activity or recession, creditor problems, slow accounts receivable, tax problems, loss of a major customer, poor management, partners, over-expansion, and theft.

Despite their differences, these two lists share two common themes: poor operations management and a lack of financial knowledge. One more reason for failure could be the absence a written business plan, which might well address the operations and finance issues (Kwansa and Parsa 1990). In a study examining data from Dun & Bradstreet (2012), Perry (2001) found that having a business plan helped in the success rate of the business. The findings indicated that overall, ". . . non-failed firms did more planning than similar failed firms did prior to failure" (Perry 2001, 201).

Failure in the restaurant industry was studied by Parsa et al. (2005). They stated that the following three key factors contribute to restaurant failures: size and type of operation, competition (or concentration of competitors), and restaurant concept or segment. Size is based on the number of units owned. Parsa et al. (2005) found that there was a difference in failure rates between independent operators (with two or fewer units) and franchised ownership (greater than three units). Results show that independent owners had a three-year failure rate of 61.4 percent as compared with 57.2 percent for franchise owners. The second factor, restaurant concentration, emerged from Parsa et al.'s (2005) finding that restaurant failure rates are higher in U.S. Postal ZIP codes where there is a high concentration of restaurants. This extended to downtown locations, which had far higher restaurant failure rates compared with suburban locations. The third factor was an inappropriate segment or type of food served for the market. In this study, Mexican-style restaurants reported the highest failure rate, followed by sub shops, bakeries, coffee shops, and pizza restaurants. In contrast, cafeterias and seafood restaurants had the lowest cumulative failure rates.

The Parsa study also highlighted personal reasons for restaurant failure, based on interviews with several owners of failed restaurants. These issues included owners' operational attitudes, expectations, control, knowledge, skills, and ambition. Other factors included a high "demand of labor and time; poor food-quality controls or low perceived value; being undercapitalized or having poor financial management; and the quality of employees and service, including the amount of turnover" (Parsa et al. 2005, 315). Having an "ill-defined concept" was also a frequent contributor to failure. The study states, "Failed restaurant owners, when asked about their concept, discussed only their food product. They would state that their concept was 'vegetarian food,' or 'Alaskan seafood.' They all offered high-quality foods, but that did not make them successful" (Parsa et al. 2005, 315).

Building on the 2005 study's findings Parsa et al (2010) and Parsa et al (2011) compared restaurant failures of independent operation with that of franchise or chain ownership operations. That study concluded that 25 percent of the independent restaurants would close in the first year versus 10 percent of chain restaurants. This study also highlighted the importance of size and operational complexity. The greater the operational complexity, the higher the chances of success. Finally, the presence of barriers to entry was actually a benefit. Restaurants with low barriers to entry are more than likely to have higher failure rates than larger more complex operations with higher barriers to entry. As we explain below, the study described in this article adds the variables of health inspection records and demographic data to the many possible causes of restaurant success or failure.

Failure Rates Vary by State

The so-called Great Recession of 2007, followed by a slow recovery, was hard on businesses everywhere, but several of the western states had extremely high increases in failure rates during that time. California and Nevada had the highest small business failure rates from 2007 through 2010, and Colorado was ranked fifth in the 2010 failure index (Dun & Bradstreet 2011, para. 5). According to the SBA, in 2008 Colorado had a total of 541,927 small businesses, of which 127,264 were employers and 414,663 were nonemployers (Small Business Profile Colorado 2011).

Demographics and Business Failure

We alluded above to the effect of business owners' demographic characteristics on business success. However, as numerous studies have focused on this issue (e.g., Van Praag 2003), we are taking a different approach to demographics in this study by looking at the demographics of the market, rather than the restaurateur. That said, owner demographics clearly influence restaurant success. Several studies examined a possible gender effect on organizational survival (Kalleberg and Leicht 1991), for instance. Study findings include the following: men are more likely to be self-employed than women (Hisrich and Brush 1984), businesses owned by men have lower failure rates and are more profitable than those owned by women (Aldrich 1989; Bird and Sapp 2004; Cuba, Decenzo, and Anish 1983; Loscocco et al. 1991), but on average, businesses owned by men and

women are equally successful (Chell and Baines 1998; Kalleberg and Leicht 1991).

A number of researchers sought to test the notion that discrimination is one factor that might have made women-owned businesses less successful in the past. Cromie and Hayes (1988) argued that self-employment enables women to fight discrimination and to increase their chance of success. Others claimed that systematic discrimination was a source of lower performance of female-owned businesses (Aldrich 1989). Noting that size is a predictor of success, one alternative explanation for relatively higher failure rates of businesses owned by women is that women operate businesses that are relatively smaller in size compared with businesses owned by men (Loscocco et al. 1991).

The 2005 Parsa study highlighted the owner's family situation as an important predictor of business failure, and other studies have shown that owners benefit from emotional and tangible support from their families (Scase and Goffee 1982). However, family obligations can be distracting to business owners and thus can lead to higher failure rate (Ghiselli, La Lopa, and Bai 2001; Parsa et al. 2005).

A business owner's age was also recognized as a significant determinant of business failure, as Headd (2003) observed that businesses owned by younger owners have higher failure rates. Similarly, an owner's educational level and work experience were directly related to the likelihood of business survival (Boden and Nucci 2000; Brüderl, Preisendörfer, and Ziegler 1992; Carter and Auken 2006). Businesses whose owners had more than ten years of work experience and an appropriate higher education proved to have significantly lower failure rates compared with others (Boden and Nucci 2000).

The owner's race has also been a meaningful demographic characteristic, as research has shown significant racial disparities regarding business ownership. Fairlie and Robb (2008, 1) reported that only "5.1 percent of African American workers and 7.5 percent of Hispanic workers own businesses, compared to more than 11 percent of Caucasian and Asian workers." However, those researchers' big concern is that African American– and Hispanic-owned businesses have lower sales, lower profits, and higher failure rates compared with businesses owned by Caucasian and Asian American owners.

Based on the above discussion, the study described here investigates the effect on restaurant failure of demographic factors not relating directly to the owner, including restaurant size, location (operationalized by ZIP code), neighborhood characteristics, and nature of ownership (chain or independent). We also look at the effect of restaurant turnover at a specific site. Our study is motivated by the following research questions, which we investigated with the secondary data obtained from the local health department.

Research Questions Investigated

Research Question 1: Are restaurant failure rates affected by the nature of the location (measured by U.S. Postal ZIP codes)?

Research Question 2: Is there is a relationship between neighborhood demographic factors (i.e., age, income, family size, homeownership) and restaurant failures?

Research Question 3: Is there a relationship between restaurant failures and the nature of professions in the population?

Research Question 4: Are restaurant failure rates affected by macroeconomic factors such as unemployment?

Research Question 5: Are restaurant failure rates affected by the size of the restaurant (measured by the number of seats)?

Research Question 6: Are restaurant failures related to the complexity of restaurant operations (full service vs. quick service)?

Research Question 7: Are restaurant failures affected by the nature of ownership (chain affiliated vs. independent)?

Research Question 8: Is there a threshold point for number of restaurant failures occurring at a specific location before that location is no longer considered suitable for a restaurant tenant?

We apply a deductive logic approach in which meaningful and testable research hypotheses can be derived from analyzing obtained secondary data (Goldfarb 2003; Railton 1986). Based on the results obtained from the secondary data analysis, we developed testable relationships between restaurant failure rates and selected demographic variables.

Method

Our data were obtained from two sources: U.S. Census data for Boulder, Colorado, for 2000 and 2010, and health department records from the Boulder County Health Department during that decade. In 2010, Boulder's population was estimated to be 118,400, distributed among five ZIP codes. At the time of this data collection in 2010, a total of 496 restaurants were inspected by the Boulder County Health Department in the five ZIP codes in question.

With a relatively small population and few ZIP codes, as compared with large metropolitan areas, we considered the city of Boulder to be a good target for studying restaurant failures. Secondary data on restaurant failures from large metropolitan places come with embedded noise from the tourism arrivals resulting from socio-political activities, professional sports, conventions, and large meetings. Restaurant failures in major metropolitan cities can be affected by various social, political, and cultural activities

Exhibit 1:
Restaurant Failure by U.S. Postal ZIP Codes.

ZIP Code	Failure	Success	Total Restaurants	Grand Total (%)
80301	28.67% (41)	71.33% (102)	143	100.00
80302	21.33% (48)	78.67% (177)	225	100.00
80303	28.17% (21)	71.83% (53)	74	100.00
80304	29.27% (12)	70.73% (29)	41	100.00
80305	15.38% (2)	84.62% (11)	13	100.00
Grand total	24.95%	75.05%	496	

that often take place within larger cities, but are less common in medium-size markets.

Furthermore, major metropolitan cities often comprise multiple health departments, making data collection across various health departments a challenging task that may result in unwanted compromises. We argue that, in the case of midsize towns, changes in restaurant failures can be directly attributed to the demographics of that town. Before choosing Boulder, we considered some of Colorado's small towns, but unfortunately, the sample size for restaurants in small towns was too small to study the demographic factors, and health department records are (once again) difficult to obtain. Moreover, the absence of multiple ZIP codes in most small towns also makes it difficult to compare the effects of different neighborhood demographics. Although we sought a geographical market with the fewest possible distortions, we must note one potential distorting factor, namely, the fact that Boulder is home to the University of Colorado, as we discuss below.

The 2000 and 2010 census data for Boulder, Colorado, were obtained from the U.S. Census Department. The restaurant failure data for the same time period were obtained from the Boulder County Health Department that keeps computerized records of all food-service facilities within the city limits, which it inspects at least annually.

Restaurants must also renew their operating permit annually. When a restaurant permit is not renewed in a timely manner, the health department officials visit the property to check the status of whether the business is still open or has closed. If a restaurant has closed for business, the health department records that closure.

Similarly, any time a restaurant changes ownership, the new owner must apply and receive a new health permit. As any change in restaurant ownership requires a new health department permit, local health departments keep the most accurate and comprehensive record of restaurant openings and closings. Also in the health department records are data on the location of the restaurant, nature of the ownership, name and address of the owners, number of inspections conducted at the restaurant, scores of all health inspections conducted, and any fines levied for violation of the health code. Nevertheless, there are no standardized data collection

methods across health departments, and the quantity and quality of information collected on restaurant ownership may vary across health departments depending on available resources and local laws.

Most health departments, in addition to restaurants, also inspect other food facilities such as theaters, bowling lanes, catering operations, food trucks, commissaries, hospitals, food vendors (street vendors), pool halls and bars, employee cafeterias, and school cafeterias. For this reason, we engaged a culinary expert who has local knowledge to review the census data and health department data to filter out any non-restaurant information and unrelated demographic factors and to delete non-restaurant data points, such as information regarding day care centers, convenience stores, and pool halls. We limited the U.S. Census data to the five Boulder ZIP codes that overlap with the Boulder Health Department data. The categorical data were recoded and analyzed using SAS software.

Results

Results from the data analysis indicated that location makes a difference in restaurant failure, a finding consistent with the earlier studies by Parsa et al. (2011) and Parsa et al. (2005). Among the five ZIP codes, 80301 (28.67%), 80304 (29.27%), and 80303 (28.17%) had the three highest failure rates (see Exhibit 1). Although we present the results for all five ZIP codes here, ZIP code 80305 was not considered further as it had an insufficient number of restaurants ($n = 13$, 2.6%), less than 8 percent of the population, and the lowest population density. As a result, comparisons using that ZIP code may not be realistic.

In terms of demographic factors, two of the three ZIP codes with high failure rates, 80301 and 80304, also had a high percentage (over 66%) of people owning a house. From this observation, we conclude that contrary to the commonly held belief, homeownership does not necessarily help in lowering the failure rate of restaurants in the vicinity. This conclusion is further supported by the fact that the ZIP code 80302, which had one of the highest restaurant success rates (78.67%), also has the highest proportion of renters (62.14%; see Exhibit 2). These results indicate that

Exhibit 2:

Percentage of Homeowners and Renters in the Population by Various U.S. Postal ZIP Codes.

ZIP Code	Owner-Occupied Percentage	Renter-Occupied Percentage	Total Percent Check
80301	66.66	33.34	100.00
80302	37.86	62.14	100.00
80303	45.40	54.60	100.00
80304	67.37	32.63	100.00
80305	62.68	37.32	100.00

Exhibit 3:

Percentage of Population Groups by Age and ZIP Codes.

Age Groups	80301	80302	80303	80304
Eighteen to twenty-four years (%)	10.96	47.38	25.03	10.74
Twenty-five years and over (%)	89.04	52.62	74.97	89.26
Total population (%)	100.00	100.00	100.00	100.00

Exhibit 4:

Percentage of Families with Children by ZIP Code.

ZIP Codes	Families with Children under Eighteen Years (%)
80301	27.50
80302	14.50
80303	20.60
80304	27.40

a high percentage of renters could be more beneficial to the success of the restaurant industry than previously recognized. Apartment dwellers and transient populations, such as students, were found to be contributing to the success rate of restaurants in Boulder. As we noted above, one caveat to these results is that the University of Colorado is located in this Boulder ZIP code. Thus, it may not be apartment dwellers as such who are contributing to the high success rate of restaurants in the university's ZIP code, but the fact that these renters are students.

In that context, we found that restaurant failure rate was also affected by the neighborhood's age group. Where the percentage of the population between the ages of eighteen and twenty-four was highest, restaurant failure rate was found to be the lowest. This again applied to ZIP code 80302, which has the highest percentage of population from the eighteen to twenty-four age group (47.38%) along with the greatest restaurant success rate (see Exhibit 3). A higher percentage of young people (particularly students) could indicate a higher occurrence of eating out and, thus, a higher success rate of restaurants. Although our findings apply to restaurants in general, we note that some sources suggest that people aged eighteen to twenty-four years are most likely to patronize quick-service restaurants (QSRs) at the expense of high-end full-service restaurants (National Restaurant Association 2012a). Ironically, as we explain below, this phenomenon appears not to apply in the vicinity of the University of Colorado.

Students also figure into the next demographic variable we considered, which is family and non-family groups in the vicinity. True to form, the census data for ZIP code 80302, with its low restaurant failure rate, show the highest percentage of non-household families (62.14%). Given this area's restaurant success rate, we conclude that non-household families (unrelated individuals living together, such as roommates) are a contributing factor to the success of restaurants in Boulder. At the same time, ZIP code 80304, with the highest failure rate (29.27%), had the lowest percentage (32.63%) of renters and concomitantly the highest percentage of homeowners (67.37%).

Paralleling the high homeownership rates in ZIP codes with high failure rates, 80301 and 80304, these areas had the greatest percentage of families with children under the age of eighteen years, at about 27 percent each, while student-dominated 80302 had the lowest percentage (14.5%; see Exhibit 4). These results demonstrate that the geographical presence of families with children under eighteen years of age does not necessarily promote restaurant longevity.

Exhibit 5:

Total Family Incomes by U.S. Postal ZIP Codes.

Family Income	80301	80302	80303	80304
Less than $10,000 (%)	5.22	14.96	9.19	4.97
$10,000-$49,999 (%)	39.68	47.59	39.60	36.80
$50,000-$99,999 (%)	30.61	20.77	30.74	31.94
$100,000-$149,999 (%)	15.60	8.77	13.02	13.88
$150,000 or more (%)	8.89	7.91	7.45	12.41
Total (%)	100.00	100.00	100.00	100.00

Our examination of family income revealed an unexpected outcome regarding income and the restaurant failure rate. The ZIP code 80302, with its low restaurant failure rate, had the highest percentage of families with incomes less than $49,999 per annum. Although the presence of the University of Colorado students may again be driving this outcome, these findings demonstrate that middle- and low-income families do in fact support the restaurant industry. This observation extends to the fact that the ZIP code 80304 with its relatively high restaurant failure rate also had the highest percentage (26.29%) of high-income families (over $100,000; see Exhibit 5). These findings suggest that annual family income is inversely related to the success rate in the nearby restaurant industry.

This finding seems counterintuitive, as one would expect high-income families to be spending more while dining out. Our methodology sheds no direct light on that question, but we may infer that the home-owning upper income families have a frequency of eating out that is less than that of middle- and low-income families. As the percentage of high-income families in the general population is relatively low, our results indicate that the restaurant industry is not receiving the benefit of their wealth and their residence in the neighborhood. At the same time, low- and middle-income families may be spending less per visit at a restaurant, but a larger proportion of them may be eating out and doing so frequently, resulting in higher levels of restaurant revenues.

A contrary explanation may be that high-income families are, in fact, supporting the industry, but are doing so by traveling to high-end, formal, destination restaurants located away from town. We make this suggestion in part because most of Boulder's high-end neighborhoods restrict the locations of restaurants and other commercial activities, so the city has only a limited number of high-end, formal, destination restaurants. Given the absence of nearby suburban restaurants, one could argue that high-income families are forced to drive to a destination restaurant, and it appears that once they are in the car, their disposable incomes are mostly benefiting the restaurant business outside the city.

One other possibility (suggested by a perceptive reviewer) is that the residents of the high-end neighborhoods could be traveling to Boulder's middle and low-end neighborhoods for dining out. That would argue that the success of the restaurants in low- and middle-income neighborhoods may not be attributed totally to the residents of those neighborhoods, as residents of high-income neighborhoods could also be contributing partially by driving there to dine out. So, not only are there a limited number of restaurants in high-end ZIP codes, but those restaurants struggle, while those in neighboring ZIP codes of modest means are surviving. Further investigation exploring the relationship between restaurant failures and economic geography, residential zoning codes, and property development practices is highly warranted.

We also considered the effects of the economy, as represented by the unemployment rate. It appears that there is a direct relationship between the local unemployment rate and restaurant failure, given that ZIP code 80301, with the highest unemployment rate (7.8%), also had one of the highest restaurant failure rates. This indicates that the unemployment rate could be an important factor in evaluating the status of the restaurant industry, and it supports the work of Smith (1983), Parsa et al. (2013), and many others who showed a direct relationship between restaurant failures and unemployment.

The nature of the professions within a geographic area does not seem to affect restaurant failure rate, but the level of education might have an effect, given the high percentage of college graduates in ZIP code 80302 (72.2%) and its low failure rate. Again, there seems to be little doubt that Boulder's status as a campus town drives this phenomenon.

Our finding regarding restaurant size and success echoes that of Parsa et al. (2011). It seems that the larger the restaurant, as measured by the number of seats, the higher the probability of success. This conclusion is supported by the situation in the ZIP codes with the highest restaurant failure rates, 80304 and 80303, which had the highest percentage of small-size restaurants (97.56% for 80304 and 92.96% and 80303). By contrast, ZIP code 80302 with its lowest failure rate also had the lowest percentage of small-size restaurants (83.11%) along with the highest percentage (12.89%) of midsize restaurants (100-200 seats) and the second highest percentage (4.00%) of large-size (over 200

Exhibit 6:
Restaurant Success and Failure Rates by Size of a Restaurant (Number of Seats).

Postal ZIP Codes	80301	80302	80303	80304
Failure %	28.67	21.33	28.17	29.27
Success %	71.33	78.67	71.83	70.73
No. of seats	80,301	80,302	80,303	80,304
0-100 seats (%)	83.22	83.11	92.96	97.56
101-200 seats (%)	10.49	12.89	7.04	0.00
Over 200 seats (%)	6.29	4.00	0.00	2.44

Exhibit 7:
Composition of Restaurant Types by ZIP Codes.

ZIP Code	Full-Service Restaurants (%)	Quick-Service Restaurants (%)
80301	43.36	56.64
80302	52.00	48.00
80303	40.85	59.15
80304	48.78	51.22
Total	47.46	52.54

seats) restaurants (see Exhibit 6). It can also be explained by the fact that larger restaurants with high number of seats also require high initial capital, thus requiring greater scrutiny by the lenders. Moreover, the high capital requirement of larger size restaurants discourages inexperienced and undercapitalized entrepreneurs from entering this arena, which helps to ensure the higher rate of success for larger size restaurants. An alternative explanation would be that inexperienced and undercapitalized entrepreneurs are most likely to open smaller size restaurants thus contributing to the greater percentage of restaurant failures.

Our investigation of the relationship of failure rates with the style of service (i.e., full service vs. quick service) found that the higher restaurant failure rates occurred in the ZIP codes with a higher percentage of QSRs (i.e., 80303, with 59.15% QSRs, and 80301, with 56.64% QSRs; see Exhibit 7). At the same time, ZIP code 80302 had the highest percentage (52.0%) of full-service restaurants. This is ironic, given the presence of the university and the presumption that young people are more likely to patronize QSRs. That tendency is apparently not sufficient to offset the effects of size, but another factor here is the presence of university staff members, who presumably would seek out a full-service or fast-casual restaurant. Most full-service restaurants tend to be larger in size and also offer lucrative alcohol service, whereas QSRs tend to be smaller in size with limited or no alcohol service. Our observation here that high restaurant failure can be attributed partially to the style of service is consistent with Parsa et al. (2011). Another finding from this study that supports previous studies (International Franchise Association 2010; Khan 2014; Walker 2012) is

that chain restaurants had lower failure rates (21.43%) compared with non-chain independent restaurants (33.33%).

Finally, we investigated the phenomenon of "fatal attraction" that is often noted in the restaurant industry. Despite the fact that a failed location is usually not a good choice, restaurateurs continue to open a new concept in a location where a restaurant has failed earlier, on the grounds that the new concept will succeed where others have failed (Parsa et al. 2013). There is a certain logic to this approach, as a person can minimize the initial investment required to open a restaurant by using the equipment from a defunct restaurant(Naylor 2010). Non-removable fixtures such as heating, ventilating, and air conditioning (HVAC) systems usually are not removed due to the cost of doing so. As a result, failed restaurant locations often become potentially fatal attractions to prospective restaurateurs who are seeking a location with low initial capital investment (i.e., low entry barriers) to open their new venture. Eventually, after enough restaurants have failed in a particular location, building owners will no longer lease the property to a restaurateur. Interestingly, one of the coauthors of this article has personally experienced this phenomenon. In 2007, he visited the restaurant location that he had opened and managed few years earlier in Oklahoma City, Oklahoma. That particular site, after going through the fatal attraction phase and several restaurant ownership turnovers, eventually was converted to a neighborhood pharmacy owned by a national drugstore chain.

Our data from Boulder indicate that the fatal attraction limit is reached after the third ownership turnover, and restaurants are no longer considered for the fourth ownership

Exhibit 8:
Restaurant Failure Rates after Successive Ownership Changes at the Same Location.

No. of Successive Ownership Changes at the Same Location	% Closed	% Still in Business
0	21.72	78.28
I	20.16	79.84
2	33.33	66.67
3	5.88	94.12
4	0.00	100.00
5	0.00	100.00
6	0.00	100.00
7	0.00	100.00
Grand total	21.10	78.90

turnover. Thus, one can conclude that restaurant ownership turnover at a particular site could happen up to a maximum of three times (see Exhibit 8), after which it is likely that the location would cease to function as a choice for restaurateurs and be converted to a non-restaurant business site. This can be explained by the fact that most property owners prefer to have reliable tenants who are willing and able to pay rent while retaining an attractive business. When repeated business failures occur in the same location (about three times) as restaurants, to maintain the brand value of the location and the rest of the shopping area and to build a steady cash flow, most property owners may prefer to attract businesses other than restaurants.

Conclusion

Our investigation of the role of local demographic factors on restaurants presents the first empirical evidence regarding the effects of various neighborhood demographic factors on restaurant failure rates. Contrary to the common belief, having homeowners nearby was not found to be effective in aiding restaurants' viability, while a substantial number of apartment dwellers and a transient population were found to contribute to restaurants' success. Similarly, non-household families appear to contribute to the success of Boulder's restaurants, most likely due to the presence of a substantial number of students. This was unexpected, and further research is needed to determine whether these effects pertain to non-campus towns. In another finding that is probably driven by the university, level of customer education was found to have an effect on restaurant failure. ZIP codes with a low failure rate had a higher percentage of college graduates, but customers' type of profession had no relationship to restaurant failure. Restaurant size and location seem to influence restaurant failure rate, with larger restaurants having a greater success rate. Full-service restaurants, which are generally larger than quick-service operations, had a lower failure rate than QSRs. Finally, the current study empirically shows that fatal attraction of restaurant locations may cease to attract new restaurant entrepreneurs after it has been leased three times to the failed restaurateurs.

We have already mentioned the chief limitation of this study, which is the presence of the University of Colorado in one of Boulder's ZIP codes. We also note the use of secondary data as a limitation, especially as these data do not permit reporting or testing of null hypotheses. As the restaurant failure data obtained from the Health Department of Boulder were combined with aggregated Census data, each restaurant in a given ZIP code received the same value from the census data. Hence, it was, for example, not possible to compute an "SSE (within sum of squares)" for an analysis of variance (ANOVA) test. Due to this unfortunate limitation, the analysis was restricted to observations. Similarly, from the current data, it was not possible to differentiate between various restaurant segments from a marketing perspective, or to test the potential skew from the proportion of college students in the town of Boulder.

Future research should investigate the research questions presented here with primary data and alternative research methods. Future studies may include geographic information system (GIS) mapping of restaurant failures by ZIP code, street location address, or demographic segmentation. Given the importance of the restaurant industry, we see such a study as being important for city planners, economic geographers, urban planners, local utility companies, labor departments, banks and lenders, and investors. Research investigating how the restaurant industry could best be supported and encouraged with tax incentives and other tax-related benefits on par with manufacturing industries could also be a worthwhile cause to pursue.

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Note

1. Interestingly, no one has been able to identify the source of this canard, which apparently developed in the 1990s and was popularized by a report from American Express. Despite its being debunked numerous times, it continues to be repeated. For example, see http://blogs.msbcollege.edu/2013/05/10/90-percent-of-new-restaurants-fail-does-a-business-degree-make-a-difference/.

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