THE PRODUCTION DECISIONS OF LARGE COMPETITORS: DETECTING COST ADVANTAGES AND STRATEGIC BEHAVIOR IN RESTAURANTS

by

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Abstract

This paper evaluates firm profitability in the highly competitive restaurant industry by comparing variation in firm size and production decisions with variation in market size. In the Census microdata, I find that multi-unit firms operate a greater number of restaurants and larger individual restaurants in larger MSAs. They also increase production intensity by increasing production during operating hours, extending operating hours, increasing the volume of meals and non-meals output. These results are generally consistent with full capacity exploitation in efficient firms, rather than underutilization by firms seeking to limit rivalry through excess capacity or product proliferation.

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1 Introduction

In this paper, I show that multi-establishment restaurant firms in more populous MSAs exploit resources more intensively and generate more revenue from each restaurant than do firms in smaller MSAs. These findings support the view that large markets support larger, more efficient firms. They do not support the view that large firms maintain excess capacity or own a range of restaurants to deter entry in their markets. These firms typically do not belong to large national chains and average productivity at individual restaurants does not vary significantly with market size. These findings suggest that efficiency gains accrue at the firm level, not from advertising or scarce resources at individual restaurants. I also find that multi-establishment firms own a larger number of restaurants in more populous MSAs. These tend to have the same menu type but different locations, suggesting that efficiency gains are specific to restaurant type.

There is a long tradition in industrial organization of studying the relationship between market structure and profitability using variation in market size, going back to Bain's structure-conduct-performance paradigm and recently extended by Sutton (1991), Bresnahan and Reiss (1990, 1991), and Campbell and Hopenhayn (2005). I apply the approach to the restaurant industry in large urban markets and find a strong positive relationship between both firm revenue and establishment revenue with market size. This means that both firm-level and establishment-level profitability are positively correlated with market size in this industry. This could be due to cost advantages or the application of market power to limit competition. To evaluate the economic mechanisms behind the structure and market size relationship, I examine firms' production decisions at the firm level and at individual restaurants.

Two main approaches to explaining a positive relationship between profitability and market size are efficiency gains, proposed and tested in Demsetz (1972) and Peltzman (1977), or entry deterrence arguments such as those advanced by Spence (1977), Milgrom and Roberts (1982) and Schmalensee (1978). I examine a broad empirical prediction that differentiates between these views, namely, that capacity utilization should be high in large firms to reflect efficiency gains and low under entry deterrence strategies. I find evidence of more intensive production during operating hours and of primary products, rather than restricted capacity utilization or product proliferation. This suggests that efficiency gains, rather than entry deterrence strategies, contribute to greater profitability for restaurant firms in larger markets.

In Section 2, I describe the restaurant industry in large urban markets, outlining some sources of efficiency gains and entry deterrence strategies that could be important in this industry. Section 3 points out unique features of the data and defines variables for empirical work. Section 4 contains the empirical findings. Section 5 summarizes these findings and concludes.

2 Some Determinants of the Size and Structure of Firms

I examine firm and restaurant revenues in MSAs to evaluate some determinants of firm size and structure in competitive markets that can be broadly classified as efficiency gains and strategic behavior arguments. These two views differ in the mechanism by which profitability remains high in large markets and therefore in their predictions for capacity utilization. The efficiency gains arguments suggest that high profitability does not induce entry because entrants cannot replicate the cost advantages of existing firms.

The strategic entry deterrence view suggests that entry would erode profits, generating incentives for preemptive actions to block it. This means that large firms should exploit their resources more intensively to reap efficiency gains while large firms should under-utilize their inputs to benefit from strategic flexibility.

The restaurant industry in large urban markets is a highly competitive environment, with few barriers to entry, relatively low scale economies at the establishment level, large numbers of buyers and sellers, competitive suppliers, and many substitutes for restaurant service. The typically urban market consists of a large number of relatively small stores that mostly earn low profits. Restaurants are differentiated along multiple dimensions and depend heavily on human input. They may benefit from having a superior product or from superior technology. This may allow successful restaurants to exercise some market power. In the following subsections, I discuss possible efficiency gains from fixed restaurant-level inputs, advertising outlays and entrepreneurial input, as well as strategic advantages from excess capacity and excess differentiation.

For a unified framework, consider a market with a large number of consumers. Assume that consumers are distributed across geographic space and have diverse tastes for restaurants. A typical firm's problem consists of two stages. In the first stage, a potential entrant decides whether or not to enter the market. If it chooses to enter, it also decides how many stores to own, the location, brand name and type of restaurant service produced at each store. It also chooses fixed investments in learning and advertising at this stage. In the second stage, firms that have entered the market choose prices to maximize profits at each store. They may also vary opening hours and product lines at each store to regulate output. Fixed investments from the first stage affect firms' cost and

demand structure in the second stage. In equilibrium, market prices are such that every establishment has positive market share.

2.1 Efficiency Gains

In a competitive environment, greater overall demand in larger markets may motivate firms to exploit scale economies from fixed resources or undertake sunk investments that reduce costs or improve product quality. More successful producers then justifiably supply a larger share of the market. Sutton (1991) shows that endogenous fixed costs can lead to concentrated structure in large markets. Firms that increase production to exploit efficiency gains should experience higher rates of return to inputs, longer operating hours or greater variety of output. Demsetz (1972) and Peltzman (1977) articulate this idea and examine rates of return in manufacturing industries. In this subsection, I examine predictions for different types of cost advantages. In general, efficiency gains at the restaurant level should generate higher productivity for restaurant-level inputs. Increasing returns to advertising or brand value should show up most readily in large national chains. Advantages from experience and ability should increase capacity utilization at the restaurant level and firm level. They may lead to greater volume or greater variety of output per unit of input.

One source of increasing returns to restaurant production could be human and physical capital at the store-level. This could be due to scarce managerial skill or fixed investments in equipment and production technology. Restaurant workers may possess unique knowledge of their production process or environment that cannot be easily transferred to other firms. Restaurant-level efficiency gains imply that large firms should

operate single large restaurants. Furthermore, scale economies should generate higher rates of return to variable inputs at the restaurant level. Demsetz (1972) and Peltzman (1977) find evidence for cost advantages in large manufacturing firms. The following simple propositions that will examined in the data for restaurants.

Proposition 1.1 If scale economies at the restaurant level fully account for firm size differences, then large firms find it profitable to operate single large restaurants.

Proposition 1.2 If scale economies accrue at the restaurant level, then variable inputs such as labor generate higher rates of return at larger restaurants.

Advertising outlays may provide another source of scale economies in this differentiated products industry. Since consumers in this industry have diverse tastes and non-negligible transportation costs, profitability depends on restaurants' efforts to inform consumers of characteristics such as type of meal, type of menu, quality of service and physical location. Advertising costs are largely invariant to the scale of production and can be spread across different restaurants if they have similar characteristics. Sutton (1991) shows that endogenous investments such as advertising that increases demand lead to concentrated industry structure. In fact, the restaurant market supports several large national chains that spend a significant amount on advertising and marketing. Chains offer standardized services and benefit most readily from shared advertising. Increasing returns to advertising should be most readily detected in chain store revenues.

A firm's advantage may also lie in a superior business concept or brand. Since intense competition and diverse tastes are key characteristics of this industry, a firm that develops a better product or a more efficient way to produce will capture a larger share of demand. If entrants cannot easily replicate the business concept, then the firm can exploit its

unique resource by expanding in larger markets. Such efficiency gains imply that large firms should operate multiple large restaurants that offer the same product. In fact, firms that belong to national chains where the business concept is a legal asset, namely a brand with protected trademarks, should benefit the most and capture an increasingly large share of the market. This would be observationally equivalent to the effect of increasing returns to advertising. Both these ideas generate the following prediction for restaurant production in large chains.

Proposition 2 If scale economies in advertising or superior business concepts explain differences in firm size, then firms that belong to large national chains should benefit most from common advertising or from tried and tested methods and therefore, show the largest changes in profitability with market size.

Ability may grow from learning and experience, generating a scarce resource embodied in a firm's owners or employees that may not be easily transferred to other firms. Since the restaurant business is notoriously difficult, with fast-paced production and highly capricious demand, skill in organizing the diverse activities involved in restaurant production crucially affects profitability and probably accumulates through practice. Acquired ability of this sort may transfer more readily to similar types of production activities. Firms may exploit this advantage by expanding their production of existing product lines or by establishing additional restaurants that produce similar types of services. Acquired ability may also transfer to restaurant production in general. In this case, firms may expand the range of products at individual restaurants or establish restaurants producing different types of services.

Exogenous ability endowments may also generate cost advantages for firms. Some entrepreneurs may have a talent for generating new restaurant concepts or be better at operating restaurants. If the unique resource is creativity in generating ideas for new restaurants, then large firms should own increasingly diverse restaurants in larger markets. If entrepreneurial skill is more general, large firms may own either similar or diverse types of restaurants. Notice that creativity in new concepts or processes would probably not be advantageous in large national chains where it is difficult for independent owners to modify production techniques and restaurant characteristics. The following propositions contain these ideas.

Proposition 3.1 If efficiency gains that account for differences in firm size are specific to type of restaurant service, then firms should produce more of the same type of service in larger markets. They may produce more intensively at existing restaurants or own more restaurants that provide similar services.

Proposition 3.2 If general skill in restaurant production accounts for differences in firm sizes, then large firms may produce more of similar products or a greater variety of products in larger markets.

Proposition 3.3 If scarce talent for new restaurant concepts accounts for differences in firm sizes, then large firms should own a variety of restaurants and greater variety in larger markets.

2.2 Strategic Entry Deterrence

Alternatively, larger markets may support strategic behavior by firms to limit competition. In this case, producers that successfully exercise market power supply a

larger share of the market. They are able to maintain high profits even if they do not possess superior technology or products because entry would erode prices to unsustainable levels for new firms. This type of advantage usually depends on the ability to pre-commit to intense price competition after entry, due perhaps to first-mover advantage.

One type of entry deterrence strategy described by Spence (1977) and Milgrom and Roberts (1982) is for firms to build excess capacity, making a credible commitment to produce more output at low prices if entry occurs. This makes it unprofitable for new firms to enter. In equilibrium, firms in the industry have large capacity and low intensity of exploiting this capacity. If markets are geographically segmented, firms may operate large overall capacity by having a large number of small restaurants in different regions. While firms may be larger in larger markets, individual restaurants owned by these firms are not necessarily larger in larger markets. If excess capacity serves to ward off entry, large firms should under-utilize their production capabilities. This means that large firms should not generate higher returns from inputs, stay in operation for longer or produce a greater volume or variety of products in larger markets, even though they possess the ability to do so.

Schmalensee (1978) shows that firms can limit competition in the market by producing a range of differentiated products, leaving no profitable niches for new variants. Models of competition with differentiated products such as Hotelling (1929), Salop (1979), and Anderson et al (1992) show that entrants will not produce goods with intermediate attributes if consumers are unwilling to substitute between similar variants. This type of strategy predicts that large firms own a large number of small restaurants

that serve different groups of consumers. This means that large firms should operate a variety of restaurants, with greater variety in larger markets. If localized competition dominates, firms should own a range of restaurants in close physical proximity to block entry in their neighborhoods. If consumers have strong preferences for product attributes, firms should spread their production across geographic submarkets. These ideas generate two simple predictions for large firms.

Proposition 4.1 To deter entry, firms should have idle capacity. Firm output may increase with market size but production intensity should not rise with market size.

Proposition 4.2 To deter entry in geographic submarkets, firms may own restaurants in different locations. To deter entry in product characteristics space, firms may own different types of restaurants. Physical dispersion or variety within firms should increase with market size.

3 Data

The primary data consist of establishment level observations of revenues, components of revenues and firm characteristics from the 1997 Census of Retail Trade (CRT) for the food services industry. Markets are defined as Metropolitan Statistical Areas (MSA), with market demographics from 1994 County and City Data Book (CCDB). A secondary dataset contains the same information for non-MSA counties and counties that are single-county MSAs. A firm is defined as a tax-paying entity. An establishment, unit, restaurant or store is a discrete restaurant unit. A single-unit firm owns one restaurant. A multi-unit firm owns multiple restaurants. Each commonly-owned restaurant is referred

to as a multi-unit establishment. A national chain is one of fewer than 200 of the largest chains nationwide, as ranked by Nation's Restaurant News in 2003.

I measure firm size with establishment level revenues. These are available for all establishments in the survey. Other measures of size are number of employees and seating capacity. These variables are highly correlated with establishment revenues. I examine the decomposition of revenue into sales by day parts and product lines. I also examine restaurant characteristics, menu type and zip code location. Information for seating capacity, sales by day parts, product lines and menu type exist for a subset of firms, with sampling weights provided by the Census.

I measure market size with total population and population density of each MSA. Total population represents the maximum number of potential consumers facing a restaurant in an urban market. Population density may be an accurate of market size if restaurant demand is geographically localized. The empirical results for total population are described in this paper and results for population density are qualitatively identical.

I include other MSA demographic characteristics to control for variation in demand for food service across markets. The percentage change in total population over 10 years shows if an urban area is growing or in decline, an important indicator of the demand for restaurants. The income distribution, age distribution and racial characteristics in a market may also affect the demand for food service or type of food service. The composition of households affects the demand for food service away from home. Two variables, the percentage of one-person households and the percentage of households composed of married adults with children under 18, are included as controls. The percentage of total population housed in group quarters also affects the demand for

restaurant service since group quarters are often equipped with cafeteria service and limited kitchen facilities. The unemployment rate reflects general economic conditions and the propensity to spend on food service. The incidence of serious crime may affect residents' propensity to leave their homes, as well as reflect general economic conditions in a market. The percent of total population working outside their county of residence and average travel time to work accounts for the amount of regular travel within the MSA, reflecting the mobility of potential restaurant customers.

I include establishment and firm characteristics to account for variation in demand and cost conditions for different types of restaurants. The number of months in the survey year that an establishment is in business controls for seasonality in different types of businesses and variation in demand across markets. For firms, I use the average number of months in business across commonly-owned establishments. According to publicly available data from the 1997 Business Expenditures Survey (BES), payroll accounts for 49% of total variable expenditures for a typical restaurant. To control for variation in wage costs that are specific to each restaurant, I include establishment average wage, defined as total payroll divided by total employment, as a right hand side variable in establishment level analysis. For firm-level analysis, I use the average across establishments of establishment average wage to account for wage costs. In market-level analysis, the average across establishments in the MSA is included to control for market wage costs. The length of time that a restaurant has been in business is often correlated to lower costs and more stable demand through learning, reputation effects or survivorship bias. I obtain the first year that an establishment appears Census surveys from the Longitudinal Business Database (LBD). Since restaurants often fail or succeed

within a year, this should account for learning, reputation effects and survivorship bias. For firm-level analysis, I use the earliest first year of establishments owned by the same firm to account for firm-level vintage. The LBD also provides zip codes for establishments in the data.

4 Empirical Results

I first compare establishment revenues with market size for different types of firms to show how the size and structure of competitive firms varies with market size in the data. I then examine production intensity in restaurants belonging to multi-unit firms and the characteristics of commonly-owned restaurants to determine if efficiency gains or strategic behavior can help to explain variation in profitability

The appendix contains tables of statistics and model estimates. For model estimates, each column in a table represents a different specification. The top number in each cell is the coefficient estimate for the corresponding independent variable and the bottom number is its standard error. Observations on seating, day part sales, product line sales and menu type are weighted by Census sampling weights, designed to generate representative aggregate statistics for each market. Standard errors are clustered by market to allow for correlated variability in establishment and firm characteristics within markets but not across markets.

4.1 Firm Size and Restaurant Size in MSAs

To show how establishment size changes with market size, I run linear regressions of the form

$$\log(rev) = \alpha + \beta \log(totalpopulation) + \gamma X + \varepsilon$$

where X represents a vector containing the market and establishment characteristics variables described in Section 3. Table 1 contains the OLS estimates for three samples, all establishments, single-unit establishments and multi-unit establishments, models (1) through (3) respectively. Model (1) shows that, taking all establishments, individual establishment revenues increase by 0.04% for a 1% increase in total population. This is qualitatively similar to Campbell and Hopenhayn's (2005) results that average establishment size increase with market size in this and other retail industries. Models (2) and (3) show that the relationship between establishment size and market size varies for single and multi-unit establishments. For single-unit establishments, the estimated change in revenues for a change in total population is -0.02% for a 1% increase in total population, which not significantly different from zero at the 10% level. For multi-unit establishments, revenues change by 0.04% for a 1% increase in total population, significant at the 1% level. Notice that the magnitude is equal to that for all establishments, indicating that variation in multi-unit establishment revenues accounts for the estimated variation in average establishment revenues.

Model (4) shows how the number of stores owned by multi-unit firms changes with market size. It has the form

$$\log(numberofstores) = \alpha + \beta \log(totalpopulation) + \gamma X + \varepsilon$$

The vector, X, contains firm-level characteristics instead of establishment level characteristics. The number of stores owned by a multi-unit firm increases by 0.13% for a 1% increase in total population. This is significant at the 1% level. This means that the

number of stores, as well as store revenues, increases with market size for multi-unit firms.

It is also interesting to note that other estimates in this table indicate that single-unit restaurants are larger in MSAs with higher 10-year population growth rates but not multi-unit restaurants. Multi-unit firms have a greater number of restaurants in faster growing MSAs. Establishments that are in business for more months in the survey year have higher revenues. Establishments that have higher average wages also have higher revenues. Establishments with later first years have lower revenues. Multi-unit firms that are in business for more months on average own fewer individual restaurants. The number of restaurants owned is independent of the average wage rate. Multi-unit firms with later first years own fewer numbers of restaurants.

Total population may be a poor measure of market size for individual restaurants in large markets. This could be especially true for single-unit restaurants that draw on local demand. Measurement error could bias the coefficient estimates for single-unit establishments more towards zero than estimates for multi-unit establishments. I examine alternative market size measures, population density in MSAs and total population in small markets, reporting the estimated effects with standard deviation in brackets. For a 1% increase in population density, single-unit establishment revenues change by -0.008% (0.01%), not significantly different from zero. Multi-unit establishment revenues increase by 0.04% (0.01%) for a 1% increase in population density, while the number of restaurants owned by a multi-unit firm increases by 0.05% (0.01%) for a 1% increase in population density, both significant the 1% level. These findings are similar to those with total population, indicating that mismeasurement of

localized demand does not account for the differences in single and multi-unit restaurants.

In non-urban counties and single-county MSAs where the population is smaller overall and less geographically segmented within market, total population may be a more accurate measure of market size than in large MSAs. Similar analysis shows that single-unit establishment revenues change by -0.01% (0.01%) and multi-unit establishment revenues increase by 0.10% (0.02%) for a 1% increase in total population in these markets. The number of restaurants owned by a multi-unit firm increases by 0.15% (0.01%) for a 1% increase in total population. The negative estimates for single unit revenues support the idea that previous results are not significantly biased by measurement error. The magnitudes of these effects are larger than those for urban markets, indicating that increasing firm size with market size is a robust feature of the restaurant industry.

The fact that store size and number of stores increases with market size implies that multi-unit firms capture a larger share of the market in larger MSAs. In fact, Table 2 shows that establishment share and revenue share of multi-unit firms increase with total population across MSAs. The number of multi-unit establishments relative to total establishments increases by 0.05, significant at the 1% level, for an incremental change in log total population. The total revenue from multi-unit establishments relative to total industry revenue increases by 0.09, significant at the 1% level, for an incremental change in log total population.

The analysis shows that large firms expand output by expanding the number of restaurants as well as production at each restaurant as market size increases. This

indicates that production capabilities are not best exploited by owning a single large restaurant and are not consistent with Proposition 1.1. Restaurant-level cost advantages are not sufficient to explain the variation in firm and establishment sizes.

4.2 Multi-Unit Establishments and National Chains

This section shows that the difference between single and multi-unit establishment does not arise from differences between non-chain and chain establishments. Firstly, the terms, multi-unit and single-unit, are not equivalent to chain and non-chain. While 92% of single-unit establishments are non-chain establishments, 8% representing 18174 establishments are chain units. More importantly, 34% of multi-unit establishments are non-chains. The numbers of establishments that fall into each category are found in the observations counts in Table 3.

This table also shows that multi-unit establishments that are chains are not significantly larger in larger markets while multi-unit establishments that are not chains are significantly larger in larger markets. Columns (1) through (4) display results from linear regressions comparing establishment revenues and total population for four samples, single-unit non-chain establishments, single-unit chain establishments, multi-unit non-chain establishments and multi-unit chain establishments, respectively. For single-unit non-chain and single-unit chain revenues, the coefficient estimates are small in magnitude and not significantly different from zero. Multi-unit non-chain revenues increase by 0.05% for a 1% increase in total population, significant at the 1% level. Multi-unit chain revenues increase by 0.003% for a 1% increase in total population, not significantly different from zero at the 10% level.

This shows that the positive relationship between multi-unit establishment size and market size is accounted for by *non-chain* establishments. Since chain establishment revenues do not vary with market size, these findings are not consistent with Proposition 2, suggesting that advertising and brand value are not sufficient to explain the variation in firm sizes.

4.3 Production Intensity at Multi-Unit Restaurants

Production intensity may be reflected in the rates of return to factors of production such as employees and seating facilities. The composition of total revenues by sales in different day parts shows how resources are exploited over time. The breakdown of sales by product lines shows how equipment and labor are used to generate different types of output. These data help to uncover variation in capacity utilization.

4.3.1 Average Productivity

The rate of return (ROR) is defined as the ratio of revenue net of payroll relative to total revenue and provides an indication of the average productivity of a restaurant. Total revenues divided by the number of seats provides an indication for the average return to physical capital. Total revenues divided by the number of employees indicates the average return to a worker.

Table 4 presents summary statistics for these variables in single-unit and multi-unit establishments. On average, multi-unit establishments have more than twice as much revenue, employees and payroll as single-unit establishments. They also have more

seating capacity. They have nearly identical average ROR and revenues relative to employees and higher revenues relative to seats than single-unit establishments. These figures indicate that multi-unit establishment employ more inputs and generate more output but do not exploit their resources more intensively than single-unit establishments.

Furthermore, average productivity measures do not increase and even decline with market size. Table 5 presents the results. The number of employees and seats at multi-unit establishments increase by 0.04% and 0.06% for a 1% rise in total population, respectively, which are similar to the percentage change in revenue. ROR declines by 0.001% and revenues per employee declines by 0.01% for a 1% rise in total population. These estimates are significant at the 1% level. Revenues per seat rise by 0.002% but this is not significantly different from zero.

These results indicate that multi-unit restaurants do not exploit their resources more intensively than single-unit restaurants and do not become more productive in larger markets. This contradicts Proposition 1.2 and does not support efficiency gains at large restaurants. For a broader view of capacity utilization in large firms, I next examine how multi-unit restaurants exploit their resources over time and product lines.

4.3.2 Production by Day Parts

In the Census survey, the 24h day is divided into four day parts, 6am-11am (day part1), 11am-5pm (day part 2), 5pm-11pm (day part 3) and 11pm-6am (day part 4), with restaurants reporting sales in each day part. Table 4 compares sales by day parts in single and multi-unit establishments. The main difference is one of scale. Revenues in each day part are, on average, twice as large in multi-unit establishments. The distribution of

sales across day parts is similar for both types of restaurant, with a nearly even split between lunch and dinner. Notice that the day part 4 has a larger share in multi-unit restaurants. On average, both types of restaurant are open for two to three day parts and make roughly 60% of total sales in a single day part.

Since breakfast, lunch and dinner foods and service generally differ, even in the same restaurant, service across these day parts represents differentiated products. Restaurants that stay open late at night generally offer an identical or reduced form of the dinner menu. Increased sales during a day part represent increased volume of service for the same meal. Increased sales across day parts represent sales of different types of meals.

Table 6 shows how revenues in each day part vary with market size in multi-unit establishments in OLS regressions similar to previous specifications. The estimated effects of total population are 0.03, 0.02, 0.05 and 0.11 for sales in day parts 1 through 4, respectively. The first two are relatively small in magnitude and not significantly different from zero. The last two are significant at the 1% level. This means that multi-unit establishments increase dinner sales and late night sales but not breakfast or lunch sales. The last column shows that the estimated change in the largest single day part share is not significantly different from zero.

Since the average restaurant is open for dinner, these results suggest that multi-unit restaurants intensify production during dinner hours and extend production into late night hours. This is consistent with Proposition 1.2, indicating efficiency gains to greater restaurant production. Since the effect is meal-specific, it is consistent with Proposition 3.1 and 3.2, but not 3.3, indicating that efficiency gains may be dinner-specific. The results do not support capacity under-utilization for strategic purposes. They do not fit

with Proposition 4.1, in the sense that late night capacity is not left idle. They also contract a special case of Proposition 4.2. Restaurants do not appear to stay open in different day parts in order to block competitors from serving those day parts.

4.3.3 Product Lines

Total revenues are also broken down by product lines in the Census survey. The main product lines for food service establishments are "meals, unpackaged snacks and non-alcoholic beverages for immediate consumption", "packaged food products", "packaged and unpackaged alcoholic beverages", "tobacco products", "other types of merchandise" and "non-merchandise services" for customers. Table 4 compares product line sales in single and multi-unit establishments. The main difference is one of scale, not scope. The average revenue share of "meals", for short, is over 90%. On average, "meals" contributes twice as much revenue in multi-unit establishments than in single unit establishments. The second largest product line is generally "alcoholic beverages", "other merchandise" or "packaged food products". Notice that a typical restaurant can easily produce these services and they may enhance consumers' dining experiences.

Table 7 contains OLS estimates that show how product line sales vary with market size for multi-unit restaurants. Models (1) through (3) examine variation in "meals" sales, non-"meals" sales and the revenue share of "meals" in multi-unit restaurants across markets. Meals sales increase by 0.04% and total non-meals sales increase by 0.13% for a 1% rise in total population. Consequently, meals share of total revenues decreases by 0.004%. These estimates are significant at the 1% level.

These findings suggest that restaurant resources generate more meals and more complementary products in larger markets. This is consistent with Propositions 1.2, 3.1 and 3.2, but not with 3.3, suggesting that large firms may benefit from efficiency gains in the production of meals. The results do not support capacity under-utilization and do not fit with Proposition 4.1 in the sense that the ability to serve complementary products is not left idle. They also provide no support for Proposition 4.2 since meals dominates production in each restaurant. They could, however, fit with a strategy of bundling to limit competition. A restaurant might find it profitable to serve alcoholic beverages to its customers, rather than see them leave for a competitor's bar. This is especially true if liquor licenses are scarce.

4.4 Menu Type and Location of Commonly-Owned Stores

In this subsection, I analyze firm-level capacity utilization in the production of variety in restaurant services and at different locations. Menu type provides an indication of product variety within firms. The Census survey classifies establishments by twelve menu type categories. These are American, Italian, Chinese, Mexican, Steak, Seafood, Hamburger, Sandwich, Pizza, Chicken, Snack and Other, with American and Hamburger as the most common classifications. Zip code locations provide an indication of geographic dispersion within firms. I obtain zip codes from the LBD for all establishments in the survey. Table 8 shows that the average multi-unit firm operates 5 establishments with 1 menu type in 4 zip codes. This table also shows that the average number of zip codes in an MSA is over 100. The average multi-unit firm is located in a small number of zip codes relative to the total available.

Table 9 shows how product variety and dispersion within firms varies with market size. Model (1) is a probit model for the probability that a multi-unit firm operates strictly more than one menu type. The coefficient estimate total population is -0.02, not significant at the 5% level. Models (2) and (3) contain OLS estimates for zip codes per firm. The number of zip codes per firm increases by 0.19% for a 1% rise in total population, significant at the 1% level. The number of zip codes relative to establishments per firm increases by 0.06% for a 1% rise in total population, significant at the 1% level. Additional variables, average zip code population and average zip code land area, control for variation in zip code definitions across markets. Menu variety within firms does not increase with market size. Geographic dispersion within firms increases with market size.

These results indicate that large firms operate more and larger restaurants that share a menu type in larger markets. These restaurants tend to be dispersed in different zip code locations. This is consistent with scale economies but not scope economies, fitting with Propositions 3.1 and 3.2 but not with 3.3. They are inconsistent with product proliferation in localized submarkets, a special case of Proposition 4.2, but fit with product proliferation across submarkets.

5 Conclusion

The goal of this paper is to evaluate sources of profitability for firms in a competitive industry by examining production decisions at the firm level and restaurant level. The literature on cost advantages and strategic competition generates a broad empirical prediction: capacity should be fully exploited in large firms that are more efficient

producers and under-exploited in large firms that seek to limit competition from rivals. The data are generally consistent with increasing production intensity, indicating that greater efficiency accounts for the expansion of large firms in larger markets. There is little evidence for excess capacity or strategic product proliferation in this industry.

I find that multi-establishment firms operate a larger number of restaurants and larger individual restaurants in larger MSAs. They capture a larger share of the market relative to single-establishment firms. The fact that large firms expand when market demand increases suggests that they are either more efficient than potential entrants or can credibly threaten to erode profitability if entry occurs. The fact that individual restaurants are larger in larger markets indicates full capacity utilization, rather than excess capacity to ward off entry. The fact that large firms own more restaurants indicates that firms' advantages can be spread over multiple locations. The fact that non-chain restaurants account for these effects suggests that advertising and brand value do not contribute dominant advantages.

On further study, I find that multi-unit firms increase production during operating hours and increase both the volume and range of services at each restaurant in larger markets. This fits with full capacity utilization, rather than idle capacity as a threat to potential entrants. I also find that multi-unit firms operate a greater number of similar but geographically dispersed restaurants in larger markets. This suggests that efficiency gains may be product-specific but not restaurant-specific. This also indicates that firms do not block entry in local markets by owning diverse restaurants in close physical proximity.

Some possible sources of efficiency gains in large firms are skills in restaurant production generated through practice or talent. This would fit with the practitioner's view that the restaurant business is best learned by working in it and the sheer amount of work that does into running a successful restaurant.

Appendix

Table 1. Establishment revenues and total population in urban markets

	(1)	(2)	(3)	(4)
Dependent variable	Log estab rev	Log estab rev	Log estab rev	Log estabs
Sample	All estabs	Single-unit estabs	Multi-unit estabs	Multi-unit firms
Obs=	323374	232752	90622	16898
R-sq=	0.2946	0.3012	0.1749	0.1095
Log total population	0.0408	-0.0190	0.0395	0.1321
	0.0141	0.0127	0.0100	0.0142
Percentage change in population	0.0033	0.0024	0.0000	0.0016
	0.0006	0.0005	0.0005	0.0006
Percent households income over $35k	-0.0045	0.0030	-0.0014	-0.0062
	0.0019	0.0016	0.0015	0.0014
Percent population of age over 65	-0.0245	-0.0253	0.0095	0.0067
	0.0067	0.0054	0.0048	0.0046
Percent population of age 25-54	-0.0010	-0.0126	0.0036	0.0126
	0.0074	0.0059	0.0051	0.0043
Percent population black	0.0028	0.0009	0.0021	0.0034
	0.0013	0.0011	0.0010	0.0008
Percent population hispanic	-0.0052	-0.0050	0.0006	-0.0021
	0.0010	0.0009	0.0009	0.0013
Percent one-person households	0.0002	0.0112	-0.0117	-0.0021
	0.0068	0.0057	0.0055	0.0050
Percent married w/ children households	0.0014	-0.0021	-0.0013	0.0060
	0.0059	0.0053	0.0051	0.0043
Percent population in group quarters	-0.0250	-0.0191	0.0062	-0.0120
	0.0069	0.0063	0.0042	0.0032
Percent labor force unemployed	-0.0173	-0.0018	-0.0104	-0.0118
	0.0089	0.0082	0.0052	0.0064
Log serious crimes per 100k pop	0.0130	0.0038	0.0044	0.0065
	0.0090	0.0067	0.0045	0.0063
Percent working outside county of resider	-0.0023	-0.0021	0.0004	0.0001
	0.0010	0.0010	0.0008	0.0009
Log average travel time	-0.5312	-0.3271	0.2313	-0.2426
	0.1454	0.1167	0.0823	0.0809
Log estab months in business	1.2993	1.3384	0.9269	
	0.0136	0.0148	0.0245	
Log estab payroll/employees	0.6438	0.6009	0.3202	
	0.0153	0.0141	0.0172	
Log estab first year	-2.1323	-1.7421	-1.1627	
	0.0454	0.0484	0.0728	
Constant	13.5008	11.6228	8.0964	10.7518
	0.6293	0.5216	0.6548	0.4646
Log firm average months in business				-0.0494
				0.0240
Log firm average payroll/employees				-0.0192
				0.0121
Log firm first year				-2.4450
				0.0809

Table 2. Establishment and revenue shares of multi-units

	(1)	(2)
Dependent variable	Multi-unit estab share	Multi-unit revenue share
Sample	MSAs	MSAs
Obs=	326	326
R-sq=	0.5492	0.5385
Log total population	0.0474	0.0862
	0.0063	0.0072
Percentage change in population	0.0010	0.0008
	0.0003	0.0003
Percent households income over $35k	-0.0084	-0.0101
	0.0008	0.0010
Percent population of age over 65	-0.0133	-0.0087
	0.0025	0.0028
Percent population of age 25-54	-0.0050	0.0018
	0.0030	0.0034
Percent population black	0.0020	0.0015
	0.0006	0.0006
Percent population hispanic	-0.0012	-0.0013
	0.0005	0.0006
Percent one-person households	0.0058	-0.0008
	0.0032	0.0037
Percent married w/ children households	0.0043	0.0042
	0.0025	0.0029
Percent population in group quarters	-0.0095	-0.0069
	0.0023	0.0026
Percent labor force unemployed	-0.0146	-0.0124
	0.0034	0.0039
Log serious crimes per 100k pop	-0.0046	-0.0023
	0.0035	0.0040
Percent working outside county of resider	-0.0008	-0.0005
	0.0005	0.0005
Log average travel time	-0.0997	-0.1172
	0.0520	0.0594
Log MSA average payroll/employees	0.1569	0.0687
	0.0545	0.0622
Constant	0.4791	0.0836
	0.2228	0.2542

Table 3. Establishment revenues and total population for chains and non-chains

	(1)	(2)	(3)	(4)
Dependent variable	Log estab rev	Log estab rev	Log estab rev	Log estab rev
Sample	Single unit Non chain	Single unit Chain	Multi unit Non chain	Multi unit Chain
Obs=	214578	18174	30726	59896
R-sq=	0.3114	0.6655	0.1743	0.6037
Log total population	-0.0001	0.0016	0.0488	0.0028
	0.0127	0.0102	0.0212	0.0089
Percentage change in population	0.0025	0.0000	0.0015	-0.0004
	0.0005	0.0005	0.0009	0.0004
Percent households income over $35k	0.0038	-0.0022	0.0006	0.0005
	0.0017	0.0013	0.0030	0.0012
Percent population of age over 65	-0.0221	-0.0100	0.0214	-0.0062
	0.0056	0.0046	0.0096	0.0043
Percent population of age 25-54	-0.0109	0.0075	0.0121	-0.0047
	0.0061	0.0056	0.0099	0.0063
Percent population black	0.0009	-0.0022	0.0054	-0.0005
	0.0011	0.0009	0.0021	0.0007
Percent population hispanic	-0.0048	-0.0004	0.0004	0.0007
	0.0010	0.0008	0.0016	0.0008
Percent one-person households	0.0122	-0.0072	0.0015	-0.0052
	0.0057	0.0044	0.0109	0.0041
Percent married w/ children households	-0.0018	-0.0076	0.0117	-0.0049
	0.0056	0.0043	0.0111	0.0038
Percent population in group quarters	-0.0201	-0.0001	0.0093	-0.0027
	0.0065	0.0040	0.0093	0.0046
Percent labor force unemployed	-0.0032	-0.0095	-0.0060	-0.0004
	0.0083	0.0057	0.0116	0.0060
Log serious crimes per 100k pop	0.0062	-0.0066	-0.0068	-0.0090
	0.0069	0.0074	0.0073	0.0056
Percent working outside county of resider	-0.0021	0.0005	-0.0008	0.0002
	0.0010	0.0007	0.0015	0.0005
Log average travel time	-0.3655	-0.1307	0.1512	0.1189
	0.1143	0.0762	0.1649	0.0768
Log estab months in business	1.3206	1.2525	0.9402	0.9937
	0.0157	0.0295	0.0389	0.0225
Log estab payroll/employees	0.6072	0.2658	0.3869	0.1938
	0.0144	0.0138	0.0261	0.0143
Log estab first year	-1.7873	-0.7819	-1.5357	-0.6339
	0.0512	0.0852	0.1319	0.0541
Constant	11.4635	8.3213	8.4009	7.5799
	0.5482	0.5311	1.1575	0.3711
Chain dummies	N/A	yes	N/A	yes

Table 4. Size and production activities of single and multi-unit establishments

	Single-unit estabs			Multi-unit estabs		
Variable	Obs	Mean	SD	Obs	Mean	SD
Revenue ($k)	232752	430.11	695.82	90622	952.37	870.28
Employees	232752	13.07	20.25	90622	30.08	26.97
Payroll ($k)	232752	122.12	218.98	90622	264.73	265.21
Number of seats (weighted)	85850	63.22	77.55	65856	94.93	90.03
Rate of return	232752	0.73	0.12	90622	0.72	0.09
Revenue/seats ($k)	79367	8.38	10.33	59100	15.33	25.87
Revenue/employees ($k)	202393	38.34	26.28	88088	34.21	17.01
Day part 1 revenues ($k)	61140	44.42	120.01	68292	102.67	185.32
Day part 2 revenues ($k)	61140	189.64	286.67	68292	418.54	356.86
Day part 3 revenues ($k)	61140	263.87	480.38	68292	450.69	535.94
Day part 4 revenues ($k)	61140	13.13	73.89	68292	40.46	100.97
Total revenues ($k)	61140	510.02	740.62	68292	1003.26	873.28
Day part 1 share of rev	61140	11.69	20.69	68292	11.10	16.64
Day part 2 share of rev	61140	42.33	23.49	68292	42.95	17.39
Day part 3 share of rev	61140	44.29	28.68	68292	42.77	21.18
Day part 4 share of rev	61140	1.81	7.00	68292	4.54	12.10
Number of active day parts	61140	2.34	0.69	68292	2.88	0.82
Largest day part share	61140	65.68	16.77	68292	57.54	14.90
Meals revenue ($k)	58434	455.76	609.55	69638	947.81	734.90
Other revenue ($k)	58434	66.74	202.69	69638	55.35	190.12
Meals share of rev	58434	0.92	0.13	69638	0.97	0.08

Table 5. Establishment revenues and total population for chains and non-chains

	(1)	(2)	(3)	(4)	(5)
Dependent variable	Log employees	Log seats	Log ROR	Log(rev/seats)	Log(emp/seats)
Sample	Multi-unit estabs	Multi-unit estabs	Multi-unit estabs	Multi-unit estabs	Multi-unit estabs
Obs=	90622	65856	90622	59100	88088
R-sq=	0.1611	0.0481	0.0456	0.0862	0.4692
Log total population	0.0360	0.0623	-0.0012	0.0018	-0.0101
	0.0104	0.0220	0.0006	0.0117	0.0049
Percentage change in population	0.0000	0.0019	0.0000	-0.0008	-0.0001
	0.0004	0.0012	0.0000	0.0004	0.0002
Percent households income over $35k	-0.0043	-0.0050	0.0002	0.0046	0.0032
	0.0013	0.0034	0.0001	0.0015	0.0007
Percent population of age over 65	0.0058	0.0153	0.0005	0.0066	0.0010
	0.0041	0.0114	0.0002	0.0048	0.0021
Percent population of age 25-54	0.0006	0.0011	-0.0005	0.0096	-0.0001
	0.0048	0.0107	0.0003	0.0057	0.0024
Percent population black	0.0014	0.0031	0.0001	0.0020	0.0000
	0.0008	0.0021	0.0001	0.0010	0.0004
Percent population hispanic	-0.0012	0.0016	0.0002	0.0012	0.0016
	0.0008	0.0018	0.0000	0.0009	0.0003
Percent one-person households	-0.0191	-0.0085	-0.0001	-0.0134	0.0025
	0.0043	0.0120	0.0003	0.0044	0.0020
Percent married w/ children households	-0.0046	0.0089	-0.0002	-0.0131	-0.0012
	0.0039	0.0106	0.0003	0.0041	0.0019
Percent population in group quarters	0.0050	-0.0004	0.0005	0.0156	0.0016
	0.0041	0.0099	0.0002	0.0042	0.0022
Percent labor force unemployed	-0.0184	-0.0391	0.0011	0.0233	0.0118
	0.0048	0.0121	0.0003	0.0060	0.0027
Log serious crimes per 100k pop	0.0050	-0.0031	-0.0003	-0.0038	-0.0031
	0.0039	0.0100	0.0002	0.0077	0.0015
Percent working outside county of resider	0.0015	0.0008	-0.0002	-0.0013	-0.0008
	0.0007	0.0014	0.0000	0.0007	0.0003
Log average travel time	0.1491	0.0169	0.0253	0.3327	0.1689
	0.0756	0.1670	0.0044	0.1033	0.0369
Log estab months in business	1.0406	0.2362	0.0242	0.8297	0.7505
	0.0277	0.0556	0.0013	0.0280	0.0228
Log estab payroll/employees	-0.0244	0.3581	-0.0200	0.0563	0.5980
	0.0215	0.0338	0.0009	0.0175	0.0080
Log estab first year	-1.8034	-2.9967	0.0073	0.4112	0.1584
	0.0739	0.1568	0.0045	0.0682	0.0273
Constant	8.4157	15.6857	0.4108	-2.7013	-0.1342
	0.5220	1.1963	0.0294	0.5613	0.2058

Table 6. Day part revenues and total population in urban markets

	(1)	(2)	(3)	(4)	(5)
Dependent variable	Log DP1 rev	Log DP2 rev	Log DP3 rev	Log DP4 rev	Log largest DP share
Sample	Multi-unit estabs	Multi-unit estabs	Multi-unit estabs	Multi-unit estabs	Multi-unit estabs
Obs=	68292	68292	68292	68292	68292
R-sq=	0.0222	0.0984	0.0853	0.0244	0.0282
Log total population	0.0292	0.0156	0.0519	0.1054	-0.0049
	0.0393	0.0194	0.0236	0.0485	0.0042
Percentage change in population	0.0018	-0.0002	0.0010	0.0055	0.0001
	0.0018	0.0008	0.0010	0.0022	0.0002
Percent households income over $35k	0.0136	0.0007	-0.0071	0.0219	0.0009
	0.0054	0.0026	0.0031	0.0058	0.0006
Percent population of age over 65	0.0442	0.0045	0.0024	-0.0367	-0.0001
	0.0183	0.0084	0.0118	0.0188	0.0016
Percent population of age 25-54	0.0292	-0.0082	-0.0010	-0.0715	0.0021
	0.0176	0.0115	0.0129	0.0221	0.0021
Percent population black	-0.0089	0.0015	0.0021	-0.0017	0.0000
	0.0035	0.0017	0.0020	0.0038	0.0003
Percent population hispanic	-0.0038	-0.0005	-0.0007	0.0006	-0.0004
	0.0034	0.0012	0.0020	0.0038	0.0002
Percent one-person households	-0.0272	0.0090	-0.0330	0.0283	-0.0004
	0.0165	0.0094	0.0128	0.0212	0.0018
Percent married w/ children households	0.0040	0.0133	-0.0057	-0.0082	-0.0028
	0.0139	0.0077	0.0103	0.0181	0.0015
Percent population in group quarters	0.0309	-0.0061	-0.0030	-0.0157	0.0029
	0.0157	0.0086	0.0092	0.0192	0.0017
Percent labor force unemployed	0.0679	-0.0061	-0.0182	0.0403	0.0029
	0.0212	0.0092	0.0129	0.0264	0.0022
Log serious crimes per 100k pop	0.0313	0.0266	0.0121	-0.0092	-0.0062
	0.0198	0.0107	0.0100	0.0173	0.0029
Percent working outside county of resider	-0.0006	0.0000	0.0003	0.0029	0.0000
	0.0026	0.0013	0.0015	0.0027	0.0002
Log average travel time	-0.0449	0.1783	-0.0059	-0.0792	-0.0301
	0.3075	0.1399	0.1920	0.3486	0.0346
Log estab months in business	0.5334	0.8614	0.9897	0.2623	0.0261
	0.0487	0.0322	0.0271	0.0358	0.0069
Log estab payroll/employees	-0.2244	0.4970	0.3028	0.0128	-0.0180
	0.0514	0.0364	0.0306	0.0499	0.0061
Log estab first year	-3.2017	-1.3282	-2.0483	-2.5099	0.5025
	0.2440	0.1180	0.1654	0.2716	0.0254
Constant	13.0752	7.8654	12.6543	12.6464	1.8626
	1.7330	0.9481	1.4600	1.8917	0.1642

Table 7. Product line revenues and total population in urban markets

	Largest line=Meals		
	(1)	(2)	(3)
Dependent variable	Log meals rev	Log other rev	Meals share
Sample	Multi-unit estabs	Multi-unit estabs	Multi-unit estabs
Obs=	69638	69638	69638
R-sq=	0.2129	0.0436	0.0328
Log total population	0.0353	0.1250	-0.0041
	0.0102	0.0283	0.0010
Percentage change in population	0.0003	0.0021	-0.0001
	0.0006	0.0014	0.0001
Percent households income over $35k	-0.0005	0.0135	-0.0003
	0.0016	0.0052	0.0002
Percent population of age over 65	0.0100	0.0076	-0.0001
	0.0051	0.0113	0.0004
Percent population of age 25-54	0.0013	0.0319	-0.0014
	0.0060	0.0163	0.0006
Percent population black	0.0032	-0.0079	0.0004
	0.0011	0.0032	0.0001
Percent population hispanic	0.0007	0.0019	0.0000
	0.0010	0.0022	0.0001
Percent one-person households	-0.0118	0.0199	-0.0007
	0.0056	0.0136	0.0005
Percent married w/ children households	-0.0021	-0.0047	0.0003
	0.0054	0.0120	0.0004
Percent population in group quarters	0.0059	0.0264	-0.0008
	0.0046	0.0118	0.0004
Percent labor force unemployed	-0.0132	-0.0084	-0.0001
	0.0070	0.0166	0.0005
Log serious crimes per 100k pop	0.0035	0.0181	-0.0008
	0.0042	0.0119	0.0004
Percent working outside county of resider	0.0007	0.0000	0.0000
	0.0008	0.0022	0.0001
Log average travel time	0.1456	-0.1045	-0.0032
	0.0930	0.2529	0.0094
Log estab months in business	0.9623	0.2391	-0.0019
	0.0240	0.0314	0.0015
Log estab payroll/employees	0.3314	0.5846	-0.0164
	0.0176	0.0522	0.0021
Log estab first year	-1.4461	1.7201	-0.0662
	-0.0803	0.1553	0.0067
Constant	9.7203	-11.4831	1.4365
	0.7029	1.2321	0.0488

Table 8. Menu type and geographic distribution of multi-unit firms

	Multi-unit estabs		
Variable	Obs	Mean	SD
Number of establishments	16898	5.36	10.31
Number of menu types	16898	1.18	0.44
Number of menu types relative to estabs	16898	0.38	0.21
Indicator for more than one menu type	16898	0.16	0.36
Number of zip codes	16898	4.28	6.40
Number of zip codes under 6	16898	3.09	1.65
Number of zip codes relative to estabs	16898	0.86	0.20
MSA number of zip codes	16898	118.16	104.34
MSA average zip code population	16898	12368	5293
MSA zip code land area	16898	45.76	63.68
MSA total population	16898	1705283	2061759
MSA population density	16898	607.26	871.87

Table 9. Number of menu types and zip codes for multi-establishment firms

	(1)	(2)	(3)
Dependent variable	P(more than one menu)	Log zip codes	Log(zipcodes/estabs)
Sample	Multi-unit firms	Multi-unit firms	Multi-unit firms
Obs=	16898	16898	16898
Log pseudo likelihood=	-7119.33		
Observed P=	0.1567		
Predicted P (at mean)=	0.1495		
R-sq/Pseudo R-sq=	0.0296	0.1172	0.0518
Log total population	-0.0171	0.1942	0.0569
	0.0105	0.0170	0.0083
Log average zip code population		-0.0645	-0.0350
		0.0323	0.0192
Log average zip code land area		-0.0227	-0.0234
		0.0157	0.0077
Percentage change in population	0.0005	0.0017	0.0001
	0.0002	0.0007	0.0003
Percent households income over $35k	0.0008	-0.0064	-0.0004
	0.0006	0.0018	0.0009
Percent population of age over 65	-0.0012	0.0057	-0.0009
	0.0021	0.0055	0.0027
Percent population of age 25-54	-0.0004	0.0102	-0.0023
	0.0023	0.0056	0.0032
Percent population black	0.0006	0.0029	-0.0006
	0.0004	0.0011	0.0006
Percent population hispanic	-0.0002	-0.0031	-0.0011
	0.0003	0.0014	0.0005
Percent one-person households	0.0010	-0.0031	-0.0005
	0.0019	0.0061	0.0031
Percent married w/ children households	0.0003	0.0060	0.0003
	0.0020	0.0052	0.0027
Percent population in group quarters	-0.0015	-0.0241	-0.0124
	0.0022	0.0045	0.0028
Percent labor force unemployed	-0.0013	-0.0086	0.0020
	0.0027	0.0075	0.0038
Log serious crimes per 100k pop	0.0040	0.0105	0.0038
	0.0039	0.0096	0.0046
Percent working outside county of resider	-0.0005	-0.0005	-0.0004
	0.0003	0.0011	0.0004
Log average travel time	0.0299	-0.3360	-0.0963
	0.0374	0.1017	0.0572
Log firm average months in business	-0.1034	-0.0451	0.0038
	0.0115	0.0245	0.0114
Log firm average payroll/employees	0.0450	-0.0249	-0.0057
	0.0067	0.0136	0.0059
Log firm first year	-0.5614	-2.1577	0.2864
	0.0319	0.0816	0.0314
Constant	N/A	9.5423	-1.3987
	N/A	0.5914	0.3196

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