THE

RESTAURANTS OF

DURHAM

ABSTRACT

Studying the advent of several of Durham's restaurants can help create economic models on the decisions faced by restaurant proprietors when deciding entry into the food industry in an area experiencing high economic growth.

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Introduction

It became recognized on a national level when Durham/Chapel Hill was named *Bon Appetit* magazine's 2008 "Foodiest Small Town". This was only the beginning of Durham's recognition, which has quickly exploded as new restauranteurs spring forth in hopes of finding their niche within the city. Some of these restaurants have merged perfectly into the spaces that they filled, embodying and accenting the culture and personality of their surroundings. A prime example of this would be Pompieri Pizza located at 102 City Hall Plaza, which is housed in a refurbished fire station. Others have totally transformed their surroundings with their presence, creating an entirely new environment. The best example of this kind would be the transformation of Geer St. with the arrival of the Geer St. Garden, Motorco, Cocoa Cinnamon, and other surrounding restaurants. A closer examination of Pompieri and the Geer St. restaurant cluster and their effects on the surrounding community could give more insight into the importance of restaurants in revitalizing a city and the decisions that firm owners (in this specialized case of restaurant proprietors) face when identifying spaces to enter the market.

Background Information and Models

Research from the U.S. Department of Agriculture Economic Research Service shows that approximately $^1/_2$ of food expenditures of the average U.S. consumer are spent on away-from-home markets. This shows a marked development over the years from 1960 levels, where away-from-home markets commanded a 26.3% share of total food expenditures.[1] The increase in percentage has been postulated to be due to the transformation of the average American household into a two-earner household with busier lives, thus lacking the time to prepare home-cooked meals. Contrasting to this however, is an overall decline in the percentage of income spent on food expenses (according to the Engel Curve) as a function overall total expenditure. There are many conclusions that could be drawn from the models, including the idea that while overall net food costs have gone down due to rapidly increasing automation and technology (thus driving down the percentage of total income),

the importance of restaurants in comparison has not gone down. In fact, relative to the at-home food consumption numbers, it has actually become much more important in society. Consumers are trending slowly towards full-service restaurants and away from fast-food restaurants as health consciousness and recent food scandals have pushed them away from the unhealthier and less appetizing fare. In a separate USDA ERS report[2], Hayden Stewart predicts that the expenditure at restaurants will only continue to grow, pushing the

Restaurants per 10,000 vs. Average Income (2015)
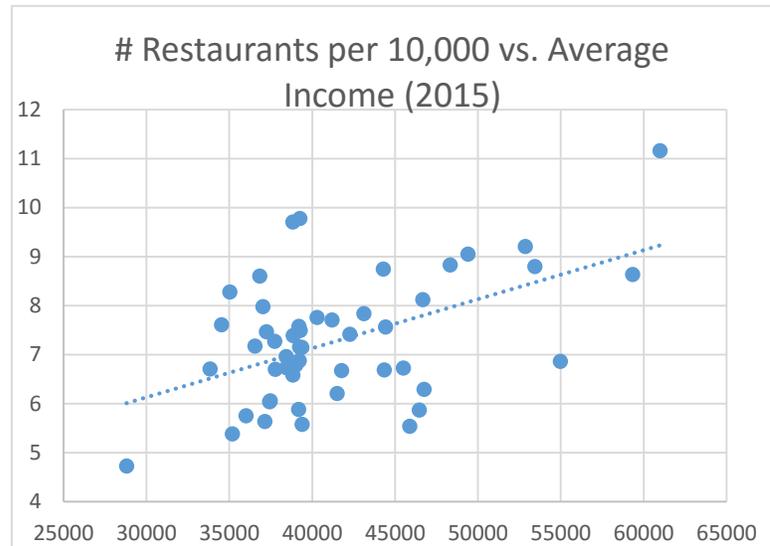
influence of full-service restaurants even further. The rapid growth increases incentives for restaurant proprietors to expand into growing cities such as Durham. An analysis of the 50 largest metropolitan areas in the U.S. shows a positive correlation between the number of full-service restaurants per 10,000 people and the average per-capita income as increasing. Rapidly gentrifying Durham therefore is a prime spot for relocation and introduction of restaurants, as industry growth from the RTP and surrounding areas has created wealth effects that have spilled over into the restaurant industry. With over 693 restaurants/food trucks in the area, it has almost the number of restaurants/capita predicted by the regression of the 50 metropolitan areas.

This paper proposes two different modifications of basic economic model theory applied to the topic of restaurants. One will look at the adaptation/introduction of restaurants to changing consumer tastes as socioeconomic factors (namely income) change in areas. The second will look at a development of the linear city model by looking at a single street of restaurants that developed in tandem. The first modification focuses on Pompieri's advent and subsequent growth, with the idea that restaurants flock to cities with established growth and high standards of living. The catalyst for enticing restaurants is an established industry (in the case of the RTP area, this would be the tech industry including biotech/pharmaceuticals, chemicals, and electronics) which would provide a solid income base. The income of the workers at the industry firms will spend a proportion of their income modeled by the USDA ERS data on restaurants in the area surrounding their workplace.
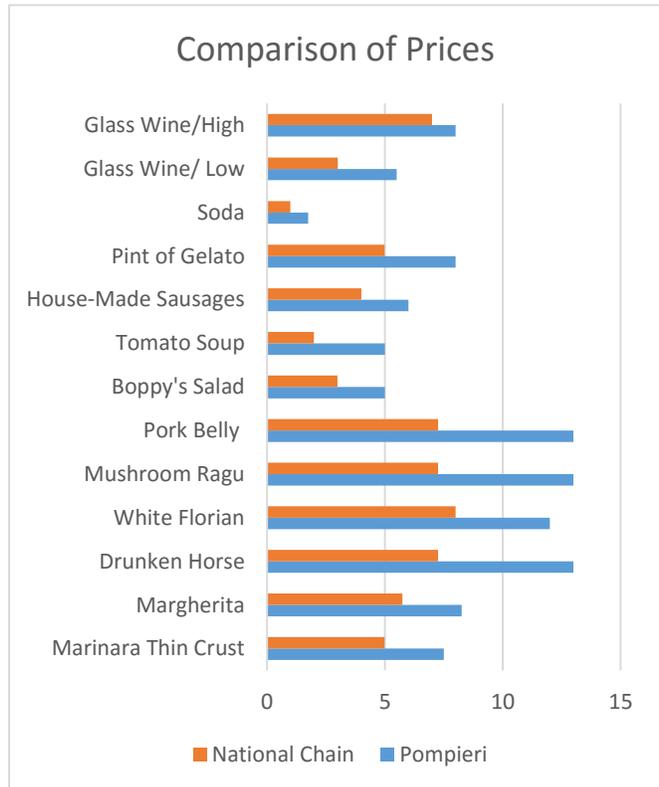
The second modification follows the Geer St. complex's success at revitalizing an area of Durham. The first is based intuitively on "following where the money is," in that restaurant proprietors evaluate the future economic prospects of cities before choosing whether or not to enter into business within the area. The second is based on the idea that clusters of restaurants and business can "revitalize" an area, with the added advantage that prior to the advent of these businesses the value of the property is steeply below comparable properties within the same city limits (and having relatively lower costs of entry collectively.) Having enough differentiation between their products while serving similar needs gives enough customer segmentation such that their businesses do not wholly cannibalize each other's consumer base. These two business decisions are not mutually exclusive and in fact when taken in tandem, could do a very good job of explaining the rapidly growing food culture and transformation in Durham along with the restaurant decisions.

Pompieri

Pompieri Pizza was founded by Chef-Owner Seth Gross, who incidentally also founded one of Durham's most popular burger joint and brewery (Bull City Burger) right down the street from the Pompieri location. Pompieri was built inside Durham's historic Fire Station #1 after a fierce project bidding process that included a detailed outline of the new owner's plans for the building. Stipulations for renovation of the fire station included the preservation of the iconic exterior and interior to a very high degree, along with the original fireman pole. Seth stated in an interview with me that his main intention was to preserve the culture of historic Durham. The placards given to customers waiting for food feature the names of various historical figures in Durham's past, including fire and police chiefs, and firetrucks. Several items on the menu reference history within Durham and the fire station itself. The "Drunken Horse" pizza at the restaurant is based on the story when the firefighters at the station fed a horse alcohol, causing it to become intoxicated. They subsequently led it up the stairs of the building, and had an extremely hard time leading it back down when sobered up. The most important selling point for Pompieri (and Bull City Burger) is the strict use of locally-sourced ingredients. Pompieri makes almost all of its ingredients in its pizza (including the mozzarella) in house sourced from produce from farmers within a 100-mile radius of the city of Durham. Gross boasts a 100% pasture-raised meat menu along with fully organic vegetables and house-made bread/pizza dough.

When asked about his motivations for relocating to the city of Durham in 2011 to open up Bull City Burger (and later Pompieri), he states that he was "drawn to the culture and history of Durham." His career started at the Goose Island Brewing Company where he helped innovate some of their iconic beers, but he was drawn to the "rich environment in Durham and the liveliness of the city." He felt like he could add his own niche into Durham's rapidly changing environment that was becoming more gentrified and focused on authentic foods with fresh ingredients.

A comparison of the prices of the fare offered at Seth's restaurant with those available at fast-food restaurants with non-locally sourced ingredients and less quality control gives interesting insight into consumer behavior at Pompieri. A comparison of the menu against national chain restaurants used as a base comparison price showed a "Consumer Luxury Index" (that is, what percent over prices of comparable goods at Chain/National restaurants with standardized food service that customers at Pompieri pay) of 1.62. Note: The reasoning behind using a series of

Comparison of Prices

	National Chain	Pompieri
Glass Wine/High	7	8
Glass Wine/ Low	3	5.5
Soda	1	2
Pint of Gelato	5	8
House-Made Sausages	4	6
Tomato Soup	2	5
Boppy's Salad	3	5
Pork Belly	7.5	13
Mushroom Ragu	7.5	13
White Florian	8	12
Drunken Horse	7.5	13
Margherita	6	8.5
Marinara Thin Crust	5	7.5

national chain restaurants for comparison is that their products are standardized across the board, and prices hold relatively constant across the board with necessary adjustments for local costs faced by all restaurants (rent, price of raw materials, etc.) This provides a good baseline comparison for future models and against specialized restaurants like Pompieri. This estimate took some of Pompieri's best-selling products and compared their prices to restaurants located within the vicinity offering similar (though not exactly) fare. The fact that the unweighted prices average 62% higher than what comparable restaurants charge has a very high margin of error due to the imperfect substitution of ingredient availability within the Pizzas/Salads. However, the general datum shown is that the restaurant is marketed as a luxury good with very high margins over what similar foods would cost. The restaurant's décor and history are not enough to account for this discrepancy, but

would be complementary to the perceived quality by consumers for Pompieri's locally sourced and in-house made fresh ingredients. I am unable to find any sales data online nor willing to ask Gross to disclose numbers regarding the business. Further insight into the sales data including gross numbers month to month and the distribution of sales within the various menu items within Pompieri would provide a better "Consumer Luxury Index" of Pompieri in addition to give an important correlation between Pompieri's sales (whose goods are considered closer to a luxury/normal good as opposed to an inferior good) and the changing demographics within the city.

Distribution of median household income in 2013 (number of people)
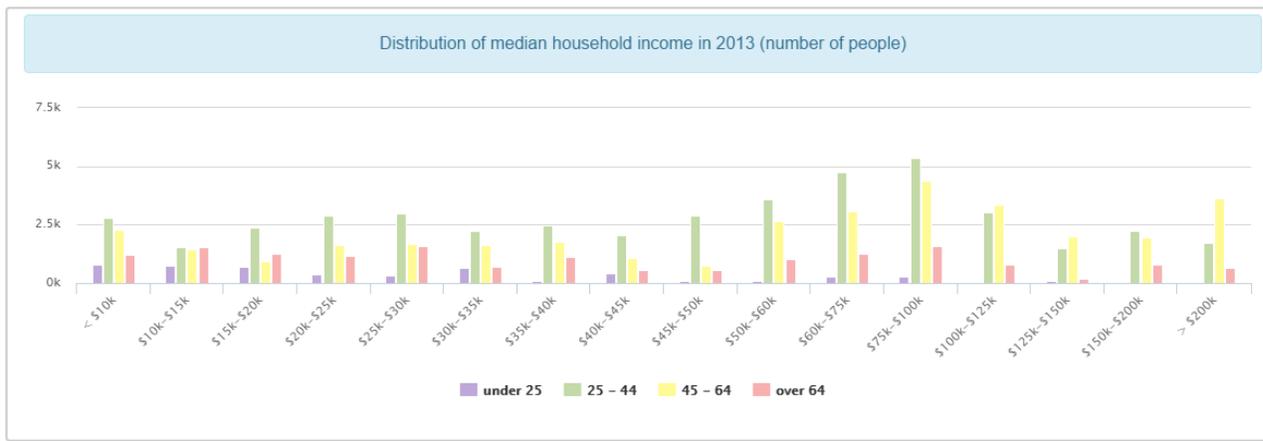
Census data show that at $29,347, per capita income for Durham is greater than the state average by 16%.[3] However, far more revealing data can be found within the distribution of median household income (see above figure for Durham 2013 statistics), which has an almost bimodal normal income distribution. An examination of the income distribution within Durham's city limits from City-data.com shows a very high concentration of adults within the age range of 25-44 who surpass the national average household income by orders of magnitude.[4] Further data from
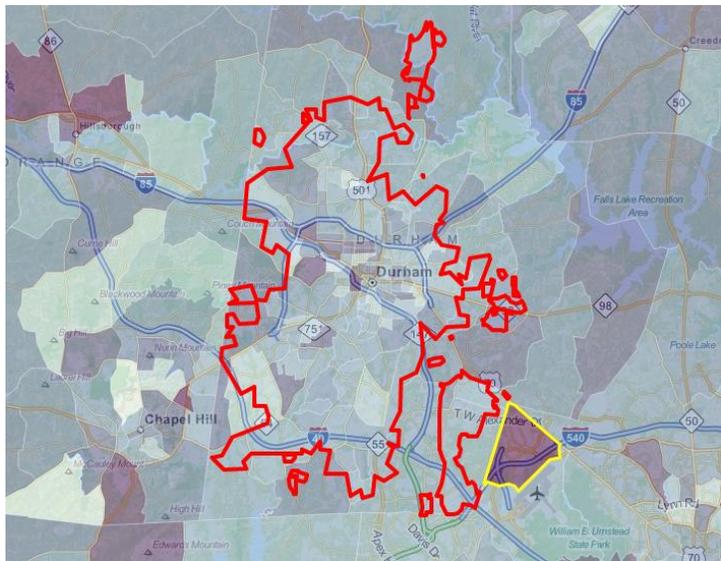
City-data show that as a whole, the population has seen a 36.8% increase in per-capita income from the year 2000 to 2013, which just barely outpaces the Bureau of Labor Statistic's 35% inflation

adjustment.[5] This data at first shows that there has not been much change to Durham's income within the past 13 years. However, when taking into account the theory of suburbanization and racial segregation, some numbers become apparent from city-data's income % change gradient map. Areas just barely outside of Durham's city limits (including Chapel Hill) have seen triple digit growth since 2000. Highlighted in Yellow in the attached image is an area located next to RDU airport that has seen particularly high levels of displacement of low-income individuals, with an astounding 291% increase (to almost four times the original value) of median income to a staggering $94,000 median household income. Very concentrated spots within Durham itself have seen median income increases of over 75%, while neighboring areas have seen only single digit growth which becomes negative under inflation. I attempted but was unsuccessful in finding exact numbers regarding the changes in distribution of income throughout the years. Equally if not more important would have been the estimation of income growth numbers from before 2008, which would give information from the restaurant owners' point of view for the pioneering restaurants first deciding to enter the business in Durham.

The net conclusion postulated from this information is that while the overall population of Durham's income levels has not changed much relative to inflation, concentrated areas (including suburbs and downtown areas) of Durham have seen massive growth and an influx of high-income families. Restaurants like Pompieri have adapted and found their own niche within Durham. The RTP central node acts as a central node and catalyst, drawing in an influx of high-income immigrants from across the U.S. to the area. Restaurants owners respond to this by opening up restaurants within the vicinity which offer luxury goods (e.g. organic, pasture raised beef and in-house made from scratch menu items) in response to this influx. They are able to command much higher prices from the discerning customers who choose healthier and better tasting options than the lower quality competitors. The population that migrates to these central nodes with very high disposable incomes flock to these places, and there are reinforcing effects as new restaurants increase the attractiveness of living within the city. A better model behind this could be built with a wider array of cities that have experienced an increase in high-income families and the corresponding change in restaurant diversity and prices.
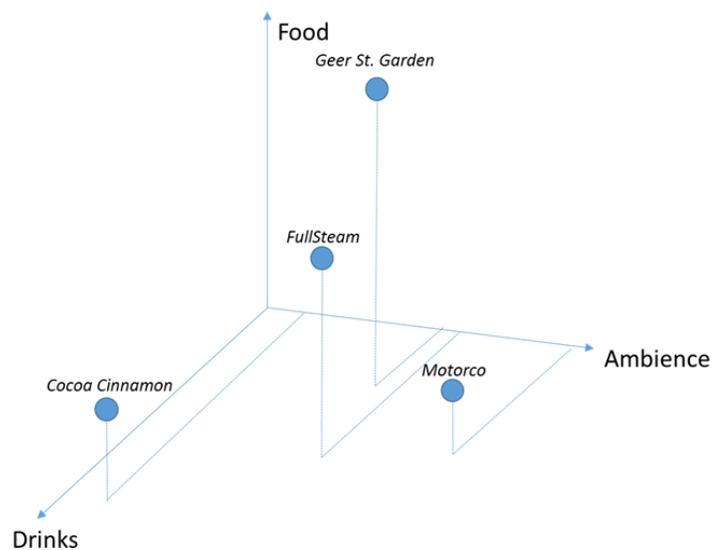
Geer St. Garden

When talking to a few Durham natives about restaurants around Durham, invariably the topic of the Geer St. complex comes up. Located right next to the Durham Athletic Park is a dense concentration of restaurants including Geer St. Garden, Cocoa Cinnamon, The Pit, Motorco, and Fullsteam Brewery. One resident noted that "it's amazing how much those restaurants have changed the place." Driving further East along Geer St, the quality of the buildings quickly deteriorate from the very Yuppie vibe surrounding West Geer St. to one that is more muted and slightly run down. Several buildings only 3-4 blocks away have boarded up windows, adorned graffiti and are currently derelict. Shops in this rundown area are limited to miniscule convenience stores and small restaurants the size of a single bedroom. Geer St. Garden refurbished the old Fletcher's Gulf filling station into the modern day eatery/pub. The owner, Andrew Magowan, had lived in the area since 2004 and had been eyeing the location all the way up until his restaurant's opening in 2011. He has since opened several restaurants (including newly opened Boot, an Italian-American eatery), all following a similar theme to Pompieri's of serving local high-quality (and high-cost) premium ingredients.

The entire Geer St. complex sprung up as if by magic around late 2010/early 2011. Despite the fact that many of the establishments are almost direct competitors with each other, the owners remain on friendly terms, even to the point of celebrating each other's opening anniversaries. Motorco refurbished an abandoned car dealership, Cocoa Cinnamon renovated an old service station, with Fullsteam similarly refurbishing an old car garage. A single restaurant alone is very unlikely to turn around the dilapidated car servicing area that was Geer St. Thus, each of the properties were sold at very favorable prices to the restaurant owners, because of the lack of overall outlook for the area. However, the combined efforts of all the restaurants have restored a vibrant daytime and nightlife culture around the area. The prices of the individual buildings purchased are dwarfed by how much each individual one is currently worth after the revitalization of the area. The effective combination of the restaurants, which revolve around similar themes but are differentiated enough to attract diverse crowds demonstrate an interesting twist onto the classic linear city model, along model, along with providing more insight into the linear-city model product differentiation variation.

Because each of the buildings along Geer St. are essentially right next to each other, it is assumed that transportation costs for a consumer standing at the intersection of Geer St. and Foster St. would be zero for all of the restaurants (the reality that there is a small walk in between the shops is ignored because for all intents and purposes they are within a 1 minute walk within each other and realistically have no true bearing on consumers' decisions.) Therefore, in the absence of any product differentiation (say, if all the businesses sold the same quality alcohol with the same service and prices) one would see a Bertrand competition model with at-marginal cost pricing. In fact, the removal of any transport subsequently removing all spatial differentiation within the equation would make it appear to consumers as if the cluster of businesses were located at the same location! Thus, the real differentiation within this model are the products offered by each of the businesses. Rather than spatial location differentiating the goods, the actual differentiation in terms of "distance" comes from what products each are offering! I presents a simplified model of this, basing a Consumer's decision on where to go on 3 factors: Food, Alcohol/Drinks, and Entertainment/Ambiance. The businesses, rather than being located within the line of a linear/circular city, are now points within a 3-dimensional space. Consumers self-select which factors are most important to their individual profile at the time of decision while standing at the intersection of Geer and Foster, and then go to the closest "niche" occupied by the restaurants. In the model, located at the origin (0, 0, 0) would be a restaurant located along Geer St. which has a very quiet atmosphere serving large-chain quality food and generic drinks (Coca Cola or Anheuser-Busch beer). It is assumed for simplification purposes that the service at each restaurant from the staff is identical and in the basic model, a consumer faces the same price per "visit" to each of the restaurants. Assume that the "length" of each of the axes has a maximum of one, and thus we are in a cube where the furthest a consumer's taste could be from a business is $\sqrt[3]{3}$ (if a consumer has a demand for an extremely loud and active environment serving very exotic beer and food). In the below model, Cocoa Cinnamon with its exotic drinks (using a variety of spices within its coffee to create unique concoctions), quiet ambience (which is ideal for the Duke student during finals season needing a simultaneous mixture of caffeine and silence) and mediocrely differentiated plain food is located somewhere around (.85, .1, .2) in the (Drinks, Ambience, Food) location factor. Each of the restaurants along Geer St. is

similarly differentiated within the sphere. A consumer randomly located at (X,Y,Z) will then choose the restaurant closes to his/her tastes at that given moment and give that restaurant business. Thus, each restaurant radiates concentric "spheres of influence" in which they capture all consumers within the volume of the sphere, extending outwards until they meet another sphere of influence, in which then they start to flatten as the indifferent consumer would go to each with equal probability. An interesting variation of this is that if firms are equidistant from each other and the borders of the cube and located within a lattice pattern, the "spheres of influence" then become perfectly shaped cubes with sides equaling the distance between the restaurants! This model helps explain why so many restaurants are located in a cluster. If the consumer distribution isn't uniform in this cube (i.e. if there is a gradient that is more concentrated towards the more exotic side of the spectrum located at (1,1,1)) you will see a higher cluster of restaurants located away from the origin (contingent on density of demand)! This both helps explain why you don't see a restaurant like McDonald's located near that location, along with why each of the restaurants (other than Cocoa Cinnamon) focus on the quality of their alcoholic drinks and ambience. This model could be extended to the food truck rodeo held at the Durham farmers' market which attracts hordes of consumers focused solely on food/drink and the inevitable overconsumption by the visitors in comparison to their baseline food expenditure.

Another interesting extension of this model would be looking at if consumers were not necessarily limited to one option. A visitor from Duke University may spend his afternoon at Café Cinnamon preparing for a test, but then subsequently go for dinner at Geer St. and then a beer at Fullsteam. His "distance" from each of these in the succession in which he visits them could therefore be much less than the net distance he would face while staying at Duke eating mediocre food, drinking coffee from the relatively bland Joe Vangogh and drinking Bud Light at a dorm party. Thus, even if he was indifferent in terms of location with respect to one of the services (e.g. He was

indifferent from drinking coffee and studying at Cocoa Cinnamon, and buying Coffee at Duke and studying at Perkins Library), He would still be drawn to the area because he had a craving for Geer St.'s fried chicken. As a result, his business as a bundle is drawn together and he ends up going to Cocoa Cinnamon, Geer St., and Motorco. This brings a new and exciting dimension to the Linear City model. The consumer enjoys a bundle of goods at each "visit", and thus his net distance of product differentiation plays a role in addition to the spatial differentiation of the customer's location. While co-located at Duke University (and thus having travel cost of 0) the consumer may find that his actual product differentiation distance at Duke from the ones at Geer St. would outweigh the travel cost from Duke to Geer St..

Durham has a quickly changing and rapidly expanding restaurant scene. Analysis of the growth of a city in terms of income sheds light into the expansion of new niche restaurants focused on high-cost and high-margin foods that offer finer dining options to the incoming consumer base with individual tastes more reflective of higher-income families. More interestingly, the clusters of restaurants that have spawned across Durham brings up an interesting discovery and phenomenon. I hypothesize that product differentiation of goods that can be complementary rather than competitive can both revitalize a surrounding area while overcoming the travel cost assumption of the linear city model! A consumer who is indifferent or spatially closer towards a specific location offering a suite of products may instead choose a location further away if the actual product differentiated bundle at the further location is closer to the consumer's preferences at the time! Thus, a restaurant owner (or business owner in general) in Durham must not only examine the overall consumer niche within Durham (which by projections will edge towards higher-income families increasingly eating out more) but also consider his immediate surroundings in building his restaurant! Externalities including location to different attractions (such as Geer St.'s proximity to local parks and athletic fields) along with the other restaurants within the same location all need to play a significant part of the restaurant owner's decision in where to move. The examination of some restaurants in Durham provide an interesting model and insight into general business strategy of restaurants. Further possible research could be done in mapping the entire city of Durham as a whole (complete with the 639 restaurants) in terms of geospatial distribution and restaurant differentiation.

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