

Food Truck **Truth**

Why Restaurants—and Cities—Have
Nothing to Fear from Mobile Food Businesses

By Dick M. Carpenter II, Ph.D.,
and Kyle Sweetland

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Executive Summary

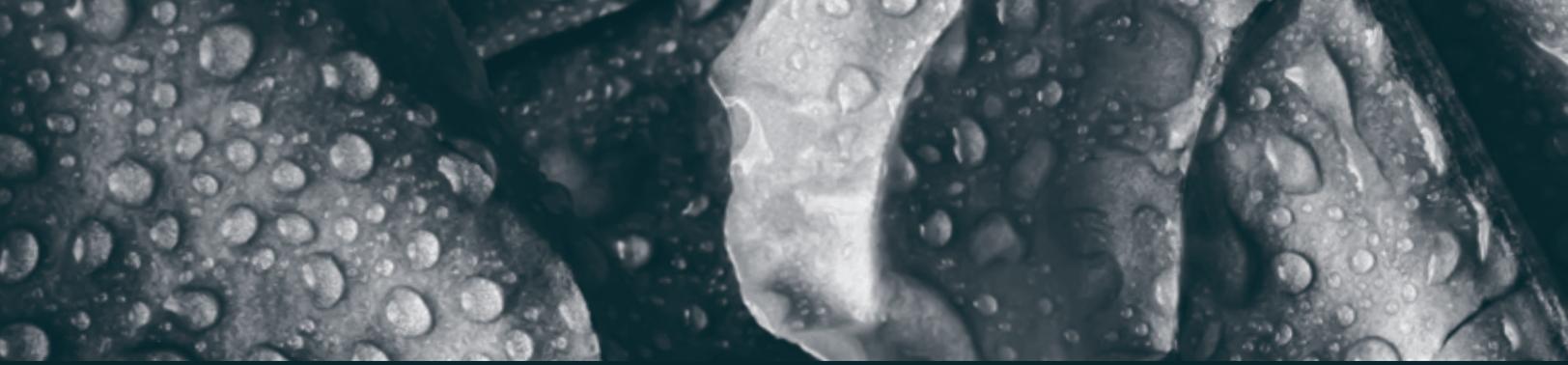
Budding culinary entrepreneurs love food trucks because they are a less expensive way for chefs with big dreams but little cash to open their own businesses. Consumers love them because they provide a wide variety of delicious foods conveniently. But opponents (usually restaurants and their associations) allege that the very things many people love about food trucks—their lower startup and operating costs and their mobile nature—give them an unfair advantage and risk putting brick-and-mortar restaurants out of business. Accordingly, opponents have lobbied municipalities, often successfully, for a variety of restrictions on food trucks.

This study puts food truck opponents' concerns to the test. Specifically, it uses 12 years of county-level census data on food trucks and restaurants to explore whether growth in the number of food trucks results in fewer restaurants.

Results show:

- By the numbers, food trucks do not appear to represent a major threat to the restaurant industry. Not only do restaurants vastly outnumber food trucks—across the study period, the average county had 145 restaurants and just one food truck—but both sectors generally grew over the 12 years studied. Even as food trucks took off following the Great Recession, the restaurant industry continued to grow.
- Stronger evidence comes from our statistical analysis, which controls for factors like economic conditions and confirms food truck growth is not followed by restaurant decline. Specifically, the number of food trucks in one year has no effect on the number of restaurants in the next year.
- Instead, food trucks may complement the restaurant industry. We found a positive relationship between the number of food trucks and the number of restaurants in the same year, suggesting both sectors can thrive at the same time.





Introduction

Benny Diaz’s specialty is tacos made with recipes inherited from his grandmother. When he started making them at a Florida restaurant where he worked, the unique tacos were such a hit that patrons urged him to start his own business. After a lot of planning and a little financing, Benny’s food truck, Taco Trap, was born.

With his new mobile business, Benny hoped to share his tasty tacos with customers in towns and cities all along Florida’s Treasure Coast. But he soon found there was one place where his truck was not welcome: Fort Pierce, the seat of St. Lucie County, had a law banning food trucks from operating within 500 feet of brick-and-mortar restaurants—even if the trucks were on private property. This rule effectively barred food trucks from serving customers in downtown Fort Pierce or anywhere else in the city where they were likely to find customers.¹

City regulators did not care how many people wanted to try Benny’s delicious tacos—or the offerings of other food truck entrepreneurs. Rather, what they cared about was

protecting brick-and-mortar restaurants from competition. Indeed, when the city passed the ban in 2014, then-Commissioner Edward Becht justified it by saying allowing food trucks to operate in Fort Pierce could “hurt the brick-and-mortar businesses.”²

Fort Pierce is far from the only city that has shown hostility toward food trucks. In recent years, cities across the country have adopted rules severely curtailing when, where and how food trucks can operate.³ It is understandable—and legitimate—that cities would adopt some regulations for the sake of traffic and sanitation, but many regulations are, like Fort Pierce’s 500-foot ban, geared toward protecting established businesses from competition in the face of food trucks’ rapidly rising popularity.

Where once food trucks existed on the periphery of American society, they have become decidedly trendy in recent years. For example, food trucks have featured prominently in mainstream movies such as *The Five-Year Engagement*, *What to Expect When You’re Expecting* and *Chef*.⁴ They have also

Where once food trucks existed on the periphery of American society, they have become decidedly trendy in recent years.





appeared in television shows such as *Big Food Truck Tip*,⁵ *Shark Tank* and *The Great Food Truck Race*, the last of which averages over a million viewers ages 18 to 49 per episode.⁶ Even an Olympian is talking about food trucks. Tamyra Mensah-Stock, who won wrestling gold at the 2020 Summer Olympics in Tokyo, said she would give her mother \$30,000 of her winnings to help her fulfill her dream of starting a food truck.⁷

This newfound cultural relevance has coincided with tremendous industry growth. In 2021, there were almost 32,500 food truck businesses in the United States, and they employed over 38,000 people.⁸ In 2018, food trucks were active in more than 300 cities across the country,⁹ and from 2010 to 2016 the number of food trucks grew by more than 400% in Salt Lake City, 500% in San Francisco and 600% in Austin, Texas.¹⁰ And from 2014 to 2017, industry revenue more than quadrupled, growing from \$650 million to an estimated \$2.7 billion.¹¹



Anticompetitive rules barred Benny Diaz from operating his food truck in Fort Pierce, Florida.



**NO
FOOD
TRUCKS**



This growth is both remarkable and simple enough to explain. On the supply side, food trucks have relatively low startup and overhead costs, putting business ownership in reach for people seeking new economic opportunity.¹² Moreover, the mobile nature of the business allows entrepreneurs to take their food to where the customers are. And on the demand side, consumers value the culinary experience and convenience that food trucks provide.¹³

These features of food trucks saw them first start to take off following the Great Recession of 2008, when many people found themselves out of work or unable to secure funding for a brick-and-mortar venture.¹⁴ They also contributed to food trucks' continued popularity during the COVID-19 pandemic. With many downtowns turned to ghost towns and indoor dining options severely restricted, food trucks headed out to the suburbs in search of customers, whom they were able to safely serve outdoors.¹⁵ According to Ren Budde, the business development director of a company that customizes food trucks, the "demand for trucks [was] rising and manufacturers [were] struggling to keep pace." Budde said, "We're now seeing more call volume pick up from individual operators."¹⁶

But not everyone loves food trucks. Opponents—typically restaurateurs and their allies—allege the mobile businesses represent "unfair" competition to restaurants because they supposedly do not make the same heavy investments in the community as brick-and-mortar restaurants.¹⁷ For example, Newport, Rhode Island, already bans food trucks from operating within 250 feet of established restaurants. Nevertheless, the owners of a

brick-and-mortar pizza restaurant located on the city's Bellevue Avenue have argued that a pizza truck should not be allowed to operate on Bellevue Avenue at all because the truck's owners do not pay rent or property taxes.¹⁸ As a result, the City Council has proposed banning all food trucks from operating on Bellevue Avenue. Together with the 250-foot ban, this would effectively leave just seven spots in the entire city for food trucks to operate.¹⁹

Food truck opponents claim food trucks' operational advantages threaten to put restaurants out of business. For example, following the Great Recession, one San Francisco brick-and-mortar restaurant owner claimed that competition from food trucks had forced him to cut his labor just to stay in business.²⁰ Similarly, in Covington, Ohio, a longtime meat shop owner worried that allowing food trucks to sell in commercial areas of the city would harm restaurants struggling to stay alive following the recession.²¹ To protect restaurants from this "unfair" competition, food truck opponents advocate for restrictions on food trucks, such as limits on the number of food trucks that can operate, where they can operate and how long they can operate in any one spot.²²

This study puts the restaurant industry's concerns to the test: Do more food trucks threaten the restaurant industry? Although some restaurants may close because of ordinary competition from food trucks (or other restaurants), our results show that more food trucks do not mean fewer restaurants. In fact, the evidence suggests that food trucks may *help* the restaurant industry. These results indicate that thriving food truck and restaurants industries can go hand in hand.

A Brief History of Food Trucks

Though food trucks' current popularity began with the Great Recession in 2008, food trucks have been around for decades, and their lineage goes back even further. Food trucks in the United States find their genesis in public markets, where some vendors who could not afford stalls would set up outside to sell food and other wares. As public markets declined and private stores grew in popularity during the late 19th century, outdoor vending continued in the streets of poorer areas.²³

During the first few decades of the 20th century, street vending was viewed as a legitimate business that provided work to a growing immigrant population.²⁴ But as private stores became more popular, small-business owners and the business elite in many cities across the country saw ridding the streets of immigrant vendors as a way to modernize their

cities. Many brick-and-mortar businesses also resented the competition vendors provided.²⁵



Brian Pepper, owner of Creative Chef on Wheels, is one of the food truck owners who was shut out by Fort Pierce, Florida's protectionist rules.

Dubbing vendors the "pushcart evil," these established interests lobbied—often successfully—for increasingly restrictive regulations on street vending.²⁶

Progressively marginalized, some vendors sought new niches. This is how food trucks gained their association with construction sites. During the 1960s, the United States saw a building boom, and vendors saw an opportunity. Welcome in few other places, food trucks often parked at construction sites and other areas that had lots of blue-collar workers and few lunch alternatives.²⁷ With this change in scenery came a change in reputation—and not one for the better, unfortunately. With little competition, some vendors let standards slip. For example, the poor sanitation practices of some construction-site food trucks caused them to gain the unflattering moniker of "roach coaches."²⁸

For years, food trucks languished under this reputation. But the Great Recession of 2008 changed that.²⁹ Many people out of work because of the bad economy saw operating a

food truck as a way to get back on their feet while providing customers with affordable, high-quality food.³⁰ At the same time, the explosion of social media usage, particularly Twitter, allowed food trucks to build buzz and, importantly, share their location with customers.³¹

One of the earliest and best-known examples of this phenomenon at work is the Los Angeles food truck Kogi founded by chefs Roy Choi and Mark Manguera. In 2008, Choi was unemployed and unable to find a job due to the recession.³² He was intrigued when Manguera told him about his idea for a Korean-Mexican fusion food truck. The two friends teamed up to make and sell Korean barbecue-stuffed tacos from a rented truck.³³ The truck used Twitter to let people know where it was going and quickly became incredibly popular, drawing 300 to 800 people at each stop.³⁴ Before long, Choi and Manguera had a small fleet of food trucks.³⁵





Until a lawsuit forced the city to repeal its anticompetitive rules, Louisville, Kentucky, was a no-vending zone for food trucks like Robert Martin's Daug Pound.

And in 2016, they opened a brick-and-mortar restaurant, Kogi Taqueria, as a complement to the trucks.³⁶

Food trucks initially became popular in large cities like Los Angeles and New York City but eventually spread to other metropolitan areas of varying sizes.³⁷ As food trucks became more popular across the country, food truck rallies—where multiple food trucks gather in one location—were born. In 2010, Los Angeles' first-ever food truck rally drew thousands of attendees, some of whom drove up to an hour to get there.³⁸ Today, food truck rallies attract tens of thousands of people each year. For example, the Seattle Street Food Festival, founded in 2013, sees dozens of food trucks and other street food vendors gather at South Lake Union to sell their food to over 100,000 people.³⁹

During the first few years of their renaissance, food trucks grew substantially. By 2011, food trucks were the fastest growing sector of the restaurant industry.⁴⁰ Some observers thought food trucks were a flash in the pan, but the public saw things differently: A study revealed that 91% of consumers



familiar with food trucks thought trucks were here to stay.⁴¹

And stay they have. As food trucks have become a more established industry, they have diversified to keep growing, with many experimenting with new culinary creations or opting to specialize in more healthful offerings. Others have started catering private events as a sideline or even their specialty. And many successful food trucks have, like Kogi, spun off their own brick-and-mortar restaurants. Examples include Curry Up Now, which started as an Indian food truck in San Francisco in 2009 and now has 18 brick-and-mortar locations across the country; Ms.

Cheezious, which originated as a food truck in Miami in 2010 and today also has a restaurant; and Nong's Khao Man Gai, which began as a cart in Portland, Oregon, in 2009 but now has two restaurant locations serving up chicken and rice dishes.⁴²

Even after opening brick-and-mortar locations, many such restaurants continue to keep their trucks rolling.⁴³ For example, after Kirk and Juliann Francis started their Captain Cookie and the Milkman food truck in 2012 in Washington, D.C.,⁴⁴ the truck proved so popular that the Francis opened a brick-and-mortar bakery to meet the demand.⁴⁵ Today, they have three brick-and-mortar locations as well as three food trucks in the District.⁴⁶ The Francis also opened a brick-and-mortar food hall and commercial kitchen in the nation's capital to give them and other food truck owners more space to prepare food and to serve as an incubator for new food businesses.⁴⁷





The War on Food Trucks

Despite this popularity, food trucks have their detractors—mostly restaurateurs and their allies—who argue food trucks harm restaurants. When food trucks started becoming popular, restaurants and their associations in large cities raised concerns about their impact on the restaurant industry. For example, Andrew Kline, head of legislative affairs for the Restaurant Association of Metropolitan Washington, D.C., alleged in 2011 that food trucks kept business from brick-and-mortar restaurants in the District: “If you have a restaurant located on a street and a popular food truck pulls up in front of you, people see the crowd, they don’t want to come to the restaurant.”⁴⁸

Others in large cities have expressed similar concerns. In San Francisco, shortly after the Great Recession ended, food truck opponents argued for a limit on the number of food truck permits.⁴⁹ Landlords were worried about losing restaurant tenants, while restaurant owners thought it unfair that the city allowed food trucks to compete with restaurants so freely when they supposedly have minuscule overhead in comparison.⁵⁰ Rob Black, executive

director of the Golden Gate Restaurant Association, even claimed that association members saw “a daily revenue loss of up to 30 percent or 40 percent when [food] trucks park outside their businesses.”⁵¹ Similarly, in Los Angeles, the Baja Fresh on Miracle Mile complained food trucks were hurting its bottom line. It allegedly saw its revenue decline 20% because of food trucks operating directly across the street and had to cut employee hours as a result.⁵²

As food trucks have spread to smaller cities and towns in more recent years, these complaints against food trucks have continued to arise. For example, in 2018, when Bowling Green, Ohio, considered allowing food trucks to operate in the city’s downtown, restaurant and other brick-and-mortar business owners complained that competition from the trucks would hurt their revenue.⁵³ Similarly, in Burién, Washington, more than 50 restaurants opposed a food truck pilot program because they worried food trucks would harm brick-and-mortar businesses already hurting during the COVID-19 pandemic.⁵⁴ Likewise, restaurants in Ottawa, Illinois, asked the City Council to regulate food



trucks due to the pandemic's impact on their businesses, "stating that the last thing they need is food trucks sitting at their front door."⁵⁵

Food truck opponents in many cities have lobbied—often successfully—for various restrictions on food trucks, including limits on the number of food trucks that can operate, where they can operate and how long they can operate in any one spot.⁵⁶ An especially egregious example of caps on food trucks comes from South Padre Island, Texas. After receiving complaints about food trucks from restaurants, City Council members voted to cap the number of food truck permits at 12. Worse yet, the city required permit applicants to obtain the signature of a local restaurant owner—that is, one of their future competitors—to qualify for one of those 12 permits.⁵⁷

A second type of restriction bans trucks from operating within certain sections of a city or within a certain distance of brick-and-mortar restaurants. For example, in Albuquerque, after restaurants started to complain about food trucks parking near their doors, City Councilor Isaac Benton introduced an ordinance to

prohibit food trucks from parking within 100 feet of a brick-and-mortar restaurant, citing "unfair competition."⁵⁸ The ordinance passed in September 2015, but in March 2016 the distance was reduced to 75 feet—to the chagrin of several downtown restaurant owners and City Councilor Ken Sanchez—after food trucks complained they could not find spaces to park.⁵⁹ And in 2011, Louisville, Kentucky, banned food trucks from operating—even on private property—within 150 feet of any restaurant selling similar food unless they received the restaurant's permission.⁶⁰ This effectively turned large swathes of the city into no-vending zones. After IJ teamed up with two food vendors to sue the city, the Metro Council entered into a federal consent decree and repealed the protectionist ordinance.⁶¹

Finally, some cities restrict how long food trucks can operate in any one spot. To try to curb trucks, Los Angeles tried making it illegal to park for more than 30 minutes in residential areas and for more than 60 minutes in commercial areas. However, the Los Angeles Superior Court struck this down for violating state law in 2009.⁶²

“Food Trucks Harm Restaurants”

A Testable Theory





Food truck opponents have alleged that food trucks substantially harm restaurants and have often successfully persuaded city councils to impose restrictions on them. But are the arguments raised against food trucks true? And are policies restricting food trucks truly good for communities?

Opponents' assertion is more than just a debate point—it is, in fact, a testable theory, which can be formulated quite simply: “Food trucks harm restaurants.” The theory rests on the idea that food trucks operate with unfair advantages. And because they are mobile, food trucks supposedly do not have “skin in the game” the way brick-and-mortar restaurants do in the areas they operate.⁶³

Critics argue that, unlike restaurants, food trucks do not invest in their communities because they do not rent or buy real estate or pay property taxes. Paired with their lower overhead costs generally, this supposedly gives food trucks an unfair operating advantage over restaurants and risks driving those “real” businesses with “roots” in their communities out of business.⁶⁴ Even when food trucks are required to pay for operating permits, critics argue trucks still do not pay their fair share for using the land on which they operate.⁶⁵

Food truck critics also take issue with trucks' ability to go where the customers are. For example, in defending Chicago's stringent food truck regulations, the Illinois Restaurant Association said that restaurants were “part of the fabric of the City” and would be “unable to survive as a result of food trucks unfairly siphoning off customers.”⁶⁶ Worse, the supposed negative effects are not limited to any one locale: Food trucks can move from location to location,

“swooping in and stealing” customers from restaurants over a wider geographic area.⁶⁷ Moreover, if a particular location eventually becomes undesirable—for example, because of a large number of shuttered brick-and-mortar businesses—trucks can easily move on to greener pastures. Or so the story goes.

Underlying this story is a notion that existing restaurants have a claim on their customers that the government should protect. But competition from food trucks is no different than competition from other restaurants or other food purveyors like convenience stores. Competition from other restaurants can and does drive some restaurants out of business, with research indicating competition is a consistent and significant predictor of restaurant

failure.⁶⁸ Independent restaurants, in particular, struggle to remain operational in areas with greater competitive density. Nevertheless, competition is normal, and, many would

argue, desirable given its tendency to promote better quality and value for consumers.⁶⁹ Few would agree that cities should protect pizza parlors or coffee shops from having similar establishments open up next door. Nor would most people agree that cities should be able to stop people from patronizing fast food restaurants in order to protect high-end restaurants. Yet this is essentially what many restaurateurs and their allies demand regarding food trucks.

In the end, critics' theory that food trucks harm restaurants relies almost entirely on anecdote. But is their theory empirically correct? Does the food truck industry fundamentally threaten the restaurant industry?

Critics' theory that food trucks harm restaurants relies almost entirely on anecdote.

To test food truck opponents' theory, we examined 12 years of data on food trucks and restaurants from the Census Bureau and the Bureau of Labor Statistics. Our study uses a specialized regression to see if a greater number of food trucks in one time period significantly predicts a lower number of restaurants in a later period. If so, this would suggest food truck growth leads to restaurant closures.

This analytical method accomplishes two things. First, it tests the intuition that if more food trucks force restaurants to close, this effect will not occur immediately but instead after a passage of time, one year in our analysis. Our use of a one-year lag, rather than a longer lag (e.g., two years, three years, five years), was informed by media reporting⁷⁰ and academic literature⁷¹ suggesting that food trucks' potential effects on restaurants—if any—would be observed sooner rather than later. We discuss this in greater detail in the appendix. Second and related, our analytical approach clearly identifies food trucks as a cause temporally by having the cause (food truck growth) precede the effect (presumed restaurant closures).

Our analysis improves on work first completed by *The Economist* magazine. In 2017, the debate about food trucks and restaurants had become so prevalent that *The Economist* conducted an analysis comparing food truck and restaurant growth using Census Bureau data. The results indicated counties with higher growth in mobile food services also saw higher growth in restaurants and catering businesses.⁷² While suggestive, *The Economist's* analysis was purely correlational; put differently, its results do not indicate whether changes in the number of food trucks *caused* changes in the number of restaurants. Our analysis more directly tests food truck critics' claims that food truck growth causes restaurant decline by exploring whether there is a causal relationship between the number of food trucks and the number of restaurants.

Note, however, that our analysis is not a true experiment in which the number of food trucks can be identified as the single cause of changes in

the number of restaurants.⁷³ Factors we did not or could not measure, such as the financial health of individual businesses, weather patterns or county food truck laws, may help explain changes in the number of restaurants. Yet the type of analysis we used reduces the effects of other potential factors that could confound the results and therefore further highlights the relationship, if any, between food trucks and restaurants.

We also improved on *The Economist's* analysis by controlling for factors we *could* measure that could confound the relationship between food trucks and restaurants. Outside of a true experiment—which again this is not—an examination of the influence of a factor on some outcome could be blurred by a third factor, casting doubt on the extent to which the primary factor of interest actually influences the outcome. In this study, for example, changes in the number of restaurants might be influenced more by changes in the economy over time than by the number of food trucks. One way of addressing this is by statistically controlling for—or removing the influence of—other potential explanatory factors. We did this by controlling for county population size using population estimates drawn from annual Census Bureau data. We also controlled for economic effects by including county-level unemployment rates from the BLS Local Area Unemployment Statistics. This economic control also enabled us to account for the Great Recession, which occurred during the time period covered in this report.

To execute the analysis, we extracted the annual number of mobile food service establishments and full-service restaurant establishments by county (n = 3,133) from the 2005 to 2016 annual Census Bureau County Business Patterns database. This is the same data *The Economist* used. We also ran the analysis a second time excluding rural counties, which are sparsely populated and may have no food trucks or restaurants—potentially distorting results. The sample size for the second analysis was 1,165 counties. See the appendix for detailed methods and full results.





Results

Food Trucks Do Not Harm Restaurants and May Help Them

Overall, our results suggest food trucks pose little threat to the restaurant industry. Looking first at descriptive statistics and simple averages (see Table 1), the restaurant industry is vastly larger than the food truck industry. Across all the years in the study (2005 through 2016), the average number of restaurants per county, 145, swamped the number of food trucks, just one per county. Non-rural counties have substantially more restaurants on average, 334, but only two food trucks.⁷⁴

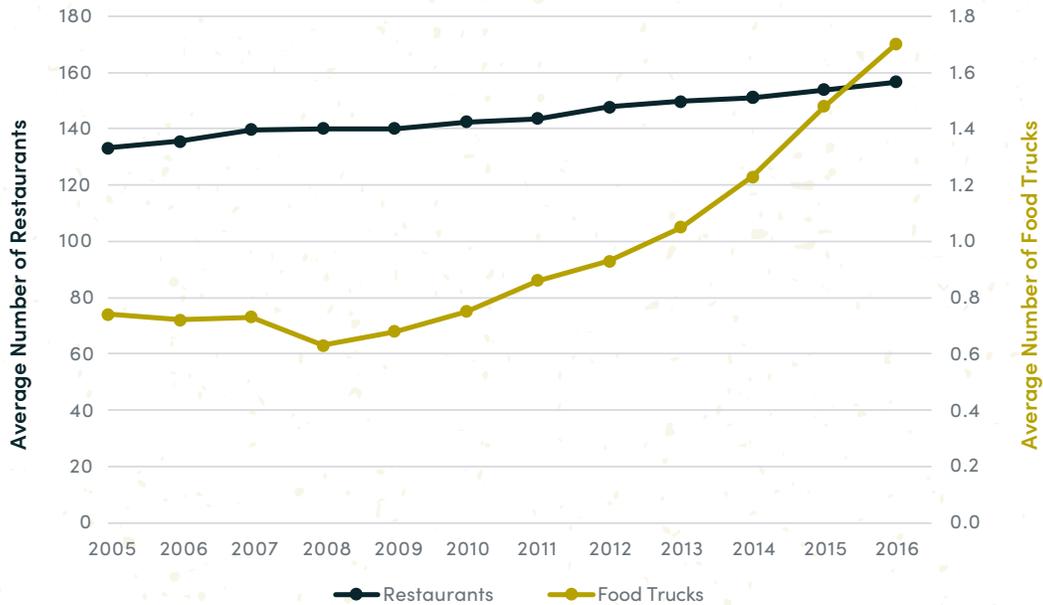
Table 1: Descriptive Statistics for the Counties, 2005–2016

	Total			Non-Rural Counties	
	Mean	SD		Mean	SD
Number of Restaurants	145	487		334	761
Number of Food Trucks	1	4		2	6
Population	98,947	316,436		226,582	492,494
Unemployment Rate	7%	3%		7%	3%

Additionally, both sectors saw growth during the time period we studied, although the growth was uneven (see Figure 1⁷⁵). The restaurant industry—again, much larger to begin with—grew from 133 per county in 2005 to 157 by 2016, though growth stagnated between 2007 and 2009, likely due to the Great Recession.⁷⁶ Food trucks saw a Recession-era dip from about 0.73 to just 0.63 per county in 2008, but after that they experienced a sharper uptick than restaurants, reaching 1.7 per county in 2016. This uptick corresponds with the increase in food truck popularity discussed above. It

could also be related to a post-Recession phenomenon of people out of work from other businesses, including restaurants, turning to food trucks as new entrepreneurial opportunities thanks to their relatively low startup costs.⁷⁷ Demand for street food may have also increased as consumers sought out lower-cost options during the economic recession and recovery.⁷⁸ Regardless of the reasons, even as the food truck industry took off, the restaurant industry continued to grow. This suggests growth in the two sectors can go hand in hand.

Figure 1: Trends in Numbers of Food Trucks and Restaurants, 2005–2016, All Counties

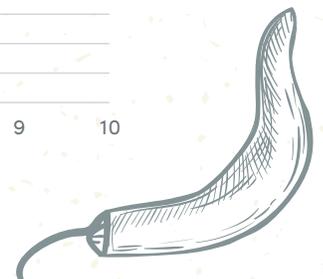
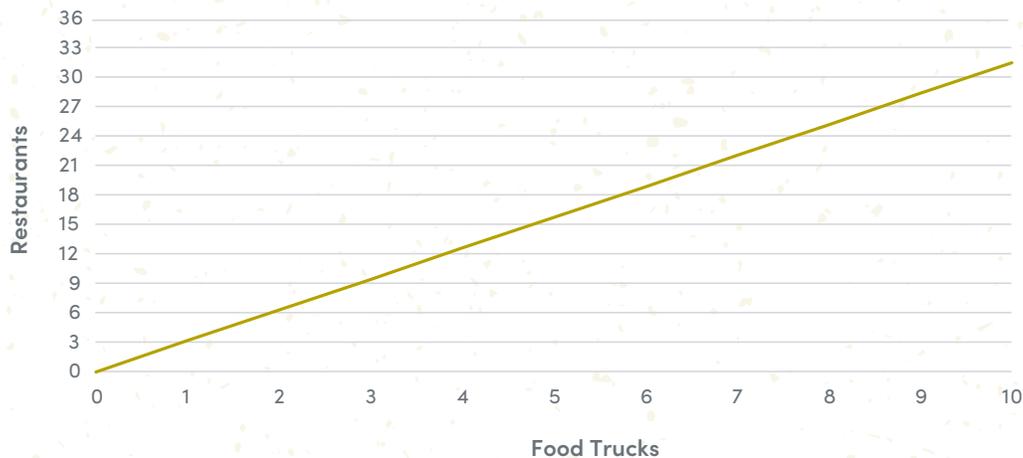


Stronger evidence comes from our regression analysis, which controlled for factors like economic conditions. This analysis was also designed to put restaurants' hypothesis to the test by examining whether food truck growth causes later restaurant closures. Our results indicate the answer is no. We found no statistically significant relationship between the number of food trucks in one year and the number of restaurants in the next. In practical terms, more food trucks today do *not* lead to fewer restaurants tomorrow.

Interestingly, we did find a positive and statistically significant relationship between food trucks and restaurants in the *same* year (all: $\beta = 3.45$, $p = 0.008$; non-rural:

$\beta = 3.14$, $p = 0.020$). As Figure 2 illustrates, a greater number of food trucks appears to correlate with a greater number of restaurants: For every additional food truck in a county, we would expect to see about three additional restaurants. Unlike the lagged analysis, this analysis is not causal—it does not mean that food truck growth *causes* restaurant growth—but it does suggest the two are positively related. This provides additional evidence food trucks do not hurt the restaurant industry—and they may even help. Below we discuss some possible reasons why food trucks may be complementary to the growth of the restaurant sector.

Figure 2: Number of Restaurants per Number of Food Trucks in a Given County, 2005–2016, Non-Rural Counties



Why Food Truck Growth and Restaurant Growth Go Hand in Hand

As our results illustrate, the critics' theory that food trucks harm restaurants fails. Not only do food trucks not appear to harm restaurants, but they actually appear associated with more restaurants. After the Great Recession in 2008, both food trucks and restaurants increased substantially at the county level throughout our study period. And while food trucks experienced higher growth rates, restaurants cannot complain because a greater number of food trucks in a county does not mean fewer restaurants in that county in a given year. In fact, the opposite is true, with three more restaurants present for each additional food truck. This further undermines food truck opponents' arguments, which they often make most forcefully during economic downturns when restaurants are hurting the most.

There are at least three possible reasons for our finding that food trucks do not harm the brick-and-mortar restaurant industry and may help it. First, food trucks are not direct competitors for all restaurants. Food trucks generally compete with fast food restaurants, not traditional, full-service restaurants.⁷⁹ According to one survey, lunch customers account for approximately two-thirds of food trucks' customer base. About half of these customers would choose to buy their lunch at a fast food restaurant if they were not buying it from a food truck, 42% would eat at home or bring food from home, and only 11% would choose to eat at a full-service restaurant.⁸⁰

Second, food trucks provide brick-and-mortar restaurants with opportunities to test new markets and products. According to the National Restaurant Association, some restaurants see food trucks as opportunities to expand their presence beyond four walls as well as to attract different market segments.⁸¹ In fact, restaurant-affiliated food trucks account for 30% to 40% of all food trucks in operation.⁸² Food trucks have even helped many restaurants weather the COVID-19 pandemic: Unable to conduct business as usual due to deserted business districts and indoor dining restrictions, many restaurants have come to see the advantages of having a food truck and have added one or more to their repertoire.⁸³

Third, instead of taking customers away from restaurants and putting them out of business, food trucks can help restaurants flourish in a variety of ways. For starters, food trucks can increase foot traffic to an area, helping existing brick-and-mortar restaurants and other businesses and encouraging new entrants into the industry. For example, until the pandemic shut it down,⁸⁴ a weekly food truck gathering at ArtsPark in Hollywood, Florida, drew hundreds of people downtown on Monday nights, traditionally the slowest night of the week for brick-and-mortar businesses.⁸⁵ In another example, food trucks at a popular location in Washington, D.C.—Farragut Square—drew so much foot traffic that four new brick-and-mortar restaurants opened across the street.⁸⁶ And in Hous-

ton in 2012, many restaurants supported deregulating food trucks because they noticed trucks brought more foot traffic to their businesses.⁸⁷ Similarly, when Sarasota, Florida, considered legalizing food trucks early in 2021, the city's planning director was in favor based on his professional experience in Atlanta and Madison, Wisconsin, where he said food trucks actually increased business at takeout restaurants.⁸⁸

It is easy to understand why this might be: People may go to an area for the food trucks, but they might choose to eat at a restaurant instead if the truck they planned to patronize is too busy or if they see a restaurant that appeals to them more. Or while buying lunch from a food truck one day, they might notice a restaurant they have not seen before and return to the area to try it on a subsequent occasion.



Food trucks can also create new places for restaurants to be established. They can do this by helping to revitalize underutilized urban spaces. In setting up shop in areas that have few other draws, they can make those areas both more attractive and safer,⁸⁹ drawing foot traffic to those areas. This new customer base, in turn, may encourage other brick-and-mortar businesses, including new restaurants, to locate in those areas. For example, municipal leaders in Montgomery, Alabama, saw food trucks as an essential part of revitalizing the downtown area—so much so that the city created events for food trucks to be hosted there.⁹⁰ Similarly, food trucks appear to have served as a low-cost revitalization tool on underutilized lots in Austin, Texas.⁹¹

Another way food trucks can help restaurants flourish is by stoking the fire of competition and innovation, contributing to the local culinary scene and even leading to the establishment of new, high-quality brick-and-mortar restaurants. For example, a survey of food truck owners in Vancouver, Washington, revealed that many believe the competition they provide is a healthy driver of restaurant innovation—that it forces restaurants out of complacency. As one survey respondent stated: “[T]he more food carts/trucks we have, the more vibrant our local culinary scene will become. This will, in time, lend itself to more high-quality brick and mortar restaurants and cafes.”⁹²

This food truck-induced culinary innovation makes intuitive sense, as restaurants must develop better and more unique menu items when food trucks are selling the same type of cuisine.⁹³ As Alan Hirsch, a restaurant owner in Baltimore, stated: “It’s the market at work. . . I’m sure when Starbucks was rolling across the country, independent coffee shops were outraged. But there are still independent coffee shops. They had to figure out a way to compete. They started making better coffee.”⁹⁴ Others have noticed the culinary innovation food trucks have brought as well. One food producer even



Once hindered by Louisville, Kentucky's protectionist rules, Troy King's Pollo food truck has spawned two restaurants.

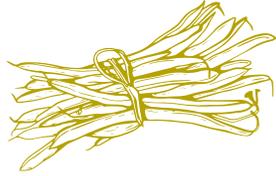


IN SUPPORT OF CANCER RESEARCH AND THE RIDE JANIE RIDE FOUNDATION

CUPCAKES FOR
COURAGE

CHANGE THE WORLD ONE CUPCAKE AT A TIME

Despite Chicago's anticompetitive rules, Laura Pekarik's Cupcakes for Courage food truck is a success. It now has two brick-and-mortar locations.



testified that the innovative nature of food trucks brought the entire industry back to concentrating on the customer: “Food trucks have helped provide the entire food industry with culinary focus at a time when many had lost sight of consumer needs and interests, taking what’s being learned on the road back into restaurants.”⁹⁵

In addition to fueling innovation through competition, food trucks fuel innovation by incubating new brick-and-mortar restaurants and other food establishments. While most food trucks may start off small, they can grow to a point in their popularity where it makes sense to open a brick-and-mortar location. For example, in 2007, Enzo Algarme started a food cart called Papatella in Arlington, Virginia, serving simple yet delicious pizzas made using traditions from his hometown of Naples, Italy.⁹⁶ Because of its success, Papatella

morphed into a brick-and-mortar restaurant with five locations.⁹⁷ The small chain continues to differentiate itself from the competition through its menu, such as by partnering with another local restaurant—Texas Jack’s Barbecue—to create a brisket pizza.⁹⁸

In another example, this one from Chicago, in 2011, IJ client Laura Pekarik opened her food truck, Cupcakes for Courage, from which she donates 10% of sales to cancer charities. The previous year, she had quit her job to help care for her sister who had been diagnosed with cancer. Following her sister’s recovery, Laura decided to go into business for herself rather than return to her previous career. Despite the Windy City’s stringent food truck regulations, Cupcakes for Courage was such a success that in 2012 Laura opened a brick-and-mortar bakery and café.⁹⁹ Today, Courageous Bakery Cafe has two locations.¹⁰⁰ Yet another example of food trucks incubating new restaurants can be found in Louisville, Kentucky, with IJ client Troy

King’s food truck, Pollo, which serves gourmet chicken dishes such as chicken and waffles. Troy bought his first food truck in 2014 and soon added a second truck as the business expanded.¹⁰¹ Troy’s continued success allowed him to open two brick-and-mortar restaurants—Six Forks, which dishes up gourmet hamburgers and hot dogs, and Fry Daddy’s, which mainly serves fried foods.¹⁰²

Today, Troy’s food trucks and restaurants contribute to his community in myriad ways. Not only do they provide consumers with more dining options, but they generate tax revenue and create jobs in Louisville. And they might not exist at all if the city’s no-vending zones, discussed above, had been allowed to stand.

Other cities where restrictive food truck regulations persist are missing out on the benefits food trucks provide. To return to Benny Diaz’s

story from our introduction, after he joined with IJ and other food truck owners to sue Fort Pierce, the court granted an injunction, stopping the city from enforcing the 500-

foot ban while the case proceeded—a strong indication that the city was unlikely to prevail.¹⁰³ In response, the city repealed the ban.¹⁰⁴ But to ensure the city never revived the ban, Benny continued to press his case,¹⁰⁵ and the city admitted during discovery that it was unaware of any harms to “public safety or any other governmental interest” caused by either the injunction against the ban or the ban’s subsequent repeal.¹⁰⁶ In the end, the court entered a consent final judgment finding the ban unconstitutional—and ensuring Benny and other food truck owners never have to worry about Fort Pierce bringing it back.¹⁰⁷ Taco Trap is now freely rolling on the streets of Fort Pierce, serving up tasty tacos and a heaping helping of healthy competition that can only be a good thing for Fort Pierce consumers and restaurants.

In addition to fueling innovation through competition, food trucks fuel innovation by incubating new brick-and-mortar restaurants.

Conclusion and Policy Recommendations

The results of this study make clear that, far from harming the restaurant industry, food trucks can complement it. Growth in the number of food trucks goes hand in hand with growth in the number of restaurants. This is not to say that restaurants are never put out of business by food trucks. Some may be—just as restaurants are sometimes outcompeted by other restaurants. However, this is normal, healthy competition, and it is good for food trucks, restaurants and consumers alike.

Food trucks, it would seem, have thus been unfairly maligned by restaurants, their associations and municipalities.

These results bear important policy implications. Cities can and should ensure the health and safety of their residents while also facilitating broad economic growth in their jurisdictions. The anti-competitive restrictions many cities have enacted to protect brick-and-mortar restaurants from food trucks serve neither of those ends. In the name of economic growth, fair competition and consumer choice, cities should repeal these counterproductive restrictions. And states should consider

preventing cities from enacting such restrictions.

More specifically, cities should repeal rules that ban food trucks—whether on public or private land—from operating in certain areas or within a certain distance from restaurants, as well as time limits that force trucks to pack up and move frequently.

Repealing such restrictions is the right thing to do at any time, but it is especially important for cities

to do before the next economic downturn, when many people will be looking for entrepreneurial opportunities

By increasing food truck freedom, not only can cities allow entrepreneurs to pursue the American Dream, they can also promote business growth and allow their communities to flourish.

and established restaurants are likely to put up resistance to food trucks. This was the case during the economic recovery from the Great Recession as well as during the COVID-19 pandemic, which saw restaurants from coast to coast oppose food truck freedom in a bid to protect their own businesses.

To the extent that cities do need to regulate food trucks—whether on public or private land—they should do so only to protect public health and safety, and the rules should be no more restrictive than those applied to brick-and-mortar restaurants.

Appendix

Detailed Methods and Results

Methods

The following question guided this study: Is there a significant relationship between the number of food trucks and restaurants from 2005 through 2016?

Annual food truck and restaurant data came from the 2005 to 2016 annual Census County Business Patterns database. Food trucks (the independent variable) were represented by mobile food establishments, NAICS code 722330. Restaurants (the dependent variable) were represented by full service, quick service and cafeteria style establishments, NAICS codes 722110, 722211 and 722212 (pre-2012) and 722511, 722513 and 722514 (post-2012).

Control variables included population estimates and unemployment rate. It is self-evident that counties with greater populations will generally have more food establishments of any kind, making it important to control for population. We drew county population estimates from annual Census Bureau data. The number of food establishments may also depend on the economic health in a county. Thus, we controlled for that using unemployment rates—a common proxy for economic health¹⁰⁸—at the county level drawn from the Bureau of Labor Statistics Local Area Unemployment Statistics. We collected and used one instrumental variable found to be a predictor of the presence of food trucks: ethnic diversity.¹⁰⁹ We estimated this as a Herfindahl-Hirschman Index using racial percentages from the Census Annual County Resident Population Estimates.

We analyzed the data for all counties ($n = 3,133$) and then for non-rural counties ($n = 1,165$). We coded the urbanicity of counties using data from the 2013 USDA Rural-Urban Continuum Codes.¹¹⁰ Rural was defined as non-metro counties with populations of fewer than 2,500 people adjacent to and not adjacent to metro counties (codes 8 and 9 on the continuum). Non-rural counties

included all other counties (codes 1 through 7 on the continuum).

We analyzed these data using dynamic panel data analysis, specifically an Arellano-Bond model in a one-step estimation.¹¹¹ In the analysis, we treated unemployment rate and population as exogenous, food trucks as a predetermined variable, and HHI as an instrument. The model also included year fixed effects and used robust standard errors. Year fixed effect controlled for any idiosyncratic year effects. Robust standard errors accounted for heterogeneity present in the data (total sample: Greene LR test = 149,000, $p = .000$; non-rural sample: Greene LR test = 43,610, $p = .000$). For robustness checks, we also analyzed the data using traditional ordinary least squares fixed effects, an Arellano-Bond model in a two-step estimation¹¹² and an Arellano-Bond-Blundell model in a two-step estimation.¹¹³ Results were substantively similar to the Arellano-Bond model in a one-step estimation. This means the results reported below are not an artifact of a particular estimation method but, instead, reflect a substantive relationship between food trucks and restaurants in the manner we describe.

In all of the preceding analyses, the food truck variable was modeled to be contemporaneous with restaurants and with a one-year lag. Our use of a one-year lag, rather than a longer lag (e.g., two years, three years, five years), was informed by media reporting¹¹⁴ and academic literature¹¹⁵ suggesting that food trucks' potential effects on restaurants—if any—would be observed sooner rather than later. In media reporting, for example, restaurant owners opposed to food trucks have described how their businesses suffered shortly after the arrival of food trucks and predicted their firms would shutter.¹¹⁶ One restaurant manager said, "When our count is down, we can just go outside and count the trucks right in front of us," while another said, "[W]hen there's a whole bunch (of trucks), we see a significant drop in sales."¹¹⁷

Moreover, research on factors that contribute to restaurant failure indicates competition is a consistent and significant predictor.¹¹⁸ Independent restaurants, in particular, struggle to remain operational in areas with greater competitive density. In media reporting, it is owners and managers of just those types of restaurants who are quoted as objecting to competition from food trucks.

Added to this are still other media articles that suggest exogenous factors have near-immediate effects on restaurants. An article about the 2019 federal government closure, for instance, described how four weeks into the closure restaurants were already reporting 20% to 60% losses in sales and significant reductions in employee work hours. Restaurants were described as just “trying to sustain their business.”¹¹⁹

In the absence of prior systematic evidence about the effects of food trucks on restaurants (specifically, a survival analysis on the relationship between trucks and restaurants), taken together, the literature described above acts as a guiding theory and suggests a one-year lag is appropriate. However, some might argue that one year is too short—that restaurants may be able to hold out for more than a year when faced with competition from food trucks. We allowed for that possibility and ran all models described herein with a second lag for food trucks. The results were not robust across all models. Specifically, inconsis-

tencies appeared in statistical significance, signs on coefficients and magnitudes of coefficients. Such results, plus the theory guiding our use of a one-year lag, compelled us to report results for only the one-year lag model.

Results

Table A1 includes results for all counties and the non-rural sample. Findings for restaurant and food truck variables are, of course, the same as reported above. Both unemployment and population are significantly related to number of restaurants and in an expected direction. Greater unemployment (a sign of a comparatively weaker economy) is associated with fewer restaurants. More populous counties have more restaurants. Notably, results are quite similar when comparing all counties and the non-rural sample. This suggests the dynamics between food trucks and restaurants are largely a suburban and urban phenomenon, which is entirely logical given the paucity of both restaurants or food trucks in rural areas. Finally, Table A1 includes autocorrelation results. As is desirable, results confirm first differences in the Arellano-Bond model are significantly correlated in the first order, indicating dynamic effects; no significant second-order autocorrelation appears in the first differences of errors.

Table A1: Full Results

	All Counties			Non-Rural Counties		
	Coef.	se	p	Coef.	se	p
Restaurants (lagged)	0.752	0.050	0.000	0.771	0.052	0.000
Food trucks	3.450	1.297	0.008	3.144	1.354	0.020
Food trucks (lagged)	1.837	1.277	0.150	2.120	1.332	0.112
Unemployment	-0.151	0.057	0.008	-0.451	0.197	0.022
Population	0.000	0.000	0.000	0.000	0.000	0.000
Intercept	1.665	6.145	0.786	6.823	14.061	0.627
AR (1)	-6.382		0.000	-6.011		0.000
AR (2)	0.538		0.591	0.514		0.607

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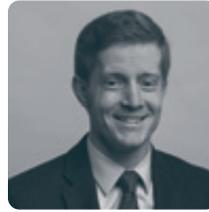
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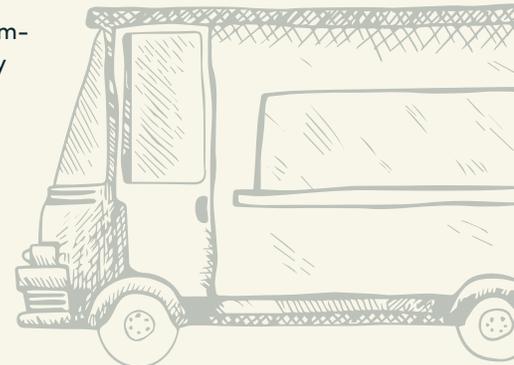


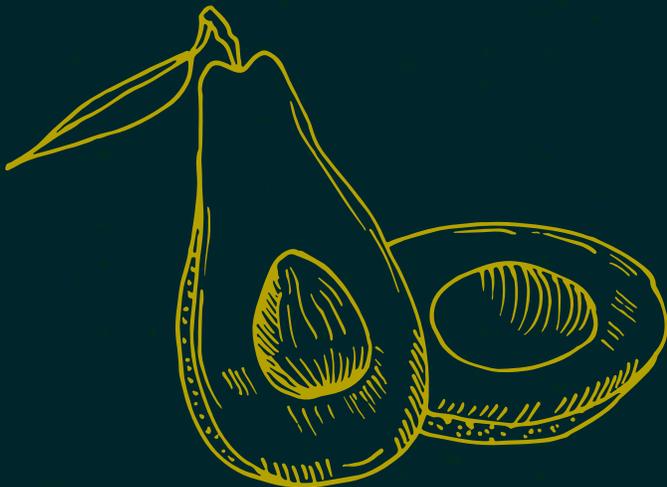
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