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Do Amazon Fulfillment Centers Help or Harm Local Economies?
Research Suggests the Latter

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Abstract

In this paper, I investigate the Amazon Corporation’s impact on the economic well-being of the communities that house its warehouses, or “Fulfillment Centers.” A review of the literature surrounding Amazon’s economic impact suggests that it has a negative net impact on local economies because it disrupts the distribution of private and public goods, suppresses wages, and displaces work in other sectors. My analytical contribution builds off of the Economic Policy Institute’s analysis of Amazon’s impact on county-level employment. I investigate: is Amazon’s impact on warehousing/storage sector employment (which EPI found to be significantly positive) and private-sector employment (which EPI found to not be significant) substantively meaningful and homogenous across communities of different sizes and regions of the U.S.? And are these findings consistent with one of EPI’s two hypotheses for their findings? Authors Jones and Zipperer hypothesize that Amazon does not have a significant impact on private sector employment because either 1) jobs created in the warehousing and storage sector are offset by job losses in other industries, or 2) Amazon creates too few jobs to significantly influence county-level employment.

After replicating their analysis and re-creating each output by region and county metropolitan status, I found that Amazon creates slightly better economic outcomes for smaller metropolitan counties and counties located in the Northeastern and Western regions of the U.S. These findings are largely consistent with the second hypothesis. However, each coefficient, when translated into substantive estimations of county-level job growth, appears minute even when significant—for example, in smaller metropolitan counties, Amazon increases the proportion of private-sector jobs that are characterized as warehousing and storage-sector from just under one percent to just over one percent. Given the enormous economic investment necessary to attract an Amazon warehouse, and the unequivocal evidence for Amazon’s negative impact on local economies, it appears that Amazon’s substantively small impact on private-sector and warehousing and storage-sector employment does not justify the investment.
Introduction

It goes without saying that the online retail giant Amazon.com, Inc., is becoming more influential and alluring than ever: at the beginning of 2020, Bank of America estimated that Amazon has about 44% of U.S. e-commerce market share, up from 40% in 2018. At the time of writing, e-commerce spending and Amazon’s stocks are at an all time high as the Covid-19 quarantine is confining people to their homes and encouraging them to shop online. Between Amazon’s growing influence and the well-publicized inter-state competition to attract (or, in the case of Long Island, reject) HQ2, scholars and consumers alike may wonder how local economies could benefit, or suffer, from bringing Amazon to their own communities. States are offering increasingly expensive incentive packages to attract Amazon and its subsequent job growth; however, despite the magnitude of these investments, Amazon’s true impact on communities is somewhat unclear. This research project investigates Amazon’s substantive impact on local economic outcomes using a comprehensive literature review and quantitative analysis.

The literature review delves into Amazon’s impact on local economies and briefly summarizes concerns with working conditions in Amazon’s Fulfillment Centers. My analytical contribution is focused specifically on Amazon warehouses, or “Fulfillment Centers,” and their impacts on county-level employment. I will be duplicating the methodology used by the Economic Policy Institute in their report *Unfulfilled Promises: Amazon fulfillment centers do not generate broad-based employment growth.* Through conducting several analyses that account for variation by region and county metropolitan status, I hope to identify any heterogeneity in Amazon’s local economic impact and substantively explore the impact Amazon has on local job creation. Through juxtaposing established economic scholarship with estimates of local-level impacts, I hope to provide readers a clearer picture of how the costs of Amazon contrast with local economic returns. In simpler terms, I would like this study to suggest answers to the question: Is Amazon worth it?

Literature Review

Existing research on Amazon Fulfillment Centers generally falls into one of three categories: research on its economic impacts, discussion of working conditions, and larger technological trends. I will not explore technological trends in this literature review because it is less relevant to the purpose of this study and fewer reliable reports have been written. This review largely emphasizes the economic costs and contributions of Amazon, though I believe discussion of working conditions is also important; poor working conditions can contribute directly and indirectly to the local economy via healthcare costs resulting from injury and mental healthcare for miserable workers. I cannot make any causal claims about Amazon’s economic impacts, but I can provide the context necessary to determine the gravity and scale of Amazon’s positive and negative influences.

Economic Impacts

As of 2019, Amazon received roughly 2.9 billion dollars in state and local economic development subsidy deals for its warehouses, data centers, and film productions. The nation-wide competition for
Amazon’s “HQ2” brought light to the enormous investments states are willing to make—even when they cannot guarantee that long-term employment will outweigh the costs. These incentive packages are large and growing; analyses of Amazon and similar companies reveal that states are paying more for comparatively fewer jobs. Economist Timothy Bartik from the W.E. Upjohn Institute for Employment Research tells Citylab that recent Amazon tax incentive packages are significantly larger than ordinary incentives packages. Many come close to the 2017 Wisconsin incentive package to attract Foxconn, a Taiwanese flatscreen manufacturer; Wisconsin offered Foxconn between $172K-$290K per job: 7-12 times greater than the average investment/job credit offer by U.S. states. Average U.S. incentives are $24K per job. These incentives are often an unnecessary cost; Bartik’s research suggests that in three of four instances, the same jobs would’ve been located in the state and local economy without an incentive.

Many economists agree that the growing costs of these incentive packages outweigh the receiving communities’ benefits. Firstly, because incentives do not pay for themselves through the jobs they create: Bartik continues that 90 percent of any increased revenue is offset by the public services needed to support the population brought to an area by new jobs. Since incentives don’t pay for themselves, states must pay for them by increasing taxes and cutting public spending: reducing residents’ incomes and ability to contribute to the local economy. Greg LeRoy, the director of the nonpartisan and nonprofit think tank Good Jobs First writes that Amazon Warehouses are so costly, Amazon ought to pay the surrounding community—not the other way around. Overall, LeRoy’s research suggests that the cost of Amazon—in terms of lost public and private goods, retail-sector layoffs, downward pressure on wages, and lack of contribution to the communities that host it—outweigh the benefits.

Public and Private Goods

The “War Among States,” where states outbid each other to attract companies like Amazon, decreases private and public goods available for all citizens to consume. Economic analyses of a variety of different tax-incentive scenarios find that the optimal tax, or the tax that distorts the least, is one that is uniformly applied to all businesses: not just the corporation they wish to attract. Discriminatory tax policies, like those used to attract Amazon, result in fewer public and private goods available to community members. In the case of private goods, tax incentives to national employers disrupt the economic competition between states that ensures goods are allocated efficiently. When states actively compete with each other for businesses by adjusting general tax and spending policies, they ensure private goods are allocated efficiently. However, when competition takes the form of preferential treatment for specific businesses—as it does with Amazon incentive packages—it “interferes with interstate commerce” and “undermines the national economic union by misallocating resources.”

Amazon tax incentives also strip states of resources otherwise used to provide public goods, like transportation and education. For example, the consulting firm Civic Economics writes that, in 2015 alone, state and local governments lost more than $1.2 billion in revenue (an increase of 18 percent from the previous year) through lost property taxes from displaced brick-and-mortar retail stores and unpaid sales tax at the state and local level. Amazon does not collect sales tax in 16 states, costing local and state governments $704 million on top of property tax losses. The Economic Policy Institute writes that tax incentives, by reducing resources available to state and local governments, and restrict public spending which can expand public services increase local economic activity. Because they sustain the workforce and improve local spending, investments in public services and infrastructure are a much
stronger recipe for spurring long-term economic development than providing tax increases to existing national employers. Carl Davis with the Institute on Taxation and Economic Policy writes

“If offering more tax incentives requires spending less on public education, congestion-relieving infrastructure projects, workforce development, police and fire protection, or high technology initiatives at public universities, the overall impact on a state’s economy could actually be negative. While the long-term economic benefits of education and infrastructure investments may not be as flashy as incentive-backed ribbon-cutting ceremonies, these investments are even more fundamental to any successful economy.”

These effects are exacerbated by the fact that Amazon often does not pay sales tax to the states that house then. In 16 states, Amazon, unlike its competitors, is not required to pay sales tax. In South Carolina, for example, Amazon made a deal with the governor to remain sales tax free even as it built warehouses in the state. In 2017, the South Carolina Department of Revenue filed a motion that Amazon “could owe the state in excess of $500 million in unpaid sales and use taxes.”

Low wages

Research suggests that Amazon centers depress wages in their regional labor markets. An analysis from The Economist found that, after Amazon opens a storage depot, local wages for warehouse workers fall by an average of 3%. Further, in places where Amazon operates, such workers earn about 10% less than similar workers employed elsewhere. This finding is corroborated by the Institute for Local Self-Reliance; in metro areas where Amazon has a significant presence (Atlanta, GA; Cincinnati, OH; Columbia, SC; Dallas-Fort Worth, TX; Harrisburg-Carlisle, PA; Inland Empire, CA; Kenosha, WI; Louisville, KY; Nashville, TN; Phoenix, AZ; Seattle, WA), Amazon wages were an average of 15 percent below the wages for comparable positions. These discrepancies were even higher among Black and Latino workers, who comprise 45 percent of Amazon’s warehouse workforce. Most workers do not earn enough to afford the premiums and deductibles for Amazon’s medical plan and earn a fraction of that earned by workers employed by similar companies, such as Associated Wholesale Grocers and Stater Bros. Markets.

Difficulties earning a living wage while working at an Amazon Fulfillment Center prevail even after Amazon raised the minimum wage to $15 per hour in 2018; a 2019 case study of Amazon warehouse workers in San Bernardino and Riverside counties in California found that 86 percent earn less than the basic living wage for that area. In 2017, the typical worker had total annual earnings of $20,585, which is slightly over half of the living wage in the San Bernardino/Riverside areas ($37,108 per year). Fourteen percent were under the federal poverty threshold and another 31 percent were just above the poverty threshold. More than half of workers live in overcrowded and substandard conditions and 61 percent of workers rely on public benefits, like subsidized health care, to make up for basic needs not met by their wages; workers who were at the job 2,080 hours a year (40 hours a week, 52 weeks a year) received an average of $5,094 in public benefits per year. This story stays the same across the country in Ohio, where 1,430 of the state’s 6,000 Amazon workers received Supplemental Nutrition Assistance Program (SNAP)—sometimes called food stamps—benefits.

Some scholars believe that Amazon’s low wages are connected to the composition of its workforce, which is young with a high turnover rate. However, the relationship between low wages and young workers is largely correlational—not causal. This means that places with low-wages attract young workers, or vice versa: young workers are given lower wages. Both phenomena may be occurring simultaneously as Amazon’s workforce has high turnover rates, low wages, and young employees. Job
tenure at the company is typically just one year according to the research firm Payscale.\footnote{xxxiv} Former Amazon compensation expert Fred Whittesley writes that the company has a 10 percent turnover rate—meaning 1 in 10 workers leave each year—and has to dedicate about 5 percent of its annual payroll to recruit, hire, and train replacements.\footnote{xxxv} Given its low wages and high turnover rates, it is possible that Amazon attracts younger workers: David Autor, a labour economist at MIT, believes Amazon’s employees tend to be younger—data from the Census Bureau suggest that nearly half of its warehouse employees are under 35.\footnote{xxxvi} Whether Amazon’s low wages attract young people, or whether young people are undervalued and paid lower wages, or both, is unclear; nonetheless, low wages and high turnover inhibit workers from advancing and earning sustainable wages. High turnover rates indicate that workers have fewer opportunities to learn how to operate sophisticated machinery and advance to more stable and higher-paying positions.\footnote{xxxvii}

Other scholars attribute low wages to Amazon’s intolerance for any sort of labor organizing. In September of 2018, a 45-minute Amazon training video depicting union-busting tactics was leaked. The video contains six sections, which the narrator states are “specifically designed to give you the tools that you need for success when it comes to labor organizing.”\footnote{xxxviii} The Gizmodo news source pulls out the quote: “We do not believe unions are in the best interest of our customers, our shareholders, or most importantly, our associates. Our business model is built upon speed, innovation, and customer obsession—things that are generally not associated with union. When we lose sight of those critical focus areas, we jeopardize everyone’s job security: yours, mine, and the associates.”\footnote{xxxix} Pervasive anti-organizing sentiment prevents workers from organizing and advocating for the higher wages traditionally associated with middle class warehousing work. When writing about a new Amazon warehouse in Chicago, Edward Mclelland writes “Many of those new jobs don’t pay as well, not because they require less skill, but because the workers who do them don’t belong to unions.”\footnote{xl}

Displaces other sectors

Amazon’s downward pressure on retail occupancy rates, rent rates, property values, property tax assessments and property tax revenues displaces retailers across the country.\footnote{xli} The Institute for Local Self-Reliance found that, by the end of 2015, Amazon displaced enough sales at brick-and-mortar stores to force the elimination of about 295,000 retail jobs: 150,000 more jobs than it created.\footnote{xlii} Their analysis estimates that in 2015, Amazon’s growing market share caused more than 135 million square feet of retail space to become vacant.\footnote{xliii} From a social perspective, localities suffer the consequences of unemployment and loss of organizations that contributed to local culture and economic life. Not only do closed properties no longer generate the same levels of property and sales taxes, but cities are forced to grapple with expenses associated with increased crime, ongoing services, and the burden of making empty storefronts—and their surrounding areas—viable again.\footnote{xlv} From an economic standpoint, city revenue sources often depend on property taxes from mainstream businesses, which ILSR estimated to generate surplus revenue—meaning more revenue than they required in public services—of at least $326 per 1,000 square feet.\footnote{xlvii} The revenues previously provided by these local retailing jobs are far greater than those of big-box retailing and warehousing jobs.\footnote{xlviii} This is especially true of Amazon Fulfillment Centers that don’t pay taxes on prime commercial properties in Central business districts.\footnote{xlix}

Given Amazon’s sales revenue, the number of new Fulfillment Center jobs fails to replace the retail storefront jobs it displaced. In Illinois in 2015, for example, Amazon generated about 1.5 million in sales in Illinois for every full-time warehouse worker employed there.\footnote{lx} In comparison, Illinois’ brick-
and-mortar retail stores employ about seven people to accomplish the same sales. All of Amazon’s 2015 sales are equivalent to 39,000 retail storefronts that would have paid $528 million in property taxes.¹ The consulting firm Challenger, Gray & Christmas, Inc. reported 60,127 announced retail job cuts for the first six months of 2017 alone, and “over 5,000 announced store closings” in the same period.² LeRoy describes Amazon’s employment impacts as “job churn” rather than “job growth” because, when Amazon creates jobs, it catalyzes lay-offs in competitors such as Sears, K-Mart, The Limited, Macy’s, Walmart, American Apparel, Lowe’s, Fossil, A & P and other local and regional retailers.³

Community dependence on Amazon Fulfillment Jobs can also inadvertently create social consequences: social scientists Troy Blanchard and Todd Matthews found that communities where a small number of corporate establishments or industries dominate a local economy are less likely to actively participate in civic engagement through activities such as voting or protesting.⁴ Meanwhile, communities with more diversified local local business owners had stronger “problem-solving” abilities though fostering social trust, investing in the welfare of the community, and promoting “civic spirit.”⁵ Having an economy made of small-scale businesses is also correlated with lower rates of crime and better public health because communities have a better ability to work together for mutual benefit.⁶ Employees are more committed to smaller and locally-owned firms,⁷ and counties with greater shared locally owned retail experience lower rates of out-migration--especially among college graduates.⁸ Amazon’s disruptive influence on local economic systems challenges this community cohesion.

Overall, economic research points to the conclusion that investing in Amazon costs the economy more than it contributes. Of its $27 billion in profits since 2008, Amazon paid less than three percent of its income through federal income tax.⁹ Cost-benefit analyses of Amazon’s public and private costs outweigh its contribution to the public through employment and taxes.¹⁰ A cost-benefit analysis of the four county area constituting Los Angeles, California identified nearly $850 million in public subsidies for Amazon and uncompensated social costs caused by Amazon in that region alone.¹¹ Beyond the economic costs discussed in this section of the literature review, this estimates takes into account costs associated with climate change impacts from cargo aircraft flights, business subsidies for warehouse construction and movie production, annual public assistance benefits to offset the wage deficit of warehouse workers, and annual uncompensated public costs for warehouse trucking. This calculation may also be conservative because it does not factor in wage deficits, such as those of underpaid delivery drivers employed by Amazon and its subcontractors. Overall, Amazon’s positive impact on communities is likely offset by its disruption of the distribution of private and public goods, pervasive wage deficits, mass lay-offs in the retail sector, and costs requiring public subsidies.

Amazon Working Conditions

Scholarship suggests that working conditions in Amazon Fulfillment Centers create disproportionately high rates of occupational injury and workplace stress. Several investigative journal pieces detail arduous Warehouse working conditions conducive of physical injury, chronic pain, and mental strain. Under the terms of its contract, Amazon does not pay property taxes to offset local tax-dollars needed to fund strained health services.¹² Many workers are hired as “temps” or seasonal, which exacerbates psychological stress with stress established to be linked to economic instability. Overall, the literature consistently conveys a message of physically dangerous and psychologically damaging working
conditions that harm workers and strain local health infrastructure. One can conclude that, not only must residents pay Amazon to place a warehouse in their community, they must offset the costs of strained emergency health services, for example, that Amazon does not reimburse by way of property taxes.\textsuperscript{lxii}

Workers in Amazon Fulfillment Centers face disproportionally high occupational injury rates. A 2019 case study of an Amazon Warehouse in Haslet Texas found that, not only was the recorded injury rate grew since 2017 more to be double the industry average, but severe injury rates—meaning injuries that result in death, loss of consciousness, require “medical treatment beyond first aid,” involve punctured eardrums, fractured bones, diagnosis of an irreversible chronic illness, etc.—were larger than those at a state psychiatric hospitals, aluminum foundries, or prisons.\textsuperscript{lxiii} The physical demands of many warehouse jobs likely contribute to the high rates of injury; one former Amazon employee tells The Mississippi Business Journal that regular Amazon workers are supposed to pick 100 items an hour, which can be especially difficult for older workers.\textsuperscript{lxiv} Sixty-six percent of the 145 Staten Island Amazon workers who were surveyed by the New York Committee for Occupational Safety and Health said they experience physical pain while performing their regular work duties.\textsuperscript{lxv} 42 percent said they continue experiencing pain when they aren’t working.\textsuperscript{lxvi} In 2018, the advocacy group National Council for Occupational Safety and Health listed Amazon as one of the most dangerous places to work in the U.S. due to higher-than-average injury rates, unnecessary risks, and an unwillingness to address workers’ concerns in its warehouses.\textsuperscript{lxvii} Workers also report experiencing unbearable temperatures, timed bathroom breaks, and dehydration on the job.\textsuperscript{lxviii}

A lack of paid time off may exacerbate physical strains and injuries; at the end of 2019, more than a quarter of a Sacramento Amazon warehouse’s workers walked off the job because they receive 0 paid days off a year despite “lift[ing] hundreds of packages a day in ‘back-breaking’ labor.”\textsuperscript{lxix} In addition to burdening workers and their families, these high rates of occupational injury burden local and national economies; a report by Economist J. Paul Leigh found that the medical and indirect costs of occupational injuries and illnesses are at least as large as the cost of cancer.\textsuperscript{lx} “Workers’ compensation covers less than 25 percent of these costs, so all members of society share the burden.”\textsuperscript{lxii} At a local level, residents must pay for emergency medical services for workers through their taxes: many county emergency services are under strain from routine and often frequent calls from Amazon, who through the terms of its contract, does not contribute local tax dollars.\textsuperscript{lxiii} Steve Little, the fire district administrator of an Ohio county containing a nearly one million-square foot facility, explains that county residents are forced to pay for a medical unit straining to accommodate routine emergency calls: shortness of breath, chest pains, and a myriad minor injuries reported sometimes several times per day.\textsuperscript{lxiv}

Amazon also shifts economic instability onto workers through negotiating strictly seasonal or temporary work contracts. Temporary and involuntarily part-time workers face greater insecurity than traditional full-time workers. In May 2015, nearly 1 in 5 workers who moved freight by hand—the largest occupation in the warehousing industry—was a temp worker.\textsuperscript{lxv} The number of temp workers employed by Amazon continues to rise: in November 2019, Amazon announced that it would hire 200,000 seasonal workers in the U.S.: double the number of temporary workers hired in 2018.\textsuperscript{lxvi} Temporary work status is connected to lower wages and decreased eligibility for benefits. The Institute for Local Self-Reliance found that temp positions pay $5.50-$1.00 less than full-time staff workers and there is no upward pressure on wages over time.\textsuperscript{lxvii} Temporary/seasonal workers are also guaranteed fewer benefits, even if they work all year round; for example, the temporary staffing agency employed by Amazon, Integrity Staffing Solutions, was involved in more unemployment compensation appeal hearings than any other employer—including Walmart—in the state of Pennsylvania.\textsuperscript{lxviii} Amazon’s flexible employment structure
discourages advancement and any push for greater benefits or wages; SUNY Buffalo professor Erin Hatton states in an interview [about Amazon] that “the very clear and occasionally explicit message to employees is that you’re replaceable, you have to be thankful for what you have, and if you’re going to ask for one penny more, one ounce more… they can replace you.”

These trends are consistent with Economist Jacob Hacker’s concept of the “Great Risk Shift.” our collective shift towards the “gig economy” where workers become responsible for social safety net services traditionally provided by their employers.

Employment instability, coupled with stressful workplace conditions, burdens workers’ mental health. The Federal Reserve’s Survey of Household Economics and Decision-making reports economic instability as a primary stressor among low-income workers, often contributing to income fluctuation, an inability to plan and save, and a number of deleterious physical and mental health outcomes for workers and their families.

Economic stress is likely exacerbated by occupational stress within the warehouse: Stuart Appelbaum, president of the Retail, Wholesale and Department Store Union, tells Vox that the speed required of warehouse workers is “unsustainable.” He explains “With two-day Prime shipping, Amazon fulfillment workers currently face speeds of 200-300 orders per hour in 12-hour shifts. They struggle already to maintain that pace.” Further, many employees describe the environment inside the warehouse to be psychologically destructive; one former worker writes “After two months, I felt I couldn’t work there and maintain a healthy state of mind.”

As mental health concerns rise across the country, counties housing Amazon Warehouses may experience increased demand for mental services—in tandem with the aforementioned strain on emergency health service infrastructure.

Analytic Contribution

My analytical contribution to the question of Amazon’s impact builds off of the Economic Policy Institute’s 2018 study, “Unfulfilled Promises: Amazon fulfillment centers do not generate broad-based employment growth” by Janelle Jones and Ben Zipperer. Jones and Zipperer merged data on Amazon fulfillment centers nationwide with Census data on average quarterly wages and employment by sector and county. They estimated the employment effect of opening a fulfillment center by assessing employment growth in a county after it opens a fulfillment center, relative to employment trends in counties that did not receive a fulfillment center. All estimates take into account population changes and control for multiple factors that may be correlated with employment outcomes and fulfillment center openings, such as national, regional, and state-specific shocks. They found that private-sector employment in counties that opened a new Amazon Fulfillment Center remains the same in the following 2 years, while warehousing and storage employment increased by roughly 30. Jones and Zipperer hypothesize that employment overall does not change because either 1) jobs created in the warehousing and storage sector are offset by job losses in other industries, or 2) Amazon creates too few jobs to significantly influence county-level employment.

Both scenarios have negative implications for communities that offer Amazon millions of dollars in subsidies in return for job growth. As evidenced in the literature review, if Amazon “shifts around” employment in a region, they may harm the community by weakening local employers and undermining jobs and wages. If they have a positive, but insignificant, effect on employment, the cost of attracting Amazon may outweigh the benefits. To explore these possibilities, I first recreated Jones and Zipperer’s findings using their same data and statistical models. To investigate if Amazon’s impact varies by receiving county size, I recreated the analysis for metropolitan counties containing more than 1 million
residents only, and again for metropolitan counties containing less than 1 million residents. Secondly, to investigate regional variation, I repeated this analysis for each of the four regions of the U.S.: the Northeast, Midwest, South, and West.

These analyses intend to investigate EPI’s two hypotheses while exploring heterogeneity in Amazon’s impact on employment. If hypothesis two were true, Amazon would have a smaller impact in more populated counties, where new warehousing jobs would be a “drop in the bucket.” If hypothesis one was true, Amazon would draw employees from other sectors, so the losses in other sectors would offset the warehousing/storage sector growth (so we do not perceive change in overall private sector employment). Though my analytical contribution does not directly address hypothesis one, we believe the two hypotheses to be conversely related: if hypothesis one was true, Amazon would not create a significant number of new jobs. It would draw employees from other industries. On the other hand, if hypothesis two were true, Amazon does create new jobs: however, there are too few new jobs to influence overall private-sector employment. We will be exploring evidence for hypothesis two and using that information to infer judgement about hypothesis one.

Methodology

For consistency and comparability, I used the same data and methodology as the Economic Policy Institute (EPI). Reliable data on Amazon Fulfillment Centers are relatively scarce and vary between datasets. EPI’s dataset, which is based in a publicly downloadable database from Guided Imports, a part of sourcing company Procu International LLC. This database was cross referenced with available data from Avalara, a Seattle-based company providing tax compliance advice to businesses, and consulting firm MWPVL International. The final sample contains all fulfillment centers listed in each of the three sources during their 2001–2015 reference period. It is worth noting that EPI updated this study in March 2018 with data on new fulfillment centers since that period. They re-ran their analysis and found that the updated data confirm their previous results. Because of this, we felt comfortable conducting our analyses with the same 2001-2015 data.

By 2015, there were 69 Amazon fulfillment centers open across the United States in a total of 45 counties. The balanced sample of 1,161 counties, for which there was warehousing employment information for the entire 2001–2015 period, includes 54 fulfillment centers in 34 counties. EPI concludes that the data therefore apply to more than three-fourths of the known fulfillment center locations in 2015. They merge this location data with employment data from the Quarterly Census of Employment and Wages (QCEW), public access data on wages and employment by industry and county from the U.S. Bureau of Labor Statistics. In addition to overall private-sector employment, the QCEW contains data on the warehousing and storage industry.

Between 2001-2015, the majority of Amazon Fulfillment Centers Counties opened in metro areas with more than 1 million people. 60 percent of counties that opened an Amazon Warehouse between 2001-2015 had more than 1 million residents. 35.6 percent of counties that opened an Amazon between 2001-2015 were smaller metro areas (between 250,000-1 million residents). One county was a metropolitan county with a population smaller than 250,000 residents but was not included in EPI’s balanced sample. No counties that opened Amazon Warehouses between 2001-2015 were designated as metropolitan by the USDA’s Rural-Urban Continuum Codes.

An explanation of EPI’s statistical methods is copied here:
“To estimate the employment effect of opening a fulfillment center, we examine whether employment rose in a county after it opens a fulfillment center, relative to employment trends in counties that did not receive a fulfillment center. We focus specifically on warehousing employment and total private-sector employment in each county. To account for population changes, we calculate county-level employment-to-population ratios for warehousing and total private-sector employment from Census Bureau estimates of county population, and we use these employment-to-population ratios as our outcomes of interest.

For robustness, we also control for multiple factors that may be correlated with employment outcomes and fulfillment center openings. For example, counties that open fulfillment centers may have higher warehousing employment in general (regardless of the opening). In addition, warehousing employment and employment overall around the time of a fulfillment center opening may also be affected by national events such as a national recession, or regional or state-specific economic changes or “shocks” to local employment, due to changes in regional labor demand or specific policies that affect employment.

When we estimate the effects of opening a fulfillment center, we use a variety of specifications to control for these permanent differences in employment between counties, and to control for time-varying economic shocks that may occur when fulfillment centers are being opened. Specifically we control for national, regional, and state-specific shocks with three different statistical models: a common time fixed effects model, a Census division–specific time fixed effects model, and a state-specific time fixed effects model. All regressions also include controls for permanent differences in county employment (county fixed effects). Depending on the specification, we also control for a measure of predicted private-sector employment (based on industry shares in the 1996–2000 period), and for different employment trends among counties (county-specific linear time trends).

We also want to make sure that we account for any employment effects that take time to develop after a fulfillment center opening, and that any changes in warehousing and overall employment we see are not simply continuations of existing trends. Therefore we also include lagged indicators of openings in order to capture up to two years of lagged employment effects that may develop after an opening, and directly control for differences in employment up to two years prior to the opening of a fulfillment center.

Warehousing employment is a larger share of private-sector employment in counties that opened a fulfillment center. In counties that never opened a fulfillment center, warehousing employment was about 0.5 percent of total private-sector employment. In counties that opened a fulfillment center, county warehousing employment averaged about 1.0 percent of total private-sector employment prior to opening a center and 1.4 percent after opening a center. We use county fixed effects to control for persistent differences in the level of warehousing employment between counties that did or did not open a fulfillment center.

Results

If one looks at the percentage increase in warehousing and storage sector employment, Amazon had a greater effect on less populated counties than in more densely populated counties. Between 2001-2015, warehousing and storage sector employment in counties with more than 1 million residents increased by roughly 65 percent. Smaller metropolitan areas increased warehousing and storage sector
employment by roughly 74 percent. Because warehousing and storage jobs comprise such a small segment of the private sector (.2 percent of all larger metropolitan jobs and .3 percent of all smaller metropolitan area jobs), these increases do not translate into a significant number of new jobs. If we apply these growth rates to the average number of warehousing and storage sector jobs in smaller (again, meaning a population of 250,000-1 million) and large metropolitan counties, smaller metropolitan counties would gain an average of 389 new warehousing and storage sector jobs from Amazon and larger metropolitan areas would gain 686 more workers. These increases are somewhat insignificant in comparison to the average number of private sector jobs per county: 148,771 jobs in the average large metropolitan areas during this time period and 60,474 in the average small metropolitan areas.

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<th>Region</th>
<th>Average number of warehousing and storage jobs in county</th>
<th>Percent increase in county warehousing employment 2 years after opening an Amazon warehouse*</th>
<th>Number of new jobs if growth rate applied to average county</th>
<th>Average number of jobs in private sector</th>
<th>Proportion of employment in warehousing/storage before Amazon</th>
<th>Proportion of employment in warehousing/storage after Amazon</th>
</tr>
</thead>
<tbody>
<tr>
<td>All Large Metro areas (&gt; one million residents)</td>
<td>1057</td>
<td>65%</td>
<td>686</td>
<td>148771</td>
<td>0.007</td>
<td>0.012</td>
</tr>
<tr>
<td>Large Metro areas (&gt; one million residents) with existing warehousing/storage employment</td>
<td>1488</td>
<td>65%</td>
<td>966</td>
<td>184665</td>
<td>0.008</td>
<td>0.013</td>
</tr>
<tr>
<td>All Small Metro areas (250,000 - one million residents)</td>
<td>526</td>
<td>74%</td>
<td>389</td>
<td>60474</td>
<td>0.009</td>
<td>0.015</td>
</tr>
<tr>
<td>Small Metro areas (250,000 - one million residents) with existing warehousing/storage employment</td>
<td>768</td>
<td>74%</td>
<td>568</td>
<td>74578</td>
<td>0.010</td>
<td>0.018</td>
</tr>
</tbody>
</table>

* uses EPI's state-specific time fixed effects model

Amazon improves private-sector employment in small metropolitan areas and has no significant effect in larger metropolitan areas. In large metropolitan areas, Amazon actually decreased private sector employment—although this finding is not statistically significant. While EPI’s argument that Amazon has no effect on private-sector employment rings true in large metropolitan areas, it omits the positive impact Amazon has on smaller metropolitan areas. Amazon increased overall private sector employment in small metropolitan areas by 1.6 percent. In the average small metropolitan area during this time period, Amazon would generate 947 more private sector jobs in the county overall.

These findings are consistent with the EPI’s second hypothesis: that Amazon creates too few jobs to significantly influence county-level employment. If the size of the receiving community affects Amazon’s ability to positively impact employment, Amazon will create greater positive outcomes in smaller communities. This idea is consistent with the results by region: Amazon had a greater positive impact on both warehousing and storage sector employment and overall private-sector employment in the
smaller metropolitan areas. In fact, Amazon creates a statistically significant increase in private-sector employment while it has negative to no effect on private-sector employment in larger areas. Amazon’s impact on small metropolitan areas seems small, especially when comparing the number of created jobs in the warehousing/storage sector industry to larger regions (389 new workers in a county versus 686). However, the positive effects of Amazon in smaller communities are proportionally larger than those in larger areas where Amazon jobs are only a “drop in the bucket.”

Amazon had larger positive impacts on the proportion of warehousing and storage jobs in the Northeastern and Western counties, moderate positive impacts in Southern counties, and negative impacts in Midwestern counties. Of the four regions, only the estimate for Western counties in the U.S. is significant: this is because there is a relatively small sample size for each region (in EPI’s analytic sample, there were 11 Amazon openings in Northeastern states, 7 openings in Midwestern states, 20 openings in Southern states, and 16 openings in Western states), so the margin of error around each estimate is much wider. Therefore, the following estimations of employment growth by region represent a general trend rather than a concrete prediction. The state-specific time fixed effect model predicted that Amazon increased the proportion of warehousing and storage jobs in the private-sector by 65 percent in Northeastern counties and 62.7 percent in Western counties. This translates into roughly 500 more warehousing and storage sector jobs in the average Northeastern county and 569 more jobs in the average Western county during this time period. In counties in Southern states, Amazon increased the proportion of warehousing/storage jobs in the private sector by 18.7 percent. When applied to the average Southern county between 2001-2015, this growth rate translates into 35 new jobs. Interestingly, in Midwestern states, where counties have an average of 189 warehousing/storage sector jobs, Amazon openings were associated with 56 fewer jobs 2 years after opening: a 30 percent decrease in the proportion of warehousing/storage sector jobs in the private sector.

Most of these findings are also consistent with hypothesis two: the counties where Amazon had a smaller impact (Southern and Midwestern counties) were almost exclusively large metropolitan counties. In Northeastern counties, where Amazon had a larger impact, all but one county in the sample was designated a smaller metropolitan area. These are consistent with hypothesis two because a new warehouse in larger metropolitan areas creates a quantity of jobs small enough to be a “drop in the bucket,” and less meaningful than in smaller metropolitan areas, like those in the Northeast. The results for the Western counties deviate from this trend, however, since the majority of Western counties were large metropolitan areas. If it were consistent with hypothesis two, the impact would have been smaller and closer resembling the Midwest and the South. In contrast, the coefficient was not just positive, but the only significant coefficient among the four regions.

<table>
<thead>
<tr>
<th>Region</th>
<th>Average number of warehousing and storage jobs in county</th>
<th>Percent increase in county warehousing employment 2 years after opening an Amazon warehouse*</th>
<th>Number of new jobs if growth rate applied to average county</th>
<th>Average number of jobs in private sector</th>
<th>Proportion of employment in warehousing/stORAGE before Amazon</th>
<th>Proportion of employment in warehousing/storage after Amazon</th>
</tr>
</thead>
<tbody>
<tr>
<td>All Northeast</td>
<td>763</td>
<td>65%</td>
<td>499</td>
<td>96543</td>
<td>0.008</td>
<td>0.013</td>
</tr>
<tr>
<td>Northeast with existing warehouse and storage sector employment</td>
<td>1027</td>
<td>65%</td>
<td>672</td>
<td>11281</td>
<td>0.009</td>
<td>0.015</td>
</tr>
<tr>
<td>All Midwest</td>
<td>189</td>
<td>-30%</td>
<td>-56</td>
<td>24029</td>
<td>0.008</td>
<td>0.006</td>
</tr>
</tbody>
</table>
Some possible explanations for the greater outcomes in Northeastern and Western counties are their proximity to ports where cargo can be shipped overseas, larger reliance on warehousing/storage employment, or some other unknown selectivity bias. Northeastern and Western counties, which benefited the most from new Amazon warehouse jobs, are located in the coastal United States where, presumably, Amazon is receiving shipments of products made overseas. Counties in the Northeast and West are most likely responsible for unloading ocean freight shipments directed towards Amazon, in addition to typical warehouse responsibilities. This may increase the amount of new jobs created by a new warehouse. Another possible explanation why returns to investment are greater in the Northeast and West is that the proportion of private-sector jobs characterized as warehousing/storage sector jobs is larger than those of the Midwestern and Southern counties. It is possible that counties with existing warehousing and storage-sector infrastructure have characteristics that contribute to employment growth with a new Amazon.

Finally, it is likely that there are at least some unknown factors that bias employment outcomes; Amazon hand-picks each Fulfillment Center location based on a variety of factors, and thus sample likely varies systematically by region and size. There may be certain characteristics about the Northeastern and Western counties that vary systematically from those in the Midwest and the South that are not included in this analysis. Although EPI’s methodology controlled for a variety of different economic trends and location characteristics, the lack of random assignment precludes us from drawing any definite conclusions on the influence of region and size on employment outcomes.

Overall, this analysis suggests that Amazon has greater positive impacts for smaller counties and counties located in Northeastern or Western states. Amazon’s impact on private sector employment remains insignificant when region and size are controlled for. While Amazon’s effect on warehousing and storage sector employment remains positive, and sometimes significant, for certain counties, it is not substantively large. As illustrated by the tables above, these growth rates, when applied to the average U.S. county, are not as large as they appear: these coefficients refer to a percent change in an already small proportion of the working population and translate into a 300-800 warehouse worker increase in the average county. Unfortunately, Amazon is not interested in setting new warehouses in counties where this increase makes the biggest difference: every single county receiving a new Amazon warehouse between 2001-2015 was designated “metropolitan.” If Amazon’s effects are indeed consistent with hypothesis two, Amazon would have the greatest positive impact on more rural communities. However, Amazon is likely
more interested in establishing warehouses outside of metropolitan areas in order to minimize shipping
time to the greatest number of buyers.xciv

While Amazon warehouses create the intended effects in the warehousing and storage sector, they
do not seem to fulfill their promise of creating a meaningful number of jobs in other sectors. Amazon had
little to no effect on private sector employment—even in smaller metropolitan areas and coastal counties.
Given the job displacement discussed in the literature review, it may be possible that any job growth
associated with Amazon is offset by losses in other industries. While there was heterogeneity in
Amazon’s impact on the warehousing and storage sector, the lack of private sector growth is consistent
for all regions and metropolitan sizes. This further confirms EPI’s conclusion that Amazon does not
deliver on its promise to stimulate the economy beyond the warehousing and storage sector.

Conclusion

Overall, the strong negative results outlined in the literature contrast the weak positive results
present in the analyses. Interdisciplinary literature suggests Amazon harms local communities through
disrupting the distribution of private and public goods, suppressing wages, and displacing labor in other
sectors. Some scholars, like Greg LeRoy from *Good Jobs First*, go as far as to say that Amazon causes so
much harm that it should pay communities, not the other way around. Warehouse work is physically and
mentally exhausting, straining local and national health service infrastructure and increasing the burden
on taxpayers. The high price tag of attracting an Amazon, coupled with the harm it causes the community,
suggests that Amazon warehouses detract more from the surrounding community than they bring.

While there is variation by county size and region, our findings suggest that Amazon has the
greatest, though arguably still substantively small, impact on warehousing and storage sector employment
in smaller and coastal counties. While its effects on warehousing and storage sector employment differ
given counties’ characteristics, the effect on overall private sector employment is insignificant in all
cases. These findings are somewhat troubling because, although these trends suggest that Amazon has a
greater capacity to benefit smaller communities, the Amazon business model prioritizes larger
metropolitan areas that are closer to their consumers.xcv Because of this, Amazon is more likely to choose
more populated counties with a higher density of residents. While more investigation is needed to draw
any causal claims, these findings are consistent with hypothesis two because Amazon has a smaller
impact on warehousing and storage-sector employment in more populated areas, where new jobs are a
“drop in the bucket.”

When juxtaposing these statistical analyses with existing scholarship, one notices a sharp contrast
in the economic implications of a new Amazon Warehouse. While scholarship shows overwhelmingly
negative evidence of Amazon’s impacts on the communities it employs, statistical analyses show that job
creation is variable, substantively small, and limited to the warehousing and storage sector. Even if
communities did not need to invest large sums of money into attracting an Amazon, the corporation is
unlikely to land in communities where there are greater impacts to its job creation. Altogether, Amazon
appears to demand more than it provides to the communities receiving new warehouses.

More research is needed to corroborate these claims, as well as explore questions posed by the
heterogeneity in Amazon’s impact: why does Amazon generate more jobs in Northeastern and Western
counties? Are we correct in connecting this job growth to ports and existing warehousing/storage
infrastructure? Our sample was limited to large and mid-size metropolitan areas—how would a new
warehouse impact rural counties? Can we scale more comprehensive studies, such as the study
investigating Amazon in the Los Angeles area, to the state or national level? More inquiry will strengthen our understanding of Amazon’s potential to help, or rather harm, the community that seeks to incentivize it. These questions are of critical importance as states bid more and more local dollars to corporations that likely create fewer jobs than promised.

To conclude this report, I will reference the nine key recommendations proposed by the authors of the rigorous *Too Big to Govern* study quantifying the costs of Amazon in Los Angeles. To achieve equity in Amazon’s logistics operations, they should:

1. Pay a minimum wage of $20 an hour, adjusted annually for cost of living changes, to provide a living income for warehouse workers and delivery drivers.
2. Provide comprehensive and affordable health insurance for warehouse workers and delivery drivers and their families, eliminating the need for workers and their families to rely on publicly subsidized health insurance.
3. Provide work breaks for warehouse workers that enable them to remain hydrated, use bathrooms and eat mid-shift meals.
4. Provide affordable child care onsite or at nearby child care centers.
5. Require logistics subcontractors to provide the same wage floor and benefits as Amazon.
6. Invest Amazon’s assets in building affordable housing in communities where its logistics facilities are located as well as the communities where employees from those facilities live. It is time for Amazon to come of age and pay its own way.
7. Become a partner in local, regional and statewide initiatives to raise the wage floor for the entire logistics sector so that all warehouse, trucking and delivery companies meet the same standards of civic responsibility as Amazon.
8. Step up as a leader in reducing climate change impacts by deploying zero emission vehicles and disclosing its full carbon footprint.
9. Collaborate in improving and expanding the scope of impact estimates provided in this report to support analysis, planning and policies for reducing the costs and increasing the benefits of the services Amazon provides.

Without a system of accountability, Amazon may continue to endanger the communities it employs. I encourage any community seeking to attract Amazon to think critically about its proposed impact and the inadvertent harms to local economies, workers, and citizens. This is analysis is just one attempt to gauge the company’s impact on the communities it employs, and I encourage both further research into the claims outlined above and policy action to ensure Amazon fulfills its promise of economic growth and improved prosperity to the places that attract it.


viii ibid.


Ibid.