REPORT JANUARY 2017

New American Economy

The Riches of the Melting Pot

How Diversity in Metropolitan Areas Helps Grow the Wages of Low and High-Wage Workers

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Report Prepared by:

Thomas Kemeny

Lecturer in Human Geography
University of Southampton

Abigail Cooke

Assistant Professor of Geography
University at Buffalo (SUNY)

Case Studies Prepared by:

Angela Marek Zeitlin

Director of Research
Partnership for a New American Economy

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Executive Summary

In 2013, there were more than 45 million foreign-born individuals living in the United States, a historic high for a nation whose history and identity have been indelibly shaped by immigration.[1] While this number frequently draws attention, what makes the foreign-born population in the United States today truly noteworthy is its tremendous diversity. Immigrants hail from a wider range of countries now than at any other point in U.S. history, and it is overwhelmingly in our cities that we see this rich melting pot on display.[2] Two people crossing paths in any metropolitan area today are more than twice as likely to have been born in different countries than two residents of a non-metro area. In some metropolitan communities such as Miami, Los Angeles, San Francisco, and New York, the likelihood of this is even greater: Residents in those cities are almost eight times more likely to encounter someone born abroad.

This has led many academics and policymakers to question whether increased diversity is helping or hurting American workers. On the one hand, people born in different countries bring diverse perspectives that may help companies or individuals discover new solutions and ideas—boosting overall productivity. On the other hand, workers from a variety of backgrounds may struggle to find common ground and communicate efficiently. While diversity can produce either of these outcomes in theory, recent research has shown that the positive effects tend to dominate, resulting in wage increases for workers in more diverse settings. Such productivity and wage benefits have been found in a wide variety of areas, including the United States and several European countries.[3]

Labor markets, however, are not monolithic—tasks, skills, and competition for available jobs differ greatly from one end of the pay spectrum to the other. Lower-wage workers, for instance, may be engaged in repetitive or manual tasks that do not benefit to the same degree from access to diverse perspectives or insights. Because of this, one could ask whether lower-wage workers actually benefit from greater diversity, or whether high-earning employees reap the lion's share of its rewards.

This report explores these questions in depth, examining how a more diverse America may be affecting both highly-paid and lower-earning workers differently. To tackle this question, we rely on a comprehensive dataset made available from the U.S. Census Bureau. These data allow us to track individual workers in 160 U.S. metropolitan areas between 1991 and 2008, measuring how their wages change as their cities or workplaces become more diverse. Tracking the movement of both wages and diversity in statistical models allows us to uncover patterns that describe the general effect that increases in diversity in those environments have on the wages of workers at different income levels.

When diversity increases through immigration, **meaningful wage benefits accrue to all workers**—from the highest earners down to the lowest.

This method of analysis produces clear and compelling findings. When diversity increases through immigration, meaningful wage benefits accrue to all workers—from the highest earners down to the lowest. The size of this effect, however, depends on where the diversity comes from. When diversity increases among the bottom 50 percent of all wage earners in a given city, the lowest-wage workers experience meaningful pay increases—a strong potential benefit of immigration for working-class families. A diversity increase centered largely on the workers in the bottom 25 percent of all earners,

Key Findings

Both **low- and high-wage workers gain** when U.S. cities become more diverse.

When a city experiences a diversity boost, the average person living in the metropolitan area sees their wages rise by about 6 percent. These wage increases are broadly shared: Workers in the top 25 percent of all earners see wage increases of 6.6 percent, while workers in the bottom 25 percent of all earners experience a 7.1 percent wage boost on average.

Increases in diversity among the highest earners in a city result in **dramatic wage gains for all income groups**.

A diversity boost concentrated among the top 25 percent of earners in a metropolitan area results in an 18 percent wage jump for other high-wage earners in the area—or an average increase in wages equivalent to $13,000 per year. Local workers in the bottom 25 percent of earners, meanwhile, see their annual wages rise by 16.2 percent on average, or by about $4,100.

Low-wage workers benefit from rising diversity in the **bottom half** of the labor market.

A diversity boost among the bottom 50 percent of wage earners in a metropolitan area raises the average local wages of workers in the city overall by 1.6 percent. That effect, however, is driven by dynamics at the lower end of the labor market: While other workers see a statistically insignificant effect, the lowest 25 percent of earners see their wages rise by 2.1 percent on average.

Increasing diversity among the lowest earners has either a **positive or neutral effect** on others.

When the lowest 25 percent of earners in a given workplace experiences a diversity boost, the wages of other workers at that company—across all income tiers—rise. At the metro level, such a diversity boost appears to have no significant effect—either positive or negative—on the income of other local workers.

meanwhile, does not either help or hurt other workers in the same city or workplace. And when immigration makes the highest-paid workers in a city more diverse, workers across the board at all income tiers experience large wage gains, translating into thousands of dollars of additional income per year.

Before discussing our results, however, it is important to make clear what we mean by an increase in diversity. In this report, diversity is linked directly to an area's foreign-born population. Metropolitan areas can become more diverse in multiple ways—by shrinking their native-born population, growing their foreign-born population, or absorbing immigrants from a wider variety of countries. To capture all these changes in one measure, we created a diversity score that ranges from 0 to 1. As the score approaches 0, the closer the population is to being composed entirely of native-born individuals. The closer the score is to 1, the higher the likelihood that two people selected at random were born in different countries.

We use this scale to express our results. In this report, when we refer to a "diversity boost," we are discussing an increase, either taking place suddenly or over the course of the full period we study, of roughly .13 on the scale. We chose .13 because it is equivalent here to what in statistics is known as a "standard deviation"—a concept used to capture how spread out or tightly grouped numbers are in any dataset. Researchers describe all kinds of phenomena using standard deviations—from test scores to the absorption of college graduates across cities. To understand how the concept works in this case, it is useful to think of what a diversity boost would mean for a metropolitan area with a level of diversity equal to the national average for all cities in our sample. For that city, an increase of .13 would mean that a metro area with an 18 percent chance that two residents chosen at random were from different countries would see that chance rise to 31 percent.

In recent years, small metropolitan areas such as Jacksonville, North Carolina and larger ones such as Miami have all experienced a diversity boost—an event that our research powerfully links to rising wages.

When immigration makes the **highest-paid workers** in a city more diverse, workers across the board at **all income tiers experience large wage gains**.

These findings run counter to what many immigration critics say about foreign-born workers. Rather than harm the wages of U.S. workers, immigrant diversity appears to have widespread benefits across the labor force. Even when cities experience increases in the diversity among the lowest-paid workers—those most often accused of harming low-wage U.S. workers—our results show no such negative wage effects on other workers in the city. What's more, when diversity increases among the bottom 25 percent of earners at a given company, their coworkers at the same company actually see their wages rise. This data suggests that immigrant workers indeed enrich local labor markets, increase productivity, and ultimately raise wages by virtue of the varied skill sets and diverse backgrounds they bring.

The findings of this report should serve as encouragement for the many U.S. cities and firms already making major efforts to welcome immigrants. Some cities, responding to decades of economic and demographic stagnation, have created offices aimed at attracting immigrants to their communities. Others, seeking to remain competitive and economically vibrant, are attempting to retain more international students so employers have access to the workers they need. This report provides strong evidence that such efforts have the potential to improve the quality of life and economic health of local families in the long term. In an age when many federal immigration reform measures are caught in legislative deadlock, such policies are one step local leaders can take to ensure that their communities feel the benefits that diversity can bring.

Introduction

In 2005 the city of Buffalo, New York was struggling. The city's population had fallen by roughly half since its peak in the 1950s.[4] Dozens of abandoned steel factories littered the waterfront.[5] And more than one in four of the city's residents were living in poverty, more than double the national average.[6] Entering office that year, the city's new mayor, Byron W. Brown, promised to improve Buffalo's economic future. He vowed to redevelop large swaths of the city. He went on the road, promoting Buffalo's virtues to expanding companies in places as varied as California and Massachusetts.[7] Equally important, Brown embraced policies that welcomed immigrants and encouraged diversity. Today, the city boasts an Office of New Americans, which helps immigrants navigate city services and access local job opportunities. More than 5,600 individuals and businesses have signed onto an "Opportunity Pledge," a commitment to promote diversity and extend opportunities to all.[8]

In the years since Buffalo embraced welcoming immigrants, the city has started to see signs of **real and meaningful economic revitalization.**

In the years since Buffalo embraced such efforts, the city is starting to see signs of real and meaningful economic revitalization. The Buffalo-Niagara metropolitan area added 12,600 new jobs in 2014—more positions than it gained in the entire four years prior.[9] A section of the waterfront that was once home to steel manufacturing is being redeveloped so it can host green energy firms.[10] Most promisingly, the Buffalo-Niagara metropolitan area, which has long had wages below the national average, has recently seen its workers gain ground. Between 2010 and 2015, the average wage in the metro area rose by 9.5 percent.[11] In 2014, the average income of residents grew faster than the national average for the first time in seven years.[12]

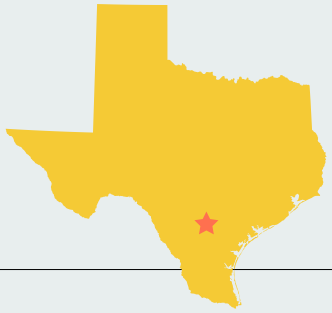
Although many factors play into the economic revitalization of a metropolitan area like Buffalo, this report explores one reason why policies that promote immigration and diversity are part of the recovery story for many once-declining American cities. While past research has indicated that immigrants help found new businesses or grow the tax base in urban centers, our research focuses on a less-noticed effect of immigration. Specifically, the role that diversity itself, achieved through immigration, can play raising the wages of other workers in a given metropolitan area. The effect is also examined within workplaces, looking at how income increases when employees within a single organization become more diverse.

Our work produces findings that should encourage civic leaders like Mayor Brown. We find that, netting out the effects of other factors, diversity raises the wages of the average worker in a metropolitan area by a considerable amount. And, slicing urban populations into income quartiles, we find that the benefits arising from increases in diversity at the metropolitan level accrue not just to high-skill, highly-remunerated workers, but to some of the most vulnerable, lowest-paid workers as well.

Buffalo, like many struggling metropolitan areas, still has a ways to go before it can claim full economic recovery. Mayor Brown, however, has said that furthering diversity remains an important part of his strategy, explaining earlier this year that "a community wide mindset that embraces diversity and inclusion" will only "accelerate" the city's growth.[13] This report shows the wisdom of such ideas. It also puts numbers to what diversity means for workers across the income spectrum.

CASE STUDY

San Antonio, Texas



In the last several decades, all of the major cities in Texas have been indelibly changed by immigration. While many think of Texas as one of the country's most popular destinations for immigrants, that wasn't always the case. In 1990, just 9 percent of Texas's population was foreign born. By 2012, that figure had risen to 16.4 percent.[14] Experts say immigrants were attracted to the state by the low cost of living, low taxes, and shift in the state's economy towards more agriculture and manufacturing jobs, particularly after the oil bust in the late 1980s.[15] San Antonio was no exception to these broader trends. From 1990 to 2011, the city's foreign-born population more than doubled.[16]

The huge migration of immigrants to Texas made several cities in the state—including Laredo, Brownsville, Dallas, and Austin—among the places that experienced the largest diversity boosts during the period of our study. San Antonio in particular, however, stands out because of the changing type of immigrants the area has been receiving in recent decades. As home to two large medically focused military installations,[17] San Antonio has experienced rapid growth in its biomedical and healthcare services industries in recent years.[18] In a city where two thirds of immigrants have historically been from Mexico, growth in the health, biomedical, and technology fields has brought in more high-skilled immigrants from places as varied as India, Russia, and South America.[19] They have joined the large numbers of lesser-skilled immigrants working in recreation, tourism, and food services. That industry is the second largest industry in the metro area, employing close to 14 percent of the population.[20]

Such a large surge in diversity has undoubtedly helped all of Texas—San Antonio included—grow wages and opportunities for local workers. From 1990 to 2011, workers at each quartile within the San Antonio metro experienced wage gains ranging from roughly 16 to 25 percent, according to the American Community Survey.[21] Based off the modeled findings from the LEHD data tracking diversity and individual's wages through time across 160 cities, we estimate that workers across all income tiers would experience a wage increase as a result of a diversity boost like the one experienced by San Antonio.

Recent wage gains for workers in all income tiers could be partly a result of **rising levels of diversity** in San Antonio.

Comparing our findings with real wage data suggests that more than half of the recent wage gains for workers in each of the lower two tiers could be a result of the rising levels of diversity in San Antonio more broadly. For the highest two tiers of earners, we estimate that roughly 40 percent of recent wage gains could be explained by the city's growingly diverse population.[22]

WAGE INCREASES IN SAN ANTONIO, 1990-2011

Sources for Graph: Authors' coefficients from pooled city models using the U.S. Census Bureau's Longitudinal Employer-Household Dynamics data, 1991-2008, applied to public use data on San Antonio's immigrant diversity levels and wages from U.S. Census 5% Sample for 1990 and 2011 American Community Survey 5-Year Sample, accessed through IPUMS-USA (Ruggles et al. 2010).

Background

In recent decades, the immigrants arriving in America have become strikingly more diverse than those who came before them. Much of this has to do with the decision in 1965 to pass the Immigration and Nationality Act, which abolished the system of national quotas that strongly favored northern European immigrants.[23] In 1960, 75 percent of all foreign-born people in the United States were born in Europe.[24] Today, that figure stands at just 12 percent.[25]

In 1960, **75%** of all foreign-born people in the United States were born in Europe. Today, that figure stands at just **12%**.

As the United States has welcomed this new wave of more diverse immigrants, there has been widespread interest in how local labor markets and communities are affected by this demographic change. One question of interest to many researchers is how the presence of the diverse set of ideas and experiences brought by immigrants may help or hurt other workers. Some researchers have theorized that immigrant diversity may make it more difficult for coworkers to communicate effectively or engage in teamwork, potentially lowering their productivity. Others have argued that diversity should have the opposite effect. Ideas about the benefits arising from diversity rest on the notion that a person's place of birth profoundly shapes his or her approach towards problem solving. More diverse groups then would be better positioned to see a wider range of solutions to shared problems, a reality that could potentially help them formulate entirely new ideas. This would raise worker productivity, and ultimately wages as well.

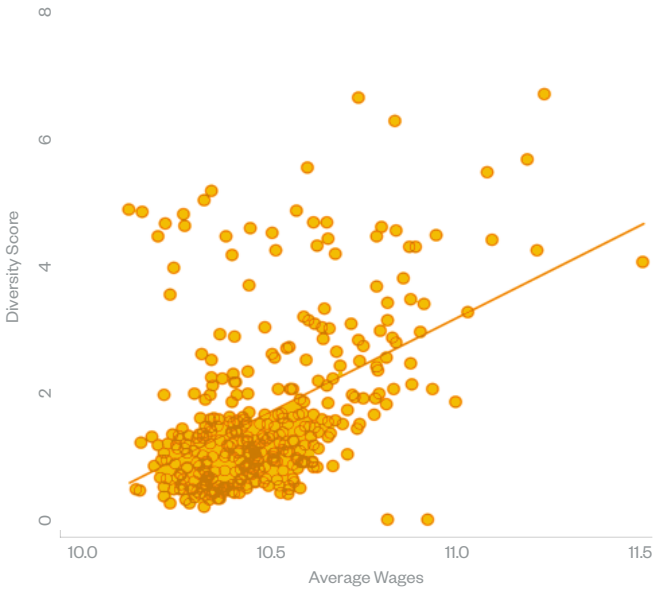
Studies examining data from various countries and time periods indicate diversity appears to have a net positive impact on productivity and wages.[26] Past research on this topic, however, has not looked at what diversity means for workers at different income levels. A positive effect for the average worker might conceal big differences for workers who possess certain characteristics. Based on this, a few key questions emerge. First, does increased diversity benefit both low-paid and high-paid workers equally? Second, if an increase in diversity is driven by changes at the high or low-end of the workforce, do other workers still enjoy positive wage benefits? These questions are important, given that lower-paid workers may engage in less complex problem solving than higher-skilled or higher-paid workers. We tackle these questions in this report.

Past research on this topic, however, has not looked at what diversity means for workers at **different income levels**.

Our Data Advantage

In general, highly diverse communities in the United States are also the places where average wages tend to be high. In Figure 1 below we show the relationship between immigrant diversity and the average wage in metropolitan areas using data from the 2007 to 2011 time period.[27] While the relationship is clearly strong, such data do not prove that diversity is one of the factors causing wages to rise. For instance, could highly productive individuals simply be deciding to work in more diverse cities for reasons not captured in the survey data? Are immigrants moving to cities where the wages are already high? Either of these

FIGURE 1: THE RELATIONSHIP BETWEEN A METROPOLITAN AREA'S DIVERSITY LEVEL AND THE AVERAGE INCOME OF RESIDENTS, 2011



Note: Data come from a 5-year (2007-2011) 5 percent public-use sample of the American Community Survey, from IPUMS (Ruggles et al, 2010). Points on the scatter plot reflect actual city values for log wages and diversity, whereas the solid line reflects the least squares fitted regression line. As a point of reference, the natural log of 10.5 is equal to $36,315 in 2011 dollars.

issues could explain the relationship between diversity and high wages. This snapshot also cannot answer another important question: What is the relationship between diversity and wage growth over time? Does it appear that a diversity increase is followed by an increase in wages?

In a recent study, "Spillovers From Immigrant Diversity in Cities," we, the academic authors of this report,[28] addressed these questions.[29] One reason why it was possible for us to do so involved the uniquely comprehensive data source we used: The U.S. Census Bureau's confidential Longitudinal Employer-Household Dynamics (LEHD) dataset. These data link individual workers to their employers over a range of years—specifically starting as early as 1991 and continuing through 2008. For our project, we used data from 160 U.S. metropolitan areas in nearly 30 states, and built our diversity measures on all the workers available in the LEHD data. When we calculated changes in wages, we chose to restrict our focus to individuals who remained working at the same employer for at least two years. Even with this restriction, our analysis was based off 33 million individual U.S. workers and their respective employers. Compared with prior work, that technique allowed us to considerably raise our confidence that what we observe is indeed a causal link between diversity increases and wage growth. In this paper, we use the same approach, this time breaking workers down into wage quartiles to enhance our analysis.

Compared with prior work, the technique we used considerably raised our confidence that what we observe is indeed **a causal link between diversity increases and wage growth**.

Terms Used in the Report

In this report, we rely on a series of terms to discuss the level of diversity in a given metropolitan area. One of the terms we employ most frequently is the "diversity score." This commonly accepted measure—referred to as a "fractionalization index" by academics—captures the probability that any two randomly selected people in a city were born in different countries. The score, which ranges from 0 to 1, allows us to gauge increases in diversity not only from having more immigrants, but also from having immigrants that hail from a wider range of countries. The closer to 1 that a metro area's diversity score is, the higher the likelihood that two randomly selected people in that area were born in different countries. Conversely, when the diversity score is close to zero, native-born Americans make up nearly the entire population.[30] Using publicly

TABLE 1: METROPOLITAN AREAS WITH THE HIGHEST AND LOWEST BIRTHPLACE DIVERSITY IN 2011

RANK IN 2011	METROPOLITAN AREA	2011 DIVERSITY SCORE (0-1)	1990 DIVERSITY SCORE (0-1)
1	Miami-Fort Lauderdale-Pompano Beach, FL	0.67	0.54
2	Los Angeles-Long Beach-Santa Ana, CA	0.63	0.55
3	San Francisco-Oakland-Fremont, CA	0.57	0.41
4	Salinas, CA	0.56	--
5	New York City-N. New Jersey-L. Island, NY-NJ-PA	0.55	0.26
...			
350	Williamsport, PA	0.03	0.01
351	Huntington-Ashland, WV-KY-OH	0.03	0.07
352	Altoona, PA	0.03	--
353	Johnstown, PA	0.02	0.04
354	Parkersburg-Marietta-Vienna, WV-OH	0.02	0.02

Source: Authors' calculations from Census 5% Sample for 1990 and 2011 ACS 5-Year, accessed through IPUMS-USA. Rankings based on 2011 data, using time-consistent metropolitan statistical areas with 1990 figures provided for comparison.

available data, Table 1 highlights the most and least diverse cities in the country in 2011 using this measure.

The results we present in the following sections quantify how workers' wages are impacted when diversity goes up in the workplace or metropolitan area around them. When discussing increases in diversity, we use a different term, the "diversity boost." A diversity boost is a fixed amount, equal to an increase of .13 on the diversity scale. We chose that number because it is equivalent to what is known as one "standard deviation" in the academic literature. Statisticians frequently use standard deviation to show what a change of similar magnitude means to entities that start out at very different places on a scale. For instance, boosting test scores by a certain percentage would mean very different things to a failing student versus one with a B average. Standard deviation helps to provide a measurement that captures a boost of equal importance to all types of students.

How a diversity boost looks in the real world depends on the size of the setting. Smaller, less diverse cities can increase their diversity score with much smaller influxes of immigrants than large metro areas. Small Jacksonville, North Carolina, for instance, saw its diversity score increase by 0.13 between 1990 and 2011. During that

period, the foreign-born share of its workforce increased from 3.8 percent to almost 6.9 percent and the number of countries of origin represented increased from 25 to 66. These changes happened while the city's overall population grew by around 27,000. In a larger, more diverse city like Miami, on the other hand, a diversity boost can look somewhat different. Between 1990 and 2011, the Miami metropolitan area grew from nearly 3.2 million to more than 5.5 million residents. It also saw its diversity score increase by slightly more than 0.13. From 1990 to 2011, the foreign-born share of Miami's workforce increased from 39.2 percent to 46.3 percent, while the number of countries of origin represented among immigrants increased from 130 to 149.

How a diversity boost looks in the real world **depends on city size and context**.

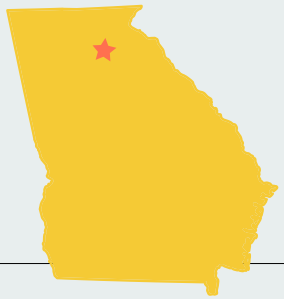
What the diversity boost would mean to residents in a given city also varies depending on the context. Our data indicates that the average U.S. city in our sample had a diversity score of .18 in 2011—meaning there was an 18 percent chance two random residents of the community hailed from different countries of origin. For a city with that level of diversity, experiencing a diversity boost would raise its overall diversity score from .18 to .31. That would make it 72 percent more likely that two random people on the street hailed from different countries (because 31/18=1.72). For a place like Miami, however, a diversity boost would feel less consequential. If Miami's .67 percent diversity score in 2011 is boosted to .8, residents would become only 19 percent more likely to encounter someone from elsewhere.

Over the 21 years of public data that we examine between 1990 and 2011, 15 percent of the cities we observe saw their diversity scores increase by more than 0.13.[31] There were also a number of cities that increased their diversity by substantially more than one diversity boost over this period—including Laredo, Texas and Durham, North Carolina, as we discuss in later sections. The average increase in immigrant diversity across all cities over this time period is about 0.065, or half a diversity boost. A representative worker in a city that experiences a diversity boost of that size would enjoy a wage benefit equal to half of what we document here.

Over the 21 years of public data that we examine between 1990 and 2011, **15%** of the cities we observe saw **a full 'diversity boost' or more**.

CASE STUDY

Gainesville, Georgia



It's hard to talk about Gainesville, Georgia, a small metropolitan area in the Northeastern part of the state, without speaking about poultry. Long nicknamed "the poultry capital of the world," Gainesville is home to some of the country's largest poultry processors, including Pilgrim's Pride, Fieldale Farms Corporation, and Mar-Jac Poultry, which employ thousands of local workers each.[32] After expanding in the 1980s, however, many of these firms found they could no longer find enough American workers willing and able to do the arduous work in their factories. That led such firms to turn to immigrant workers, and particularly, Latin Americans. While roughly 2,000 immigrants lived in the metro area in 1990, that figure had surpassed 28,000 by 2011.[33] In the 1990s alone, the Gainesville's Hispanic population more than quadrupled.[34]

Although many would argue that such a surge in diversity would be bad for a community, in recent decades, **Gainesville has experienced strong wage gains across all income tiers.**

Because of these changes, Gainesville experienced the sixth largest diversity boost of any U.S. metropolitan area between 1990 and 2011. The increase in diversity was felt from the lowest tier of workers, such as line workers in poultry factories, up to the highest, such as the increasingly diverse set of educators and business managers who moved to the area to serve them. On Main Street, most businesses now hang signs in the windows saying "Se Habla Espanol" to be welcome to Spanish speaking customers.[35] Recent research has found that at 63 percent of the students in Gainesville schools, including one prominent National Blue Ribbon School of Excellence, hail from immigrant families.[36]

Although many immigration proponents would argue that such a surge in diversity would be bad for a community, in recent decades, Gainesville has experienced strong wage gains across all income tiers. Between 1990 and 2011, the average wage grew by roughly 20 percent for the city's bottom tier of earners, 19 and 28 percent for the two tiers in the middle, and more than 45 percent for top earners, according to the American Community Survey (ACS).[37] Increasing diversity likely played a large role driving such growth.[38] Applying our modeled findings to Gainesville's changes in diversity, calculated from ACS data, suggests that diversity could explain more than two-thirds of the wage gain experienced by the lowest-income workers from 1990 to 2011. It also could explain an estimated 30 percent of the gains experienced by the richest residents, as well as roughly 38 and 61 percent of the wage gains in the middle.

WAGE INCREASES IN GAINESVILLE, GEORGIA, 1990-2011

Sources for Graph: Authors' coefficients from pooled city models using the U.S. Census Bureau's Longitudinal Employer-Household Dynamics data, 1991-2008, applied to public use data on Gainesville, GA's immigrant diversity levels and wages from U.S. Census 5% Sample for 1990 and 2011 American Community Survey 5-Year Sample, accessed through IPUMS-USA (Ruggles et al. 2010).

The Effects of a Widespread Diversity Boost

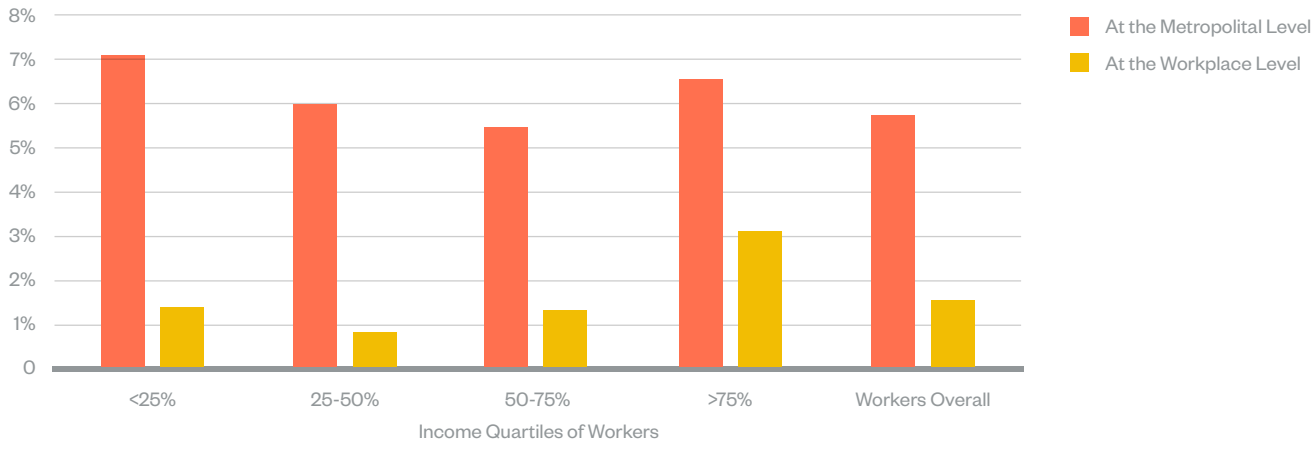
The following sections examine how the benefits arising from immigrant diversity are distributed among the working population. Specifically, we quantify how growing diversity impacts the wages of workers in different segments of the labor market, from those earning the lowest wages to those earning the highest. The first question we consider is what happens if the increase in diversity itself is measured across the entire workforce—with both low-paid and high-paid workers contributing to the changes in diversity over time.

Our study found that a single diversity boost at the metro level leads to a **6% increase in wages** for local workers.

The academic authors of this study examined the impact of such a widespread boost in diversity in a recent paper, which we described briefly in the background section of this report. The overall finding of that paper was that as urban immigrant diversity increases, average wages in a city also rise. In terms of the magnitude of that relationship, our study found that a single diversity boost at the metro level leads to a 6 percent increase in wages for local workers. When an individual employer experiences a diversity boost, wages in the workplace rise by nearly 2 percent. Note that these estimates are always for the average worker in each environment. In other words, the report did not consider whether low-paid or high-paid workers responded differently to changes in diversity. Did some types of workers get larger wage increases than the average overall?

In this study, we explore that question. Figure 2 shows how a widespread diversity boost affects workers of different income levels. It demonstrates that when a given metropolitan area experiences a diversity boost, workers in every single income tier experience positive

FIGURE 2: ESTIMATED WAGE INCREASE RESULTING FROM A WIDESPREAD DIVERSITY BOOST



Source for Graph: Authors' calculations using the U.S. Census Bureau's Longitudinal Employer-Household Dynamics program, 1991-2008.

and significant wage benefits. Estimates across these quartiles do vary, but across a fairly narrow range. For workers in the bottom 25 percent of wage earners, a diversity boost produces a 7.1 increase in wages, whereas for those between the 50th and 75th percentile, it is associated with a 5.4 percent wage increase. The wages of the wealthiest workers in the metro area also respond positively to rising diversity—growing by 6.6 percent. One surprising finding here concerns the impact that a city growing more diverse has on the lowest-wage workers in the area. While many critics argue that lower-wage workers are hurt by immigrant competition, this work actually shows that they experience wage increases in line with workers who earn more.[39]

To deepen the understanding of the economic impact of greater diversity, we also translated our results into dollar terms. The findings here show the additional amount per year that workers can expect to be earning roughly as their city experiences a diversity boost. For lower income workers, a widespread diversity boost raises average annual earnings by $1,800 more than they would have earned otherwise. The same increase in diversity translates into roughly $4,800 more per year for the average worker in the highest earning group. Here it is important to note that higher income workers receive more dollars from the diversity boost simply because their average wages started at a higher place to begin with, enlarging the effect in actual dollars of each percentage point increase.

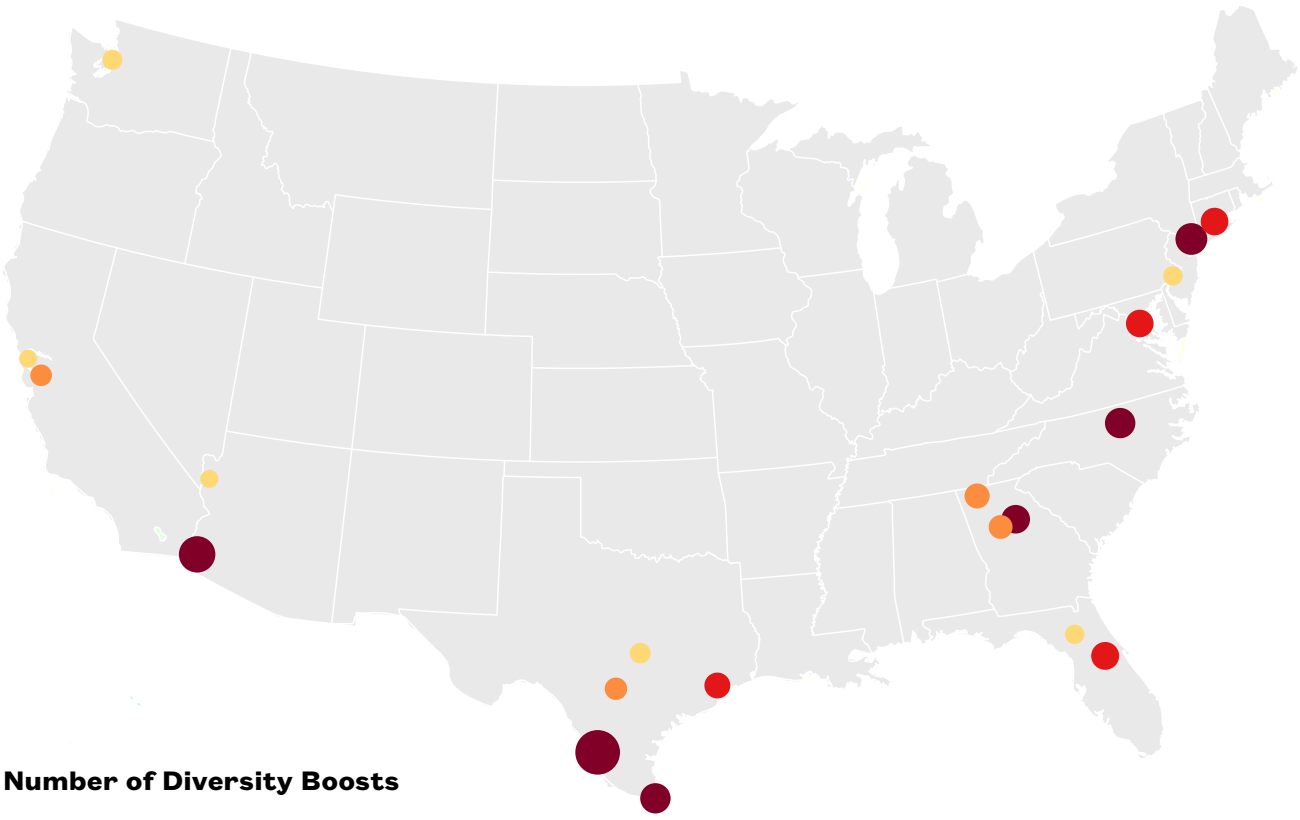
Our second layer of analysis looked at effects arising from changes in diversity in the workplace. Once again, we find that as diversity in workplaces increases, wages for the average employee there also increase. To understand the magnitude of this relationship, we once again examine the impact experienced when a given workplace undergoes a diversity boost, this time defining the term based on the distribution of diversity across all employers. Once again, we find that a single diversity boost inside a workplace has positive and significant wage benefits for workers at all income tiers. However, the increase in wages is smaller than what we saw when diversity increases citywide. As Figure 2 demonstrates, within workplaces, the benefits of rising diversity vary within a fairly narrow range: Wage increases range from 0.8 percent to 3.1 percent, depending on the income tier.

To add context to the metropolitan area findings, we also used data from the American Community Survey to pinpoint the 20 cities that experienced the largest increases in immigrant diversity, stated in terms of the number of diversity boosts experienced during the 1990-2011 period. (See Figure 3.) The diversity increase represented here, of course, mean different things to different cities. In Orlando, Florida and Washington, DC for instance, the diversity increase on the map means that between 1990 and 2011 a randomly chosen U.S.-born resident became twice as likely to run into someone from a different country on the street. In Yuma, Arizona and Austin, Texas, they became three times more likely. While in small Gainesville, Georgia that likelihood increased by a factor close to six.

For lower income workers, a widespread diversity boost raises average annual earnings by **$1,800 more** than they would have earned otherwise.

There are some interesting things to note about the group of cities represented in Figure 3. For instance, one in four of the cities are located in the state of Texas—including Brownsville, Houston, Austin, San Antonio, and Laredo. The strong presence of that state is little surprise considering that almost half of all new arrivals to Texas in recent years have been foreign-born.[40] Another interesting aspect of the map is that it also includes a wide range of different types of metropolitan areas. While many large, historically diverse cities appear—such as Atlanta, New York, Seattle, and Philadelphia—smaller, less prominent metropolitan areas are present as well, including Lake Havasu, Arizona and Dalton, Georgia, a center of U.S. carpet manufacturing. We discuss three specific cities—and the role diversity played raising wages there—in the case studies accompanying this report.

FIGURE 3: U.S. METROPOLITAN AREAS THAT EXPERIENCED THE LARGEST WIDESPREAD INCREASES IN DIVERSITY, 1990-2011

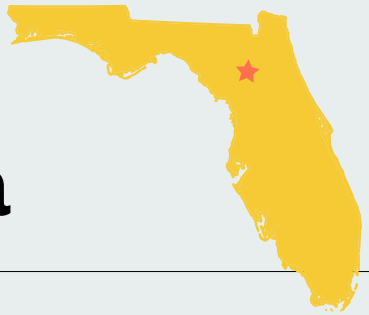


Number of Diversity Boosts

> 2	1.75 - 2	1.5 - 1.74	< 1.5
Laredo, TX Metropolitan Statistical Area	Orlando-Kissimmee-Sanford, FL Metropolitan Statistical Area	Dalton, GA Metropolitan Statistical Area	Austin-Round Rock-San Marcos, TX Metropolitan Statistical Area
Yuma, AZ Metropolitan Statistical Area	Washington-Arlington-Alexandria, DC-VA-MD-WV Metropolitan Statistical Area	Atlanta-Sandy Springs-Marietta, GA Metropolitan Statistical Area	Seattle-Tacoma-Bellevue, WA Metropolitan Statistical Area
New York-Northern New Jersey-Long Island, NY-NJ-PA Metropolitan Statistical Area	Bridgeport-Stamford-Norwalk, CT Metropolitan Statistical Area	San Antonio-New Braunfels, TX Metropolitan Statistical Area	Philadelphia-Camden-Wilmington, PA-NJ-DE-MD Metropolitan Statistical Area
Brownsville-Harlingen, TX Metropolitan Statistical Area	Houston-Sugar Land-Baytown, TX Metropolitan Statistical Area	San Jose-Sunnyvale-Santa Clara, CA Metropolitan Statistical Area	Gainesville, FL Metropolitan Statistical Area
Durham-Chapel Hill, NC Metropolitan Statistical Area			Lake Havasu City-Kingman, AZ Metropolitan Statistical Area
Gainesville, GA Metropolitan Statistical Area			San Francisco-Oakland-Fremont, CA Metropolitan Statistical Area

CASE STUDY

Gainesville, Florida



For many people, Gainesville, Florida is synonymous with one thing: The massive University of Florida, which graduates more than 14,000 students a year[41] and employs almost 28,000 local residents.[42] The university, in fact, is the backbone of the economy in this north Florida city, where both education and healthcare rank as the largest industries. UF Health, a healthcare system affiliated with the university, is the second largest employer, providing residents with roughly 12,000 jobs.[43] The Veteran's Affairs Medical Center provides jobs to another 3,500.[44]

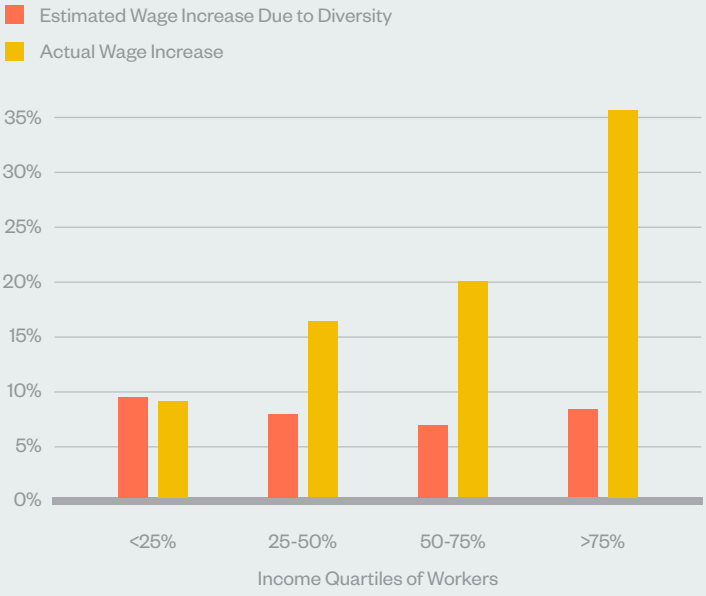
In recent decades, growing diversity in both the healthcare and education fields has made Gainesville strikingly more international: While 6.1 percent of the population was foreign-born in 1990, the figure reached 11.0 percent in 2011.[45] It's a story mimicked in several other college towns, including Ann Arbor, Michigan, which also experienced a sizeable diversity increase during the period of our study. In Gainesville, local hospital officials have said that immigrant healthcare professionals, including nurses from the Philippines, have helped medical facilities avoid staffing shortages and provide valuable care.[46] The University of Florida, meanwhile, has seen international enrollment grow in the last several decades. While international students on temporary visas made up less than 5 percent of enrollees at the University of Florida as recently as 1994, they accounted for more than 1 in 10 of the students the university graduated in the 2013-2014 school year.[47] From 2007 to 2012 alone, the number of Chinese students on campus more than doubled.[48]

While the growing diversity within Gainesville had a positive impact on the wages of workers at all income tiers, our figures show that it was particularly meaningful for the lowest tier of workers—or those in the bottom 25 percent. Between 1990 and 2011, the wages of the lowest-wage workers grew by 9.1 percent, according to the American Community Survey.[49]

Without the city's widespread increase in diversity, however, our research suggests their wages would have held steady during that period—or experienced zero growth after adjusting for inflation. For higher income workers, the story was different. Diversity can explain only about a fourth of the total 35.9 percent wage gain experienced by the highest tier of workers from 1990 to 2011. It also is one possible explanation for about a third of the wage growth explained by the second highest tier.[50]

Without the city's widespread increase in diversity, our research suggests that lower wage workers would have experienced **zero wage growth**.

WAGE INCREASES IN GAINESVILLE, FLORIDA, 1990-2011



Sources for Graph: Authors' coefficients from pooled city models using the U.S. Census Bureau's Longitudinal Employer-Household Dynamics data, 1991-2008, applied to public use data on Gainesville, FL's immigrant diversity levels and wages from U.S. Census 5% Sample for 1990 and 2011 American Community Survey 5-Year Sample, accessed through IPUMS-USA (Ruggles et al. 2010).

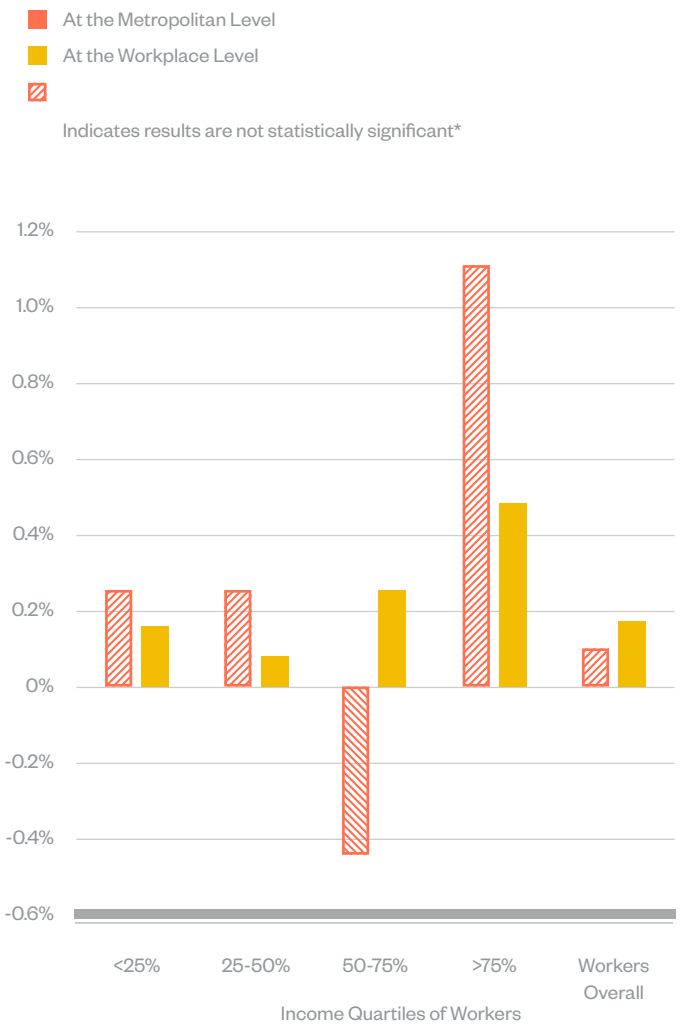
The Effect of Diversity Increases Among Just Lower or Higher-Income Earners

Greater Diversity Among Lower-Wage Workers

We now turn to the question of where the benefits of diversity come from. In some cities, rising diversity may occur disproportionately at one end of the labor force. A metropolitan area with rapidly expanding technology startups, for instance, may become more diverse largely at the higher end of the income spectrum as companies hire talented engineers from around the globe. Similarly, a city that boasts poultry production or meat slaughtering as the most prominent industry may become more diverse at the lower end of the earning spectrum if native-born workers turn away from jobs in the factories, leaving immigrants to fill such positions. Or it could be that immigrants are making all parts of the labor force more diverse, but the changes at one end or the other simple matter more for the overall picture. In this section, we estimate what increases in diversity among high- or low-paid workers mean for other workers in the same metropolitan area or at the same employer. This allows us to determine if the positive wage effects we document in the previous section are largely driven by change at one end of the pay scale or another.

First, we calculate the effect of increasing diversity among the least-well paid workers in each city and workplace. (See Figure 4.) We find a diversity boost among workers in the bottom 25 percent of earners at a given workplace has a very moderate, yet positive, impact on the wages of their co-workers at all income tiers. This includes roughly a half

FIGURE 4: ESTIMATED WAGE INCREASE RESULTING FROM A DIVERSITY BOOST AMONG THE BOTTOM 25 PERCENT OF EARNERS



* Results were not statistically significant within a threshold of 10 percent. As such, these should be viewed as suggestive rather than conclusive.

Source for Graph: Authors' calculations using the U.S. Census Bureau's Longitudinal Employer-Household Dynamics program, 1991-2008.

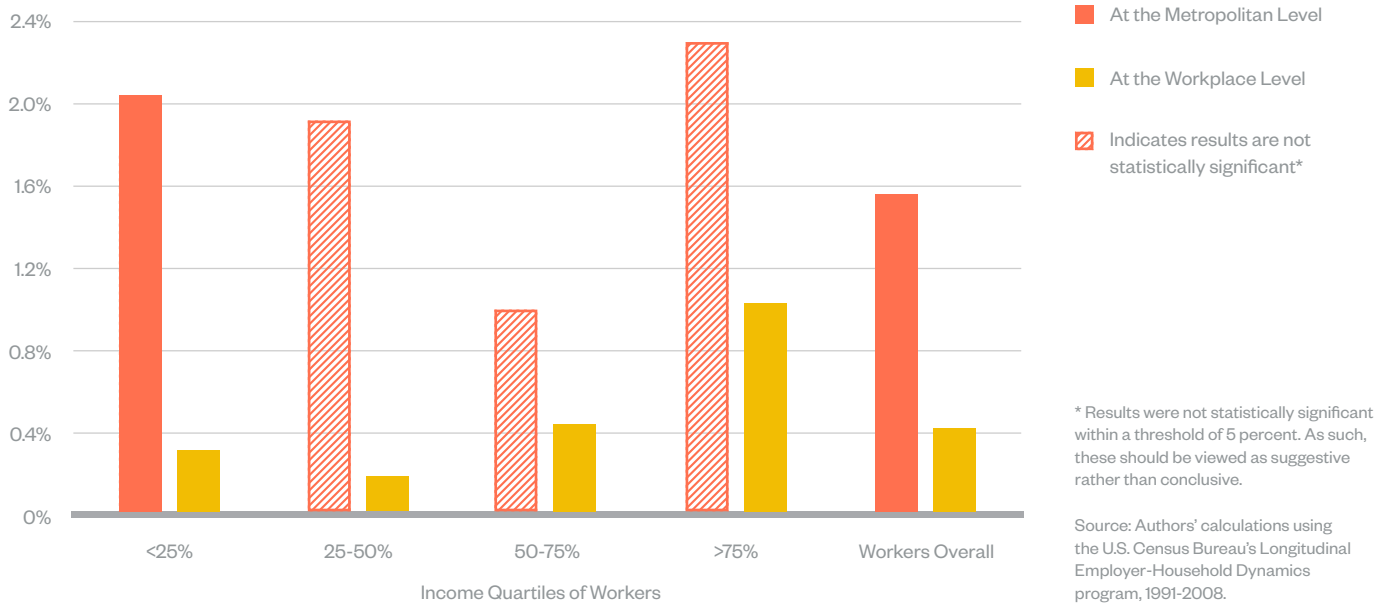
a percentage point increase in pay for the highest income workers at the same establishment, and a roughly 0.2 percent increase for workers in the lowest tier of earners. When the same type of diversity boost occurs in the broader metropolitan area, however, we find a somewhat less encouraging picture: Increasing diversity among the lowest income workers citywide has no meaningful effect on the wages of others. Instead, the estimated effect is very small and statistically insignificant.

A diversity boost among workers in the **bottom 25%** of earners at a given workplace has a very **moderate, yet positive**, impact on the wages of their co-workers at all income tiers.

It is important to note that while increasing immigrant diversity among the lowest paid workers offers no discernable wage benefit at the metro level, it also does not appear to harm other local workers either. This runs counter to what immigration opponents sometimes argue about influxes of less-skilled, immigrant labor. While our results do not rule out the possibility that there are indeed negative aspects of immigrant diversity in terms of productivity, these findings suggest that the positive benefits offset any potential losses.

Seeking to better understand the role of increased diversity among lower-income workers, we next widen our analysis—looking at what happens to wages when the entire lower half of wage earners in a city or employer experience a diversity boost. This means diversity increases among the pool of workers earning below the median in their workplace or broader metropolitan area. Cities with particularly high immigrant diversity among workers in the bottom half include large metropolises such as Miami, Los Angeles, New York, and San Francisco, as well as smaller cities like Salinas, California; Naples, Florida; and Las Vegas. Some cities have seen particularly large increases in immigrant diversity among lower-wage workers over the past couple of decades, including Gainesville, Georgia; Yuma, Arizona; Durham-Chapel Hill, North Carolina; and Bridgeport, Connecticut.

FIGURE 5: ESTIMATED WAGE INCREASE RESULTING FROM A DIVERSITY BOOST AMONG THE BOTTOM HALF OF EARNERS



* Results were not statistically significant within a threshold of 5 percent. As such, these should be viewed as suggestive rather than conclusive.

Source: Authors' calculations using the U.S. Census Bureau's Longitudinal Employer-Household Dynamics program, 1991-2008.

As shown in Figure 5, a diversity boost across workers in the bottom half of the labor market in a metropolitan area produces a 1.6 percent wage increase for workers overall. When we unpack this finding by income quartile, however, what becomes clear is that this finding is driven by the relationship at the bottom end of the labor market. Only those in the bottom 25 percent of earners are influenced by rising diversity among the least well paid, with their wages rising by 2.1 percent. Workers in each of the other three quartiles are unaffected by changes in diversity among workers in the bottom 50 percent of the wage distribution.

A diversity boost across workers in the bottom half of the labor market in a metropolitan area produces a **1.6%** wage increase for workers overall.

When we turn our focus to diversity within a given employer, we see a familiar pattern to the previous section. Once again, increasing immigrant diversity in the workplace among those earning less than the median salary has a positive and statistically significant effect on the wages of those they work with. This raise, however, is small, ranging from 0.2 percent for wage earners making between 25 to 50 percent of the average to 1.1 percent for the top 25 percent of earners. This raise, however, is small, ranging from 0.2 percent for wage earners in the 25th to 50th percentile up to 1.1 percent for highest earners.

Greater Diversity Among the Highest-Paid Workers

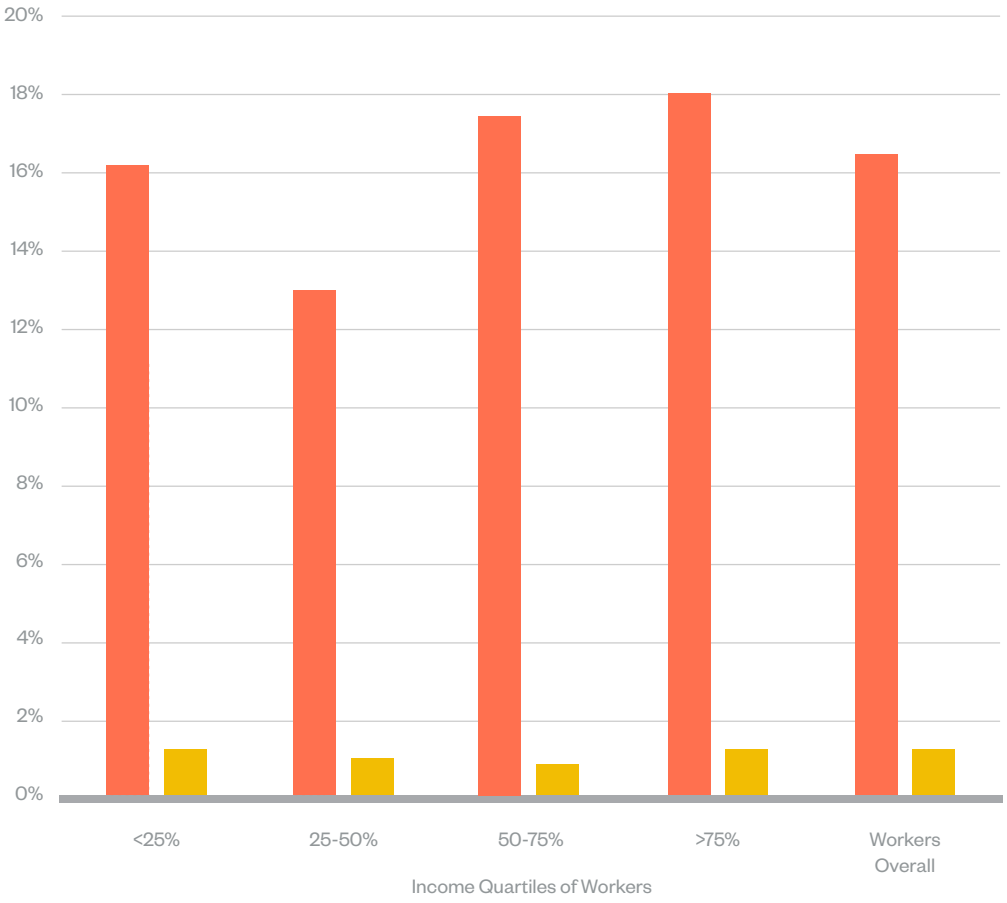
Finally, we turn our attention to immigrant diversity among the top 25 percent of wage earners in each city and workplace. Cities with particularly high immigrant diversity among this highly paid group of workers include many of the previously mentioned large and diverse metropolitan areas—such as San Francisco and New York—as well as a few other metro areas, including: El Centro, California, Trenton-Ewing, New Jersey, and McAllen, Texas. Since 1990, the largest growth in diversity in this group has been in several cities in Texas, such as Laredo, Brownsville, and Houston, as well as education and technology hubs like San Jose, California and Durham-Chapel Hill, North Carolina.

Immigrant diversity among high-wage earners has a strong impact on workers at all wage tiers. Indeed, the size of the effect is much larger than what we observed for lower income workers in the previous sections. A diversity boost among the highest earners at the metro level is associated with a wage increase of 16.4 percent for the average worker. The magnitude of the effect ranges from wage increases of around 13.5 percent for workers in the 25th-50th percentiles of their city's wage distribution, to almost 18 percent for workers in the highest income tier. For the average worker in the highest paid group, that boost translates into an additional $13,000 in annual pay. Wages among the lowest-paid workers rise by approximately $4,100.

When we turn our focus to diversity within the workplace, once again we see a smaller wage impact than in metropolitan areas. When diversity increases among the top 25 percent of earners in a given workplace, the average wages of workers there rises by 1.2 percent. This increase varies little across income tiers, and hovers around 1 percent for every income tier we examine.

For the average worker in the highest paid group, that boost translates into an additional **$13,000** in annual pay. Wages among the lowest-paid workers rise by approximately **$4,100**.

FIGURE 6: ESTIMATED WAGE INCREASE RESULTING FROM A DIVERSITY BOOST AMONG THE TOP 25 PERCENT OF EARNERS



Source: Authors' calculations using the U.S. Census Bureau's Longitudinal Employer-Household Dynamics program, 1991-2008.

Conclusion

This report provides evidence that for many metropolitan areas across the country—from big cities to college towns to Southern manufacturing hubs—rising immigrant diversity has played an important role increasing workers' wages in recent decades. While prior research indicated that increasing diversity in a metropolitan area grew the wages of workers there by 6 percent, this study found that the benefits of diversity are experienced relatively consistently among higher- and lower-wage workers. This finding is particularly important for the lowest-paid American workers, a group that is often described as paying a cost when their cities experience an influx of immigrants. When cities experience a widespread diversity boost, workers in the bottom 25 percent of earners see their wages rise by 7.1 percent on average. When diversity increases among top earners in a given city, the benefit accruing to the lowest earners is even greater—with wages rising 16.2 percent.

When cities experience a widespread diversity boost, workers in the **bottom 25%** of earners see their wages rise by **7.1%** on average.

One of the most powerful findings of this report, however, concerns an issue frequently in the news during this year's presidential election cycle: The impact that greater immigrant competition has on similarly placed U.S.-born workers. While many critics of immigration argue that the arrival of immigrants depresses the wages of American workers, champions of immigration argue instead that the economy is more accurately thought of as a dynamic and growing entity: When immigrants with diverse ideas and new skills arrive, employers can fill positions that would otherwise remain vacant, hit on better solutions to problems, and expand into new areas of business .

When immigrants with diverse ideas and new skills arrive, employers can fill positions that would otherwise remain vacant, hit on better solutions to problems, and **expand into new areas of business**.

This report provides strong evidence of the latter interpretation of immigrants' role in the American economy. We find that when diversity increases among the bottom half of earners in a given city, not only are their fellow low-wage workers not hurt by that development, they enjoy an increase in their wages. A similar dynamic exists among the highest end of the wage scale, where we find that experiencing a diversity boost centered on the top 25 percent of earners in a city raises the wages of other top earners there by 18 percent. Such findings are part of a growing body of literature supporting the positive impact that immigrants are having on a diverse range of metropolitan areas across America, touching workers at a variety of income levels.

Methodological Appendix

Data and Approach

The data used to estimate the size of the relationship between rising diversity and wages in this report come from the U.S. Census Bureau's Longitudinal Employer-Household Dynamics (LEHD) program.[51] These data originate with administrative records shared with LEHD by state partners, providing quarterly earnings data for jobs covered by Unemployment Insurance, which is about 90 percent of employment in the United States.[52] The administrative data are supplemented by other sources of Census Bureau data on the characteristics of the employers and employees. There is extensive geographical coverage in these data: We have data for about 30 states, from which we have complete coverage on all necessary variables for about 160 metropolitan areas. There is also deep longitudinal coverage: our data span from as early as 1991 through 2008.

The jobs frame in the LEHD provides a link between individual workers and their employers, but also by extension, between coworkers. This allows us to identify employees in particular metropolitan areas and complete groups of coworkers in places of employment in each calendar year. Because the LEHD data provide the country of birth for each individual, we can calculate measures of birthplace diversity for each city in our sample, which change annually as people move in and out of the city's labor force. But we can also build birthplace diversity measures for each workplace, shifting annually as workers join or leave the establishment. This allows us to better understand the scale of the diversity effects – whether they are primarily emanating from interactions at work or in the "sidewalk ballet" described by Jane Jacobs.[54] The specific measure of diversity we use is quite common in the academic literature on immigrant diversity.[54] The birthplace fractionalization index captures the probability that any person you might run into randomly on the street was born in a different country from you, as expressed mathematically:

$$Fractionalization_j = 1 - \sum_{r=1}^{R} s_{rj}^2$$

where s is the proportion of residents in city j who were born in country r; and R is the number of different countries represented among residents of that city. The index is near zero when diversity is low (when nearly everyone in the city was born in the same country) and nears one as diversity increases. One of the helpful features of this measure is that it captures increases in diversity from both the number of countries people come from and increases in the size of each national group.

For workplace diversity measures, we use the same basic fractionalization measure, calculating the diversity of each group of coworkers. The only difference is that we weigh the contribution of workers to workplace diversity quarter by quarter. Meaning if a person works for half the year for one employer and half the year for another, that person counts as "half" a person in each workplace for that calendar year.

We calculate these city and workplace specific diversity measures annually for all workers, but also specific to particular segments of the labor market. This helps us better understand where any effects of diversity are coming from: Are the effects specifically coming from workers at the top or bottom of the wage distribution? Does diversity at one end of the pay scale affect the wages of workers at the other end, or just the workers in their own segment of the labor market? To do this, we calculate three additional annual city-level

fractionalization measures: diversity among workers in the bottom quartile of each city's wage distribution, diversity among those below the median, and diversity among those above the 75th percentile. We do the same thing at the establishment-level, calculating three additional workplace specific diversity measures: for groups of workers below the 25th percentile, below the median, and above the 75th percentile of their workplace's wage distribution.

The annual measures of diversity at the city and workplace levels are calculated using all available metro area workers in the LEHD data. However, when we turn to estimating the effect of this diversity on workers' wages, we focus on a narrower subset of workers. We look only at workers who remain in a single job for at least two consecutive years, who we call 'stayers,' taking full advantage of the panel structure of the LEHD data. By doing so, we are able to more closely isolate the relationship between changing diversity and individuals' wages, by excluding and controlling for several other potential influences on wage changes. First, it allows us to observe changes in individual's wages in a single workplace, excluding cases where changes in wages may be due to job changes. Second, it allows us to control for hard-to-observe characteristics that may be important to both wages and patterns of geographical sorting, such as having high human capital—i.e. innate ability, intelligence, motivation, etc. In other words, there could be two U.S. born, white, college dropouts that are observably similar, but one is Average Joe and one is Mark Zuckerberg. They have some clear important unobservable differences in human capital that are likely to contribute strongly to different earnings levels. If the Zuckerbergs in the U.S. disproportionately choose to move to places like Silicon Valley that also happen to be more immigrant diverse, then we might misattribute any correlation between diversity and wages to increasing productivity from diversity spillovers rather than uneven geographical sorting. Focusing on the change in wages of stayers over time while diversity in the city and their workplace moves around them controls for stationary unobserved characteristics that may affect their wage gains. Because the work establishment and city remain the same for each stayer by definition, any stationary unobserved heterogeneity at the workplace and at the metro level also drop out of the model. Additionally, we observe not just the relationship between levels of diversity and levels of wages, but also the relationship between changes in diversity and changes in wages. All these aspects of our analytical strategy help us make more confident statements about the causal effect of immigrant diversity on the average wages of all workers.

By limiting our analytical sample to the longest single job spell recorded in the LEHD data of at least two years for each worker, we exclude many observations. However, our analytical sample remains enormous. We observe wages changes for over 33.5 million individual stayers. The stayers also broadly resemble the U.S. urban labor force, as can be seen in Appendix Table 1, although the sample is certainly missing individuals with extremely low labor market attachment.

The 33.5 million individual workers in our analytical sample include highly paid employees, workers earning very little, and everyone in between. To understand whose wages may be affected by changing diversity, and where those effects come from, we group the stayers by wage quartiles, specific to their metropolitan area. Quartile 1 consists of workers with the lowest earnings, those who earn less than the 25th percentile of the wage distribution in their metro area. In Quartile 2 are employees between the 25th and 50th percentile, in Quartile 3 are those between the 50th and 75th percentiles, and Quartile 4 contains the highest paid workers, who earn above the 75th percentile in their metro. Grouping stayers in this way allows us to estimate the wage-diversity relationship across the different segments of the labor market. It also allows us to calculate immigrant diversity—our term for birthplace fractionalization—among workers in different quartiles of their city's wage distribution and their workplace's wage distribution.

APPENDIX TABLE 1: SUMMARY STATISTICS OF THE ANALYTICAL SAMPLE

VARIABLE	MEAN	STANDARD DEVIATION
Individual 'Stayers'		
Log Annual Earnings	10.48	0.637
Age	40.32	11.67
White	0.667	0.471
U.S. Born	0.840	0.366
Female	0.467	0.499
Spell Duration	4.970	3.304
Workplace Establishments		
Birthplace Fractionalization	0.220	0.207
Employment (number of coworkers)	63.01	278.39
Metropolitan Area		
Birthplace Fractionalization	0.180	0.129
Employment (size of labor force)	472,000	882,900
College Share of the Labor Force	0.256	0.074
Counts		
Total Observations (Person-Year)	166.54 million	
Individuals	33.54 million	
Workplace Establishments	1.193 million	
Metropolitan Areas (CBSAs)	163	

Note: All variables are constructed from the LEHD data except for the metropolitan area college share of the workforce, which is from IPUMS (Ruggles et al. 2010).

Estimating the effect of changing diversity on wages

To estimate the size of the change in wages with an increase in immigrant diversity, we estimate the following equation:

$$ln(w)_{ipjt} = d_{jt}\beta + d_{pjt}\gamma + X'_{ipjt}\delta + E'_{pjt}\theta + C'_{jt} + \mu_{ipj} + \eta_t + \nu_{ipjt}$$

The dependent variable is the change in logged annual wages, specific to each individual (i), who works in establishment (p) in metropolitan area (j) at time (t). There are two key explanatory variables: city specific immigrant diversity (d_{jt}) and establishment specific immigrant diversity (d_{pjt}). The rest of the terms in the equation are controls, for time-varying individual characteristics (X'), employer characteristics (E'), employer characteristics, and city characteristics (C'). As discussed above, focusing on stayers allows us to account for the unobservable characteristics of individuals, establishments, and cities that stay the same over time in a single fixed effect term (μ_{ipj}). We also include a year fixed effect (η_t), which absorbs time specific shocks that are uniform across all individuals, such as business cycles. The final term is the standard error term (ν_{ipjt}). Applying the fixed effects estimator, this equation shows how an individual's wages respond to changes in the level of immigrant diversity in her metropolitan area and workplace, while holding constant other important sources of variation.

APPENDIX TABLE 2: FIXED EFFECTS ESTIMATES OF THE SPILLOVERS FROM IMMIGRANT DIVERSITY AMONG ALL WORKERS BY WAGE QUARTILE

	DEPENDENT VARIABLE: LOG OF ANNUAL EARNINGS				
	(1)	(2)	(3)	(4)	(5)
	ALL WORKERS	WAGE QUARTILE 1	WAGE QUARTILE 2	WAGE QUARTILE 3	WAGE QUARTILE 4
City Measures					
Birthplace Fractionalization	0.375***	0.436***	0.384***	0.347***	0.414***
	(0.065)	(0.058)	(0.086)	(0.099)	(0.123)
College Share	0.162***	(0.004)	0.089**	0.233***	0.499***
	(0.040)	(0.035)	(0.041)	(0.063)	(0.071)
Employment	0.000***	0.000***	0.000***	0.000***	0.000***
	0.000	0.000	0.000	0.000	0.000
Establishment Measures					
Birthplace Fractionalization	0.073***	0.069***	0.040***	0.062***	0.139***
	(0.007)	(0.004)	(0.007)	(0.013)	(0.018)
Employment	0.000*	0.000*	0.000	0.000**	0.000
	0.000	0.000	0.000	0.000	0.000
Observations (millions)	166.54	51.57	42.30	37.92	34.65
Individuals (millions)	33.54	11.90	8.44	6.97	6.23

Notes: This table generates the findings in Figure 2 in the body of this brief. Standard errors in parentheses, corrected for clustering by establishment. * p <0.10, ** p <0.05, *** p <0.01. Year effects included in each model. Overall counts of individuals and observations are rounded to the nearest 10,000 to entire confidentiality. Estimates produced using Stata's AREG command.

Appendix Table 2 reports the estimates of Equation 2 where the two measures of diversity are calculated using all workers in each metro area and all coworkers in each establishment, thus estimating the effect on wages from diversity across all segments of the labor market. The first column presents results for all workers together.[55] Note the positive and significant (at the 1 percent level) coefficients for both city and establishment birthplace fractionalization. These are what allow us to estimate the impact of a one standard deviation increase in diversity (or "diversity boost" as we call it in the body of the report) on the wages of an average worker, as presented in Figure 2 of the report. Reassuringly, the control variables in this and the other columns operate in much the way we might expect, suggesting that we are controlling as well as possible for other sources of variation in the change in wages. In the subsequent columns in this table, we turn our attention to who benefits from this overall positive effect of increasing diversity. Column 2 presents estimates for the lowest paid workers in each city, and on up through Column 5, which shows estimates for the highest paid workers in each city. Note that all groups not only have positive and significant coefficients for metro level diversity, but also that they are roughly the same magnitude.

Appendix Table 3 shows the estimates of Equation 2, but using the diversity measures calculated on the group of workers earning the lowest wages in each city and each workplace. These are the estimates that produce the size effects in Figure 3 in the body of the brief. Note that in these results, city-level diversity is not significant for any group of workers.

APPENDIX TABLE 3: FIXED EFFECTS ESTIMATES OF THE SPILLOVERS FROM IMMIGRANT DIVERSITY AMONG THE LOWEST WAGE EARNERS (BELOW THE 25TH PERCENTILE) FOR ALL WORKERS AND BY WAGE QUARTILE

	DEPENDENT VARIABLE: LOG OF ANNUAL EARNINGS				
	(1)	(2)	(3)	(4)	(5)
	ALL WORKERS	WAGE QUARTILE 1	WAGE QUARTILE 2	WAGE QUARTILE 3	WAGE QUARTILE 4
City Measures					
Low Wage Birthplace Fractionalization (<25th p)	0.007	0.017	0.018	(0.036)	0.084
	(0.047)	(0.037)	(0.063)	(0.072)	(0.090)
College Share	0.219***	0.053	0.145***	0.296***	0.505***
	(0.041)	(0.035)	(0.042)	(0.064)	(0.073)
Employment	0.000***	0.000***	0.000***	0.000***	0.000***
	0.000	0.000	0.000	0.000	0.000
Establishment Measures					
Low Wage Birthplace Fractionalization (<25th p)	0.009***	0.008***	0.004***	0.008***	0.023***
	(0.001)	(0.001)	(0.001)	(0.002)	(0.004)
Employment	0.000*	0.000*	0.000	0.000**	0.000
	0.000	0.000	0.000	0.000	0.000
Observations (millions)	166.54	51.57	42.3	37.92	34.65
Individuals (millions)	33.54	11.9	8.44	6.97	6.23

Notes: This table generates the findings in Figure 4 in the body of this brief. Standard errors in parentheses, corrected for clustering by establishment. * p <0.10, ** p <0.05, *** p <0.01. Year effects included in each model. Overall counts of individuals and observations are rounded to the nearest 10,000 to entire confidentiality. Estimates produced using Stata's AREG command.

APPENDIX TABLE 4: FIXED EFFECTS ESTIMATES OF THE SPILLOVERS FROM IMMIGRANT DIVERSITY AMONG THE LOW WAGE EARNERS (BELOW THE 50TH PERCENTILE) FOR ALL WORKERS AND BY WAGE QUARTILE

	DEPENDENT VARIABLE: LOG OF ANNUAL EARNINGS				
	(1)	(2)	(3)	(4)	(5)
	ALL WORKERS	WAGE QUARTILE 1	WAGE QUARTILE 2	WAGE QUARTILE 3	WAGE QUARTILE 4
City Measures					
Low Wage Birthplace Fractionalization (<50th p)	0.115**	0.148***	0.139*	0.078	0.164
	(0.056)	(0.043)	(0.072)	(0.084)	(0.106)
College Share	0.199***	0.030	0.122***	0.274***	0.486***
	(0.040)	(0.035)	(0.042)	(0.064)	(0.072)
Employment	0.000***	0.000***	0.000***	0.000***	0.000***
	0.000	0.000	0.000	0.000	0.000
Establishment Measures					
Low Wage Birthplace Fractionalization (<50th p)	0.020***	0.016***	0.009***	0.021***	0.051***
	(0.003)	(0.002)	(0.002)	(0.005)	(0.009)
Employment	0.000*	0.000*	0.000	0.000**	0.000
	0.000	0.000	0.000	0.000	0.000
Observations (millions)	166.54	51.57	42.3	37.92	34.65
Individuals (millions)	33.54	11.9	8.44	6.97	6.23

Notes: This table generates the findings in Figure 5 in the body of this brief. Standard errors in parentheses, corrected for clustering by establishment. * p <0.10, ** p <0.05, *** p <0.01. Year effects included in each model. Overall counts of individuals and observations are rounded to the nearest 10,000 to entire confidentiality. Estimates produced using Stata's AREG command.

Appendix Table 4 shows the estimates of Equation 2, using the diversity measures for workers earning below the median in each city and each workplace. These are the estimates that produce the size effects in Figure 4 in the body of the brief. Here, city-level diversity is not significant for workers above the median in each city, but is for all workers as a whole, as well as for those workers earning below the median. Note that the positive coefficient for workers earning in the 2nd quartile is significant at only a 10 percent level.

APPENDIX TABLE 5: FIXED EFFECTS ESTIMATES OF THE SPILLOVERS FROM IMMIGRANT DIVERSITY AMONG THE HIGHEST WAGE EARNERS (ABOVE THE 75TH PERCENTILE) FOR ALL WORKERS AND BY WAGE QUARTILE

	DEPENDENT VARIABLE: LOG OF ANNUAL EARNINGS				
	(1)	(2)	(3)	(4)	(5)
	ALL WORKERS	WAGE QUARTILE 1	WAGE QUARTILE 2	WAGE QUARTILE 3	WAGE QUARTILE 4
City Measures					
High Wage Birthplace Fractionalization (>75th p)	0.819***	0.813***	0.715***	0.858***	0.873***
	(0.044)	(0.047)	(0.055)	(0.067)	(0.088)
College Share	0.142***	(0.010)	0.077*	0.199***	0.435***
	(0.041)	(0.033)	(0.040)	(0.064)	(0.074)
Employment	0.000	-0.000***	-0.000**	0.000	0.000***
	0.000	0.000	0.000	0.000	0.000
Establishment Measures					
High Wage Birthplace Fractionalization (>75th p)	0.056***	0.062***	0.051***	0.045***	0.061***
	(0.003)	(0.002)	(0.003)	(0.005)	(0.007)
Employment	0.000*	0.000	0.000	0.000*	0.000
	0.000	0.000	0.000	0.000	0.000
Observations (millions)	166.54	51.57	42.3	37.92	34.65
Individuals (millions)	33.54	11.9	8.44	6.97	6.23

Notes: This table generates the findings in Figure 2 in the body of this brief. Standard errors in parentheses, corrected for clustering by establishment. * p <0.10, ** p <0.05, *** p <0.01. Year effects included in each model. Overall counts of individuals and observations are rounded to the nearest 10,000 to entire confidentiality. Estimates produced using Stata's AREG command.

Appendix Table 5 shows the estimates of Equation 2, with diversity calculated on the group of workers earning the most, above the 75th percentile in each city and each workplace. The size effects in Figure 5 in the body of the brief come from these results. These models suggest that diversity among the highest earners has the largest effect, raising wages across all segments and by the largest magnitudes seen in these models.

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51 Disclaimer: This work was produced while the authors were Special Sworn Status researchers at the U.S. Census Bureau's Center for Economic Studies. Any opinions and conclusions expressed herein are those of the authors and do not necessarily represent the views of the U.S. Census Bureau. All results have been reviewed to ensure that no confidential information is disclosed. Acknowledgments: We thank Olmo Silva and Max Nathan for helpful discussions and suggestions. This work has been supported by U.S. National Science Foundation grant BCS-1359768. The research uses data from the Census Bureau's Longitudinal Employer Household Dynamics Program, which was partially supported by the following National Science Foundation Grants SES-9978093, SES-0339191 and ITR-0427889; National Institute on Aging Grant AG018854; and grants from the Alfred P. Sloan Foundation.

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