



# The Geography of Recent U.S. Wage Growth

## Research Note

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# Key Takeaways

- *From 2019 to 2021, and in contrast to years prior, low-end salaries increased most rapidly in cities with the lowest pay levels. It is more viable to remain out of the workforce in such cities, requiring increased pay from employers struggling to hire.*
- *In expensive coastal cities, high-end pay registered the greatest gains. Those increases likely are, at least in part, an artifact of remote worker migration, a trend that contributed to the hollowing out of the middle of the income distribution.*
- *For those without a college degree, the cost of living in expensive cities has long exceeded the benefit of higher wages. For those workers, low-end earnings growth in low-income cities is tilting the balance against expensive cities even more, with implications for polarization.*

In 2021, about 1 in 20 salaried, private-sector workers in the San Francisco metro area earned more than \$609,000.<sup>1,2</sup> In the San Jose metro area, the heart of Silicon Valley, the corresponding figure was \$692,000.

Those exceptional pay levels are part of a new set of ADP Research Institute indices that track 26 million workers across the U.S. The indices, slated for public release later this year, track wage quantiles for private-sector workers and a variety of sub-groups at the metropolitan level.

The Bay Area numbers provide a snapshot of some of the highest-paid people in the country, the 95th percentile of private-sector salaried workers. But we also looked at earners in low-cost metros and people whose salaries put them near the bottom of the pay scale, the 5th percentile.

This article is a preview of what the new indices can show us.

Focusing on salaried workers for simplicity, we found that low-end earnings increased more than others during the pandemic and, in sharp contrast to before the pandemic, they increased the most in low-income cities.<sup>3,4</sup> We also found evidence suggesting that the pandemic-driven migration out of the nation's most expensive cities contributed to hollowing the middle of their income distributions. [Download the data in Excel](#)

<sup>1</sup> Metro areas in this study refer to Core-Based Statistical Areas (CBSAs).

<sup>2</sup> That figure reflects only workers whose employment spell spanned the year in its entirety.

<sup>3</sup> Salaried workers' share of full-time workers in the private sector workforce varies substantially across metros. In 2021 it ranged from 30.7 percent in the Riverside metro area (California's Inland Empire) and 60.2 percent in the Washington, D.C., metro. In the San Francisco and San Jose metro areas, respectively, about 56.5 and 58.5 percent of full-time private sector workers were salaried in 2021. That means that 1 in 20 salaried workers is equivalent to about 1 in 35 full-time workers.

<sup>4</sup> The pools of salaried and hourly workers are both subject to normal labor market churn as workers enter and exit the workforce, switch between hourly and salaried work, and move locations. Hourly workers' gross wages are also affected by the number of hours worked, which can vary from week to week, making their analysis and its interpretation more complicated.

# The National Picture

Looking at pay levels before and during the pandemic, we found that they were up across the board, but especially at the low end.

Nationally, the 12-month average of median monthly earnings was 6.77 percent higher in 2021 than in 2019. By the same measure, high-end earnings – those paid to workers in the 95<sup>th</sup> percentile – had jumped 8.02 percent. But low-end pay – the 5<sup>th</sup> percentile – increased even more over the same period, by 10.36 percent.<sup>5</sup>

People tend to see the biggest pay raises when they switch jobs, and positions paying at the low-end of the spectrum are generally prone to high turnover, which means more job starts. As a result, our preferred metric when focusing on low-end pay is the one above, which uses monthly earnings.

In contrast, when focusing on high-end pay we prefer using annual earnings, even if that requires us to leave out recent hires who have less than a full year of earnings to see. Observing annual instead of monthly earnings is preferable because high-end pay often includes substantial bonus or equity components which are only paid in some months of the year.

New hires probably played a crucial role in driving low-end earnings growth. When we look at annual instead of monthly earnings – which leaves out workers with less than 12 months on the job – low-end earnings growth falls below that of median and high-end workers. From 2019 to 2021, low-end annual earnings increased by 5.38 percent, while median and high-end annual earnings grew by 6.52 and 9.34 percent respectively, in line with their monthly-based figures given above.

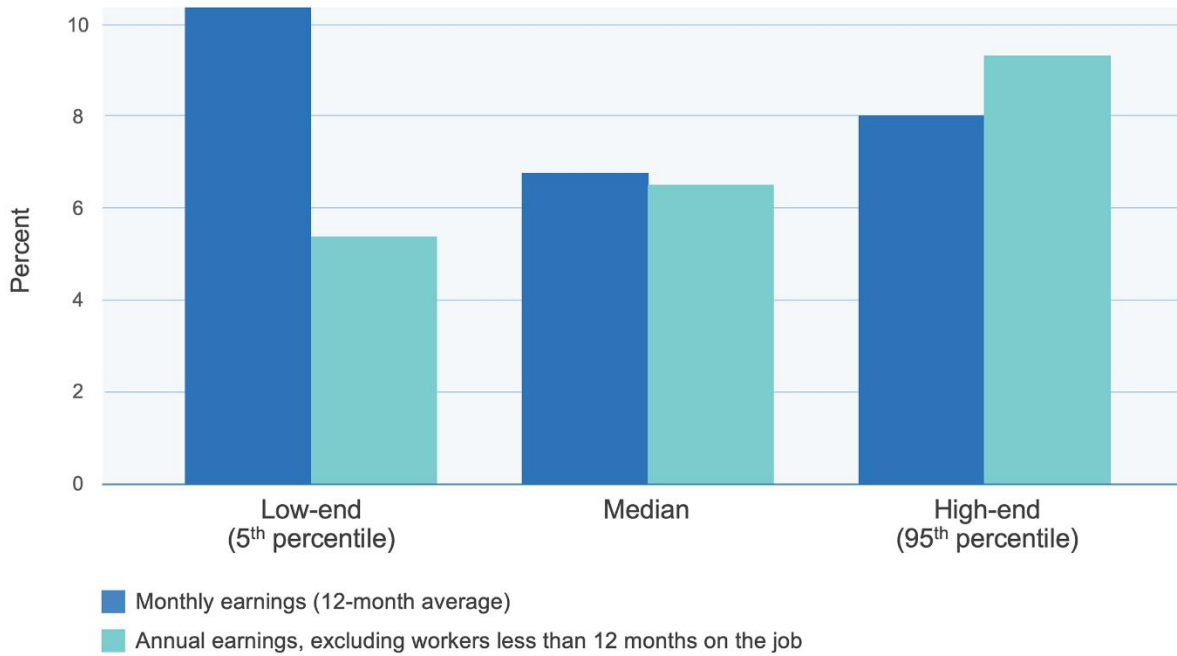


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<sup>5</sup> Economists generally believe that money reaching low-income households is less likely to be saved and more likely to drive consumption because low-income households tend to have more pressing and unfilled needs than high-income households. (Economists call this tendency a higher [marginal propensity to consume](#)). If that theory is correct, the surge in low-end salaries can help explain the current rise in inflation. The notion that money reaching low-income households is contributing to inflation would be consistent with a shift from goods-driven inflation fueled by supply-chain challenges to service-driven inflation rooted in wage hikes.

## Low-end earnings growth tied to new hires

National earnings growth, 2019–2021



**ADP** | Research INSTITUTE Source: ADP Research Institute



# Low-end salary growth was greater in low-income cities

Although low-end salary growth was common to nearly all large U.S. metros, it was significantly stronger in low-income cities, in both percentage and dollar terms.<sup>6,7</sup>

In greater New Orleans, the 5th percentile earnings ranked the lowest in the U.S. in 2019. Its lowest-paid salaried workers, in other words, were among the country's lowest paid. But two years later, monthly earnings for those in the 5th percentile of New Orleans had soared 42.4 percent, the equivalent of a \$432 per month pay increase.

Across the country, low-end earners in high-cost San Jose saw their monthly incomes grow by only 7.3 percent over the same period, a \$246 increase.

**An Effect of the Pandemic** – This new phenomenon, whereby low-end salary growth was greater in low-income cities than elsewhere, is almost surely rooted in the labor market extremes wrought by the pandemic.

Identical measurements taken from 2017 to 2019 show that, on average, low-end earnings in high- and low-income cities were similar.

After millions of jobs were lost early in the pandemic, the quick re-opening of the economy had employers scrambling to rehire. At first, they were able to bring back the same workers who had been laid off or appeal to those motivated to work.

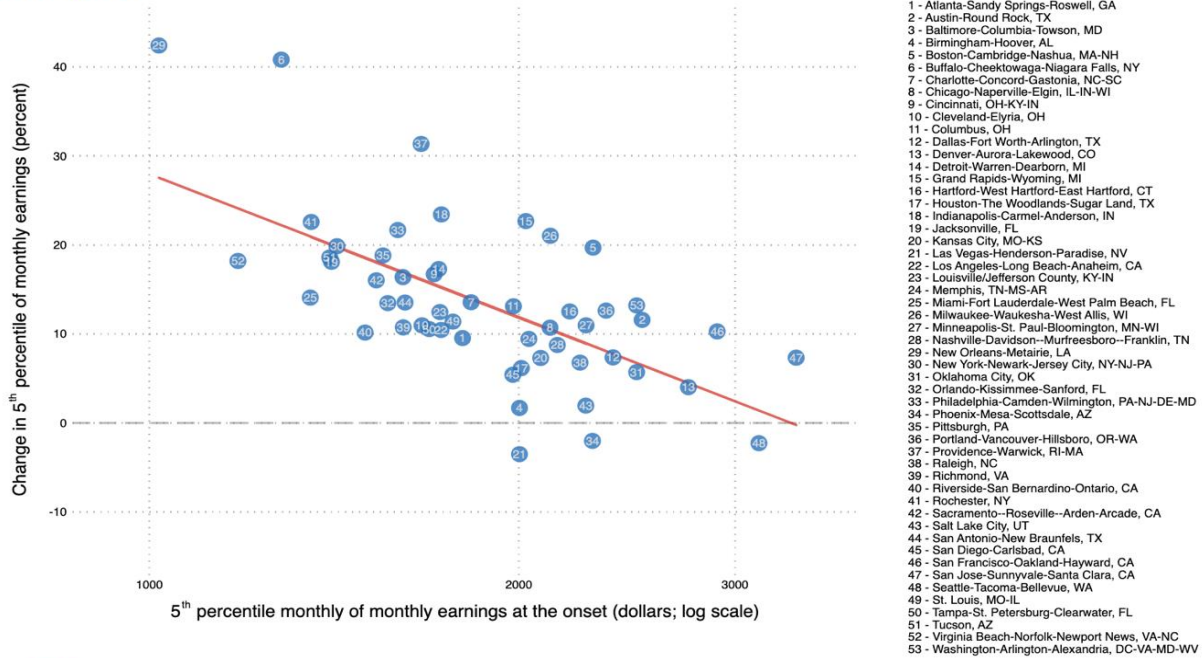
But when that low-hanging fruit was picked, employers were left with a pool of candidates who had grown increasingly acclimated to living outside of the labor force. They had compelling reasons not to return to work, such as health concerns, school-aged children studying from home, or early retirement. In fact the latter may have been especially important, as the population in the nation's low-income cities tends to be older than elsewhere.

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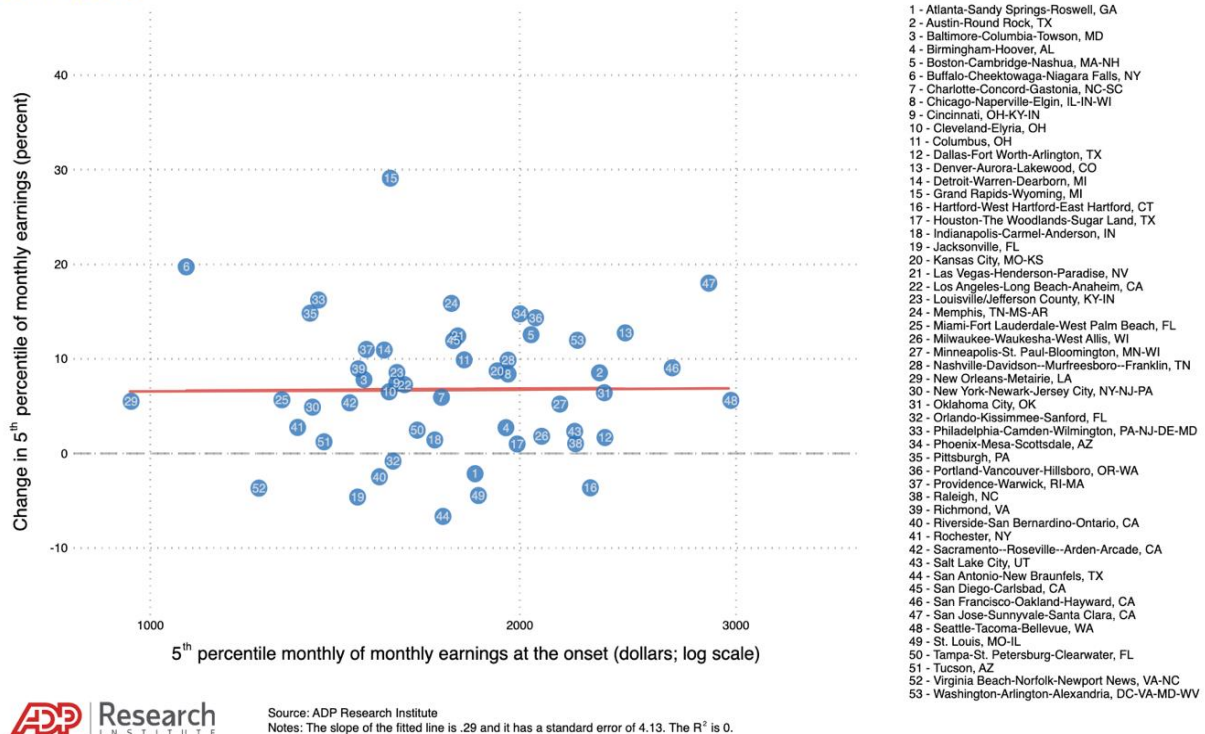
<sup>6</sup> Low-end salary growth was positive in 50 of the 53 U.S. metros with a million or more residents using average monthly earnings, and in 47 of the 53 using annual earnings.

<sup>7</sup> On average, a metro area whose 5th percentile (12-month average) monthly earnings were 10 percent higher than another's in 2019 saw average low-end monthly earnings increase by 2.32 percent *less* than the other by 2021. Alternatively, that metro saw monthly earnings decrease by \$166 per month, on average. The two regressions informing those estimates, as well as two additional ones using annual earnings of workers with at least 12 months on the job instead of monthly earnings, all yield statistically significant estimates and are reported in Appendix Table 1.

## Low-end salaries increased more sharply in low-income cities 2019 to 2021



## Before the pandemic, low-end salaries in high- and low-income cities fared similarly 2017 to 2019



And many of those people had adapted financially, subsisting on retirement income or a single spouse's paycheck, tapping unemployment benefits or other government relief, or doing part-time or informal work.

Crucially, getting by without working is more viable in low-income cities, all else being equal, because the cost of living and lost earnings tend to be lower.<sup>8</sup> Alternative means of subsistence are better able to compensate for lost earnings when costs and lost incomes are low.

So it makes sense that reluctance to re-enter the workforce would have been more pervasive in low-income cities.

And that could explain why employers in those cities increased wages more vigorously than elsewhere as they tried to lure workers back.

**The Industry Variable** – Drilling deeper, we found that rapid low-end earnings growth in low-income cities held true across industries.<sup>9</sup> That finding supports explanations like those given above, which hold broadly and aren't specific to certain industries.

That said, there could be some industry-specific trends at work. Employment in cities with the most robust low-end salary growth might have been especially concentrated in industries where early pandemic layoffs and subsequent re-hiring were extreme, or where workers had reason to stay outside the labor force.

Two industries over-represented in cities with the greatest low-end salary growth are education and healthcare, both of which were assaulted by the pandemic in exceptional ways.<sup>10</sup>

Healthcare was hit hard by COVID-19 caseloads and unsparing in-person exposure. Schools weathered a difficult and unprecedented transition to remote learning – which proved especially challenging for older workers – followed by in-person exposure once classrooms reopened.

It would not be surprising if people who left jobs in those industries were especially reluctant to return.

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<sup>8</sup> Low-income and low-cost cities are not identical, but they are similar. As of 2019 the correlation between the 5th percentile earnings and the Zillow Home Value Index (ZHVI) among the 53 metros was 0.56 and 0.57 for monthly and annual earnings, respectively. Using ZHVI as a stand-in for cost, the result that low-end earnings growth was higher in low-income cities applies to low-cost cities as well.

<sup>9</sup> The only exception is the manufacturing industry. In every other two-digit NAICS industry, regressions of the change in the log of the 5th percentile metro-by-industry monthly earnings from 2019 to 2021 on the log of their 2019 levels was downward sloping and statistically significant (at least at the 10% significance level; most often at the 5% or even 1% significance level).

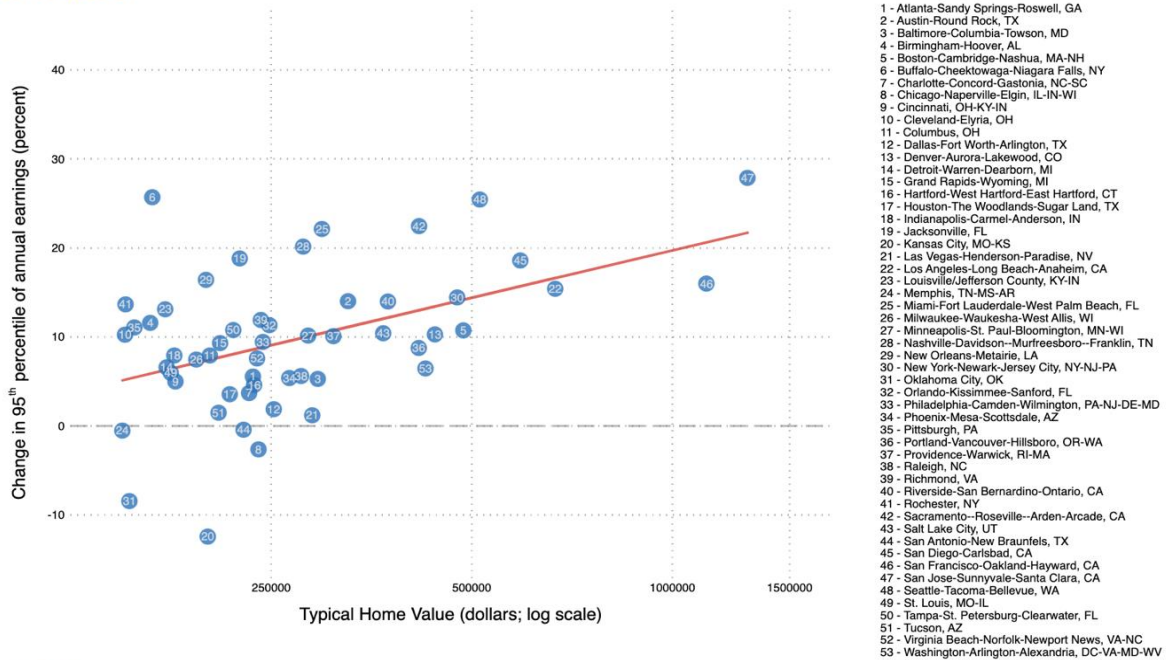
<sup>10</sup> The statement is based on regressing industry shares on the 2019-2021 log change 5th percentile monthly earnings using two-digit industry employment shares in the 2016-2020 five-year American Community Survey.

# Migration from expensive cities helped hollow their income distributions

The \$692,000 San Jose salary we mentioned earlier is off the charts in more ways than one. It reflects a 27.9 percent increase from 2019, the largest 95th percentile salary jump of any metro.

On average, annual high-end earnings grew in the most expensive metro areas more than anywhere else. This growth trend pre-dates the pandemic, but its magnitude is unprecedented, a boost probably rooted in the pandemic.<sup>11</sup>

High-cost cities saw more growth at the upper end of the pay scale  
2019 to 2021



Source: ADP Research Institute and Zillow Group; analysis by ADP Research Institute  
 Notes: The slope of the fitted line is 7.68 and it has a standard error of 1.93. The R<sup>2</sup> is .216.

With high housing costs and an occupational mix relatively amenable to remote work, the nation’s most-expensive cities saw substantial out-migration during the pandemic, which could help explain the big increase in high-end salaries.

<sup>11</sup> From 2019 to 2021, a 10 percent increase in ZHVI was associated with 0.77 percent higher 95th percentile annual earnings, on average. From 2017 to 2019 that figure was 0.34 percent. The two regressions informing those estimates, as well as additional ones using the 12-month average of monthly earnings instead of annual earnings and dollar-valued changes instead of percent changes are reported in Appendix Table 2.



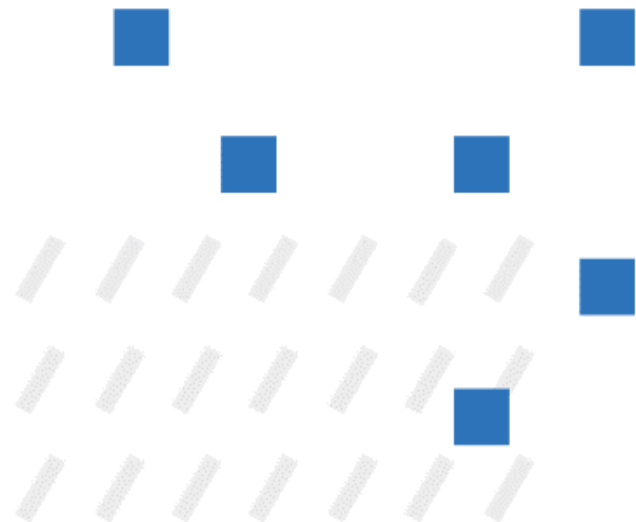
Not everyone who could work remotely had equal motivation to leave their expensive cities during the pandemic. In fact, those most compelled to pull up stakes were people in remote-friendly lines of work who also had difficulty making ends meet given the high cost of housing – typically people earning less than the 95th percentile salary.

Their departures likely thinned the middle of the salary distribution, shifting some high earners down the percentile chain and giving the 95th percentile spot to an even higher earner.

In informal statistical terms, the upper end of the pay distribution has a long right tail, meaning that earners at the far end of the spectrum are spread thinly over a very wide range of very high salaries. A shift of even a small number of people could correspond to a big difference in pay, consistent with the rapid increase observed for high-end salaries.<sup>12</sup>

That means the big increases in 95th percentile salaries in those pricey metros probably weren't actually experienced by workers – at least not in full – but were to some extent statistical artifacts of a hollowing out of the income distribution.

Although the pandemic-driven migration out of expensive metros has received lots of attention, its role in widening income inequality in those cities by draining them particularly of middle and upper-middle income residents has been obscure until now.



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<sup>12</sup> It also means that the 95th percentile salary in the high-income metros like San Jose, San Francisco and Seattle is likely to be volatile over time. It would not be surprising if changes in such metros' 95th percentile salary shift substantially going forward, possibly in the opposite direction than they did in 2021.

# The geographic divergence in wage growth is fuel for economic polarization

The high- and low-end salary results fit into a broader narrative around who is able to live where. This geographic divergence in wage growth between high and low earners affects the way people sort across the nation and is driving economic polarization.

From World War II to the 1980s and 1990s, wages in today's expensive coastal cities were sufficiently higher at all income levels to compensate for the higher cost of housing.<sup>13</sup>

Since then, however, the fortunes of workers with and without college degrees have diverged.

While the cost-benefit calculus of expensive city living ostensibly remains favorable for the college-educated, rising home prices have made it increasingly unfavorable for people without a degree, whose earnings have failed to rise in step with housing costs.<sup>14,15</sup>

Consequently, migration flows into expensive coastal cities have slowed and skewed more educated, while outflows have done the opposite.<sup>16</sup> That [population sorting](#) has concentrated degree-holders and their high salaries in the nation's expensive metros, resulting in increased economic – and likely political and cultural – polarization.

Greater growth of low-end salaries in low-income metros could tilt the cost-benefit calculus of coastal living even further out of balance. Low-income cities could become even more financially attractive compared to expensive ones for people without a college degree. That could exacerbate polarization well into the future.

We'll have to see if the developments of the past two years prove to be a pandemic-driven aberration or a harbinger of longer-term trends. We'll keep you posted.

[Download the data in Excel](#)

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<sup>13</sup> Higher wages in larger cities are known as the urban wage premium. See Glaeser, Edward L., and David C. Mare. "[Cities and skills](#)." *Journal of labor economics* 19.2 (2001): 316-342.

<sup>14</sup> See Figure 3 in Ganong, Peter, and Daniel Shoag. "[Why has regional income convergence in the US declined?](#)." *Journal of Urban Economics* 102 (2017): 76-90, and see also Figure 13 in Autor, David H. 2019. "[Work of the Past, Work of the Future](#)." *AEA Papers and Proceedings*, 109: 1-32.

<sup>15</sup> In addition, according to a new study, in more recent years the large-city cost and reward calculus has been negative for college-educated workers as well. See Section VI of Card, David, Rothstein, Jesse and Yi, Moises, (2021), "[Location, Location, Location](#)." Working Papers, U.S. Census Bureau, Center for Economic Studies.

<sup>16</sup> International migration into the expensive coastal cities usually more than compensates for those cities' negative net domestic migration, preventing them from shrinking. The period since 2018 has been exceptional in that respect, in that reduced international in-migration owing first to the political climate in the U.S. and then to the COVID-19 pandemic has caused some expensive coastal metros to experience slight population declines.

# Appendix

The following regression tables report results of bivariate linear regressions of the form  $Y_c = a + bX_c + e_c$ , where  $Y_c$  is the outcome for metro area  $c$ ,  $X_c$  is the explanatory variable,  $e_c$  is a residual term and  $a$  and  $b$  are intercept and slope coefficients.

The outcome variables will be the 5<sup>th</sup> percentile earnings growth over the denoted period in the first table and the 95<sup>th</sup> percentile earnings growth in the second. Columns 1 and 2 of each table measure earnings using the 12-month average of monthly earnings and changes thereof in percent and dollars, respectively. Columns 3 and 4 do the same with annual earnings, which excludes workers with fewer than 12 months on the job.

In the first table, the explanatory variable is the log of the 5<sup>th</sup> percentile earnings at the start of the denoted period. In the second table, the explanatory variable is the log of the Zillow Home Value Index (ZHVI) for the metro area at the start of the denoted period in all columns.

Note that because both pay levels and home values are lower in low-income cities, the shift from measuring changes in percent to dollars in the first table tends to flatten the downward slopes, whereas the same shift tends to steepen the upward slopes throughout the second table. For consistency, we have focused on results with percent changes of the outcomes in the main text, despite the better linear fit ( $R^2$ ) for dollar changes in the high-end pay results.

## Appendix table 1

**Regressions of 5<sup>th</sup> percentile earnings growth on log-level at the start of the period**

Period		12-month average of monthly earnings		Annual earnings for workers with at least 12 months on the job	
		Percent change	Dollar change	Percent change	Dollar change
		(1)	(2)	(3)	(4)
2019-2021	slope coefficient	-23.23 ***	-166 **	-19.68 ***	-2,411 **
	robust std. err.	(4.75)	(72)	(6.32)	(1,140)
	R <sup>2</sup>	0.411	0.099	0.242	0.070
2017-2019	slope coefficient	0.29	151 *	-0.95	745
	robust std. err.	(4.67)	(79)	(5.35)	(1,359)
	R <sup>2</sup>	0.000	0.076	0.001	0.006
Number of CBSAs		53	53	53	53

Source: ADP Research Institute®

Notes: 1, 2 or 3 asterisks denote statistical significance at the 10, 5 and 1 percent significance levels, respectively.

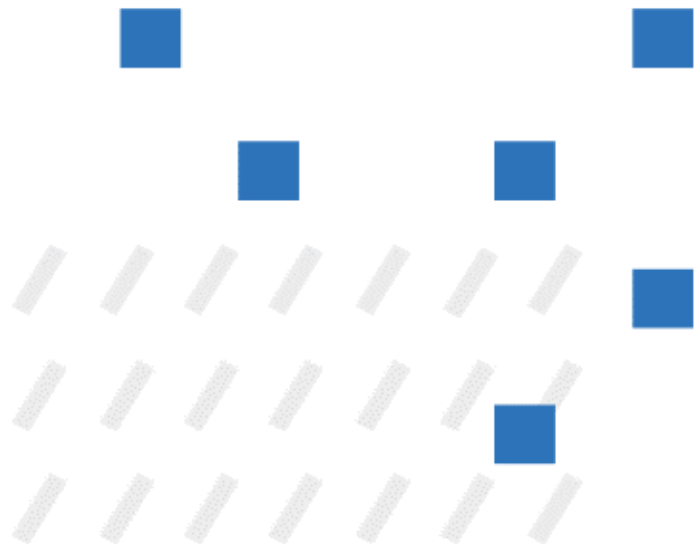
## Appendix table 2

### Regressions of 95<sup>th</sup> percentile earnings growth on log-ZHVI at the start of the period

		12-month average of monthly earnings		Annual earnings for workers with at least 12 months on the job	
		Percent change	Dollar change	Percent change	Dollar change
Period		(1)	(2)	(3)	(4)
2019-2021	slope coefficient	9.39 ***	4,015 ***	7.68 ***	42,789 ***
	robust std. err.	(3.19)	(1,484)	(1.93)	(8,942)
	R <sup>2</sup>	0.391	0.490	0.216	0.481
2017-2019	slope coefficient	2.13	1,078 **	3.35 *	18,285 **
	robust std. err.	(1.57)	(516)	(1.97)	(8,302)
	R <sup>2</sup>	0.050	0.191	0.070	0.190
Number of CBSAs		53	53	53	53

Source: ADP Research Institute® and Zillow Group; analysis by ADP Research Institute®

Notes: 1, 2 or 3 asterisks denote statistical significance at the 10, 5 and 1 percent significance levels, respectively.



# Methodology

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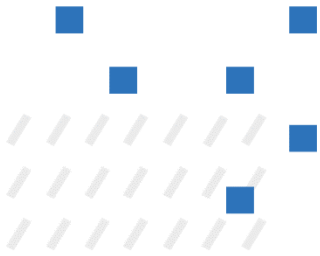
The ADP Research Institute wage indices used in this article are derived from gross wages of private-sector workers recorded in ADP payroll data. The data are reweighted to reflect the population addressed by the Bureau of Labor Statistics' Quarterly Census of Employment and Wages (QCEW) using weights at the 2-digit industry by employment county level.

The indices consist of monthly weighted quantiles of all earnings paid over the course of the month, regardless of pay frequency, within a variety of defined geography and population subsets. The article draws specifically on indices at the national and Core-Based Statistical Area (CBSA) level for salaried workers based on residence, and for subsets thereof based on employers' 2-digit industry.

The sample used was limited to months in which workers were actively employed with gross wages of at least \$100. First and last months of employment spells were omitted, as they often reflect partial pay (That comes at the cost of omitting signing bonuses when they are paid within the first calendar month of an employment spell).

The Zillow Home Value Index (ZHVI) data used in this article was drawn from Zillow's public-facing interface, according to the current terms of use (updated Jan. 12, 2021).





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