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## Have Changing Job and Worker Characteristics Restrained Wage Growth?

In the wake of the Great Recession, nominal wage growth has been subdued. But it is unclear how much of this relatively low wage growth reflects protracted weakness in the labor market versus other factors, such as changes in the composition of the workforce and jobs over time. Wage growth tends to vary across personal and job characteristics, so it stands to reason that changes in the composition of the workforce, alongside demographic and work characteristics, could be an important explanation of overall movements in wage growth.

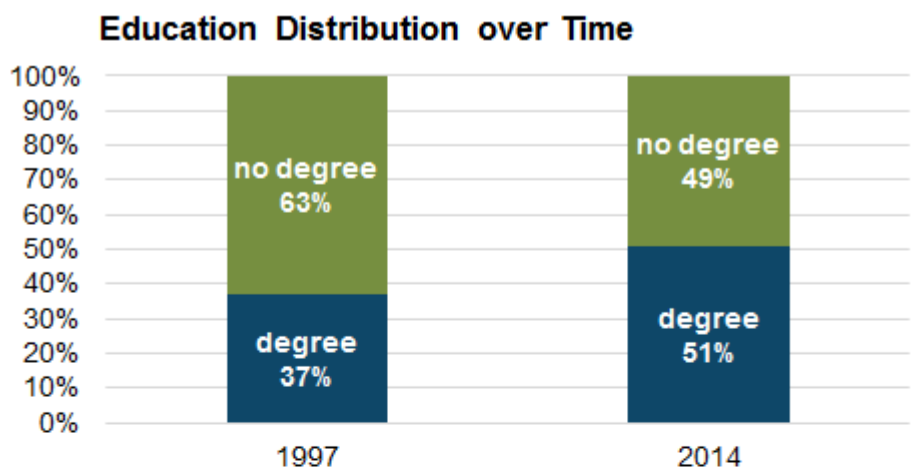
In this post, we explore the impact of the changing mixture of worker characteristics (by age and education) and types of jobs (by industry and occupation) on the [Atlanta's Fed Wage Growth Tracker](#). We find that composition effects do not account for the low median wage growth experienced in recent years. Holding worker and job characteristics fixed at their 1997 shares raises the median wage growth in 2014 by only about 0.2 percentage point. Our results are consistent with the analysis in a previous [macroblog post](#), which found that changing industry-employment shares could not explain much of the sluggish growth in the average hourly earnings data from the payroll survey.

### Median wage growth, composition change by worker characteristics

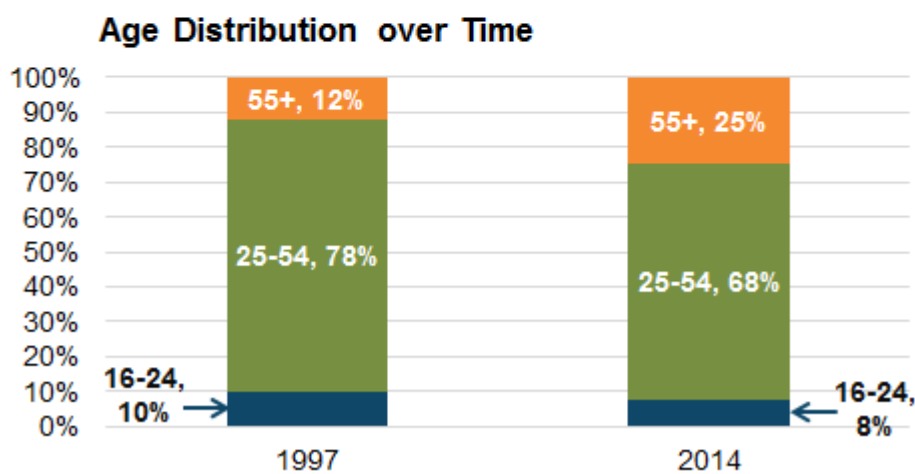
In terms of demographics, we consider two features: a worker's age and education. As shown in this [earlier macroblog post](#), younger workers tend to experience higher median wage growth than do older workers. Although older workers tend to be paid more based on experience, they are also more likely to be near the top of the wage distribution for their job, so the median older worker experiences less wage growth. The difference is quite large. In 2014, the median wage growth of workers over age 54 was around 1.2 percentage points lower than the overall median.

A person's education can also affect his or her wage growth. Workers with a high school diploma or less tend to have lower median wage growth. In 2014, the median wage growth of less-educated workers was about 0.1 percentage point lower than the overall median, reflecting that these workers are more likely to be earning minimum wage, which does not change very frequently.

In addition, the employment shares by age and education have changed over time. The proportion of workers in the Atlanta Fed's Wage Growth Tracker data who are over age 54 has more than doubled from 12 percent in 1997 to 25 percent in 2014. During the same period, the share of workers without a college degree has declined from 63 percent to 49 percent (see the charts).



Source: Current Population Survey and authors' calculations



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### Wage growth, composition change by job characteristics

In terms of job characteristics, we consider two features: the worker's industry (where they work) and their occupation (what they do). Before 2011, workers in service-producing industries experienced slightly higher (about 0.1 percentage point) median wage

growth than all workers. But since then, the trends have flipped. In recent years, median wage growth of individuals working in service-producing industries has been slightly *below* the median wage growth of all workers.

Nonetheless, workers in professional occupations such as managerial, legal, scientific, and engineering jobs tend to experience relatively higher median wage growth. In 2014, the median wage growth of workers in these professional jobs was 0.2 percentage point higher than the median wage growth for all workers.

The share of workers in service-producing industries and in professional jobs has increased moderately over time. In 1997, 77 percent of workers in the data were employed in service-producing industries. In 2014, the share had increased to 82 percent. During the same period, the share of workers in professional occupations rose from 36 percent to 41 percent.

### Composition effects on median wage growth

Individually, an aging workforce is putting downward pressure on wage growth, whereas rising education levels are adding upward pressure. The rising share of workers in professional occupations is also pushing wages up somewhat, although the impact of the rising share of workers in service-producing industries is ambiguous. But how large are these effects when combined?

To get an idea, we conducted two counterfactual experiments. First, we held fixed the age and education distributions at their 1997 levels (the first year in our Wage Growth Tracker data). Second, we held fixed the age, education, industry, and occupation characteristics at their 1997 levels. We used three age groups (16–24, 25–54, and 55-plus years of age), two education groups (college degree and no college degree), two industry groups (service- or goods-producing industries), and two occupation groups (professional and other occupations).

The blue line in the next chart is the median wage growth over time with no adjustments for changes in composition. For example, for 2014, the chart shows median wage growth of workers in the data set with earnings in January 2014 and January 2013, February 2014 and February 2013, etc. This depiction is the Atlanta Fed Wage Growth Tracker, but at an annual frequency. The other two lines show the results of the experiment: demographically adjusted (green) and both demographically and job adjusted (orange).



[\(enlarge\)](#)

### Conclusion

These experiments suggest that—for our data set, at least—the impact on the median of the wage growth distribution from shifts in the composition of the workforce and jobs over time has increased in recent years, but the impact is not especially large. For example, the unadjusted median wage growth for 2014 is 2.5 percent. Holding fixed all four characteristics at their 1997 levels would have raised this by only 0.2 percentage point. Shifting worker and job characteristics are not a primary explanation of low median wage growth since 2009.



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