

THEMATIC PAPER: APPRENTICESHIP

Do apprenticeships raise short-term earnings? Evidence from the American apprenticeship initiative

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ABSTRACT

In 2015, the US Department of Labor (DOL) launched the American apprenticeship initiative (AAI) to expand registered apprenticeships in the United States. This paper examines the short-term earnings growth of apprentices participating in AAI compared to the earnings growth for comparable workers during the same period. AAI apprentices initially earn less than comparable workers, but catch up early in the apprenticeship, and ultimately earn more than comparable workers. AAI apprentices' quarterly earnings increased 43% from quarter 4 before the start of the apprenticeship to quarter 10 after starting the apprenticeship, whereas comparable worker quarterly earnings increased by 16%, a 27% age point difference. All demographic groups experienced similar patterns. They began their apprenticeships with lower earnings than comparable workers in the same subgroup but increased their earnings at a faster pace through the apprenticeship and eventually earned more than comparable workers.

Key words: earnings, growth, American apprenticeship initiative, apprentices

INTRODUCTION

The US Department of Labor (DOL) launched the American apprenticeship initiative (AAI) in 2015 to expand apprenticeship with three to five-year awards to 46 grantees, such as nonprofit organizations, unions, industry associations, community colleges, local workforce boards, and state apprenticeship offices. A key goal was to extend registered apprenticeship programs beyond traditional construction occupations to cover such other fields as advanced manufacturing, healthcare, and information technology (IT). A second goal was to increase participation in apprenticeships by underrepresented populations. All employers and other apprenticeship sponsors were required to register their programs with a state or federal apprenticeship office. The evaluation of AAI consisted of a wide range of analyses, from the costs and benefits to employers

(Kuehn *et al.*, 2022), the average cost incurred by grantees of stimulating employers to hire apprentices (Lerman *et al.*, 2022), and the impact of an intensive sales approach on employers (Trutko *et al.*, 2022). This paper examines two research questions: (1) Did AAI apprentices achieve faster earnings growth than comparable workers? (2) How did differential earnings patterns vary by demographic group, occupation, and new hires versus incumbent workers?

METHODS AND RESEARCH DESIGN


Apprentices' labor market outcomes are often reported descriptively, without reference to how an apprentice would have fared in the absence of their apprenticeship program. In the AAI evaluation, descriptive labor market outcomes are reported by Walton *et al.* (2022), who find that average earnings for AAI apprentices one

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year after program exit are \$52,876. This information is valuable for characterizing the experiences of apprentices, but to evaluate whether apprenticeship training increased earnings, apprentice labor market outcomes must be compared to the outcomes of similar workers who did not participate in an apprenticeship program. The most rigorous approach to this comparison is an experiment or a randomized control trial. Such a social experiment was not feasible for AAI, so instead we compared AAI apprentices to non-apprentices with similar characteristics.

We obtained data on earnings growth of individual apprentices from quarterly the earnings records reported by employers and stored at the National Directory of New Hires (NDNH). We created a comparison group of comparable workers matched on the basis of age, sex, educational attainment, race, ethnicity and state. To tabulate the earnings growth of these comparable workers, we used data from the US Census Quarterly Workforce Indicators (QWI) on quarterly earnings. The QWI reports average earnings for each state separately by age and sex, by educational attainment and sex, and by race and ethnicity. We match each of the three QWI files with data on individual apprentices. Recognizing apprentices age over the study period, we match apprentice's to progressively older workers in the QWI. The analysis period runs from October 2015 through September 2021.

One limitation is that the data on apprentices is for the same cohort while the data on comparable workers are averages of all workers matched in each quarter but are not a single cohort of workers.

For each calendar quarter beginning four quarters (1 year) before and ending 10 quarters (2.5 years) after the apprenticeship start date (15 quarters, or 3.75 years in total). Earnings of apprentices entering programs lasting more than 2.5 years may reflect in-program earnings. The data for the figures include 3734 apprentices (2419 men and 1312 women) and about 130 million comparison group workers.

RESULTS

AAI apprentices initially earn less than comparable workers, but they more than catch up during the apprenticeship (Figure 1). As shown, comparable workers earned about \$1300 more per quarter than AAI apprentices in quarter 4 before the apprenticeship start date. But 2.5 years (10 quarters) after entering the apprenticeship, the AAI apprentices earned \$1000 more on average per quarter than comparable workers (\$14,920 compared to \$13,694). In percentage terms, quarterly earnings of AAI apprentices rose by 43% over

the full 14-month period, well beyond the 16% earnings increase attained by comparable workers. Much of the differential growth took place during the apprenticeship itself. Between quarter 4 prior to the apprenticeship and quarter 1 after starting the apprenticeship, AAI apprentice earnings increased by 16%, or more than three times the 5% increase of comparable workers. Thus, unlike other training programs where participants forgo paid employment during training, these apprentices did not give up earnings to undertake their training.

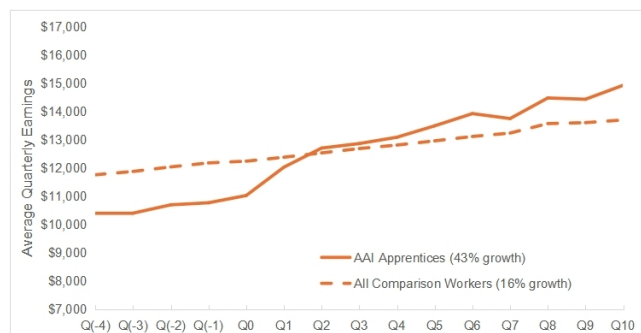


Figure 1. Quarterly earnings growth of AAI apprentices and comparison workers. AAI, America apprenticeship initiative.

While both male and female AAI apprentices achieved higher earnings growth than comparable workers, growth rates for women apprentices greatly outpaced gains for men. As Figure 2 shows, women AAI apprentices experienced a 62% increase, far outpacing the 19% growth for comparable women workers. As with all AAI apprentices, the biggest gains for women AAI apprentices occurred at the start of the apprenticeship itself. During the first quarter of the apprenticeship, their earnings were 28% higher than their earnings four quarters before starting. By quarter 10, women apprentices earned nearly \$2700 more than comparable women workers.

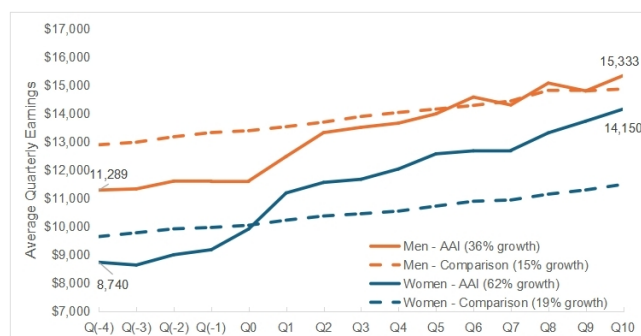


Figure 2. Comparison of earnings growth for women vs. men. AAI, America apprenticeship initiative.

Apprenticeships narrowed the female-male earnings gap

dramatically. A year before starting their AAI apprenticeships, women AAI apprentices earned 77% of what men earned. Two and a half years after the start of their AAI apprenticeships, women AAI apprentices earned 92% of the average earnings of men.

The relative gains for apprentices extended to white, Black, and Hispanic workers. Both Black and white apprentices experienced nearly 40% increases in earnings compared to 15% for comparable workers. The apprenticeship advantage was substantially larger for Hispanic workers, with apprentices seeing a 54% gain compared to 18% for comparable workers.

By far the largest subgroup to gain from apprenticeship was workers newly hired by the employer. These workers experienced a 93% increase in quarterly earnings, while the earnings growth for comparable workers was only 20%. The AAI sample of new worker apprentices earned \$8275 before the apprenticeship, well below the \$11,734 level for comparable workers. But 2.5 years after starting their apprenticeships, new workers were earning more than comparable workers (\$15,988 *vs.* \$13,963). Gains were only modest for incumbent workers—those entering an apprenticeship with the employer they were already working for. These apprentices experienced 19% growth *vs.* 13% for comparable workers.

Occupational and industry patterns varied substantially, this was partly because of the difference in the duration of the apprenticeships. Apprenticeships in construction and manufacturing take longer to complete than apprenticeships in IT and health care. Since the follow-up period may not even extend to the end of the construction and manufacturing apprenticeships, the results for these occupations are unlikely to capture the gain from apprenticeship. While this report shows only a short post-apprenticeship period for IT and healthcare apprenticeships, the results through the first 2.5 years after starting apprenticeships in these fields reveal striking gains. Those entering IT apprenticeships achieved a 95% increase in average earnings by the end of the follow-up period, six times the 15% rise in average earnings of comparable workers. The relative gains for healthcare apprenticeships were similarly dramatic, with apprentices seeing an 82% growth in quarterly earnings as opposed to 21% growth for comparable workers.

CONCLUSION

This paper has documented AAI apprentices' earnings before and after the apprenticeship relative to comparable workers. The results capture the timing as well as the absolute and relative levels of the short-term earnings gains among subgroups of apprentices. The key

findings are summarized below.

Nearly all AAI apprentice subgroups experienced a sharp increase in earnings from a year before the start of their apprenticeship and early in their apprenticeship, and through the 10th quarter after the start of the apprenticeship. The observed trends align with the apprenticeship model, in which apprentices earn a lower wage at the start of their apprenticeship, when they have not mastered competencies, and experience earnings gains during the apprenticeship itself, in line with regular wage increases as apprentices master occupational skills (Lerman *et al.*, 2022). For most subgroups, AAI apprentices earn less than comparable workers before the apprenticeship, catch up during the apprenticeship, and often see more rapid growth in earnings than comparable workers by 10 quarters following the start of the apprenticeship.

AAI apprentices newly hired by the employer and AAI apprentices in IT occupations (regardless of incumbency status) achieved by far the largest increases in apprenticeship earnings (93% and 95%, respectively). Comparable workers to the IT AAI apprentices saw gains in earnings of only 20% and 15%. New workers and IT apprentices had lower earnings than comparable workers a year before their apprenticeships. Apprentices in both subgroups showed no sign of catching up with comparable workers before the apprenticeship and had lower earnings in the second quarter before their apprenticeship than they did four quarters before their apprenticeship. Both subgroups experienced an increase in earnings in the quarter at which they entered; over the first four quarters (first year) after entering the apprentices' earnings caught up with those of comparable workers. In subsequent quarters, both newly hired apprentices and IT apprentices experienced more rapid growth in earnings than did comparable workers.

Examining earnings over 15 quarters (the four quarters prior to the apprenticeship and 10 quarters following the start quarter) reveals insights not always captured by comparing two points in time. For example, AAI apprentices experienced large earnings gains at the time of apprenticeship enrollment, and steady but more modest gains during the apprenticeship itself. After two years, the steady growth in earnings for the full sample of apprentices began to level off, as shown in Exhibit 1.

Relative earnings trends differ by ethnicity but not by race. Both white and Black AAI apprentices have earnings well below comparable workers in the four quarters prior to apprenticeship, reach parity with them soon after the apprenticeship begins, and then keep pace with comparable workers. In contrast, Hispanic apprentices also see an increase in earnings with the start of the apprenticeship and continue to outpace

comparable workers through the 10 quarters after enrolling in an apprenticeship (Exhibit 3).

A follow-up period of 10 quarters (2.5 years) after enrolment in an apprenticeship is too short for judging the post apprenticeship earnings of manufacturing and construction apprentices, which typically last 2.6 and 3.4 years, respectively (Gardiner et al., 2021). Additionally, given the relative lengths of apprenticeship programs, the earnings of manufacturing and construction apprentices through quarter 10 reflect their in-program earnings, whereas the observation period is long enough to capture post program earnings for healthcare and IT apprentices, which typically last 1.1 and 1.3 years, respectively (Gardiner et al., 2021). This suggests the value of longer-term outcomes or impact study of registered apprentices.

DECLARATIONS

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Author contributions

Lerman R: Methodology, Writing—Original draft, Writing—Review and Editing. Kuehn D: Methodology, Formal analysis, Writing—Original draft, Writing—Review and Editing. All authors have read and approved the final version of the manuscript.

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Informed consent

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Conflict of interest

The authors have no conflicts of interest to declare.

Data availability statement

No additional data.

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