

# From Higher Education To Work In West Virginia 2006

Results For Work Participation And  
Wages With Analysis By Residency  
Status And Selected Degree

December 2007

Prepared for the  
West Virginia Higher Education Policy  
Commission

By

George W. Hammond, Associate Director  
J. Sebastian Leguizamon, Graduate Research  
Assistant

Bureau of Business and Economic Research  
College of Business and Economics  
West Virginia University

© Copyright 2007 WVU Research  
Corporation

This research was conducted under contract  
with the West Virginia Higher Education  
Policy Commission. Opinions expressed  
herein are the responsibility of the authors.



## **Table of Contents**

Executive Summary .....	1
Employment Data Description .....	3
West Virginia Work Participation Of State Higher Education Graduates .....	4
West Virginia Wages Of State Higher Education Graduates .....	9
Appendix: List of Institutions and Degrees .....	15

## List of Tables

1. Annualized Wages Of W.Va. Graduates By Select Degree .....13

## List of Figures

1. Three Measures Of West Virginia Employment .....3
2. Percent Of Graduates From W.Va. Higher Education Institutions Working In the State In 2006 .....4
3. Shares Of Graduates Working In The State In 2006 By Enrollment .....5
4. Percent of Graduates From W.Va. Higher Education Institutions Working In the State 2003-2006 .....6
5. Full- And Part-Time W.Va. Work Participation Of State Higher Education Graduates In 2006 .....7
6. Percent Of State Higher Education Graduates Working In W.Va. In 2006 By Residency For Fee Purposes.....8
7. Shares of State Higher Education Graduates Working In The State In 2006 By Degree.....9
8. Wages Of Graduates From W.Va. Higher Education Institutions In 2006 .....10
9. Annualized Wages Of Graduates From W.Va. Higher Education Institutions .....11
10. Full-Time and Part-Time Annualized Wages Of W.Va. Graduates Working In The State In 2006 .....12
11. Annualized Wages Of Graduates From W.Va. Higher Education Institutions In 2006 By Residency .....12
12. Annualized Wages Of W.Va. Higher Education Graduates By Degree.....14

## **Executive Summary**

Human capital is an important determinant of economic competitiveness and growth. Universities and colleges are a crucial component of the system by which nations, states, and local areas generate human capital. A critical consideration is then the degree to which graduates from state higher education institutions remain in the state to work and the wages they earn.

This report summarizes West Virginia labor market experiences of graduates from West Virginia public institutions of higher education during the last decade. This initial report focuses on trends in the number of graduates on the payrolls of establishments located in the state, as well as their wages. Also included are analyses of the work participation and wages of graduates by selected degrees and by residency.

Highlights of the study include:

### ***Work participation***

Of the 106,583 state public higher education graduates during the last decade, 49,436 earned wages in West Virginia in 2006. Thus, 46.4 percent of West Virginia higher education graduates during the 1995-1996 to 2004-2005 period were on the payrolls of state establishments for at least one quarter of the year.

State graduates during the past decade accounted for 7.0 percent of state covered payroll jobs in 2006.

In 2006, 57.1 percent of state graduates in the 2004-2005 academic year were working at establishments located in West Virginia. This share gradually decreases over time, reaching 37.9 percent of 1995-1996 academic year graduates working in the state in 2006.

The majority of state graduates participate in full-time work, measured by those graduates earning an annualized wage above the minimum wage. In 2006, 40.1 percent of graduates from 1995-1996 to 2004-2005 were engaged in full-time work, while 6.2 percent were engaged in part-time employment.

In 2006, 94.3 percent of graduates that were on the payrolls of state establishments were classified as in-state residents for fee purposes. Those classified as out-of-state accounted for 4.0 percent of graduates on the payrolls in 2006. Thus, in-state graduates are more likely to work in West Virginia.

Work participation in the state also varies by degree earned. Graduates with Associate's degrees posted the highest work participation rate, with 64.2 percent of these graduates working in the state in 2006. Graduates with Masters' degrees posted a work participation rate of 49.2 percent, followed by First Professional (44.0 percent), Bachelor's (41.1 percent), and Doctoral (23.8 percent) graduates.

## ***Wages***

Graduates during the past decade from state public institutions of higher education earned \$1.56 billion in wages at establishments located in West Virginia in 2006. That accounts for 6.8 percent of the \$23.1 billion in wages paid to all workers on the payrolls of state firms covered by unemployment compensation.

Averaged across the 49,436 graduates on the payrolls of state firms, that translates into average wages per higher education graduate of \$31,618 in 2006.

Adjusted for part-year work, annualized wages for state graduates were \$36,954 in 2006. Wages rise as workers gain experience, with recent graduates earning an average annualized wage of \$27,190. Graduates during the 1995-1996 academic year earned an annualized wage of \$45,726 in 2006.

West Virginia higher education graduates working full-time in 2006 averaged \$41,779. In 2006, graduates from the 1995-1996 academic year that worked full-time had annualized wages of \$49,656 compared to \$33,557 for the most recent graduates.

Annualized wages for 2004-2005 West Virginia graduates working part-time in the state in 2006 averaged \$6,122. As the time since graduation increases, annualized wages for part-time workers decrease slightly.

In 2006, out-of-state graduates from 1995-1996 to 2000-2001 academic years averaged annualized wages of \$44,923, while those with in-state residency earned an average of \$43,128.

For graduates during the last decade, annualized wages in 2006 were highest for those with First Professional degrees (\$88,947), followed by those with Doctoral degrees (\$59,824), Master's degrees (\$45,648), Bachelor's degrees (\$32,477), and Associate's degrees (\$30,494).

West Virginia Associate's and Bachelor's degree graduates earn approximately the same average annualized wages (ranging from the mid-\$20,000 to the mid-\$30,000) during the first six years following graduation. However, after the sixth year since graduation, graduates with Bachelor's degrees do significantly better, with Bachelor's degree graduates during the 1995-1996 academic year earning an average of \$6,330 more than Associate's degree graduates.

The data analyzed in this report were provided by the West Virginia Higher Education Policy Commission and cover graduates from state public institutions of higher education during the academic years from 1995-1996 to 2004-2005. Data on graduates is matched, by Workforce West Virginia, with data on employment and wages covered under the state unemployment compensation system. The employment data is well known to be of high quality, but it does not include all individuals working in a state at a given time. For instance, the dataset excludes the self-employed and other workers not covered by state unemployment compensation (railroad workers and federal government employees).

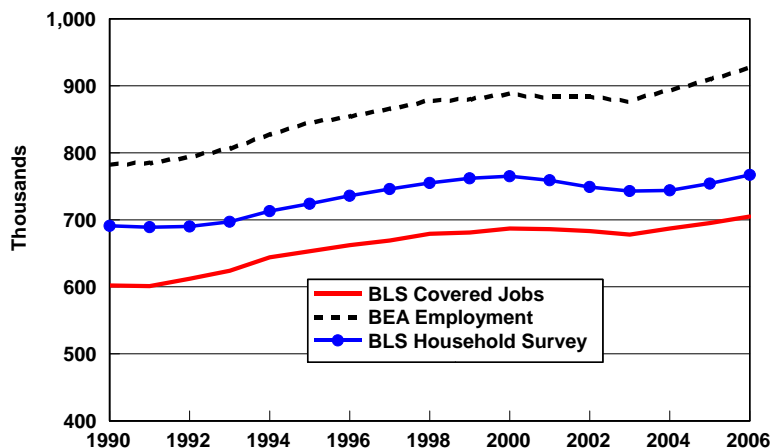
## Employment Data Description

The data analyzed in this study were provided by the West Virginia Higher Education Policy Commission (HEPC).<sup>1</sup> The dataset comes from the matching of demographic information on graduates from West Virginia institutions of higher education (compiled by the HEPC) with employment records maintained by Workforce West Virginia. Graduates reflect the highest degree earned at the time of measurement.

The employment data used is gathered from state unemployment compensation records. This is a well-known dataset which measures jobs by place of work. It covers jobs and wages reported by firms participating in the West Virginia Unemployment Compensation system. As a general rule, any firm which employs one or more workers for some part of a day in at least 20 different weeks of a calendar year is required to contribute to the state's unemployment insurance system. Major exceptions are railroad companies and the federal government, which contribute to separate systems. The self-employed, student workers, most church workers, and unpaid family workers are also generally not covered.

Covered employment counts 705,189 jobs at establishments in West Virginia in 2006.<sup>2</sup> As Figure 1 shows, this measure of employment is lower than two other major measures of employment: employment measured by the U.S. Bureau of Economic Analysis and employment measured by the U.S. Bureau of Labor Statistics household survey. Differences arise because of the treatment of the self-employed, who are excluded from covered jobs but are included in the BEA measure and in the BLS household survey, as well as the exclusion of student workers, most church workers, and unpaid family members from the measure of covered jobs. Further, BLS household employment is measured by place of residence, which includes state residents working out of state.

**Figure 1**  
**Three Measures Of West Virginia Employment**



<sup>1</sup> We would like to thank Larry Ponder of the WVHEPC for providing the data used in this study.

<sup>2</sup> Federal government jobs are added in separately for completeness.

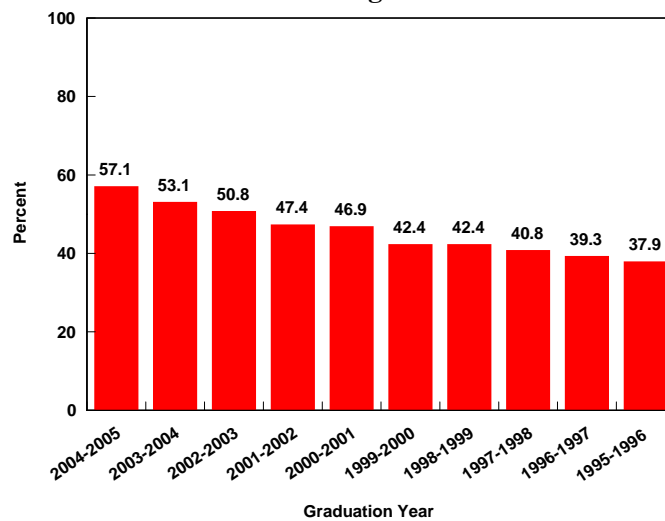
Finally, wages are an important source of compensation for work. This data is readily available and well understood and is useful in the evaluation of returns to work of state higher education graduates. However, it is not the only form of compensation offered by firms. Fringe benefits, particularly employer-paid pension and health insurance, have accounted for an increasing share of work compensation during the last 30 years. Indeed, the share of other labor income to gross earnings by place of work has risen from 6.3 percent in 1969 to 13.8 percent by 2006 for West Virginia.

## West Virginia Work Participation Of State Higher Education Graduates

In 2006, 46.4 percent of West Virginia public higher education graduates during the 1995-1996 to 2004-2005 period were on the payrolls of establishments located in the state for at least one quarter of the year.<sup>3</sup> Thus, of the 106,583 state higher education graduates during the last decade, 49,436 earned wages in West Virginia last year. In addition, state graduates accounted for 7.0 percent of state covered payroll jobs in 2006.

As Figure 2 shows, work participation falls as the time from graduation increases, which implies that more recent graduates are more likely to work in West Virginia than graduates in the more distant past. Indeed, in 2006, 57.1 percent of graduates in the 2004-2005 academic year worked at establishments located in West Virginia. This share gradually decreases over time, reaching 37.9 percent of 1995-1996 graduates working in the state in 2006. The declining share of graduates working in the state over time reflects the normal churning of the labor market, as individuals find opportunities to apply their skills in other states or in occupations/industries not captured by the dataset (such as self-employment, railroad workers, federal government workers).

**Figure 2**  
**Percent Of Graduates From W.Va. Higher Education**  
**Institutions Working In The State In 2006**



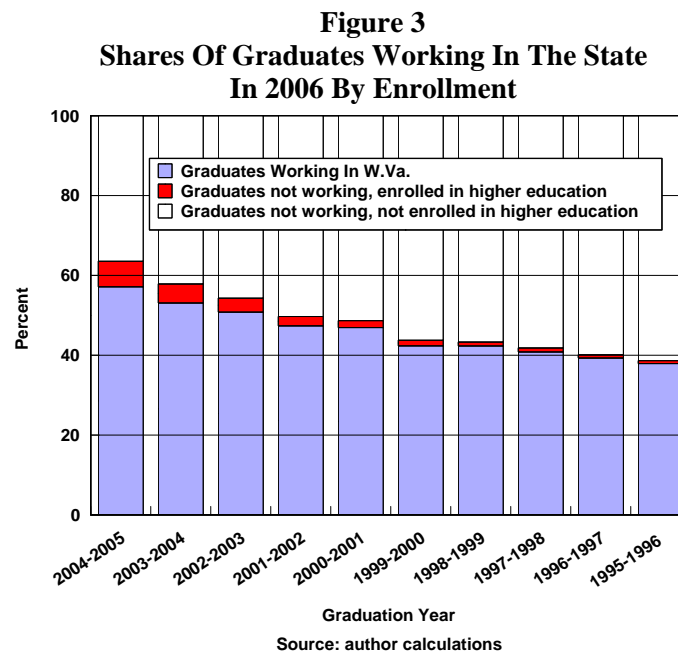
Source: author calculations

<sup>3</sup> See the Appendix for a list of public institutions and types of degrees granted.



As noted above, graduates from West Virginia institutions of higher education may be counted as not participating in the state labor market for a number of reasons. They may not be working at all, they may be self-employed, they may be working in an industry not covered by the unemployment compensation system, or they may be continuing their education (and thus not working for that reason).

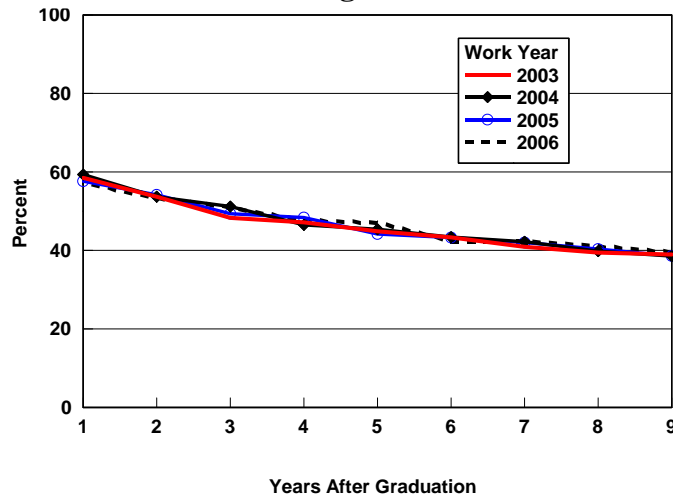
Figure 3 shows the shares of state graduates that were working in the state in 2006, not working in the state in 2006 but enrolled in higher education, and not working in the state and not enrolled in West Virginia higher education.



In 2006, 2.5 percent of West Virginia higher education graduates (during the 1995-1996 to 2004-2005 period) were enrolled in higher education after graduation. This share also declines as the number of years after graduation increase, as Figure 3 shows. Overall, the share of graduates that were not working in the state, but enrolled in higher education, falls from 6.4 percent for the most recent graduates to 0.7 percent for graduates during the 1995-1996 academic year.

The data for 2006 shows that 46.4 percent of West Virginia higher education graduates during the last 10 years are working in the state. We find similar rates of work participation using data for 2003-2005. Figure 4 shows work participation trends have been fairly similar during the 2003-2006 period, with more recent graduates posting higher rates of work participation than later graduates.

**Figure 4**  
**Percent Of Graduates From W.Va. Higher Education**  
**Institutions Working In The State 2003-2006**



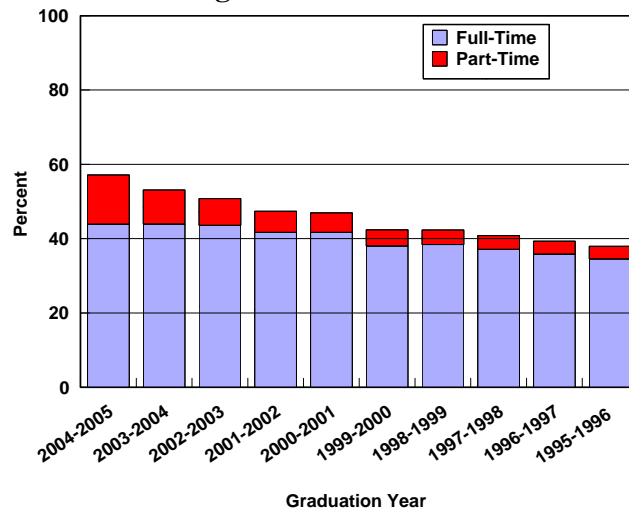
Source: author calculations

Overall work participation rates give a general picture of the experiences of graduates from West Virginia institutions of higher education. However, an important consideration is the character of the work participation of West Virginia graduates. One important aspect of work participation is full-time versus part-time participation. One approach to this would classify all graduates working four quarters per year as full-time employees. However, this will tend to under count full-time work. For example, a graduate may participate in full-time work for one or two quarters of a year and then stop working. The participation of that worker should be classified as full-time, not part-time.

Another method for classifying full-time work is to focus on wages. In this report, full-time participation is defined as work that generates annualized wages above the minimum wage. This is also an imperfect classification system, but it has the advantage of including full-time workers that choose not to participate for all four quarters of the year.

Figure 5 shows the 2006 work participation of West Virginia graduates, using the minimum wage classification system. The majority of state graduates participate in full-time work. In 2006, 40.1 percent of graduates from 1995-1996 to 2004-2005 were engaged in full-time work, while 6.2 percent were engaged in part-time employment. As the figure shows, part-time participation is concentrated in the latest graduates, with 13.3 percent of graduates classified as part-time. This share falls off rapidly, dropping by more than one-half (to 5.2 percent) for those graduating during 2000-2001. For graduates during the 1995-1996 academic year, part-time participation falls to 3.4 percent.

**Figure 5**  
**Full- And Part-Time W.Va. Work Participation**  
**Of State Higher Education Graduates in 2006**



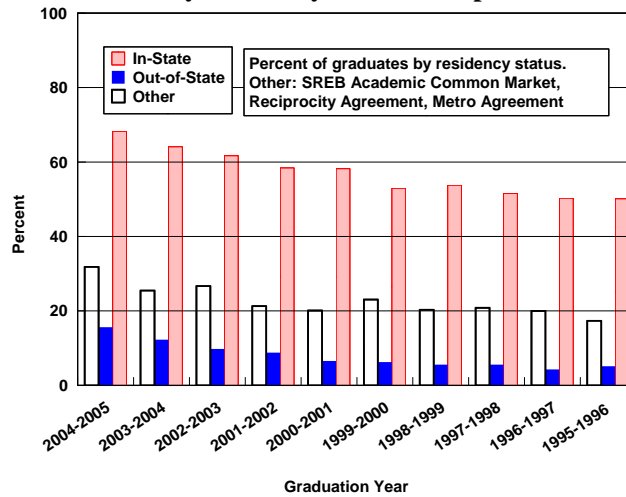
Source: author calculations

One factor which influences the work participation of state higher education graduates is their native state. It is likely that graduates originally from West Virginia will be more likely to stay in the state after graduation. While data on state of origin for graduation is not available, data on residency for fee purposes is included in the database. This data will give an indication of the degree to which origin influences work participation in the state.

Overall, most state higher education graduates during the last decade that were working in the state in 2006 were classified as in-state for fee purposes. Indeed, in-state graduates accounted for 94.3 percent of graduates (for which we have residency status) that were on the payrolls of state establishments. Those classified as out-of-state accounted for 4.0 percent of graduates on the payrolls in 2006. Thus, in-state graduates are more likely to work in West Virginia. Overall, for those graduates classified as in-state for fee purposes, 57.6 percent worked in the state in 2006. This is far higher than the 8.3 percent of out-of-state graduates still working in the state in 2006.

Figure 6 shows the percent of graduates during the 1995-1996 to 2004-2005 period working in the state in 2006 by residency for fee purposes. This data shows the familiar trend of declining work participation as the number of years since graduation increases. For in-state graduates, work participation drops from 68.3 percent for the 2004-2005 academic year to 50.1 percent in the 1995-1996 academic year. For out-of-state graduates, work participation drop from 15.6 percent in 2004-2005 to 5.1 percent in 1995-1996.

**Figure 6**  
**Percent Of State Higher Education Graduates**  
**Working In W.Va. In 2006**  
**By Residency For Fee Purposes**



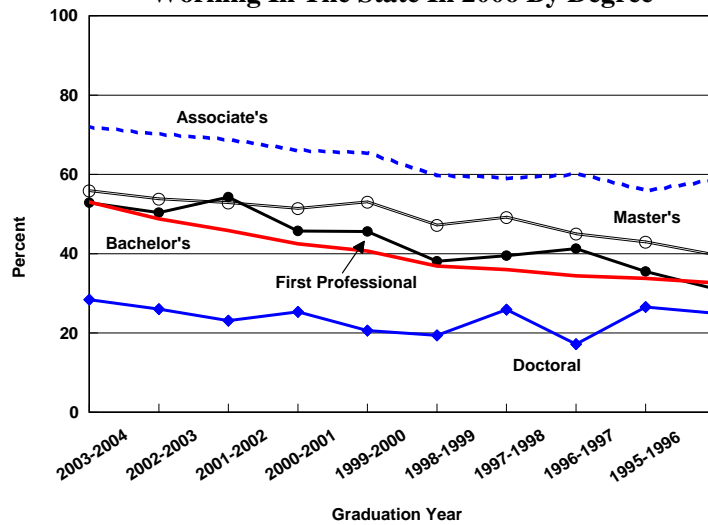
Source: author calculations

Work participation also tends to vary by degree, measured by the highest degree earned. In 2006, 64.2 percent of state higher education graduates during the past decade with an Associate’s degree as the highest degree were on the payrolls of establishments located in the state. Graduates with a Master’s degree had the next highest rate of retention in 2006, with 49.2 percent, followed by graduates with a First Professional degree (44.0 percent), Bachelor’s degree (41.1 percent), and Doctoral degree (23.8 percent).

As Figure 7 shows, we see the familiar pattern of declining participation as the time from graduation increases. Graduates with an Associate’s degree always have the highest participation rates, ranging from 72.0 percent for the latest graduates to 58.7 percent for graduates during the 1995-1996 academic year. Work participation rates are similar for Master’s, First Professional, and Bachelor’s degrees, with initial participation rates in the 53-56 percent range for the latest graduates to the 31-40 percent range for graduates during the 1995-1996 academic year. Graduates with Doctoral degrees have the lowest participations rates, which range from 28.4 percent for recent graduates to 25.0 percent for graduates during the 1995-1996 academic year.

Overall, the largest declines in work participation occur in graduates with Bachelor’s and First Professional degrees, which experienced declines of 20 percentage points from the latest graduates compared to graduates during the 1995-1996 academic year. Graduates with Master’s degrees experienced declines in work participation of 16.2 percentage points, while graduates with Associate’s degrees experienced declines of 13.3 percentage points. Doctoral graduates experienced the smallest declines with work participation for the latest graduates just 3.4 percentage points above the participation of graduates during the 1995-1996 academic year.

**Figure 7**  
**Shares Of State Higher Education Graduates**  
**Working In The State In 2006 By Degree**



Source: author calculations

## West Virginia Wages Of State Higher Education Graduates

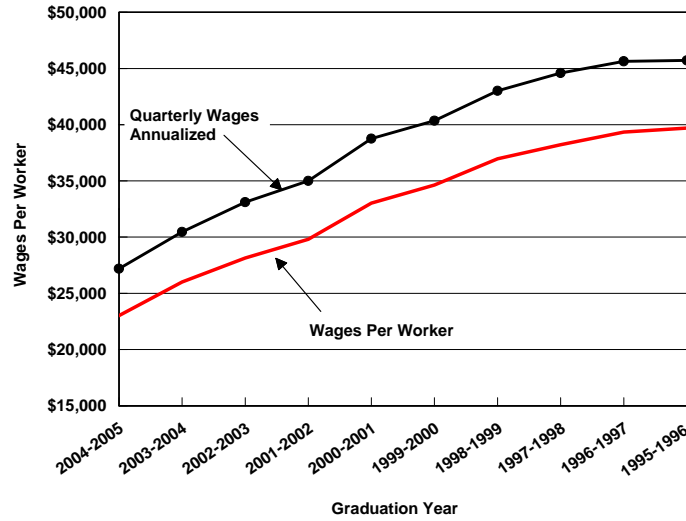
Graduates from state institutions of higher education earned \$1.56 billion in wages at establishments located in West Virginia in 2006. That accounts for 6.8 percent of the \$23.1 billion in wages paid to all workers on the payrolls of state firms covered by unemployment compensation. Averaged across the 49,436 graduates on the payrolls of state firms, that translates into average wages per higher education graduate of \$31,618 in 2006.

Figure 8 shows how average wages change as the time from graduation increases for the 2006 wage data. As the figure shows, average wages increase as the number of years since graduation rises, with the most recent graduates earning \$23,016 in 2006. This average wage rises to \$39,699 for graduates during the 1995-1996 academic year.

Figure 8 also shows average annualized wages, which include an adjustment for part-year work. This adjustment puts those that worked one, two, or three quarters during the year on the same footing as those that worked four quarters during the year.<sup>4</sup> Annualized wages for state higher education graduates averaged \$36,954 in 2006. Annualized wages rise as workers gain experience, with recent graduates earning an average annualized wage of \$27,190. Graduates during the 1995-1996 academic year earned an annualized wage of \$45,726 in 2006.

<sup>4</sup> The adjustment is to divide a worker's total wages for the year by the number of quarters worked. The resulting quarterly wage is then 'annualized' by multiplying by four. Thus, a worker with total wages of \$33,000 for the year, with three quarters worked, will have an average annualized wage of \$44,000 ( $= (\$33,000/3)*4$ ).

**Figure 8**  
**Wages Of Graduates From W.Va. Higher Education**  
**Institutions In 2006**



Source: author calculations

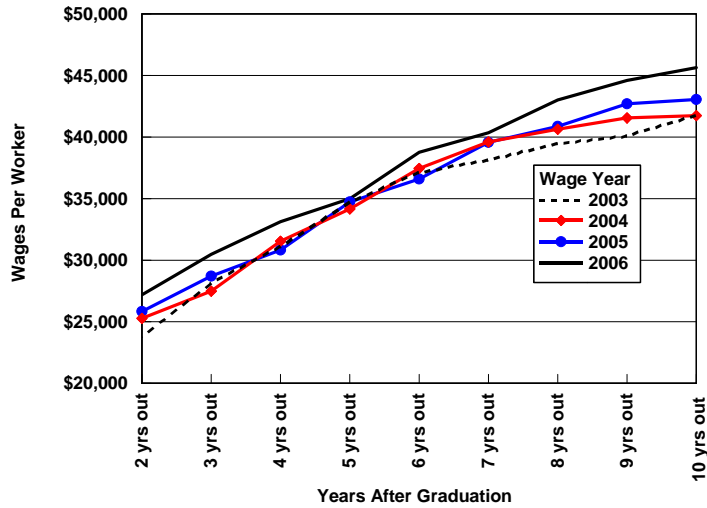
Annualized wages of West Virginia higher education graduates have increased over time, from \$33,836 in 2003 to \$36,954 in 2006. This translates into a compound annualized rate of growth of 3.0 percent per year, which exceeds the national rate of inflation during the period of 2.8 percent.<sup>5</sup>

Figure 9 shows that the annualized wage trend we observe for 2006 is similar to the overall trends for 2003-2005. It also shows that wages tend to rise over time, after controlling for one measure of experience (years since graduation), because the curves generally shift up over time. This will reflect the impact of inflation and also overall labor market conditions, as tighter labor markets (reflecting lower unemployment rates) generate higher wage gains.

---

<sup>5</sup> Inflation measured by the compound annual percent change in the personal consumption expenditures deflator.

**Figure 9**  
**Annualized Wages Of Graduates From W.Va. Higher Education Institutions**

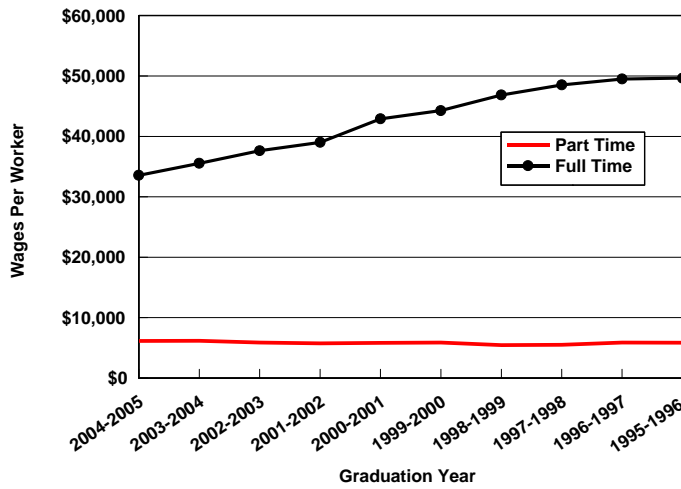


Source: author calculations

As mentioned above, not all of the graduates from West Virginia higher education institutions work all four quarters of the year. Figure 10 shows the average annualized wages of state graduates working in West Virginia for those working full-time and part-time. Part-time workers are those earning an average annualized wage below minimum wage level (\$11,700) in 2006.

As Figure 10 shows, annualized wages for 2004-2005 West Virginia graduates working part-time in the state in 2006 averaged \$6,122. As the time since the graduation year increases, annualized wages for part-time workers decrease. On the other hand, West Virginia higher education graduates working full-time in 2006 averaged \$41,779. As Figure 10 also shows, the average annualized wage increases with the number of years since graduation. In 2006, graduates from the 1995-1996 academic year averaged annualized wages of \$49,656 compared to \$33,557 for the most recent graduates.

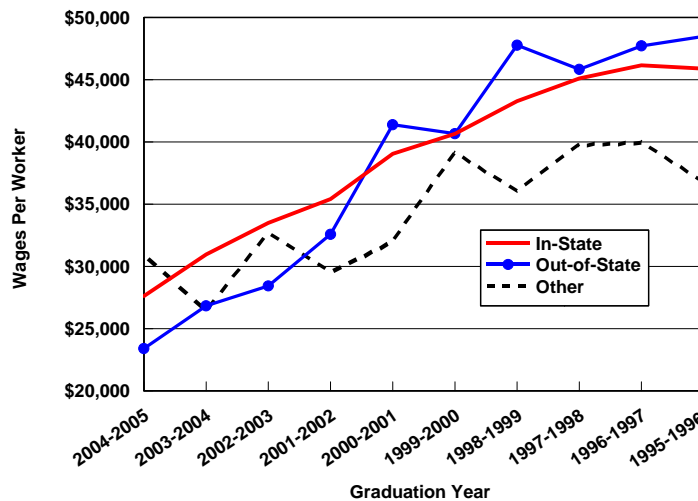
**Figure 10**  
**Full-Time and Part-Time Annualized Wages**  
**Of W.Va. Graduates Working In The State In 2006**



Source: author calculations

On average, annualized wages for out-of-state graduates start out lower than those with in-state residency upon graduation. However, as Figure 11 shows, as the number of years from graduation increases, wages for graduates with out-of-state residency start climbing up and even exceed the wages of in-state graduates. In 2006, out-of-state graduates from 1995-1996 to 2000-2001 academic years averaged annualized wages of \$44,923, while those with in-state residency earned an average of \$43,128.

**Figure 11**  
**Annualized Wages Of Graduates From W.Va. Higher**  
**Education Institutions In 2006 By Residency**



Source: author calculations



Table 1 breaks the state’s average annualized wages down by the level of degree earned by graduates of a West Virginia higher education institution. As expected, the higher the degree, the higher the average annual wage. For graduates during the last decade, annualized wages in 2006 were highest for those with First Professional degrees (\$88,947), followed by those with doctoral degrees (\$59,824), Master’s degrees (\$45,648), Bachelor’s degrees (\$32,477), and Associate’s degrees (\$30,494).

**Table 1**  
**Annualized Wages Of W.Va. Graduates By Select Degree**

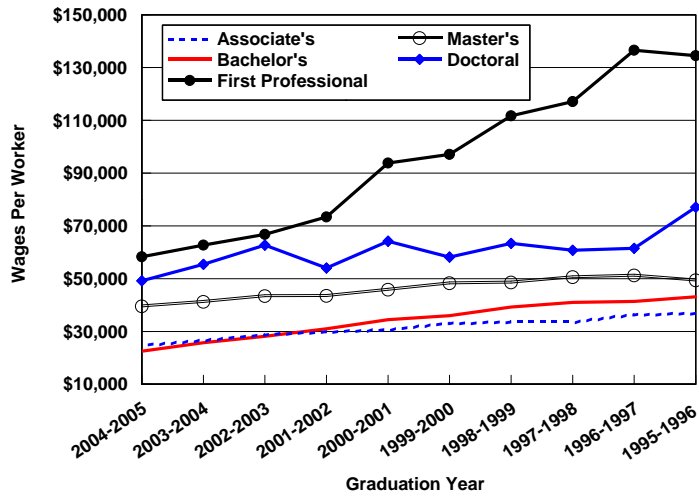
	Associate's	Bachelor's	Master's	First Prof.	Doctoral
2003	\$27,898	\$30,042	\$41,837	\$80,918	\$53,133
2004	\$28,621	\$30,252	\$42,300	\$81,215	\$54,463
2005	\$29,587	\$31,160	\$43,120	\$83,675	\$55,247
2006	\$30,494	\$32,477	\$45,648	\$88,947	\$59,824
Annual Growth Rate 2003-2006	3.0	2.6	2.9	3.2	4.0

Source: author calculations

Annualized wage growth during the last four years was fastest for graduates with Doctoral degrees (4.0 percent per year), followed by graduates with First Professional degrees (3.2 percent), Associate’s (3.0 percent), Master’s (2.9 percent), and Bachelor’s (2.6 percent).

Figure 12 shows that as the time after graduation rises, First Professional degree earners increase their annual incomes more rapidly than those with other type of degree, with annualized wages rising from \$58,260 for recent graduates to \$134,529 for graduates during the 1995-1996 academic year. In 2006, the most recent doctoral graduates earned an annualized wage of \$49,197, while graduates during the 1995-1996 academic year earned \$77,103.

**Figure 12**  
**Annualized Wages Of W.Va. Higher Education**  
**Graduates By Degree In 2006**



Source: author calculations

Figure 12 also shows that during the first six years after graduation, West Virginia Associate's and Bachelor's degree graduates earn approximately the same average annualized wages (ranging from the mid-\$20,000 to the mid-\$30,000). However, after the sixth year since graduation, graduates with Bachelor's degrees do significantly better, with Bachelor's degree graduates during the 1995-1996 academic year earning an average of \$6,330 more than Associate's degree graduates.

## **Appendix: List Of Institutions And Degrees**

### **Higher Education Institutions**

Bluefield State College  
Community and Technical College at WVU Tech  
Community and Technical College of Shepherd  
Concord University, Fairmont State University  
Eastern West Virginia Community and Technical College  
Fairmont State Community and Technical College  
Glennville State College  
Marshall Community and Technical College  
Marshall University  
New River Community and Technical College  
Potomac State College of West Virginia University  
Shepherd University  
Southern West Virginia Community & Tech College  
West Liberty State College  
West Virginia Northern Community College  
West Virginia School of Osteopathic Medicine  
West Virginia State Community and Technical  
West Virginia State University  
West Virginia University  
West Virginia University Institute of Technology  
West Virginia University at Parkersburg

### **Degrees**

Undergraduate Certificate  
Associate's Degree  
Bachelor's Degree  
First Professional  
Master's Degree  
Post-Master's Certificate  
Doctoral Degree