

From Higher Education To Work In West Virginia 2009

Summary Results For Work Participation And
Wages With Analysis By Residency Status,
Degree, Area of Concentration, Gender, Race,
Academic Achievement, Tuition Assistance,
Nearby States, Industry, and County

January 2011

Prepared for the
West Virginia Higher Education Policy
Commission

By

George W. Hammond, Associate Director
Adam Hoffer, Graduate Research Assistant

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

© Copyright 2010 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
Results By Year, Experience, Residency, And Degree	4
Results By Area Of Concentration, Gender, And Race	10
Results By Academic Achievement And Tuition Assistance	15
Results For Nearby States	20
Results By Industry	25
Results By Region And County	29
Conclusion And Directions For Future Research.....	34
Appendix I: Detailed Description Of Employment Data	36
Appendix II: List of Institutions, Degrees, And Areas Of Concentration	38

List of Tables

1. Number Of Graduates By Area Of Concentration And Degree From W.Va. Public Higher Education Institutions During 1996-1997 To 2007-2008	11
2. Work Participation And Annualized Wages In 2009 By Area Of Concentration Graduates From W.Va. Public Higher Education Institutions	12
3. Work Participation And Annualized Wages Of Graduates From West Virginia Public Higher Education Institutions By Degree And Area Of Concentration In 2009	13
4. Work Participation And Annualized Wages In 2009 By Area Of Concentration And Gender For Graduates Of W.Va. Public Higher Education Institutions.....	14
5. Work Participation And Annualized Wages In 2009 By Race For Graduates Of W. V. Public Higher Education Institutions	15
6. Work Participation And Annualized Wages In 2009 For W.Va. Public Higher Education Graduates By ACT Score	16
7. Work Participation And Annualized Wages In 2009 For W.Va. Public Higher Education Graduates By College GPA.....	18
8. Work Participation And Annualized Wages In 2009 For W.Va. Public Higher Education Graduates Receiving PROMISE and HEGP Assistance	20
9. Work Participation Rates In 2009 For W.Va. Public Higher Education Graduates By Participating State	22
10. Annualized Wages In 2009 For W.Va. Public Higher Education Graduates By Participating State.....	24
11. Work Participation And Annualized Wages Of West Virginia Public Higher Education Graduates From 1996-1997 To 2007-2008 Working In West Virginia In 2009 By Industry	26
12. Employment Shares And Annualized Wages Of Graduates By Region Of Employment In 2009	31
13. Employment Shares And Annualized Wages Of Graduates By County Of Employment In 2009	33

List of Figures

1. Percent Of Graduates From W.Va. Higher Education Institutions Working In The State In 2009.....	4
2. Percent Of Graduates From W.Va. Higher Education Institutions Working In The State 2003-2009	5
3. Percent Of Graduates From W.Va. Higher Education Institutions Working In The State 2008-2009	6
4. Percent Of State Higher Education Graduates Working In W.Va. In 2009 By Residency For Fee Purposes	7
5. Shares Of State Higher Education Graduates Working In The State In 2009 By Degree	7
6. Annualized Wages Of Graduates From W.Va. Higher Education Institutions In 2009	8
7. Annualized Wages Of Graduates From W.Va. Higher Education Institutions 2003-2009	8
8. Average Annualized Wages Of Graduates From W.Va. Higher Education Institutions In 2009 By Residency	9
9. Annualized Wages Of W.Va. Higher Education Graduates By Degree In 2009	10
10. Work Participation In 2009 Of Graduates From West Virginia Public Higher Education Institutions During 2003-2004 To 2007-2008	19
11. W.Va. Public Higher Education Graduates (1996-97 To 2007-08) Working In Participating States In 2009	21
12. Percent Of Graduates From W.Va. Public Higher Education Institutions Working In Participating States In 2008 And 2009	23

List of Figures, Continued

13. Annualized Wages In 2008 And 2009 Of Graduates From W.Va. Public Higher Education Institutions By Participating State	25
14. Industry Composition Of W.Va. Graduates Working In W.Va. In 2009 By Gender	28
15. Annualized Wages Of W.Va. Graduates Working In W.Va. In 2009 By Gender	29
16. West Virginia's Statistical Areas	30
17. Share Of Higher Education Graduates Working In W.Va. By County	32
18. Three Measures Of West Virginia Employment.....	37

Executive Summary

West Virginia and the nation suffered major job losses during 2009, as the global recession maintained its grip on economic activity. Indeed, the state lost 17,654 jobs during the year, excluding federal government jobs.¹ That translates into a decline of 2.7 percent and the state has not seen job losses at that rate since the early 1980s. West Virginia was not alone in this respect, however, because national job losses were also severe, at -4.7 percent.

Tough labor market conditions affected employment prospects for many individuals in 2009, including college graduates. This report presents a comprehensive look at the labor market experience of students that graduated from West Virginia public higher education institutions during the past 12 years. In particular, we analyze the employment and wages earned by graduates at establishments located in West Virginia and in nearby states. We disaggregate these results across many dimensions, including year, experience, residency, degree, area of concentration, gender, race, academic achievement, tuition assistance, industry, and county.

Selected highlights of this report include:

Results By Year

- Of the 130,522 West Virginia public higher education graduates during the past 12 years, 59,811 worked at establishments in the state in 2009. That translates into an overall work participation rate of 45.8 percent.
- The severe recession of 2008-2009 essentially stopped growth in graduate work participation in the state, but did not produce a decline.
- This likely reflects the concentration of graduates working in the Health Care and Education sectors in 2009, since these industries performed better than most during the downturn. In addition, this may also reflect the concentration of graduates working in the Morgantown MSA, which continued to add jobs during the recession.
- The impact of the recession was most severe for graduates with three years or less experience. Among these graduates, individuals with First Professional degrees posted the largest decline in work participation in 2009.
- Public higher education graduates working in the state in 2009 earned \$2.54 billion, which translates into an average annualized wage of \$42,404.
- Annualized wages rose by 1.8 percent in 2009, which far exceeded the national rate of inflation, as well as real wage growth in 2008.

Results By Experience, Residency, And Degree

- The majority of recent graduates worked in the state in 2009, with 55.1 percent of graduates during 2007-2008 working in West Virginia. However, the work participation rate fell as graduates gained experience, with 37.2 percent of graduates during 1996-1997 working in the state last year.
- Annualized wages rise as graduates gain experience. Indeed, in 2009, graduates during 2007-2008 earned \$30,119, while graduates during 1996-1997 earned \$53,729.
- In-state graduates were far more likely to work in West Virginia in 2009 than out-of-state graduates. Further, in-state graduates earned slightly more than out-of-state graduates in 2009.

¹ This calculation excludes federal government employment in order to maintain comparability with graduate employment.

- Associate's degree graduates posted the highest work participation rates in 2009, followed by graduates with Master's, First Professional, Bachelor's, and Doctoral degrees.
- First Professional graduates earned the highest wages in 2009, followed by Doctoral, Master's, Bachelor's, and Associate's degree graduates. For the first two years after graduation, Associate's degree graduates earned more than Bachelor's degree graduates.

Results By Area Of Concentration, Gender, And Race

- Of graduates during the past 12 years, 56.0 percent had an area of concentration in Business, Education, Health Care, or Liberal Arts.
- Education and Health Care graduates were among the most likely to work in West Virginia in 2009, with work participation rates of 57.0 percent and 55.8 percent, respectively.
- Health Care graduates also earned relatively high wages in 2009, at \$59,363, while Education graduates earned \$39,406.
- In 2009, female graduates posted higher work participation rates than male graduates, at 50.2 percent and 40.1 percent, respectively.
- Male graduates, however, earned substantially more than female graduates in 2009, averaging \$50,001 compared to \$37,778 for female graduates.
- Caucasian graduates posted the highest work participation rate in 2009, at 47.9 percent, followed by American-Indian or Alaskan Native (43.8 percent), African-American (31.7 percent), Hispanic (24.9 percent), or Asian-Pacific or Islander (11.6 percent).
- Asian-Pacific or Islander graduates earned the highest annualized wage in 2009 (\$47,548).

Results By Academic Achievement And Tuition Assistance

- Graduates with higher college GPAs and higher ACT scores tended to have lower work participation rates in 2009, as well as higher wages.
- In 2009, PROMISE graduates during the 2003-2004 to 2007-2008 period posted a work participation rate of 60.2 percent. That was below work participation rates for all in-state graduates (64.8 percent) and Higher Education Grant Program graduates (68.2 percent) during the same period.
- Wages for PROMISE graduates in 2009 were below those earned by Higher Education Grant Program graduates with similar levels of experience.

Results For Nearby States

- Last year, 20.7 percent of West Virginia graduates during the past 12 years worked in Maryland, New Jersey, Ohio, Pennsylvania, Virginia, or the District of Columbia.
- The work participation rate for these nearby states was unchanged in 2009. This suggests that the recession did not have a large negative impact on graduate employment in these states.
- Annualized wages in 2009 were much higher in nearby states (at \$54,659) than in West Virginia (\$42,404).

Results By Industry

- West Virginia public higher education graduates worked in all industries in 2009, with the largest concentrations in Health Care (25.3 percent), Education (23.7 percent), Retail Trade (7.8 percent), and Professional, Technical and Scientific Services (7.2 percent).
- Graduates employed in Mining earned the highest wages in 2009, at \$67,677, while graduates employed in Accommodation & Food Services earned the lowest average wage (\$11,605).

Results By West Virginia County And Region

- West Virginia public higher education graduates contribute to labor markets in all state regions and counties. Graduates tended to concentrate in metropolitan counties (67.3 percent) in 2009, followed by the less populous micropolitan (17.1 percent) and nonmetropolitan counties (15.6 percent).²
- This likely arises from the fact that metropolitan areas tend to be hubs of financial, government, health care, and business service activity, which tend to hire college graduates. In addition, two of the state's largest universities are located in metropolitan counties, with West Virginia University located in Monongalia County and Marshall University located in Cabell County.
- Similarly, annualized wages in 2009 were highest in metropolitan counties (\$38,348), followed by micropolitan (\$35,208) and nonmetropolitan (\$33,440) counties.

The Data

The data analyzed in this study come from the matching of demographic information on graduates from West Virginia public institutions of higher education with employment records maintained by Workforce West Virginia and nearby state governments. Graduates reflect the highest degree earned during the 1996-1997 to 2007-2008 period. The self-employed, student workers, most church workers, and unpaid family workers are generally not covered by this data. **For this report, we do not include civilian federal government employment and wages due to recent administrative problems with the FEDES match.**

² Micropolitan statistical areas are similar in spirit to metropolitan statistical, but are based around smaller cities (those with between 10,000 and 50,000 residents).

Results By Year, Experience, Residency, And Degree

Work Participation By Year And Experience

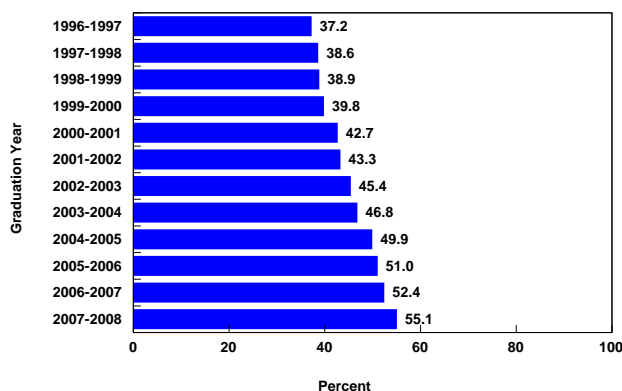
According to data provided by the West Virginia Higher Education Policy Commission, there were 130,522 graduates during the 1996-1997 to 2007-2008 period. Of those graduates, we find that 59,811 worked at wage and salary jobs in West Virginia in 2009. That translates into a work participation rate of 45.8 percent.³

Figure 1 shows how work participation rates vary by year of graduation. As the figure makes clear, work participation rates gradually decline as time since graduation increases. The most recent graduates, from the graduating class of 2007-2008, had the highest work participation rate, at 55.1 percent. Graduates from 1996-1997 had the lowest participation rates, at 37.2 percent, 17.9 percentage points lower than the graduates from 2007-2008.

This trend may arise for a variety of reasons. First, graduates with more experience may be more likely to be self-employed. Since the self-employed are not included in the data, this may cause work participation rates to decline with experience. Second, graduates may be more likely to drop out of the labor market as they gain experience. In this case, think of a stay-at-home spouse. Third, graduates may be more likely to find employment in other states as their experience increases.

In the remainder of this report, we use time since graduation as an indicator of workplace experience. It is important to remember, however, that this will not be a perfect measure because graduates may endure periods of unemployment or periods of no labor force participation in the years since graduation.

Figure 1
Percent Of Graduates From W.Va. Higher Education
Institutions Working In The State In 2009



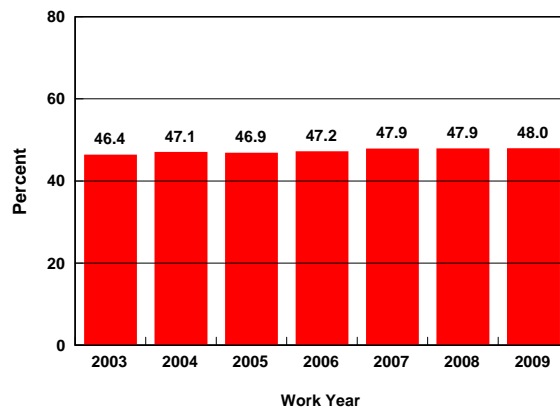
Source: author calculations

³ Data for 2009 does not include federal government employees due to administrative problems with the FEDES match.

Figure 2 shows how work participation rates have evolved during the past seven years, after we standardize for work experience. Each bar shows the work participation rate for graduates with between one and nine years of experience. This window is determined by the maximum number of years of experience available for the 2003 employment data. Maintaining the same experience window for all years increases comparability. In addition, the data in Figure 2 excludes federal government employment (for those years when it was available) in order to further increase comparability.

As the figure shows, the work participation rate rose from 2003 to 2007, reflecting the overall economic expansion during that time. However, that growth essentially stopped in 2008 and 2009, as the state economy slowed and then fell into the Great Recession. Indeed, it is remarkable that the graduate work participation rate remained roughly stable in 2009, because the state lost 17,654 jobs during the year.⁴ This likely reflects the concentration of graduates working in the Health Care and Education sectors in 2009, since these industries performed better than most during the downturn. In addition, this may also reflect the concentration of graduates working in the Morgantown MSA, which continued to add jobs during the recession.⁵

Figure 2
Percent Of Graduates From W.Va. Higher Education
Institutions Working In The State 2003-2009
Graduates With 1-9 Years Experience



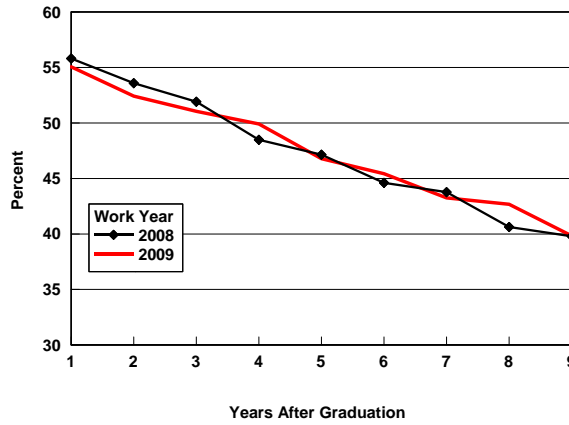
Source: author calculations

On average, the recent downturn has not had a big negative impact on the employment of graduates in West Virginia. However, these impacts may vary with particular years of experience. Figure 3 suggests that the recent recession hit new graduates harder than those with more experience. Indeed, the work participation rate for the most recent graduates in 2009 was 55.1 percent. That was 1.7 percentage points lower than the most recent graduates working during 2008. Work participation rates for 2008 and 2009 become more similar once graduates have four or more years of experience.

⁴ This measure of state job losses excludes federal government employment, in order to maintain comparability with graduate employment.

⁵ See the recently released reports, *West Virginia Higher Education Graduate Employment By Industry 2009* and *County Employment Of West Virginia Higher Education Graduates 2009* for more details on graduate employment by industry and county.

Figure 3
Percent Of Graduates From W.Va. Higher Education
Institutions Working In The State 2008-2009



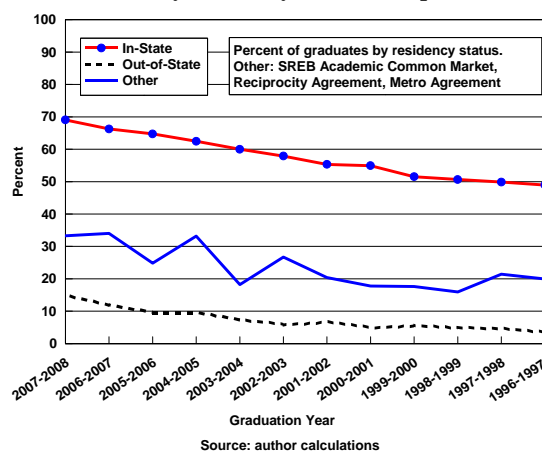
Source: author calculations

For graduates with three years or less experience, work participation rates declined in 2009 for most summary degrees. First Professional graduates posted the largest drop in 2009, at -3.7 percentage points, followed by Bachelor’s graduates (-0.8 percentage points), Associate’s graduates (-0.7 percentage points), and Master’s graduates (-0.6 percentage points). Doctoral degree graduates with three years or less experience posted a 3.8 percentage point increase in 2009.

Work Participation By Residency

The majority of graduates from West Virginia public higher education institutions during the past 12 years were in-state residents, at 74.2 percent, compared to 22.3 percent of graduates that were classified as out-of-state for fee purposes. In-state graduates were far more likely to remain in the state to work after graduation. Figure 4 shows the vast discrepancy in work participation rates between graduates by residency. In-state graduates had higher work participation rates for all years, ranging from 54.4 percentage points higher for 2007-2008 graduates to 45.3 percentage points higher for 1997-1998 graduates.

Figure 4
Percent Of State Higher Education Graduates
Working In W.Va. In 2009
By Residency For Fee Purposes

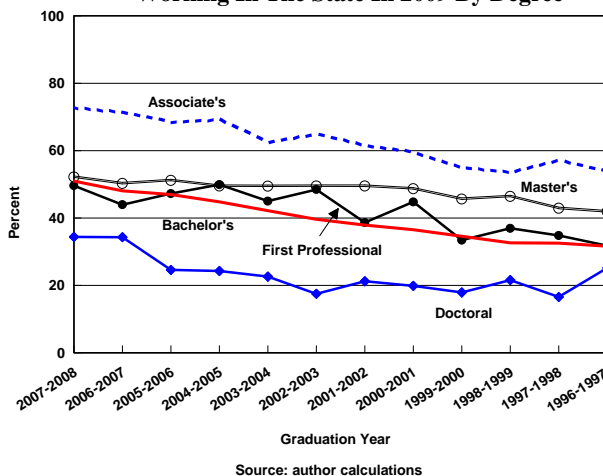


Work Participation By Degree

West Virginia graduates also had substantially different work participation rates depending on the highest degree earned. For all graduates during the past 12 years, Associate’s degree graduates were the most likely to be employed in West Virginia during 2009, with a work participation rate of 63.6 percent, while graduates earning a Doctoral degree were the least likely to be employed in West Virginia, with a work participation rate of 23.9 percent. Graduates earning a Master’s degree, First Professional degree, or Bachelor’s degree had similar work participation rates, averaging 48.2 percent, 42.6 percent, and 40.7 percent respectively.

As Figure 5 shows, we find that work participation rates decline with experience for all summary degrees. However, the decline is most rapid for Bachelor’s degree graduates and least rapid for Master’s degree graduates.

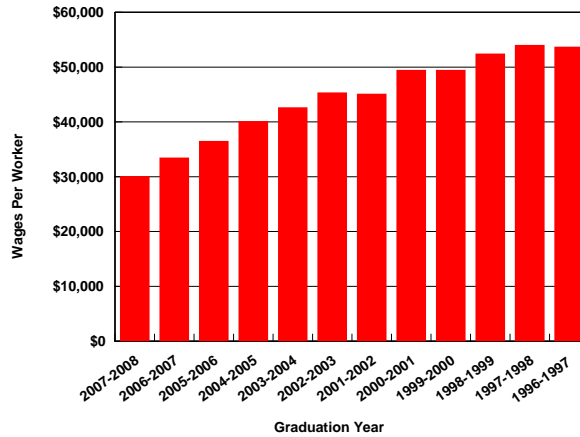
Figure 5
Shares Of State Higher Education Graduates
Working In The State In 2009 By Degree



Annualized Wages By Year And Experience

As graduates gain experience in the workforce, their value to employers increases, which we expect will result in higher wages. Figure 6 reflects this, as graduate wages rise with experience. For graduates during 2007-2008, annualized wages were \$30,119, while graduates during 1996-1997 earned \$53,729 in 2009.

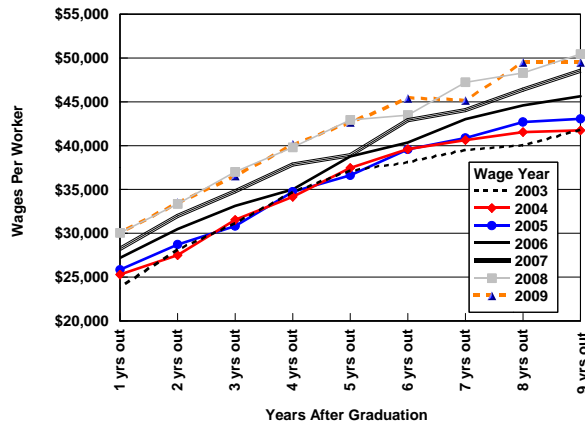
Figure 6
Annualized Wages Of Graduates From W.Va. Higher Education Institutions In 2009



Source: author calculations

Over time, graduate wages have increased as well, due in part to productivity growth, inflation, and shifts in the composition of graduates working. Figure 7 shows that wages increased marginally in 2009, despite the recession. Overall, wages for graduates with nine years of experience rose to \$39,889, up 1.8 percent from 2008. Wage growth was substantially higher than the rate of inflation (-0.4 percent). Further, the inflation-adjusted increase in wages in 2009 substantially exceeded growth in 2008, when annualized wages and prices rose at about the same rate. The increase in 2009 was related in part to the shift in graduate employment by experience reflected in Figure 3. Fewer relatively less-experienced graduates employed in 2009 than 2008 tended to boost the average wage.

Figure 7
Annualized Wages Of Graduates From W.Va. Higher Education Institutions 2003-2009

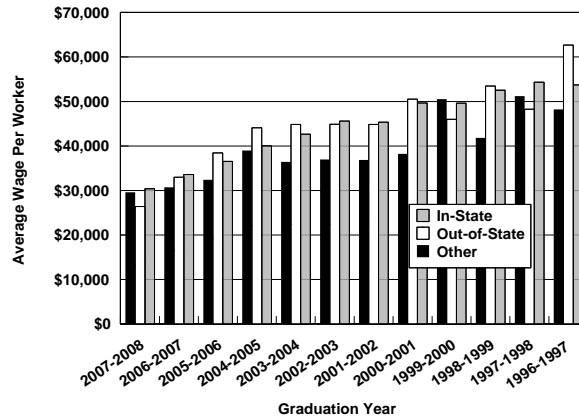


Source: author calculations

Annualized Wages By Residency

In-state graduates earned slightly more than out-of-state graduates in 2009, with \$42,588 compared to \$39,772. This was driven primarily by the wage advantage of in-state graduates with one year of experience compared to out-of-state graduates with one year of experience, as shown in Figure 8. In fact, for six of the 12 graduation years analyzed, out-of-state graduates earned more than in-state graduates (1996-1997, 1998-1999, 2000-2001, 2003-2004, 2004-2005, and 2005-2006), while in-state graduates out-earned out-of-state graduates in the other six graduation years.

Figure 8
Average Annualized Wages Of Graduates From
W.Va. Higher Education Institutions In 2009 By Residency



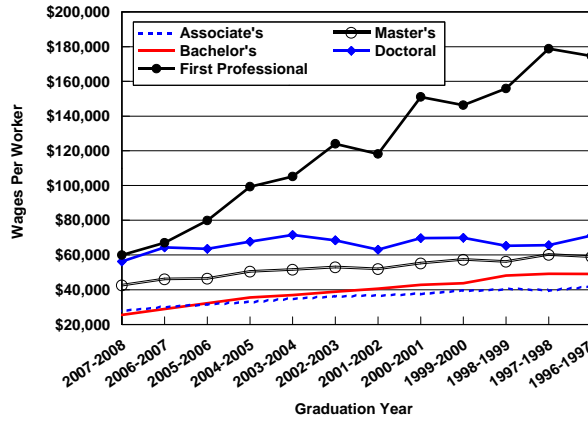
Source: author calculations

Annualized Wages By Degree

Graduate wages differ significantly by degree, as do returns to experience by degree. Associate's and Bachelor's degree recipients earned considerably less than Master's, Doctoral, and First Professional graduates. Indeed, wages earned by Associate's degree recipients and Bachelor's degree recipients averaged \$34,431 and \$37,064 respectively, while Master's recipients, Doctoral recipients, and First Professional recipients earned \$51,750, \$65,245, and \$113,332 respectively.

Experience also generates varying returns depending on the degree earned. This is illustrated in Figure 9, which shows that First Professional graduates earned \$114,636 more with 12 years experience than with only one year of experience, an increase of 191.2 percent. Associate's degree recipients, however, earned only an additional \$14,055 with 11 years of added experience, an increase of 50.7 percent.

Figure 9
Annualized Wages Of W.Va. Higher Education
Graduates By Degree In 2009



Source: author calculations

Results By Area Of Concentration, Gender, And Race

Area Of Concentration

The area of concentration a graduate pursues will have several implications. It will impact their decision to seek employment in the state, the location and industry in which they work, and the wages they earn. An area of concentration is defined using the Classification of Instructional Programs (CIP) system which is provided by the U.S. Department of Education. In general terms, an area of concentration refers to a group of majors. The majors included within each area of concentration are listed in Appendix II.

Table 1 shows the number of graduates and the highest degree earned by area of concentration with at least one graduate during the past 12 years. A majority of the graduates, 56.0 percent, pursued one of four areas of concentration: Business, Management, Marketing, and Related; Education; Health Professions and Related Clinical Sciences; and Liberal Arts and Sciences, General Studies, and Humanities.

Table 1
Number Of Graduates By Area Of Concentration And Degree
From W.Va. Public Higher Education Institutions During 1996-1997 To 2007-2008

Area of Concentration	Total Number of Graduates From 1996-1997 to 2007-2008	Degree			
		Number of Graduates with Associate's	Number of Graduates with Bachelor's	Number of Graduates with Master's	Number of Graduates with Doctoral
Agriculture, Agriculture Operations	1,334	68	954	276	36
Architecture and Related Services	312	n/d	312	n/d	n/d
Biological and Biomedical Sciences	3,530	n/d	2,817	457	256
Business, Management, Marketing, and Related	21,518	3,779	14,046	3,418	62
Communication, Journalism, and Related Programs	5,436	103	4,065	1,266	n/d
Communications Technologies	366	165	200	n/d	n/d
Computer and Information Sciences	2,019	473	1,036	460	24
Education	20,189	134	9,365	10,034	519
Engineering	5,715	35	3,712	1,695	273
Engineering Technologies/Technicians	3,028	1,316	1,262	437	n/d
English Language and Literature/Letters	1,874	n/d	1,403	440	31
Family and Consumer Sciences/Human Sciences	1,720	194	1,415	111	n/d
Foreign Languages, Literatures, and Linguistics	765	77	307	370	n/d
Health Professions and Related Clinical Sciences	19,404	6,935	5,386	2,995	96
History	1,455	n/d	1,254	n/d	52
Legal Professions and Studies	1,960	368	n/d	24	n/d
Liberal Arts and Sci., Gen. Std., and Humanities	12,026	3,034	8,881	69	n/d
Library Science	n/d	n/d	n/d	n/d	n/d
Mathematics and Statistics	618	n/d	352	233	33
Mechanic and Repair Technologies/Technicians	244	226	n/d	n/d	n/d
Multi/Interdisciplinary Studies	2,083	843	1,076	160	n/d
Natural Resources and Conservation	1,344	147	882	237	78
Parks, Recreation, Leisure and Fitness Studies	2,077	n/d	1,854	218	n/d
Personal and Culinary Services	205	194	n/d	n/d	n/d
Philosophy and Religious Studies	80	n/d	80	n/d	n/d
Physical Sciences	1,471	n/d	1,072	273	120
Precision Production	233	201	n/d	n/d	n/d
Psychology	4,176	n/d	3,315	530	221
Public Administration and Social Service Prof	2,859	207	1,143	1,500	n/d
Science Technologies/Technicians	519	328	n/d	n/d	n/d
Security and Protective Services	4,155	1,039	2,768	285	n/d
Social Sciences	4,858	n/d	4,352	451	55
Transportation and Materials Moving	n/d	n/d	n/d	n/d	n/d
Visual and Performing Arts	2,940	115	2,336	435	54
Total	130,522	19,993	75,645	26,524	1,919

n/d: data not disclosed

For graduates with concentrations in Business and Liberal Arts, a large majority earned Bachelor's degrees, at 73.8 percent and 65.3 percent, respectively. Graduates with a concentration in Education, however, were most likely to earn a Master's degree, at 49.7 percent. In contrast, a large share of graduates with a concentration in Health Professions earned an Associate's degree, at 35.7 percent.

As Table 2 shows, both Education graduates and Health Professions graduates were among the most likely to stay in West Virginia to work, having the 5th and 6th highest work participation rates, respectively. Graduates with concentrations in Library Sciences and Precision Production were the most likely to be employed in the state in 2009.

Table 2
Work Participation And Annualized Wages In 2009 By Area Of Concentration
Graduates From W.Va. Public Higher Education Institutions

Area Of Concentration	Work Participation	Work Participation Rank	Annualized Wages Per Worker	Annualized Wages Rank
Agriculture, Agriculture Operations	34.0%	22	\$36,397	17
Architecture and Related Services	10.9%	34	\$39,487	13
Biological and Biomedical Sciences	33.4%	23	\$38,705	15
Business, Management, Marketing, and Related	45.3%	15	\$41,748	11
Communication, Journalism, and Related Programs	35.4%	19	\$36,494	16
Communications Technologies	47.8%	14	\$28,554	27
Computer and Information Sciences	43.4%	16	\$46,901	6
Education	57.0%	5	\$39,406	14
Engineering	27.0%	28	\$69,076	1
Engineering Technologies/Technicians	51.1%	11	\$52,057	4
English Language and Literature/Letters	34.0%	21	\$26,382	30
Family and Consumer Sciences/Human Sciences	31.2%	26	\$25,670	31
Foreign Languages, Literatures, and Linguistics	23.5%	32	\$23,676	33
Health Professions and Related Clinical Sciences	55.8%	6	\$59,363	2
History	33.0%	24	\$27,205	29
Legal Professions and Studies	54.1%	7	\$58,305	3
Liberal Arts and Sci., Gen. Std., and Humanities	48.1%	13	\$32,314	22
Library Science	n/d	1	n/d	24
Mathematics and Statistics	23.9%	29	\$41,762	10
Mechanic and Repair Technologies/Technicians	66.0%	4	\$43,796	8
Multi/Interdisciplinary Studies	51.4%	10	\$33,829	19
Natural Resources and Conservation	39.4%	18	\$40,109	12
Parks, Recreation, Leisure and Fitness Studies	23.8%	30	\$32,345	21
Personal and Culinary Services	53.7%	8	\$23,138	34
Philosophy and Religious Studies	23.8%	31	\$27,786	28
Physical Sciences	31.5%	25	\$46,566	7
Precision Production	77.7%	2	\$43,444	9
Psychology	40.3%	17	\$29,452	25
Public Administration and Social Service Prof	48.4%	12	\$34,149	18
Science Technologies/Technicians	76.1%	3	\$31,379	23
Security and Protective Services	51.6%	9	\$33,418	20
Social Sciences	34.4%	20	\$29,019	26
Transportation and Materials Moving	n/d	33	n/d	5
Visual and Performing Arts	29.3%	27	\$24,101	32
Total	45.8%	-	\$42,404	-

n/d: data not disclosed

Graduates during 1996-1997 to 2007-2008 period.

Health Professions graduates were also some of the highest earners, averaging \$59,363, the second highest of all concentrations. Graduates with a concentration in Engineering earned the highest wages in 2009, at \$69,076, while the lowest wages were earned by graduates with a concentration in Personal and Culinary Services, at \$23,138.

Table 3 presents the work participation rates and annualized wages of graduates by area of concentration and degree earned. We find that additional education often results in increased wages and lower work participation rates, but these occur at varying rates by area of concentration. For instance, Engineering graduates with Master's degrees earned \$57,614 more than Engineering graduates with Associate's degrees. In addition, Engineering graduates with Master's degrees posted a work participation rate 28.4 percentage points below that for Engineering graduates with Associate's degrees. In contrast, the difference in wages for

Associates's and Master's graduates was much smaller for Security and Protective Services, at \$10,484. In addition, the work participation rate in 2009 was actually higher for Education graduates with a Master's degree than it was for Education graduates with an Associate's degree.

Table 3
Work Participation And Annualized Wages Of Graduates From West Virginia Public
Higher Education Institutions By Degree And Area Of Concentration In 2009*

Area of Concentration	Degree							
	Associate's		Bachelor's		Master's		Doctoral	
	Work Participation	Annualized Wages Per Worker	Work Participation	Annualized Wages Per Worker	Work Participation	Annualized Wages Per Worker	Work Participation	Annualized Wages Per Worker
Academic And Occupationally-Specific Programs								
Agriculture, Agriculture Operations	57.4%	\$21,785	33.9%	\$36,794	30.8%	\$40,769	n/d	n/d
Architecture and Related Services	n/d	n/d	10.9%	\$39,487	n/d	n/d	n/d	n/d
Biological and Biomedical Sciences	n/d	n/d	36.0%	\$35,573	27.6%	\$53,574	14.8%	\$73,067
Business, Management, Marketing, and Related	62.7%	\$27,380	41.5%	\$40,326	41.3%	\$73,827	n/d	n/d
Communication, Journalism, and Related Programs	57.3%	\$18,415	28.3%	\$29,626	56.4%	\$49,092	n/d	n/d
Communications Technologies	55.2%	\$24,903	42.0%	\$32,508	n/d	n/d	n/d	n/d
Computer and Information Sciences	61.3%	\$30,409	40.7%	\$52,409	31.3%	\$66,350	n/d	n/d
Education	54.5%	\$15,849	52.5%	\$31,637	61.7%	\$44,570	44.3%	\$67,249
Engineering	48.6%	\$22,489	30.9%	\$66,322	20.2%	\$80,103	13.2%	\$73,769
Engineering Technologies/Technicians	63.9%	\$46,784	46.0%	\$56,766	27.0%	\$66,988	n/d	n/d
English Language and Literature/Letters	n/d	n/d	34.3%	\$23,800	34.1%	\$33,543	n/d	n/d
Family and Consumer Sciences/Human Sciences	63.4%	\$16,830	26.0%	\$26,894	40.5%	\$39,822	n/d	n/d
Foreign Languages, Literatures, and Linguistics	67.5%	\$20,329	24.8%	\$22,106	11.9%	\$31,825	n/d	n/d
Health Professions and Related Clinical Sciences	66.3%	\$41,583	54.5%	\$51,120	52.8%	\$67,091	35.4%	\$79,756
History	n/d	n/d	32.7%	\$26,255	38.3%	\$30,626	25.0%	\$42,188
Legal Professions and Studies	62.8%	\$26,061	n/d	n/d	58.3%	\$51,380	n/d	n/d
Liberal Arts and Sci., Gen. Std., and Humanities	58.2%	\$26,478	44.5%	\$34,870	59.4%	\$46,633	n/d	n/d
Library Science	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d
Mathematics and Statistics	n/d	n/d	29.8%	\$41,131	16.7%	\$43,407	n/d	n/d
Mechanic and Repair Technologies/Technicians	68.1%	\$44,855	n/d	n/d	n/d	n/d	n/d	n/d
Multi/Interdisciplinary Studies	65.0%	\$32,214	40.1%	\$30,480	55.6%	\$60,405	n/d	n/d
Natural Resources and Conservation	68.7%	\$39,968	37.6%	\$36,532	33.8%	\$50,770	21.8%	\$60,631
Parks, Recreation, Leisure and Fitness Studies	n/d	n/d	22.4%	\$30,416	34.9%	\$42,399	n/d	n/d
Personal and Culinary Services	52.1%	\$22,667	n/d	n/d	n/d	n/d	n/d	n/d
Philosophy and Religious Studies	n/d	n/d	23.8%	\$27,786	n/d	n/d	n/d	n/d
Physical Sciences	n/d	n/d	34.4%	\$42,560	24.5%	\$66,120	20.0%	\$60,163
Precision Production	79.6%	\$44,180	n/d	n/d	n/d	n/d	n/d	n/d
Psychology	n/d	n/d	39.9%	\$26,344	55.3%	\$38,893	9.0%	\$53,148
Public Administration and Social Service Prof	49.3%	\$18,809	48.6%	\$28,655	48.1%	\$40,692	n/d	n/d
Science Technologies/Technicians	74.4%	\$36,861	n/d	n/d	n/d	n/d	n/d	n/d
Security and Protective Services	65.6%	\$31,626	48.0%	\$33,632	29.1%	\$42,110	n/d	n/d
Social Sciences	n/d	n/d	34.7%	\$27,949	33.5%	\$37,399	25.5%	\$53,853
Transportation and Materials Moving	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d
Visual and Performing Arts	50.4%	\$17,764	28.6%	\$22,767	29.2%	\$33,615	n/d	n/d
Total	63.6%	\$34,431	40.7%	\$37,064	48.2%	\$51,750	23.9%	\$65,245

*Including only the areas of concentration for which there is data available.

n/d: data not disclosed

Graduates during the 1996-1997 to 2007-2008 period.

Gender

During the past 12 years, West Virginia public higher education institutions graduated more female than male students. Between 1996-1997 and 2007-2008, 130,522 students graduated, with 74,119 (56.8 percent) of them female and 56,403 (43.2 percent) male. In 2009, female graduates posted higher work participation rates than males, at 50.2 percent and 40.1 percent, respectively. Male graduates, however, earned substantially more than female graduates in 2009, averaging \$50,001 compared to \$37,778 for female graduates.

Part of these work participation and wage trends can be explained by different choices of area of concentration between males and females. Table 4 shows that female graduates were far more likely to choose Family and Consumer Science or Public Administration and Social Services than males, as females composed of 94.8 and 81.4 percent of the of graduates in those areas of concentration. Conversely, females made up only 12.8 percent and 15.6 percent of the graduates in Engineering Technologies/Technicians and Engineering, respectively.

Table 4
Work Participation And Annualized Wages In 2009 By Area Of Concentration And Gender
For Graduates Of W.Va. Public Higher Education Institutions

Area of Concentration	Males			Females			All Graduates
	Total Graduates From 1996-1997 To 2007-2008	Work Participation	Annualized Wages Per Worker	Total Graduates From 1996-1997 To 2007-2008	Work Participation	Annualized Wages Per Worker	Percentage Female
Academic And Occupationally-Specific Programs							
Agriculture, Agriculture Operations	699	36.3%	\$41,507	635	31.3%	\$29,876	47.6%
Architecture and Related Services	247	10.5%	\$44,955	65	n/d	n/d	20.8%
Biological and Biomedical Sciences	1,594	33.1%	\$44,173	1,936	33.7%	\$34,286	54.8%
Business, Management, Marketing, and Related	10,675	40.1%	\$50,606	10,843	50.3%	\$34,793	50.4%
Communication, Journalism, and Related Programs	2,112	30.6%	\$37,746	3,324	38.5%	\$35,862	61.1%
Communications Technologies	207	48.8%	\$34,139	159	46.5%	\$20,930	43.4%
Computer and Information Sciences	1,552	44.7%	\$48,664	467	39.2%	\$40,228	23.1%
Education	5,936	48.6%	\$42,270	14,253	60.5%	\$38,447	70.6%
Engineering	4,822	28.0%	\$70,085	893	21.8%	\$62,101	15.6%
Engineering Technologies/Technicians	2,640	52.0%	\$54,002	388	44.8%	\$36,722	12.8%
English Language and Literature/Letters	647	34.2%	\$27,915	1,227	33.9%	\$25,567	65.5%
Family and Consumer Sciences/Human Sciences	89	30.3%	\$34,861	1,631	31.2%	\$25,183	94.8%
Foreign Languages, Literatures, and Linguistics	206	17.5%	\$31,758	559	25.8%	\$21,656	73.1%
Health Professions and Related Clinical Sciences	4,332	48.2%	\$95,268	15,072	58.0%	\$50,779	77.7%
History	960	31.5%	\$28,477	495	36.0%	\$25,049	34.0%
Legal Professions and Studies	878	51.6%	\$68,767	1,082	56.2%	\$50,511	55.2%
Liberal Arts and Sci., Gen. Std., and Humanities	5,430	42.3%	\$38,428	6,596	52.9%	\$28,287	54.8%
Library Science	n/d	n/d	n/d	n/d	n/d	n/d	n/d
Mathematics and Statistics	346	26.6%	\$43,272	272	20.6%	\$39,281	44.0%
Mechanic and Repair Technologies/Technicians	236	65.7%	\$43,222	n/d	n/d	n/d	n/d
Multi/Interdisciplinary Studies	1,028	45.2%	\$43,607	1,055	57.3%	\$26,312	50.6%
Natural Resources and Conservation	1,078	41.7%	\$40,831	266	30.1%	\$36,047	19.8%
Parks, Recreation, Leisure and Fitness Studies	1,313	21.5%	\$34,825	764	27.7%	\$29,046	36.8%
Personal and Culinary Services	92	54.3%	\$23,695	113	53.1%	\$22,674	55.1%
Philosophy and Religious Studies	61	24.6%	\$30,081	19	n/d	n/d	23.8%
Physical Sciences	946	30.3%	\$47,548	525	33.7%	\$44,975	35.7%
Precision Production	228	78.1%	\$44,046	n/d	n/d	n/d	n/d
Psychology	1,127	38.2%	\$31,211	3,049	41.1%	\$28,848	73.0%
Public Administration and Social Service Prof	531	42.4%	\$40,436	2,328	49.8%	\$32,930	81.4%
Science Technologies/Technicians	213	72.3%	\$44,873	306	78.8%	\$22,755	59.0%
Security and Protective Services	2,300	51.4%	\$38,659	1,855	51.7%	\$26,952	44.6%
Social Sciences	2,613	29.6%	\$33,278	2,245	40.1%	\$25,361	46.2%
Transportation and Materials Moving	n/d	n/d	n/d	n/d	n/d	n/d	n/d
Visual and Performing Arts	1,259	26.3%	\$27,906	1,681	31.5%	\$21,721	57.2%
Total	56,403	40.1%	\$50,001	74,119	50.2%	\$37,778	-

n/d: data not disclosed

Graduates during the 1996-1997 to 2007-2008 period.

Areas of concentration with large numbers of female graduates tended to have lower wages, such as Family and Consumer Science (31st in Table 2). In contrast, areas of concentration with large numbers of male graduates appeared near the top of the wage distribution, such as Engineering and Engineering Technologies/Technicians (1st and 4th in Table 2).

In addition, Table 4 also shows that within certain areas of concentration, there were substantial wage differentials. For instance, in Health Professions, males earned \$44,489 (87.6 percent) more than females and in Science Technologies, males earned \$22,118 (97.2 percent) more than females. However, wages for male and female graduates in Personal and Culinary Services (males earn 4.5 percent more) and Communication, Journalism, and Related Programs (males earn 5.3 percent more) were much more similar.

Table 4 also shows that differences in work participation rates between males and females vary significantly across areas of concentration. For instance, female graduates in Multi/Interdisciplinary Studies posted a much higher (12.1 percentage points higher in 2009) work participation rate than did male graduates. The difference was almost as large for Education; Liberal Arts; Social Sciences; and Business, Management, Marketing, and Related graduates.

Work participation rates for males were higher than for females in nine areas of concentration, with the largest differences in Natural Resources and Conservation; Engineering and Engineering Technologies; Math and Statistics; and Agriculture.

Race

West Virginia higher education graduates during the past 12 years were primarily Caucasian, accounting for 91.3 percent of all graduates. Table 5 shows that 3.8 percent of graduates were African-American and 3.2 percent of graduates were Asian-Pacific or Islander. Hispanic, American-Indian or Alaskan Native, and Other graduates accounted for 1.7 percent of all graduates.

Table 5
Work Participation And Annualized Wages In 2009 By Race
For Graduates Of W.V. Public Higher Education Institutions

Race	Graduates from 1996-1997 to 2007-2008	Work Participation	Average Annualized Wages
Caucasian	119,182	47.9%	\$42,703
African-American	4,990	31.7%	\$31,808
Hispanic	1,242	24.9%	\$40,619
Asian-Pacific or Islander	4,135	11.6%	\$47,548
American-Indian or Alaskan Native	384	43.8%	\$43,841
Other	589	35.0%	\$30,395
Total	130,522	45.8%	\$42,404

Graduates during the 1996-1997 to 2007-2008 period.

Work participation rates in 2009 varied substantially by race. Caucasian graduates had the highest participation rates, at 47.9 percent, while Asian-Pacific or Islander graduates were the least likely to work in the state, at 11.6 percent.

Wages, likewise, differed by race. Asian-Pacific or Islander graduates posted the highest wage in 2009, at \$47,548. This was 8.5 percent higher than American-Indian or Alaskan Native graduates, with the second highest wage at \$43,841, and 11.3 percent more than Caucasian graduates, who earned \$42,703. African-American graduates, on the other hand, earned the lowest wages, at \$31,808.

Results By Academic Achievement And Tuition Assistance

Academic Achievement

Academic achievement is likely to have a significant impact on the labor market outcomes of graduates. We summarize results for work participation and wages for 41,805 graduates with available ACT scores and 109,962 graduates with listed college GPAs.

Of the 41,805 students with recorded ACT scores, 24,256 (58.0 percent) were employed in West Virginia in 2009. An ACT score of 22+ puts the student in the 32nd percentile and a score of 19+

places the student in the 56th percentile. Graduates with the highest ACT scores, 22+, were the least likely to be employed in West Virginia in 2009, with a work participation rate of 53.7 percent. Graduates with an ACT score of 19-21 had a work participation rate of 59.9 percent, while graduates with the lowest score on the ACT, below 19, were the most likely to work in the state, with a work participation rate of 62.7 percent. Table 6 shows the work participation rates and annualized wages of graduates by ACT score and highest degree earned, residency, race, gender, and year of graduation.

Table 6
Work Participation And Annualized Wages In 2009 For W.Va. Public Higher Education Graduates By ACT Score

	Work Participation Rates in 2009				Annualized Wages In 2009			
	All Graduates With ACT Scores	ACT 22+	ACT 19-21	ACT Below 19	All Graduates With ACT Scores	ACT 22+	ACT 19-21	ACT Below 19
Total	58.0%	53.7%	59.9%	62.7%	\$35,246	\$37,934	\$34,966	\$31,928
Degree								
Associate	69.8%	70.5%	70.0%	69.2%	\$32,086	\$33,176	\$33,909	\$30,111
Bachelor	54.1%	49.8%	56.3%	59.2%	\$33,394	\$33,910	\$33,405	\$32,582
Doctoral	46.2%	39.5%	n/d	n/d	\$52,845	\$58,512	n/d	n/d
First Prof	59.5%	59.7%	59.2%	56.0%	\$86,686	\$85,186	\$95,657	\$96,240
Master	60.7%	59.1%	62.4%	62.2%	\$43,062	\$44,858	\$42,886	\$38,063
Gender								
Male	55.9%	52.1%	57.7%	59.9%	\$40,318	\$42,084	\$40,061	\$38,174
Female	59.5%	54.9%	61.2%	64.6%	\$32,005	\$35,185	\$31,901	\$27,876
Race								
White	58.5%	54.0%	60.2%	64.0%	\$35,540	\$38,092	\$35,234	\$32,298
Black	48.2%	49.7%	49.7%	47.2%	\$26,668	\$31,727	\$27,562	\$25,078
Hispanic	49.0%	44.6%	47.5%	55.9%	\$29,766	\$32,518	\$24,115	\$31,980
Asian	37.7%	35.8%	43.7%	36.1%	\$30,344	\$32,281	\$27,206	\$29,843
American Indian	53.9%	48.1%	50.0%	65.7%	\$40,628	\$38,095	\$37,945	\$45,014
Unknown	64.4%	60.8%	73.7%	60.9%	\$25,960	\$28,159	\$26,227	\$23,179
Residency								
In State	61.4%	56.7%	63.4%	66.7%	\$35,379	\$38,061	\$35,084	\$32,074
Out of State	14.3%	13.2%	14.3%	15.6%	\$29,427	\$31,741	\$30,505	\$25,760
Other	32.7%	31.3%	33.6%	33.7%	\$31,694	\$34,775	\$30,858	\$28,584
Year								
1996-1997*	50.5%	50.0%	45.5%	55.6%	\$34,028	\$34,143	\$36,005	\$32,464
1997-1998*	54.3%	43.4%	57.7%	61.0%	\$38,410	\$41,174	\$39,444	\$35,725
1998-1999*	42.9%	31.4%	49.1%	50.3%	\$41,904	\$49,018	\$42,008	\$36,650
1999-2000	45.6%	41.8%	46.8%	49.5%	\$42,825	\$43,591	\$43,896	\$40,826
2000-2001	50.5%	44.5%	53.4%	54.4%	\$41,208	\$44,769	\$41,228	\$37,793
2001-2002	50.8%	45.5%	51.6%	56.7%	\$41,484	\$47,641	\$40,306	\$36,359
2002-2003	54.9%	52.4%	54.6%	58.7%	\$41,249	\$48,112	\$38,637	\$35,419
2003-2004	55.1%	51.1%	56.7%	59.0%	\$38,800	\$43,024	\$38,642	\$33,770
2004-2005	59.3%	55.6%	59.7%	64.5%	\$37,453	\$41,390	\$38,028	\$31,790
2005-2006	61.0%	55.0%	64.4%	67.2%	\$33,598	\$36,482	\$32,633	\$30,716
2006-2007	63.4%	58.3%	66.7%	69.6%	\$30,469	\$31,873	\$30,334	\$28,268
2007-2008	67.3%	62.5%	70.1%	73.7%	\$27,472	\$29,219	\$27,206	\$24,679

n/d: data not disclosed

W.Va. ACT score (Percentile): 22 (68th), 19 (44th) in 2008.

Graduates during the 1996-1997 to 2007-2008 period.

*Little or no data for first professional or masters graduates.

The highest scoring graduates, those scoring 22+ on the ACT, earned the highest annualized wages, at \$37,934, \$6,006 more than graduates scoring below 19. This trend was persistent, as ACT 22+ scorers earned the highest wages for both males and females and for graduates from every year of graduation except 1996-1997.

While the coverage of the ACT score data was somewhat limited, data on college GPAs was available for a majority of graduates. Of the 109,926 graduates with recorded GPAs, 50,258 were working in the state in 2009, a work participation rate of 45.7 percent.

In contrast to the ACT results, we find that work participation rates rise with academic achievement measured by three categories of college GPA, as shown in Table 7. However, regression analysis presented in a previous report, titled *Academic Achievement and Work in West Virginia 2007*, shows that the modest positive correlation observed here is likely due to the crude breakdown used to summarize the data. Regression results suggest a negative correlation between college GPA and work participation, similar to the ACT results.

Table 7 also shows that the overall work participation trend is not common for all degrees earned. We find that work participation rates for Master's degree recipients were 13.4 percentage points greater for graduates with a GPA 3.5+ than for graduates with a GPA between 3.0-3.49. In contrast, graduates earning an Associate's, Bachelor's, or First Professional degree were most likely to work in the state if earning a GPA between 3.0-3.49.

Female graduates with a GPA 3.5+ posted the highest work participation rate in 2009, at 52.1 percent, well above the rates for female graduates with GPA 3.0-3.49 and GPA below 3.0. In contrast, male graduates with GPA 3.0-3.49 and GPA below 3.0 posted slightly higher work participation rates than male graduates with GPA 3.5+.

Results for graduate wages by GPA tend to follow a more stable pattern, with graduates earning a GPA of 3.5+ generally earning higher wages than graduates in the lower GPA categories. This pattern does not hold, however, for Associate's and Bachelor's degree graduates, or for Asian and American Indian graduates, or for graduates with Other residency status.

In addition, returns to academic performance varied substantially when disaggregated along other dimensions. For instance, First Professional graduates with a GPA of 3.5+ earned \$49,971 more than those with a GPA below 3.0, while Bachelor's degree recipients with a GPA 3.5+ averaged only \$1,206 more than those with a GPA below 3.0.

Table 7
Work Participation And Annualized Wages In 2009 For W.Va. Public Higher Education Graduates By College GPA

	Work Participation Rates in 2009				Annualized Wages In 2009			
	All Graduates With College GPA	GPA 3.5+	GPA 3.0-3.49	GPA Below 3.0	All Graduates With College GPA	GPA 3.5+	GPA 3.0-3.49	GPA Below 3.0
Total	45.7%	47.8%	45.1%	44.1%	\$41,982	\$46,934	\$41,118	\$37,181
Degree								
Associate	63.8%	63.9%	64.1%	63.5%	\$34,914	\$33,560	\$34,846	\$35,651
Bachelor	40.9%	41.6%	42.1%	39.8%	\$36,818	\$37,320	\$37,409	\$36,114
Doctoral	24.0%	24.2%	21.5%	n/d	\$65,997	\$66,688	\$57,349	n/d
First Prof	48.1%	47.7%	48.3%	48.1%	\$99,564	\$125,012	\$109,172	\$75,041
Master	48.8%	51.2%	37.6%	37.8%	\$51,754	\$51,614	\$53,118	\$39,398
Gender								
Male	39.8%	39.4%	40.0%	40.0%	\$48,765	\$57,373	\$49,305	\$42,749
Female	50.0%	52.1%	48.6%	48.7%	\$38,016	\$42,908	\$36,475	\$32,090
Race								
White	47.8%	50.4%	46.8%	45.9%	\$42,282	\$47,065	\$41,325	\$37,639
Black	31.5%	34.0%	32.6%	30.2%	\$32,261	\$42,416	\$33,961	\$27,601
Hispanic	24.8%	26.2%	24.4%	23.7%	\$37,117	\$45,941	\$29,087	\$33,737
Asian	11.0%	9.8%	10.2%	15.5%	\$43,932	\$45,096	\$51,305	\$34,369
American Indian	42.5%	52.4%	43.2%	33.9%	\$43,138	\$43,070	\$35,889	\$49,126
Unknown	34.4%	30.7%	40.8%	33.3%	\$31,484	\$38,748	\$26,274	\$28,522
Residency								
In State	58.6%	60.4%	57.3%	57.8%	\$42,182	\$47,148	\$41,283	\$37,396
Out of State	7.9%	9.0%	8.2%	6.7%	\$39,002	\$43,949	\$39,159	\$32,547
Other	32.7%	33.7%	33.6%	31.3%	\$31,694	\$28,584	\$30,858	\$34,775
Year								
1996-1997*	38.2%	41.1%	37.7%	36.4%	\$52,984	\$60,596	\$53,244	\$46,376
1997-1998*	39.1%	43.0%	36.4%	37.7%	\$52,019	\$56,974	\$54,545	\$44,881
1998-1999*	39.1%	43.8%	37.0%	36.5%	\$50,759	\$53,567	\$52,850	\$46,289
1999-2000	39.8%	42.7%	37.8%	38.6%	\$47,703	\$52,666	\$49,397	\$41,439
2000-2001	42.9%	47.0%	39.9%	41.2%	\$46,571	\$52,441	\$45,588	\$40,932
2001-2002	43.6%	45.6%	43.9%	41.5%	\$44,876	\$49,210	\$44,016	\$41,081
2002-2003	44.1%	45.9%	43.0%	43.0%	\$45,721	\$50,755	\$46,148	\$39,690
2003-2004	46.2%	48.5%	44.9%	44.6%	\$43,229	\$49,572	\$41,935	\$36,488
2004-2005	49.9%	50.5%	49.0%	50.1%	\$40,188	\$45,533	\$39,604	\$34,919
2005-2006	50.7%	50.6%	50.8%	50.7%	\$36,476	\$41,215	\$35,571	\$31,627
2006-2007	52.1%	51.8%	52.8%	51.5%	\$33,815	\$38,594	\$32,174	\$29,518
2007-2008	54.9%	54.5%	54.2%	56.2%	\$30,393	\$35,031	\$29,407	\$25,492

n/d: data not disclosed

*Little or no data for first professional or masters graduates.

Graduates during the 1996-1997 to 2007-2008 period.

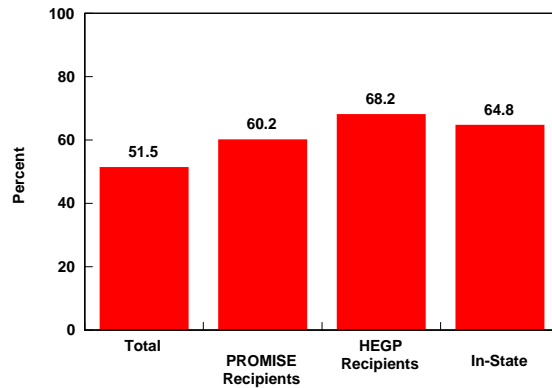
Tuition Assistance

Tuition assistance and graduate retention have been key issues concerning policymakers in West Virginia. This section analyses work participation rates and annualized wages for West Virginia higher education graduates receiving Higher Education Grant Program (HEGP) assistance or the PROMISE scholarship.

With data for 2009, we are now able to see the results from the third large wave of PROMISE graduates from West Virginia public higher education institutions. The data show that 6,072 PROMISE scholars have graduated thus far (2002-2003 to 2007-2008) and 3,655 were employed in the state in 2009, an overall work participation rate of 60.2 percent.

During the same period, 19,039 HEGP recipients graduated, with an overall work participation rate of 68.2 percent. Figure 10 compares these work participation results with a similar cohort, all in-state graduates (64.8 percent). In addition, the figure shows that HEGP recipients had a higher work participation rate than all in-state graduates, while PROMISE scholars were below that mark.

Figure 10
Work Participation In 2009 Of Graduates From West Virginia
Public Higher Education Institutions
During 2003-2004 To 2007-2008



*The 2002-2003 academic year has been removed for comparability reasons, since it only had 1 graduate with PROMISE Scholarship

Table 8 shows work participation rates and annualized wages for HEGP and PROMISE recipients by residency, degree, gender, race, and graduation year. HEGP recipients with a Bachelor's or Master's degree, at 65.3 and 71.4 percent, were more likely to work in the state than PROMISE recipients with the same degree, at 56.5 percent and 64.5 percent respectively. However, 2009 marked the first large group of First Professional PROMISE graduates. These First Professional degree PROMISE graduates had a high work participation rate, at 81.1 percent. This was far higher than the First Professional work participation rate for HEGP and all graduates.

Wages for PROMISE scholars were relatively low in 2009. PROMISE scholars earned \$27,906, while HEGP recipients averaged \$33,179 and the average for all graduates was \$35,927. This may be partially affected by PROMISE graduates' decisions to pursue higher education beyond their most recent degree, as students in graduate programs are likely to be employed, but initially earn substantially lower wages than their counterparts who enter the work force immediately.

Table 8
Work Participation And Annualized Wages In 2009 For W.Va. Public Higher Education Graduates
Receiving PROMISE and HEGP Assistance

	PROMISE Recipients		W.Va. HEGP Recipients 2003-2008		All Graduates 2003-2008	
	Work Participation	Annualized Wages	Work Participation	Annualized Wages	Work Participation	Annualized Wages
Total	60.2%	\$27,906	68.2%	\$33,179	51.5%	\$35,927
Residency						
In State	-	-	-	-	64.8%	\$36,035
Out of State	-	-	-	-	10.9%	\$34,943
Other	-	-	-	-	29.2%	\$33,195
Degree						
Associate	80.0%	\$29,279	74.3%	\$28,050	69.6%	\$30,861
Bachelor	56.5%	\$26,341	65.3%	\$30,092	47.0%	\$31,102
Doctoral	n/d	n/d	59.7%	\$66,795	28.4%	\$63,405
First Prof	81.1%	\$95,135	62.4%	\$82,293	47.0%	\$80,988
Master	64.5%	\$37,162	71.4%	\$44,497	50.8%	\$47,113
Gender						
Male	56.9%	\$29,463	62.9%	\$36,577	45.0%	\$39,971
Female	62.4%	\$26,982	71.1%	\$31,536	56.2%	\$33,563
Race						
White	60.7%	\$28,038	68.7%	\$33,540	53.7%	\$36,255
Black	53.2%	\$22,540	61.2%	\$26,326	38.8%	\$27,399
Hispanic	55.6%	\$28,705	68.9%	\$25,196	31.3%	\$30,616
Asian	40.0%	\$21,980	52.5%	\$34,003	15.5%	\$38,317
American Indian	n/d	n/d	59.6%	\$36,560	44.1%	\$35,087
Unknown	55.8%	\$23,731	63.1%	\$26,156	35.6%	\$30,395
Year						
2003-2004	69.2%	\$38,074	62.8%	\$38,802	47.1%	\$42,643
2004-2005	67.0%	\$30,730	65.8%	\$37,474	50.0%	\$40,155
2005-2006	57.0%	\$30,946	68.0%	\$33,487	51.2%	\$36,546
2006-2007	58.0%	\$27,124	69.1%	\$30,921	52.6%	\$33,485
2007-2008	62.9%	\$27,126	73.7%	\$27,933	55.2%	\$30,112

n/d: data not disclosed

Results For Nearby States

This section summarizes work participation and wages for graduates that worked in nearby states in 2009. This data arises from a match of West Virginia graduates to employment records in five neighboring states (Maryland, New Jersey, Ohio, Pennsylvania, and Virginia) and the District of Columbia. Each of these states participates in the Regional Wage Record Exchange Project (TRADE), which facilitates employment information sharing across states. For simplicity, we refer to the District of Columbia as a state in the remainder of this section.

The data analyzed in this section reflects employment by place of work. Individuals that worked in more than one state in 2009 are reflected in the totals for each state in which they worked. When we aggregate data for all six states, we count each out-of-state worker once and exclude individuals that worked both in West Virginia and in one of the six nearby states.

Figure 11 shows the geography of the participating states and the number of West Virginia higher education graduates working in those states in 2009. As the figure shows, we find that most graduates worked in Virginia, Pennsylvania, Ohio, and Maryland, with fewer graduates working in New Jersey and the District of Columbia.⁶

Figure 11
 W.Va. Public Higher Education Graduates (1996-97 to 2007-08)
 Working In Participating States In 2009
 Regional Wage Record Exchange Project Participating States

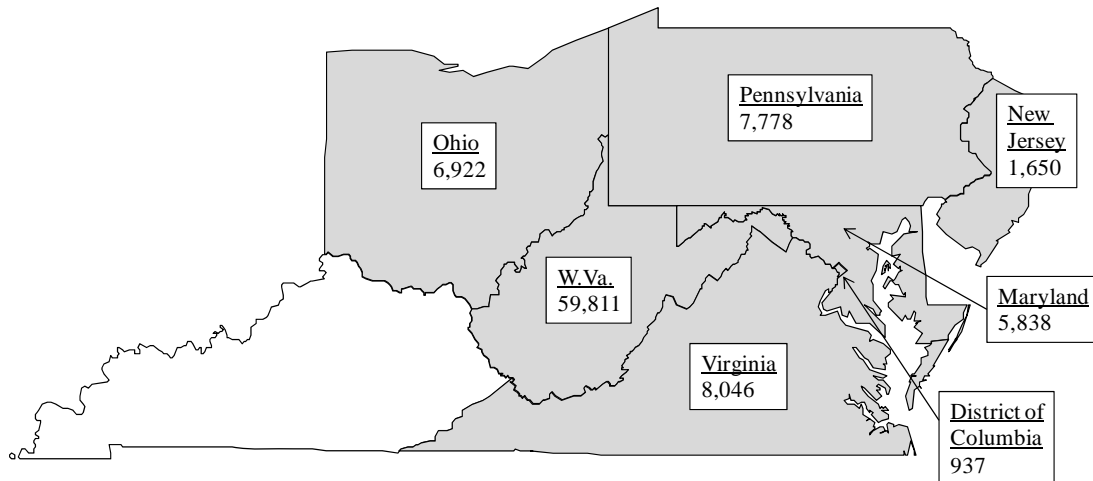


Table 9 breaks down work participation results by degree, gender, race, residency, and year of graduation. As the table shows, 20.7 percent of public higher education graduates worked at establishments located in one of the six nearby states in 2009. Virginia accounted for the largest share of graduates in 2009, with 6.2 percent, followed by Pennsylvania (6.0 percent), Ohio (5.3 percent), Maryland (4.5 percent), New Jersey (1.3 percent), and the District of Columbia (0.7 percent).

Bachelor's and Doctoral degree graduates were the most likely to work in one of the six nearby states, with 24.5 percent and 22.1 percent, respectively. Master's degree and First Professional graduates were less likely to work in one of the nearby states (17.8 percent and 16.4 percent, respectively). Associate's degree graduates were least likely to work in one of the nearby states in 2009. This general pattern holds for most nearby states individually, with the exception of Ohio, which posts an unusually small share of graduates with Bachelor's and Doctoral degrees.

In addition, a larger share of male graduates worked in nearby states in 2009 than did female graduates, African American graduates posted the highest work participation rates, and out-of-state graduates were more likely to work in nearby states than were in-state graduates.

⁶ Data for Pennsylvania reflects employment and wages during the second, third, and fourth quarters of 2009.

Table 9
Work Participation Rates In 2009 For W.Va. Public Higher Education Graduates By Participating State
Graduates From 1996-1997 To 2007-2008

Work Participation Rates in 2009 (In Percent)								
	District of Columbia*	Maryland*	New Jersey*	Ohio*	Pennsylvania*	Virginia*	Total Six States**	West Virginia
Total	0.7%	4.5%	1.3%	5.3%	6.0%	6.2%	20.7%	45.8%
Degree								
Associate	0.2%	2.2%	0.1%	6.3%	2.8%	3.6%	11.7%	63.6%
Bachelor	0.9%	5.7%	1.8%	5.0%	7.0%	7.4%	24.5%	40.7%
Doctoral	0.4%	4.8%	1.3%	5.0%	9.7%	3.0%	22.1%	23.9%
First Prof	0.8%	1.6%	0.3%	5.3%	6.2%	4.9%	16.4%	42.6%
Master	0.5%	3.3%	0.9%	5.1%	5.4%	5.0%	17.8%	48.2%
Gender								
Male	0.9%	4.8%	1.7%	5.2%	6.9%	7.0%	23.2%	40.1%
Female	0.6%	4.2%	0.9%	5.4%	5.2%	5.5%	18.8%	50.2%
Race								
Caucasian	0.6%	4.4%	1.2%	5.4%	6.1%	6.0%	20.4%	47.9%
African American	3.1%	7.5%	1.8%	5.4%	4.3%	8.9%	26.9%	31.7%
Hispanic	1.9%	5.2%	3.1%	4.3%	5.3%	7.8%	25.4%	24.9%
Asian	1.4%	3.7%	2.9%	3.0%	4.5%	7.1%	20.8%	11.6%
American Indian	0.8%	5.7%	1.0%	3.4%	4.2%	7.0%	18.0%	43.8%
Unknown	1.5%	3.7%	1.4%	2.4%	6.1%	5.3%	17.8%	35.0%
Residency								
In State	0.4%	2.7%	0.2%	4.2%	3.5%	5.0%	12.9%	58.5%
Out of State	1.8%	9.6%	4.9%	6.3%	14.8%	10.1%	44.2%	7.9%
Other	0.6%	10.0%	0.1%	21.8%	2.7%	5.9%	36.1%	24.3%
Year								
1996-1997	0.6%	4.1%	1.3%	5.1%	5.3%	5.6%	20.3%	37.2%
1997-1998	0.6%	4.3%	1.7%	5.9%	5.3%	5.7%	21.2%	38.6%
1998-1999	0.5%	4.4%	1.8%	5.8%	6.0%	6.0%	22.5%	38.9%
1999-2000	0.6%	4.6%	1.4%	5.6%	5.5%	6.4%	21.8%	39.8%
2000-2001	0.6%	4.1%	1.4%	5.8%	5.5%	5.7%	20.4%	42.7%
2001-2002	0.6%	4.7%	1.0%	5.8%	5.9%	6.1%	21.5%	43.3%
2002-2003	0.7%	4.4%	1.4%	5.4%	5.4%	6.0%	20.6%	45.4%
2003-2004	0.8%	4.6%	1.1%	5.3%	6.0%	6.5%	21.4%	46.8%
2004-2005	0.9%	4.4%	1.0%	5.1%	6.2%	6.4%	20.3%	49.9%
2005-2006	0.9%	4.4%	1.1%	5.1%	6.1%	6.3%	20.1%	51.0%
2006-2007	0.8%	4.7%	1.0%	4.7%	6.5%	6.7%	19.9%	52.4%
2007-2008	0.9%	4.7%	1.2%	4.7%	6.9%	6.3%	19.4%	55.1%

*Multi-state workers are included in each state where they earned wages in 2009.

**Total counts each worker once and excludes W.Va. workers with wages one or more nearby states. Thus, it does not equal the sum of state rates.

Work participation rates also vary by time since graduation, which we take as an indicator of experience. As Figure 12 shows, work participation rates by experience tend to be more stable for nearby states than for West Virginia. Indeed, the West Virginia work participation rate for 2009 fell by 17.9 percentage points as graduates moved from one year of experience to 12 years of experience. In contrast, the work participation rate for the nearby states varied at most by 3.1 percentage points.

The overall job losses generated by the 2008-2009 recession did not generate large declines in the work participation rates for nearby states. Indeed, the overall work participation rate for nearby

states was unchanged from 2008, at 20.7 percent.⁷ This suggests that higher education graduates working in nearby states weathered the recession relatively well.

Figure 12
Percent Of Graduates From W.Va. Public Higher Education Institutions Working In Participating States In 2008 And 2009

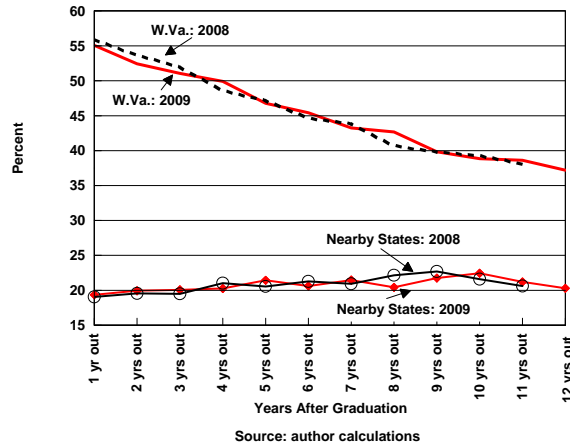


Table 10 summarizes results for annualized wages for nearby states by degree, gender, race, residency, and time since graduation. As the table shows, average wages for all graduates working in nearby states were \$54,659 in 2009, which was 28.9 percent above the West Virginia average of \$42,404. Wages were highest in New Jersey (\$57,995), followed by the District of Columbia (\$55,992), Virginia (\$52,238), Pennsylvania (\$49,639), and Maryland (\$49,212).

Wages in nearby states were highest for First Professional graduates, followed by Doctoral, Master’s, Bachelor’s, and Associate’s degree graduates. However, the percentage difference between West Virginia and nearby state wages was largest for Bachelor’s graduates, with graduates working in nearby states earning 36.6 percent more than graduates working in West Virginia. Master’s, Associate’s, Doctoral, and First Professional degree graduates also earned more in nearby states in 2009. It’s important to keep in mind that these wage differences may reflect variations in graduate experience, gender, and major.

We find that male graduates (\$62,539) working in nearby states earned more than female graduates (\$47,238). Both male and female graduates working in nearby states earned more than male and female graduates working in West Virginia. Wages for male and female graduates working in nearby states were 25.0 percent above male and female graduate wages in West Virginia.

Wages were higher in nearby states for all races, but the percentage gap was largest for Asian (66.1 percent) and African American (49.7 percent) graduates.

⁷ This remains true when we restrict the sample to graduates with the same time since graduation. West Virginia data for 2008 excludes federal government employees.

Table 10
Annualized Wages In 2009 For W.Va. Public Higher Education Graduates By Participating State
Graduates From 1996-1997 To 2007-2008

	Annualized Wages In 2009							
	District of Columbia*	Maryland*	New Jersey*	Ohio*	Pennsylvania*	Virginia*	Total Six States**	West Virginia
Total	\$55,992	\$49,212	\$57,995	\$47,035	\$49,639	\$52,238	\$54,659	\$42,404
Degree								
Associate	\$41,610	\$34,985	\$44,469	\$34,654	\$39,730	\$39,189	\$41,907	\$34,431
Bachelor	\$51,997	\$47,206	\$54,055	\$41,893	\$45,055	\$49,110	\$50,633	\$37,064
Doctoral	\$66,273	\$74,989	\$86,481	\$66,683	\$69,463	\$77,187	\$75,425	\$65,245
First Prof	\$96,750	\$112,791	\$99,300	\$136,258	\$105,191	\$120,268	\$127,815	\$113,331
Master	\$67,936	\$58,768	\$74,977	\$55,839	\$56,581	\$59,844	\$63,102	\$51,750
Gender								
Male	\$60,106	\$55,164	\$62,898	\$56,642	\$57,131	\$59,416	\$62,539	\$50,001
Female	\$51,578	\$44,001	\$51,258	\$39,917	\$42,064	\$45,298	\$47,238	\$37,778
Race								
Caucasian	\$57,669	\$49,602	\$57,494	\$46,134	\$49,539	\$51,978	\$54,300	\$42,703
African American	\$45,448	\$40,014	\$44,213	\$51,608	\$40,297	\$40,261	\$47,624	\$31,808
Hispanic	\$55,267	\$42,445	\$52,436	\$47,246	\$45,080	\$52,622	\$51,693	\$40,619
Asian	\$67,902	\$64,387	\$75,903	\$82,767	\$70,201	\$79,363	\$78,958	\$47,548
American Indian	\$30,568	\$44,956	\$50,690	\$70,070	\$35,852	\$32,700	\$49,125	\$43,841
Unknown	\$40,356	\$31,797	\$62,192	\$34,980	\$33,816	\$41,429	\$41,298	\$30,395
Residency								
In State	\$56,718	\$47,996	\$57,090	\$47,861	\$50,983	\$52,415	\$56,470	\$42,588
Out of State	\$55,533	\$51,060	\$58,075	\$47,766	\$48,424	\$52,288	\$53,745	\$39,772
Other	\$43,918	\$42,585	\$54,881	\$41,697	\$49,081	\$47,390	\$46,621	\$37,586
Year								
1996-1997	\$80,665	\$67,110	\$73,933	\$62,332	\$67,139	\$64,844	\$69,854	\$53,729
1997-1998	\$76,825	\$63,735	\$73,767	\$62,127	\$68,194	\$70,118	\$70,786	\$54,069
1998-1999	\$81,366	\$62,064	\$71,029	\$63,134	\$64,331	\$65,294	\$68,492	\$52,460
1999-2000	\$67,022	\$59,941	\$72,076	\$50,914	\$61,806	\$63,530	\$63,799	\$49,507
2000-2001	\$65,031	\$55,144	\$66,721	\$52,631	\$57,209	\$60,191	\$61,342	\$49,495
2001-2002	\$64,866	\$53,847	\$59,707	\$47,480	\$50,740	\$55,071	\$55,769	\$45,151
2002-2003	\$60,460	\$47,476	\$59,767	\$50,964	\$51,519	\$52,308	\$55,833	\$45,399
2003-2004	\$61,344	\$47,804	\$54,258	\$41,394	\$47,454	\$51,938	\$51,326	\$42,661
2004-2005	\$50,342	\$44,877	\$53,829	\$39,236	\$42,513	\$46,787	\$48,591	\$40,168
2005-2006	\$38,080	\$41,994	\$44,298	\$37,786	\$41,441	\$43,854	\$45,249	\$36,539
2006-2007	\$38,409	\$34,863	\$35,661	\$33,844	\$36,245	\$38,807	\$40,024	\$33,503
2007-2008	\$38,743	\$31,924	\$29,302	\$29,928	\$33,992	\$35,413	\$37,408	\$30,119

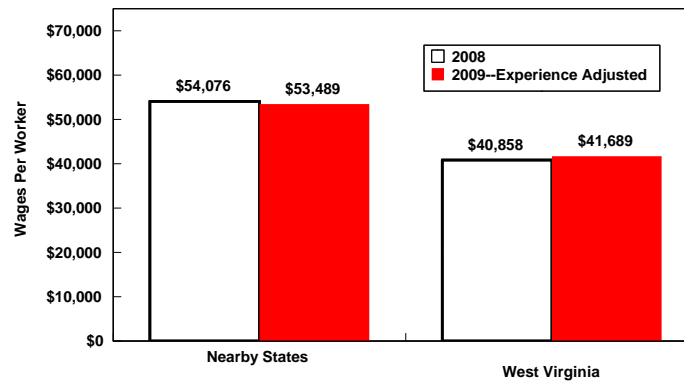
*Multi-state workers are included in each state where they earned wages in 2009.

**Total counts each worker once and excludes W.Va. workers with wages one or more nearby states.

Figure 13 shows how annualized wages changed from 2008 to 2009 for graduates working in nearby states and those working in West Virginia. We have adjusted the 2009 data so that it reflects graduates with 11 years of experience, in order to increase comparability with the 2008 data. In addition, the state data for 2008 excludes federal government employees, again to maintain comparability with the 2009 data.

As the figure shows, annualized wages in nearby states, after adjusting for experience, were slightly lower in 2009 than in 2008. Wages declined in 2009 at an rate of 1.1 percent. This contrasts with wage growth 2.0 percent in West Virginia in 2009. Thus, while overall work participation was unchanged in 2009 in nearby states, wage growth weakened.

Figure 13
Annualized Wages In 2008 And 2009
Of Graduates From W.Va.Public Higher
Education Institutions By Participating State



Source: author calculations

Results By Industry

This section provides a brief summary of results by industry. Full analysis, including results by area of concentration are included in *West Virginia Higher Education Graduate Employment By Industry 2009*.

Industry And Summary Degree

Employment is assigned to industries using the North American Industry Classification System (NAICS). We focus on two-digit NAICS industries, which are also known as NAICS supersectors. The NAICS system groups establishments into industries according to similarity in the processes used to produce goods or services.

In 2009, graduates from West Virginia public higher education institutions during the past 12 years filled 69,742 jobs in 21 different industries in West Virginia. As shown in Table 11, graduates worked in **all** sectors of the state economy. The industries employing the most graduates in 2009 were Health Care & Social Assistance, with 17,614 graduates (25.3 percent of all graduates employed in West Virginia), Educational Services, with 16,551 graduates (23.7 percent), and Retail Trade, with 5,408 graduates (7.8 percent).

Note that the employment share in Education in West Virginia for graduates was much higher than the estimated industry employment share (9.6 percent). We found a similar pattern for Health Care; Professional, Scientific, & Technical Services; and Public Administration. Graduate employment shares fell short of the state industry employment share in Retail Trade; Accommodation & Food Services; Construction; Manufacturing; Mining; Transportation & Warehousing; Other Services (which includes barber shops, laundry services, etc); and Wholesale Trade.

Table 11
Work Participation And Annualized Wages Of West Virginia Public
Higher Education Graduates From 1996-1997 to 2007-2008
Working In West Virginia In 2009 By Industry

NAICS Code Industry	Number Of Graduates Employed	Percent of Graduates Working*	Average Annualized Wages	Industry Share: All Workers**
72 Accommodation and Food Services	2,888	4.1%	\$11,605	9.4%
56 Admin. and Waste Mgmt and Remed. Serv.	2,744	3.9%	\$24,042	4.6%
11 Agriculture, Forestry, Fishing and Hunting	105	0.2%	\$31,804	0.3%
71 Arts, Entertainment, and Recreation	804	1.2%	\$13,315	1.4%
23 Construction	1,151	1.7%	\$37,345	5.7%
61 Educational Services	16,551	23.7%	\$35,148	9.6%
52 Finance and Insurance	2,506	3.6%	\$36,535	3.0%
62 Health Care and Social Assistance	17,614	25.3%	\$44,451	18.0%
51 Information (telecommunications, etc.)	1,348	1.9%	\$34,486	1.7%
55 Management of Companies and Enterprises	293	0.4%	\$56,968	0.8%
31-33 Manufacturing	2,619	3.8%	\$51,573	7.6%
21 Mining	995	1.4%	\$67,677	4.3%
81 Other Services (personal services, etc.)	1,486	2.1%	\$22,196	3.2%
54 Professional, Scientific, and Technical Services	5,040	7.2%	\$44,235	3.6%
92 Public Administration	4,754	6.8%	\$34,267	5.2%
53 Real Estate and Rental and Leasing	601	0.9%	\$31,463	1.1%
44-45 Retail Trade	5,408	7.8%	\$24,249	13.0%
48-49 Transportation and Warehousing	583	0.8%	\$43,758	2.5%
99 Unclassifiable	59	0.1%	\$37,987	0.1%
22 Utilities	526	0.8%	\$63,147	1.3%
42 Wholesale Trade	1,667	2.4%	\$57,185	3.5%
-- Total	69,742	100%	\$37,331	--

*Percent of Graduates Working is the percent of graduates working in West Virginia that are employed

in a given industry. **Estimate of the share of West Virginia jobs held by state government, local government, and private workers.

The 69,742 graduates earned \$2.6 billion in annualized wages in West Virginia during 2009, an average wage of \$37,331, also illustrated in Table 11. Graduates employed in Mining averaged the highest wage, at \$67,677, followed by those employed in Utilities, earning \$63,147, and those employed in Wholesale Trade, earning \$57,185, while graduates employed in Accommodation & Food Services earned the lowest average wage \$11,605. Keep in mind that these wage comparisons (and in the remainder of the report) do not control for other socio-economic characteristics (besides industry of work) that might have an impact.

The degree earned by a graduate had a strong influence on industry in which they worked. Graduates with Associate's, Bachelor's, and First Professional degrees tended to be fairly widespread across industries, in contrast to Master's and Doctoral graduates, which tended to concentrate in a few sectors.

Graduates earning an Associate's degree were most likely to find a job in Health Care & Social Assistance, which employed 39.5 percent of all Associate's degree graduates working in West Virginia. Bachelor's degree recipients were also most likely to find employment in Health Care & Social Assistance, at 20.7 percent, and Educational Services, at 20.0 percent. Both Master's and Doctoral degree recipients were most likely to be employed in Educational Services, at 50.8 percent and 71.0 percent respectively. As expected, graduates earning a First Professional degree, primarily doctors and lawyers, were most likely to be employed in Health Care & Social Assistance, at 38.4 percent, and Professional, Scientific, & Technical Services, at 21.5 percent. In the North American Industry Classification System, lawyers are classified in the Professional, Scientific, & Technical Services sector.

Among Associate's degree recipients, wages were highest in Utilities and Mining, at \$64,956 and \$58,895, respectively. Similarly, wages for Bachelor's degree and Master's degree recipients were highest in Mining, at \$66,318 and \$98,307, and Utilities, at \$58,356 and \$89,491 respectively. Wages for Doctoral degree recipients were highest in Manufacturing, at \$100,782, and wages for First Professional graduates were highest in Health Care & Social Assistance, at \$151,405.

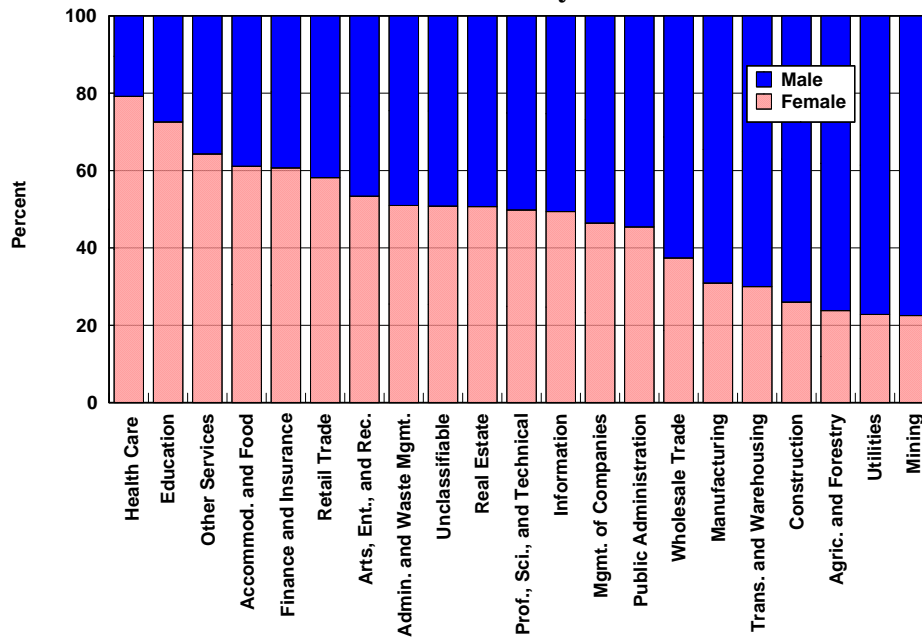
Experience And Gender

Accommodation & Food Services and Retail Trade were industries in 2009 that employed many recent graduates, but tended to lose graduates as they gained experience. For instance, in 2009 7.6 percent of graduates during 2007-2008 working in the state were in the Accommodation & Food Services sector. In contrast, only 1.9 percent of graduates during 1996-1997 working in the state were that industry. Thus, graduates with 12 years experience were much less likely to work in Accommodation & Food Services than were more recent graduates. We found a similar pattern for Retail Trade; Administration, Waste Management, & Remedial Services; and Professional, Scientific, & Technical Services. This may reflect the fact that some of these jobs are part-time or entry level positions that graduates move out of as they gain experience and/or find positions more suited to their educational background and interests.

As industries employ graduates with varying amount of experience, they also pay graduates with additional experience differently. Wholesale Trade rewarded experience the most, paying graduates with 12 years experience \$38,840 more than graduates employed with only one year experience. Results were similar for Transportation & Warehousing. Utilities, however, gave the smallest pay increases for experience, at only \$624 (1.1 percent), for graduates with the same 12 years additional experience.

Industry employment varies significantly by gender. This is also true when we examine the industry of employment for West Virginia public higher education graduates. For instance, in 2009 Health Care & Social Assistance and Educational Services industries were composed of 79.2 percent and 72.6 percent female graduates and only 20.8 percent and 27.4 percent male graduates respectively, illustrated in Figure 14. Conversely, Mining; Utilities; and Agriculture, Forestry, Fishing & Hunting were heavily male dominated, consisting of 77.5 percent, 77.2 percent, and 76.2 percent male graduates.

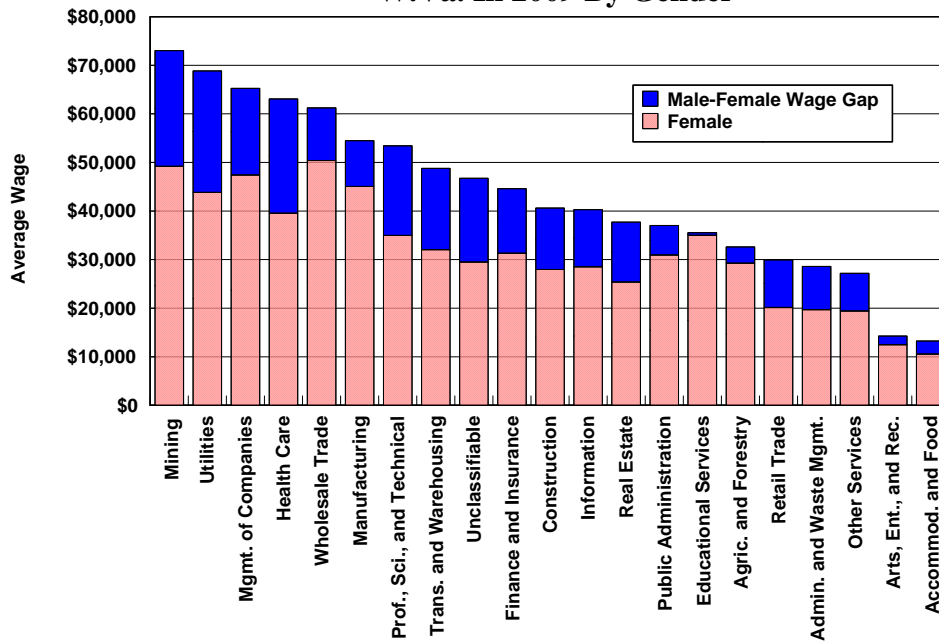
Figure 14
Industry Composition Of W.Va. Graduates Working In
W.Va In 2009 By Gender



On average, male graduates working in West Virginia tend to earn higher wages than female graduates. We also found it to be true for each two-digit NAICS industry, as Figure 15 shows.⁸ In the figure, the total height of the bar for each industry is male average wages. This total height is divided into female average wages and the male-female wage gap. The largest wage differentials were in Utilities, with male graduates earning \$24,988 more than female graduates, Mining, at \$23,799, and Health Care & Social Assistance, at \$23,547. Conversely, the smallest wage gaps were in Educational Services, with males earning \$510 more than females, and Arts, Entertainment, & Recreation, at \$1,790. Among male graduates, the highest wages were found in Mining at \$73,034 and Utilities, at \$68,864, whereas among female graduates, the highest wages were in Wholesale Trade, at \$50,390, and Mining, at \$49,235.

⁸ This is an unconditional comparison (except for the industry of work). The gap will also be affected by degree, experience, race, and other socio-economic factors.

Figure 15
Annualized Wages Of W.Va. Graduates Working In
W.Va. In 2009 By Gender



Results By Region And County

This section provides a brief summary of West Virginia public higher education graduate employment by county and region. The full report, titled *County Employment Of West Virginia Higher Education Graduates 2009*, contains detailed results by summary degree, gender, work experience, and area of concentration.

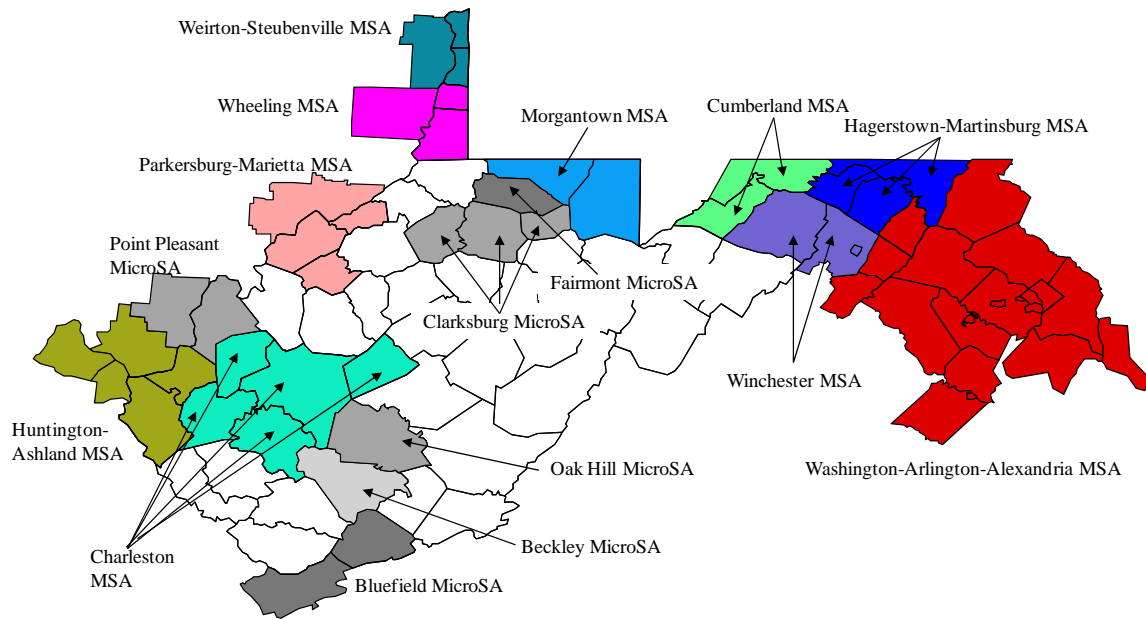
The data discussed in this section identifies, where possible, the county of employment for graduates during calendar year 2009. Graduates working in more than one county during 2009 are counted as employed in each county. Graduates holding multiple jobs within a county are counted once.

Graduates from West Virginia public higher education institutions contribute to labor markets in **all** state regions and counties. However, employed graduates are not evenly distributed across the state. In particular, we note that graduates tend to concentrate in metropolitan counties. Before describing those results, however, a little background is in order.

A metropolitan statistical area (MSA) is defined around a densely populated city (or urban agglomeration) with 50,000 or more residents. Once the urbanized area is defined the county containing it becomes the core county of the MSA. Any adjacent counties with at least 25 percent of its labor force commuting to or from the core are included in the MSA designation. A Micropolitan Statistical Area is similar in spirit to an MSA, but is based around an urban agglomeration with at least 10,000 (but less than 50,000) residents. Metropolitan and micropolitan areas are designed to reflect local labor markets (which can and often do cross state

lines). Counties that are not part of MSAs or micropolitan areas are classified as nonmetropolitan. Figure 16 depicts the MSAs and micropolitan areas with component counties in West Virginia.

Figure 16
West Virginia's Statistical Areas
Census 2000



Source: Office of Management and Budget (OMB)

As Table 12 shows, most graduates working in the state worked in counties that are part of MSAs. Indeed, in 2009, 38,834 out of 57,694 graduates whose county of employment could be identified were working in metropolitan counties (67.3 percent). A much smaller share of graduates worked in the less populous micropolitan areas (9,887 or 17.1 percent), and a still smaller share worked in nonmetropolitan counties (8,973 or 15.6 percent).

Within metropolitan areas, the largest share of graduates (25.9 percent) worked in the Charleston Metropolitan Statistical Area (MSA), followed by the Morgantown MSA (13.3 percent), and the West Virginia portion of the Huntington MSA (10.7 percent). Among micropolitan areas, Clarksburg posted the largest share of graduates employed (5.3 percent), followed by the Fairmont micropolitan area (3.8 percent), and the Beckley micropolitan area (3.2 percent).

Table 12
Employment Shares And Annualized Wages Of Graduates
By Region Of Employment In 2009

W.Va. Public Higher Education Graduates From 1996-1997 To 2007-2008

	Number Of Graduates Employed	Percentage Of All Graduate Workers	Average Annualized Wages	Percentage Of State Employment	Percentage Of State Population
Metropolitan Counties*	38,834	67.3%	\$38,348	61.4%	55.7%
Charleston MSA	14,956	25.9%	\$41,756	20.6%	16.7%
Cumberland MSA	352	0.6%	\$25,837	1.1%	1.5%
Hagerstown-Martinsburg MSA	1,897	3.3%	\$37,121	4.6%	6.6%
Huntington-Ashland MSA	6,168	10.7%	\$37,435	9.0%	7.5%
Morgantown MSA	7,648	13.3%	\$38,430	8.3%	6.6%
Parkersburg-Marietta MSA	2,561	4.4%	\$37,129	6.3%	5.5%
Wash.-Arl.-Alex. MSA	1,013	1.8%	\$35,373	2.1%	2.9%
Steubenville-Weirton MSA	903	1.6%	\$33,255	2.8%	2.9%
Wheeling MSA	3,065	5.3%	\$30,116	6.0%	4.2%
Winchester MSA	271	0.5%	\$26,281	0.6%	1.2%
Micropolitan Counties*	9,887	17.1%	\$35,208	19.1%	19.9%
Beckley MicroSA	1,856	3.2%	\$35,058	4.6%	4.4%
Bluefield MicroSA	1,535	2.7%	\$34,702	3.2%	3.4%
Clarksburg MicroSA	3,031	5.3%	\$37,671	5.5%	5.1%
Fairmont MicroSA	2,202	3.8%	\$34,115	3.0%	3.1%
Oak Hill MicroSA	805	1.4%	\$29,779	1.8%	2.5%
Point Pleasant MicroSA	458	0.8%	\$35,998	1.0%	1.4%
Nonmetropolitan Counties	8,973	15.6%	\$33,440	19.5%	24.4%
Total (metropolitan, micropolitan, and nonmetropolitan)	57,694	100.0%	\$37,047	100.0%	100.0%

*includes only West Virginia portion of metropolitan or micropolitan area.

It is likely that regions with more jobs, as indicated by a higher percentage of overall state employment, will attract more graduates and this is reflected in the data in Table 12. However, for several metropolitan areas, we find higher concentrations of graduates than we would expect, based solely on the share of jobs. This is particularly true for the Charleston and Morgantown MSAs, as well as the West Virginia portion of the Huntington MSA.

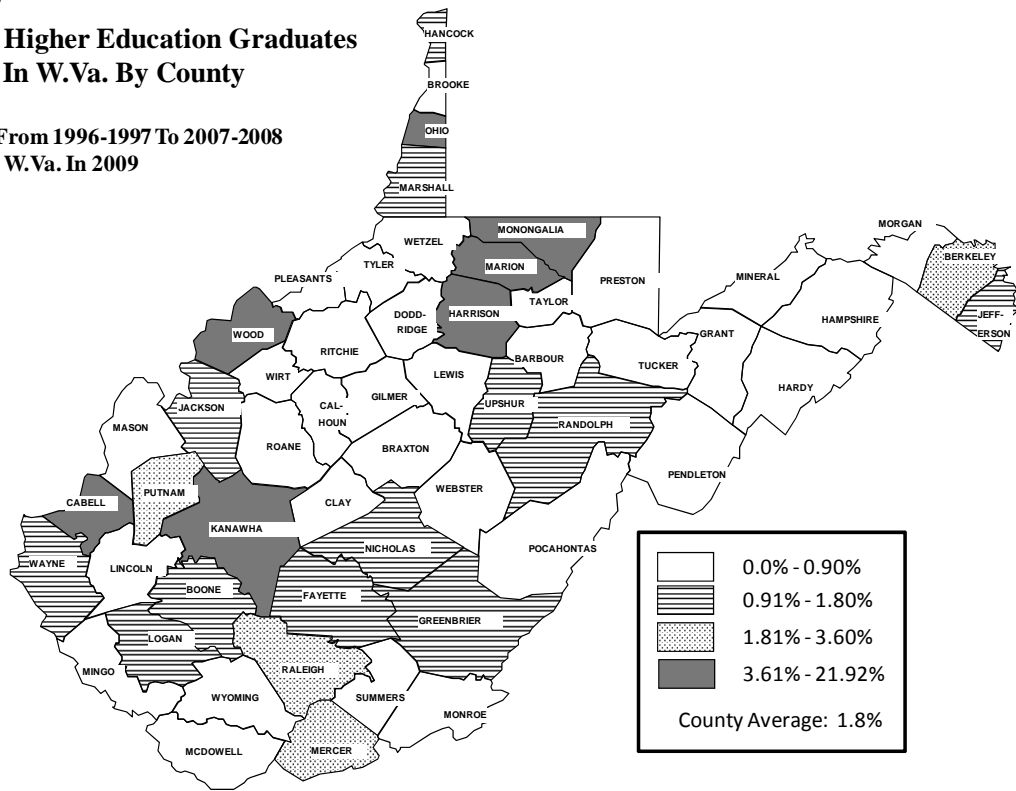
This highlights other factors that may contribute to the concentration of college graduates in a labor market. In particular, metropolitan labor markets also often have more diversified and varied job markets. Further, larger metropolitan labor markets also tend to become hubs of financial, government, health care, and professional consulting activities, which generate additional job openings for college graduates. The location of colleges and universities in a region (as is the case for the Morgantown MSA and the Huntington MSA) tends to attract college graduates as well.

Annualized wages also vary significantly across regions, with metropolitan areas posting the highest wages (\$38,348), followed by micropolitan areas (\$35,208), and nonmetropolitan areas (\$33,440). The Charleston MSA posted the highest average wages of any region in the state, at \$41,756, followed by the Morgantown MSA (\$38,430), and the Clarksburg micropolitan area (\$37,671).

Figure 17 shows the geography of graduates working in the state. This highlights again the relatively large concentrations of graduates in metropolitan counties (Kanawha, Monongalia, Cabell, Wood, and Ohio). It also emphasizes the concentration of graduates in the northcentral part of the state (Monongalia, Marion, and Harrison), which likely reflects the importance of government, business service, and higher education jobs in the region.

Figure 17
Share Of Higher Education Graduates
Working In W.Va. By County

Graduates From 1996-1997 To 2007-2008
 Working In W.Va. In 2009



Relatively few graduates work in the most isolated and rural parts of the state, including the Potomac Highlands region (Pendleton, Hardy, Grant, Hampshire, and Mineral) and the southern counties dominated by coal production (Boone, Logan, Mingo, Wyoming, McDowell). In addition, the Eastern Panhandle counties (Berkeley, Jefferson, Morgan) employ small shares of graduates. Keep in mind, however, that larger numbers of graduates may live in the Eastern Panhandle, but commute to jobs in the greater Washington MSA. These individuals will not be counted in this dataset.

Table 13 also shows that graduates also tend not to be evenly distributed across the state, from the perspective of the county-level data. Here again, it is the metropolitan counties that posted the largest shares of graduates, with Kanawha County (21.9 percent), Monongalia County (12.4 percent), and Cabell County (9.5 percent) leading the list.

Table 13
Employment Shares And Annualized Wages Of Graduates
By County Of Employment In 2009

W.Va. Public Higher Education Graduates From 1996-1997 To 2007-2008

County	Metropolitan/Micropolitan	Number Of Graduates Employed	Percentage Of All Graduate Workers	Average Annualized Wages	Percentage Of State Employment	Percentage Of State Population
Barbour	Nonmetropolitan	220	0.4%	\$33,281	0.5%	0.9%
Berkeley	Hagerstown-Martinsburg MSA	1,741	3.0%	\$37,032	4.2%	5.7%
Boone	Charleston MSA	596	1.0%	\$45,661	1.3%	1.4%
Braxton	Nonmetropolitan	305	0.5%	\$31,122	0.6%	0.8%
Brooke	Steubenville-Weirton MSA	269	0.5%	\$31,602	1.1%	1.3%
Cabell	Hungington-Ashland MSA	5,455	9.5%	\$38,130	7.6%	5.2%
Calhoun	Nonmetropolitan	169	0.3%	\$33,028	0.2%	0.4%
Clay	Charleston MSA	167	0.3%	\$40,938	0.3%	0.6%
Doddridge	Clarksburg MicroSA	94	0.2%	\$34,551	0.2%	0.4%
Fayette	Oak Hill MicroSA	805	1.4%	\$29,779	1.8%	2.5%
Gilmer	Nonmetropolitan	230	0.4%	\$28,013	0.3%	0.4%
Grant	Nonmetropolitan	290	0.5%	\$34,086	0.6%	0.7%
Greenbrier	Nonmetropolitan	813	1.4%	\$35,896	1.9%	1.9%
Hampshire	Winchester	271	0.5%	\$26,281	0.6%	1.2%
Hancock	Steubenville-Weirton MSA	634	1.1%	\$33,957	1.7%	1.6%
Hardy	Nonmetropolitan	284	0.5%	\$29,266	0.9%	0.7%
Harrison	Clarksburg MicroSA	2,727	4.7%	\$38,068	5.0%	3.8%
Jackson	Nonmetropolitan	640	1.1%	\$36,324	1.1%	1.5%
Jefferson	Washington MSA	1,013	1.8%	\$35,373	2.1%	2.9%
Kanawha	Charleston MSA	12,647	21.9%	\$41,919	15.7%	10.5%
Lewis	Nonmetropolitan	401	0.7%	\$29,813	0.9%	1.0%
Lincoln	Charleston MSA	272	0.5%	\$32,184	0.5%	1.2%
Logan	Nonmetropolitan	932	1.6%	\$31,662	1.7%	2.0%
McDowell	Nonmetropolitan	320	0.6%	\$37,299	0.8%	1.2%
Marion	Fairmont MicroSA	2,202	3.8%	\$34,115	3.0%	3.1%
Marshall	Wheeling MSA	701	1.2%	\$28,133	1.6%	1.8%
Mason	Point Pleasant MicroSA	458	0.8%	\$35,998	1.0%	1.4%
Mercer	Bluefield MicroSA	1,535	2.7%	\$34,702	3.2%	3.4%
Mineral	Cumberland MSA	352	0.6%	\$25,837	1.1%	1.5%
Mingo	Nonmetropolitan	491	0.9%	\$35,191	1.2%	1.5%
Monongalia	Morgantown MSA	7,182	12.4%	\$38,851	7.3%	5.0%
Monroe	Nonmetropolitan	161	0.3%	\$31,726	0.3%	0.8%
Morgan	Hagerstown-Martinsburg MSA	156	0.3%	\$38,114	0.4%	0.9%
Nicholas	Nonmetropolitan	672	1.2%	\$35,923	1.2%	1.4%
Ohio	Wheeling MSA	2,364	4.1%	\$30,704	4.4%	2.4%
Pendleton	Nonmetropolitan	85	0.1%	\$28,720	0.2%	0.4%
Pleasants	Parkersburg MSA	131	0.2%	\$37,783	0.4%	0.4%
Pocahontas	Nonmetropolitan	163	0.3%	\$28,711	0.5%	0.5%
Preston	Morgantown MSA	466	0.8%	\$31,949	1.0%	1.7%
Putnam	Charleston MSA	1,274	2.2%	\$40,465	2.9%	3.1%
Raleigh	Beckley MicroSA	1,856	3.2%	\$35,058	4.6%	4.4%
Randolph	Nonmetropolitan	563	1.0%	\$32,351	1.7%	1.6%
Ritchie	Nonmetropolitan	184	0.3%	\$34,796	0.4%	0.6%
Roane	Nonmetropolitan	341	0.6%	\$35,075	0.5%	0.8%
Summers	Nonmetropolitan	99	0.2%	\$30,328	0.3%	0.7%
Taylor	Clarksburg MicroSA	210	0.4%	\$33,909	0.4%	0.9%
Tucker	Nonmetropolitan	118	0.2%	\$28,965	0.4%	0.4%
Tyler	Nonmetropolitan	185	0.3%	\$38,127	0.3%	0.5%
Upshur	Nonmetropolitan	536	0.9%	\$32,656	1.2%	1.3%
Wayne	Hungington-Ashland MSA	713	1.2%	\$32,118	1.3%	2.3%
Webster	Nonmetropolitan	146	0.3%	\$39,682	0.3%	0.5%
Wetzel	Nonmetropolitan	296	0.5%	\$32,374	0.6%	0.9%
Wirt	Parkersburg MSA	98	0.2%	\$29,724	0.1%	0.3%
Wood	Parkersburg MSA	2,332	4.0%	\$37,403	5.8%	4.8%
Wyoming	Nonmetropolitan	329	0.6%	\$32,261	0.7%	1.3%
Total		57,694	100.0%	\$37,047	100.0%	100.0%

Table 13 also shows annualized wages in 2009 for graduates during the past 12 years. These average wage rates will reflect the local industry/occupation/education mix, as well as region type (metropolitan, micropolitan, and nonmetropolitan). The top five counties in 2009 were Boone (\$45,661), Kanawha (\$41,919), Clay (\$40,938), Putnam (\$40,465), and Webster (\$39,682). Four out of the five top counties are part of the Charleston MSA. This likely also reflects the importance of (high wage) coal mining jobs in most of these counties. The bottom five counties, in 2009 annualized wages, were Mineral (\$25,837), Hampshire (\$26,281), Gilmer (\$28,013), Marshall (\$28,133), and Pocahontas (\$28,711).

Conclusion And Directions For Future Research

This report examined in detail the labor market experiences in 2009 of graduates during the past 12 years. As the analysis shows, the overall graduate work participation rate in West Virginia was essentially unchanged in 2009. Given the scale of aggregate job losses during the year, it is remarkable that the rate did not decline. This suggests that West Virginia public higher education graduates weathered the downturn relatively well.

Higher education graduates did not escape the downturn unscathed, however. We find that graduates with three years or less experience did have lower work participation rates in 2009. In addition, for graduates with three years or less experience, Associate's, Bachelor's, Master's, and First Professional graduates all posted lower work participation rates in 2009.

As state job growth rebounds during the next few years, the graduate work participation rate will likely begin to rise again. Taking a longer-term perspective, a recent study from Georgetown University suggests that less than one-half of state jobs will require postsecondary education by 2018, ranking the state last in the nation.⁹ It is important to keep in mind that the postsecondary share of jobs in West Virginia is expected to be slightly higher in 2018 than it is today. Indeed, the study estimates that jobs requiring postsecondary education will rise by 5.3 percent during the 2008-2018 period. In contrast, jobs requiring a high school degree are expected to rise by 3.5 percent and jobs requiring less than a high school education are expected to increase by 3.9 percent. This implies that postsecondary education will remain critical in the future, even in West Virginia (and even though the state is expected to rank last in postsecondary education intensity).

This report highlights the value of tracking graduate employment and wages over time. It also suggests that it would be very valuable to develop a system to track graduate place of residence over time. The employment and wage data allow us to analyze graduate work by county but not graduate residence by county. This distinction is very important for West Virginia because many of the state's labor markets spill across state lines. We have evidence on this for the metropolitan and micropolitan statistical areas with counties in the state. Indeed, there are currently 16 metropolitan and micropolitan statistical areas with counties in West Virginia. However, only six of these are completely contained within the state's borders. The rest include counties outside of the state and some have the bulk of their economic activity located outside of the state. This implies that there is a significant amount of commuting from West Virginia to counties outside the state. In turn, this means that there are more graduates living in the state and contributing to the state economy than are identified through employment records.

⁹ Carnevale, Anthony P., Nicole Smith, and Jeff Strohl. "Help Wanted: Projections of Jobs and Education Requirements through 2018, State Level Analysis." The Georgetown University Center on Education and the Workforce, June 2010.

This report also highlights the fact that West Virginia public higher education graduates work in all sectors of the state economy and in all counties in the state. Even so, we find that graduates tend to concentrate in the Health Care and Education sectors, which means that graduates contribute to the development of the state's human capital. In addition, we find that graduates tend to concentrate in metropolitan counties. This likely arises from the fact that metropolitan counties tend to be hubs of finance, government, health care, and business service activity. In addition, two of the state's largest universities are located in metropolitan counties.

Higher education graduates also work at establishments of vastly different sizes, ranging from employers with just a few workers to those that employ thousands. It would be valuable to explore how establishments of different sizes employ state graduates. The data would allow us to disaggregate these results by experience, degree, area of concentration, and other dimensions.

Appendix I: Detailed Description Of Employment Data

The West Virginia data analyzed in this study come from the matching of demographic information on graduates from West Virginia institutions of higher education (compiled by the HEPC¹⁰) with employment records maintained by Workforce West Virginia. Graduates reflect the highest degree earned at the time of measurement (during the 1996-1997 to 2007-2008 period).

The employment data used is gathered from West Virginia unemployment compensation records. This is a well-known dataset which measures employment 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.

For this report, we do not include civilian federal government employment and wages due to recent administrative problems with the FEDES match. The U.S. Postal Service and the Office of Personnel Management have begun to vary their response quarter (and whether they respond at all). Based on recent matches to Federal employment data, there are roughly 2,000 graduates (during the past decade) that hold Federal jobs.

Also excluded in this study are results from a match of West Virginia graduates with covered employment (including federal employment) at establishments located in five nearby states (and the District of Columbia). These include Maryland, New Jersey, Ohio, Pennsylvania, Virginia, and the District of Columbia. These states participate in the Regional Wage Record Exchange Project (TRADE), but the data does not include geographic identifiers beyond state of employment.

Finally, in 2009, the county of employment could not be identified for roughly 13,000 employed graduates. This can occur due to the administrative nature of the data. For instance, for a firm with multiple establishments located in multiple states, the unemployment insurance contact information (and thus the geographic identifier) is sometimes only available for a centralized payroll processing center that happens to be located out of the state. Thus, for some graduates, we know they are employed in the state, but we cannot narrow the location down any further.

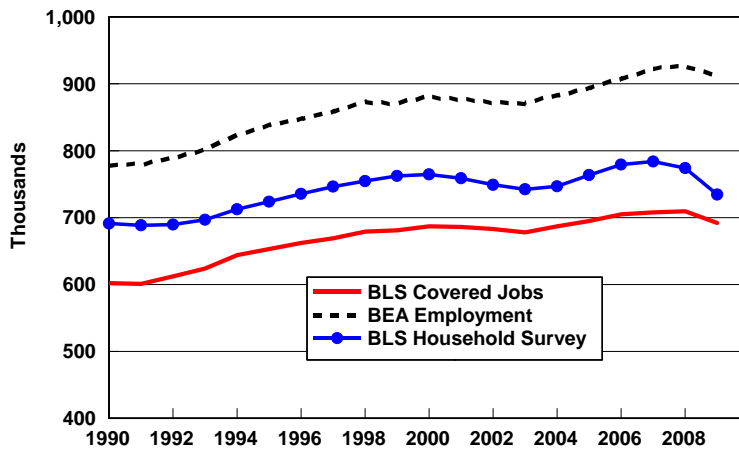
Covered employment counts 691,921 jobs at establishments in West Virginia in 2009.¹¹ As Figure 18 shows, this measure of employment is lower than two other major measures of employment: employment measured by the U.S. Bureau of Economic Analysis (BEA) and employment measured by the U.S. Bureau of Labor Statistics (BLS) 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.

¹⁰ We would like to thank Rob Anderson and Larry Ponder of the WVHEPC for providing the bulk of the data used in this study.

¹¹ Federal government jobs are added in separately for completeness.

Finally, the wages documented in the report are an important source of compensation, but they are not the only source. Data on wage income is readily available, well understood, and is useful in the evaluation of returns to work of state higher education graduates. However, wage data does not include fringe benefits provided by firms, particularly employer-paid pension and health insurance. This source of income has accounted for an increasing share of work compensation during the last 30 years. Indeed, the share of private other labor income to gross earnings by place of work has risen from 6.3 percent in 1969 to 14.3 percent by 2009 for West Virginia.

Figure 18
Three Measures Of West Virginia Employment



Appendix II: List Of Institutions, Degrees, And Areas Of Concentration

Public 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
Glenville 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

Areas Of Concentration And Majors

Agriculture, Agriculture Operations, and Related Sciences

Agricultural Economics
Agriculture, Agriculture Operations, and Related Sciences, Other.
Agriculture, General
Animal Sciences, General.
Aquaculture
Plant Sciences, Other.

Architecture and Related Services

Landscape Architecture

Biological and Biomedical Sciences

Anatomy
Biochemistry
Biochemistry, Biophysics and Molecular Biology, Other
Biological and Biomedical Sciences, Other.
Biology/Biological Sciences, General
Botany/Plant Biology
Exercise Physiology
Genetics, General.
Medical Microbiology and Bacteriology
Microbiological Sciences and Immunology, Other.
Pharmacology and Toxicology
Physiology, General
Reproductive Biology
Zoology/Animal Biology

Business, Management, Marketing, and Related Support Services

Accounting
Accounting Technology/Technician and Bookkeeping
Administrative Assistant and Secretarial Science, General
Business Administration and Management, General
Business Administration, Management and Operations, Other
Business, Management, Marketing, and Related Support Services, Other
Business/Commerce, General
Business/Managerial Economics
Business/Office Automation/Technology/Data Entry
Entrepreneurship/Entrepreneurial Studies
Executive Assistant/Executive Secretary
Fashion Merchandising
Finance, General
Hospitality Administration/Management, General
Hospitality Administration/Management, Other
Hotel/Motel Administration/Management
Information Resources Management/CIO Training.
Labor and Industrial Relations
Management Information Systems, General
Marketing/Marketing Management, General
Office Management and Supervision
Operations Management and Supervision
Retailing and Retail Operations.
Sales, Distribution, and Marketing Operations, General
Tourism and Travel Services Marketing

Communication, Journalism, and Related Programs

Communication Studies/Speech Communication and Rhetoric.

Communication, Journalism, and Related Programs, Other.

Journalism

Communications Technologies/Technicians and Support Services

Graphic and Printing Equipment Operator, General Production.

Printing Press Operator.

Graphic Communications, Other.

Communications Technologies/Technicians and Support Services, Other

Computer and Information Sciences and Support

Computer and Information Sciences and Support Services, Other.

Computer and Information Sciences,

Computer and Information Sciences, General.

Computer Programming, Specific Applications.

Computer Programming/Programmer, General.

Computer Science.

Information Science/Studies.

Education

Adult and Continuing Education and Teaching

Agricultural Teacher Education.

Business Teacher Education

Counselor Education/School Counseling and Guidance Services.

Curriculum and Instruction.

Early Childhood Education and Teaching.

Education, General.

Educational Administration and Supervision, Other.

Educational Leadership and Administration, General.

Educational Psychology. (Moved, Report Under 42.18 series)

Educational/Instructional Media Design.

Elementary Education and Teaching

Junior High/Intermediate/Middle School Education and Teaching

Kindergarten/Preschool Education and Teaching

Physical Education Teaching and Coaching

Reading Teacher Education

Secondary Education and Teaching

Special Education and Teaching, General

Teacher Assistant/Aide.

Teacher Education and Professional Development, Specific Levels and Methods, Other

Technical Teacher Education.

Trade and Industrial Teacher Education

Engineering

Aerospace, Aeronautical and Astronautical Engineering
Chemical Engineering.
Civil Engineering, General
Computer Engineering, General.
Computer Software Engineering.
Electrical, Electronics and Communications Engineering
Engineering Physics
Engineering Science
Engineering, General.
Engineering, Other
Environmental/Environmental Health Engineering
Industrial Engineering.
Mechanical Engineering.
Mining and Mineral Engineering
Petroleum Engineering.
Systems Engineering.

Engineering Technologies/Technicians

Aeronautical/Aerospace Engineering Technology/Technician
Architectural Drafting and Architectural CAD/CADD
Architectural Engineering Technology/Technician
Automotive Engineering Technology/Technician
Civil Engineering Technology/Technician
Computer Engineering Technology/Technician
Computer Technology/Computer Systems Technology
Drafting and Design Technology/Technician, General
Electrical, Electronic and Communications Engineering Technology/Technician
Electromechanical Technology/Electromechanical Engineering Technology
Energy Management and Systems Technology/Technician
Engineering Technologies/Technicians, Other
Engineering/Industrial Management
Environmental Engineering Technology/Environmental Technology
Industrial Production Technologies/Technicians, Other
Industrial Technology/Technician
Manufacturing Technology/Technician
Mechanical Drafting and Mechanical Drafting CAD/CADD.
Mechanical Engineering Related Technologies/Technicians, Other
Mechanical Engineering/Mechanical Technology/Technician
Mining Technology/Technician.
Occupational Safety and Health Technology/Technician
Petroleum Technology/Technician
Surveying Technology/Surveying.

English Language and Literature/Letters

Creative Writing.
English Language and Literature, General.
Speech and Rhetorical Studies.

Family and Consumer Sciences/Human Sciences

Child Care and Support Services Management.
Family and Consumer Sciences/Human Sciences, General
Housing and Human Environments, Other.

Foreign Languages, Literatures, and Linguistics

Foreign Languages and Literatures, General
French Language and Literature.
Sign Language Interpretation and Translation.

Health Professions and Related Clinical Sciences

Athletic Training/Trainer
Audiology/Audiologist and Speech-Language Pathology/Pathologist.
Clinical Laboratory Science/Medical Technology/Technologist
Clinical/Medical Laboratory Science and Allied Professions, Other
Clinical/Medical Laboratory Technician
Community Health Services/Liaison/Counseling
Cytotechnology/Cytotechnologist
Dental Clinical Sciences, General
Dental Hygiene/Hygienist
Dental Laboratory Technology/Technician
Dentistry (DDS, DMD).
Dietetics/Dietitian (RD).
Emergency Medical Technology/Technician (EMT Paramedic).
Health Information/Medical Records Technology/Technician
Health Professions and Related Clinical Sciences, Other
Health/Health Care Administration/Management
Medical Administrative/Executive Assistant and Medical Secretary
Medical Radiologic Technology/Science – Radiation Therapist
Medical Transcription/Transcriptionist
Medical/Clinical Assistant
Medicine (MD).
Nuclear Medical Technology/Technologist
Nurse/Nursing Assistant/Aide and Patient Care Assistant
Nursing, Other
Nursing/Registered Nurse (RN, ASN, BSN, MSN)
Occupational Therapy/Therapist
Osteopathic Medicine/Osteopathy (DO).
Pharmaceutics and Drug Design.

Pharmacy (PharmD [USA], PharmD or BS/BPharm [Canada])
Pharmacy Technician/Assistant
Physical Therapist Assistant
Physical Therapy/Therapist
Psychiatric/Mental Health Services Technician
Public Health, General (MPH, DPH).
Respiratory Care Therapy/Therapist
Speech-Language Pathology/Pathologist
Surgical Technology/Technologist
Veterinary/Animal Health Technology/Technician and Veterinary Assistant
Vocational Rehabilitation Counseling/Counselor

History

History, General

Legal Professions and Studies

Law (LL.B., J.D.).
Legal Administrative Assistant/Secretary.
Legal Assistant/Paralegal.
Legal Professions and Studies, Other.

Liberal Arts and Sciences, General Studies and Humanities

General Studies
Humanities/Humanistic Studies.
Liberal Arts and Sciences, General Studies and Humanities, Other
Liberal Arts and Sciences/Liberal Studies

Library Science

Library Science/Librarianship

Mathematics and Statistics

Mathematics, General.
Statistics, General

Mechanic and Repair Technologies/Technicians

Avionics Maintenance Technology/Technician
Heating, Ventilation, AC and Refrigeration Maintenance Technology (HAC(R), HVAC(R)).
Heavy/Industrial Equipment Maintenance Technologies, Other
Mechanic and Repair Technologies/Technicians, Other

Multi/Interdisciplinary Studies

Biological and Physical Sciences
Gerontology
Multi-/Interdisciplinary Studies, Other
Science, Technology and Society
Systems Science and Theory

Natural Resources and Conservation

Environmental Studies.

Forest Management/Forest Resources Management.
Forest Sciences and Biology.
Forest Technology/Technician.
Forestry, General.
Natural Resource Economics.
Natural Resources Management and Policy, Other.
Wildlife and Wildlands Science and Management.
Wood Science and Wood Products/Pulp and Paper Technology.

Parks, Recreation, Leisure and Fitness Studies

Health and Physical Education, General
Kinesiology and Exercise Science
Parks, Recreation and Leisure Facilities Management
Parks, Recreation and Leisure Studies

Personal and Culinary Services

Culinary Arts/Chef Training.
Food Preparation/Professional Cooking/Kitchen Assistant.
Institutional Food Workers
Restaurant, Culinary, and Catering Management/Manager

Philosophy and Religious Studies

Philosophy

Physical Sciences

Chemistry, General.
Geology/Earth Science, General
Physical Sciences.
Physics, General.

Precision Production

Machine Shop Technology/Assistant
Welding Technology/Welder
Precision Metal Working, Other

Psychology

Counseling Psychology
Educational Psychology
Psychology, General
School Psychology

Public Administration and Social Service Prof

Community Organization and Advocacy
Public Administration
Social Work

Sciences Technologies/Technicians

Chemical Technology/Technician
Science Technologies/Technicians, Other

Security and Protective Services

Corrections
Criminal Justice/Police Science
Criminal Justice/Safety Studies
Criminalistics and Criminal Science
Fire Protection and Safety Technology/Technician
Forensic Science and Technology
Security and Protective Services, Other

Social Sciences

Economics, General
Geography
International Relations and Affairs
Political Science and Government, General.
Social Sciences, General.
Social Sciences, Other.
Sociology

Visual and Performing Arts

Art/Art Studies, General
Commercial and Advertising Art
Design and Visual Communications, General
Drama and Dramatics/Theatre Arts, General
Drawing
Graphic Design
Interior Design
Music, General
Visual and Performing Arts, General
Visual and Performing Arts, Other