Blending US Bureau of Labor Statistics Occupation Wage Data with US Census Bureau Income by Educational Attainment Data

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EXECUTIVE SUMMARY

This student aid policy analysis paper proposes to fix flaws in the use of Bureau of Labor Statistics occupation wage data in the proposed gainful employment rules by combining that data with US Census Bureau income by educational attainment data. This approximation yields adjustment ratios to median Bureau of Labor Statistics occupation wage data of 3/4 for Certificates, 7/8 for Associate's degrees, 1 for Bachelor's degrees, 1-1/4 for Master's degrees, 1-1/2 for Doctoral degrees and 1-3/4 for Professional degrees.

BACKGROUND

During negotiated rulemaking for Higher Education 2009-10, the US Department of Education proposed requiring eligible programs at for-profit colleges to satisfy an 8% debt-service-to-income threshold.[1] Debt would be based on median student debt for the three most recent years of college graduates.[2] Income would be based either on Bureau of Labor Statistics 25th percentile wage data for year-round full-time workers[3] or actual earnings of the college's graduates. Loan payments would be based on the standard 10-year repayment plan for the unsubsidized Stafford loan program, with a 6.8% interest rate.

As noted in a previous student aid policy analysis paper concerning the gainful employment proposal,[4] the use of Bureau of Labor Statistics wage data is problematic because it is not disaggregated by educational attainment. For example, students can earn an Associate's, Bachelor's or MBA in accounting, but all three degree programs are mapped to the same Standard Occupational Classification (SOC)[5] code (13-2011) and to the same Bureau of Labor Statistics wage data. This yields a bias against Bachelor's and more advanced degrees, which tend to command higher salaries, by averaging down the wage data. The Bureau of Labor Statistics wage data also isn't disaggregated by starting salary or by a reasonable proxy for starting salary, such as age. There is no evidence that the 25th percentile (or any other percentile) correlates with starting salaries. The Bureau of Labor Statistics wage data is, however, disaggregated by occupation and by percentile (10th, 25th, 50th, 75th and 90th).

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[1] Issue paper #6 (pages 57-68) in www2.ed.gov/policy/highered/reg/hearulemaking/2009/integrity-summary3.pdf
[2] The Bureau of Labor Statistics wage data is based on three years of data, necessitating the use of three years of data for the proposed gainful employment regulation.
[3] www.bls.gov/oes/current/oes_stru.htm
[4] Mark Kantrowitz, *What is Gainful Employment? What is Affordable Debt?*, March 11, 2010. www.finaid.org/educators/20100301gainfulemployment.pdf
[5] See the US Department of Labor's Occupational Information Network (O*NET) at online.onetcenter.org.

On the other hand, US Census Bureau income data is disaggregated by educational attainment (e.g., Associate's, Bachelor's, Master's, doctoral and professional degrees)[6] and by 10-year age bands (e.g., age 25-34, age 35-44, age 45-54, age 55-64 and age 65+),[7] but not by occupation.

The Bureau of Labor Statistics wage data and the US Census Bureau income data by educational attainment each provides an element of the solution that the other data source lacks.

PROPOSED SOLUTION

Blending the Bureau of Labor Statistics wage data with US Census Bureau income by educational attainment data might yield a reasonable workaround to the limitations of both data sources. This blending would be accomplished by using the US Census Bureau data to calculate the ratios of median income for each level of educational attainment for the age 25-34 age band with the overall median income for age 25+. The median Bureau of Labor Statistics wage data (50th percentile) for each occupation would then be multiplied by these median ratios to adjust the occupational wage data for differences in educational attainment.

This combination of Bureau of Labor Statistics wage data with US Census Bureau income by educational attainment data assumes that the median ratios are independent of occupation. That is not necessarily a valid assumption. However, this approach seems to be more motivated than arbitrarily using the 25th percentile for Associate's degrees, the 50th percentile for Bachelor's degrees, the 75th percentile for Master's degrees and the 90th percentile for professional and doctoral degrees, albeit with similar results.

The following table shows US Census Bureau data for median income in 2005 by educational attainment for year round full time workers, all races, both sexes.[8] This is the most recent available data.

| | Total | High School | | College | | | | | | |
| | | | | | | Bachelor's or more | | | | |
By Age	Total	Not a Graduate	Graduate, including GED	Some College no degree	Associate's degree	Total	Bachelor's degree	Master's degree	Professional degree	Doctoral degree
Age 18+	$38,431	$22,326	$31,209	$36,371	$40,708	$57,541	$51,436	$64,540	$100,000+	$85,774
Age 25+	$40,631	$23,321	$32,259	$39,096	$41,546	$59,621	$52,224	$64,859	$100,000+	$85,706
Age 25-64	$40,542	$23,079	$32,164	$38,843	$41,484	$59,104	$52,092	$64,708	$100,000+	$83,774
Age 25-34	$33,859	$21,639	$28,380	$32,353	$35,535	$45,651	$42,092	$51,391	$71,308	$60,213
Age 35-44	$41,307	$22,985	$33,027	$40,136	$42,184	$61,931	$56,372	$68,591	$100,000+	$77,741
Age 45-54	$43,688	$25,141	$35,360	$41,893	$46,040	$66,393	$60,700	$70,999	$100,000+	$98,169
Age 55-64	$44,492	$25,135	$34,643	$41,888	$45,462	$66,635	$57,377	$71,348	$100,000+	$89,995
Age 65+	$45,505	$29,218	$37,470	$49,005	$46,786	$81,306	$64,269	$78,110	$100,000+	$100,000+

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[6] The US Census Bureau data does not include medians for Certificates and non-degree credentials, but the "Some College, No Degree" category might be a reasonable substitute.
[7] The age 25-34 age band is a reasonable but imperfect proxy for starting salaries.
[8] See table 8 of www.census.gov/population/www/socdemo/education/cps2006.html from the 2006 Current Population Survey (CPS).

The following table calculates the ratio of the values in the previous table to the total median for age 25+. This demonstrates how the median income for a particular level of educational attainment and a particular age-band compares with the overall median.

Ratio to Age 25+ Total	Total	High School		College						
		Not a Graduate	Graduate, including GED	Some College no degree	Associate's degree	Bachelor's or more				
						Total	Bachelor's degree	Master's degree	Professional degree	Doctoral degree
Age 18+	95%	55%	77%	90%	100%	142%	127%	159%	NA	211%
Age 25+	100%	57%	79%	96%	102%	147%	129%	160%	NA	211%
Age 25-64	100%	57%	79%	96%	102%	145%	128%	159%	NA	206%
Age 25-34	83%	53%	70%	**80%**	**87%**	112%	**104%**	**126%**	**176%**	**148%**
Age 35-44	102%	57%	81%	99%	104%	152%	139%	169%	NA	191%
Age 45-54	108%	62%	87%	103%	113%	163%	149%	175%	NA	242%
Age 55-64	110%	62%	85%	103%	112%	164%	141%	176%	NA	221%
Age 65+	112%	72%	92%	121%	115%	200%	158%	192%	NA	NA

As the highlighted values indicate, the ratios for age 25-34 to the overall median are 80% for Certificates, 87% for Associate's degrees, 104% for Bachelor's degrees, 126% for Master's degrees, 148% for Doctoral degrees and 176% for Professional degrees.[9] The figures are close to certain of the percentile figures in the Bureau of Labor Statistics wage data, with Certificates close to the 25th percentile, Bachelor's degrees close to the 50th percentile (median), Master's degrees close to the 75th percentile and Doctoral and Professional degrees close to the 90th percentile.[10]

These values are remarkably close to multiples of 1/8. Given that this approach is somewhat arbitrary, it might be best to round the ratios to the nearest multiple of 1/8. That would yield the following ratios:

Degree	Rounded Ratio	Degree	Rounded Ratio
Certificate	3/4	Master's	1-1/4
Associate's	7/8	Doctoral	1-1/2
Bachelor's	1	Professional	1-3/4

These ratios would be applied to the median Bureau of Labor Statistics wage data for SOC codes that correspond to multiple degree levels. SOC codes that correspond to a single educational level such as technician-only SOC codes would be left unchanged at the median value.

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[9] Substituting the Age 25-64 overall median in the denominator yields percentages that differ by at most 1%, namely 80%, 88%, 104%, 127%, 149% and 176%. Substituting the age 18+ overall median in the denominator yields percentages that differ by at most 10%, namely 84%, 92%, 110%, 134%, 157% and 186%. Age 25+ was chosen because it yielded the lowest ratios and hence was the most conservative.

[10] Across all occupations in the Bureau of Labor Statistics wage data, the 25th percentile is 78% of the median with a standard deviation of 5%. The 75th percentile is 129% of the median with a standard deviation of 10% and the 90th percentile is 165% of the median with a standard deviation of 24%.