

External Cost Adjustments for the Wyoming School Funding Model: 2023

Submitted to:

The Joint Appropriations Committee and
Joint Education Interim Committee

Submitted by:

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Executive Summary

Cost-based funding models are designed to provide school districts with the level of funding they need to be able to purchase an essential “basket” of real educational resources (teachers, administrators, textbooks, etcetera). Inflation alters the price of those resources, so it is important to keep a close eye on the inflationary pressures impacting Wyoming school districts.

Since 2012, the Legislature has used four separate indices to monitor inflationary pressures and guide appropriate external cost adjustments (ECAs)—one for each of the four major components of the funding model (professional staff resources, non-professional staff resources, utilities and educational materials). The indices currently in use remain the best available measures of the inflationary pressures in Wyoming, so this report provides updated estimates for each of those price indices. The updated price indices for professional and nonprofessional labor were derived from Occupational Employment and Wage Statistics (OEWS) program data on wage levels by occupation in Wyoming and the other 49 states; the updated price indices for energy and educational supplies and materials were based on selected producer price indices (PPIs). Both the OEWS and PPI data were provided by the U.S. Bureau of Labor Statistics (BLS).

When properly calibrated using an appropriate price index (such as those recommended here) ECAs maintain the status quo. If the baseline price estimates overstate actual costs for one or more of the funding components, then applying an ECA to those funding components would simply perpetuate that overfunding. If a baseline price estimate understates actual costs for a funding component, then applying an ECA to that baseline estimate could keep the problem from getting worse but would not eliminate the underfunding problem. As such, the appropriate use of any or all of the recommended ECAs depends on the extent to which existing funding levels were appropriate to begin with.

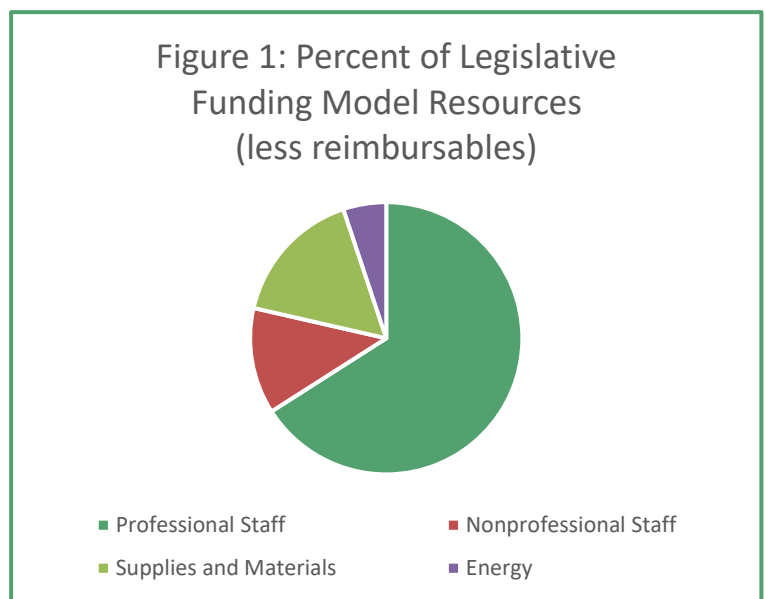
Introduction

Cost-based funding models are designed to provide school districts with the level of funding they need to be able to purchase an essential “basket” of real educational resources. The model funding levels are determined by multiplying the model-recommended real resource quantities (such as the recommended number of teachers or the recommended number of administrators) by the best available estimates of resource prices. Inflation alters those resource prices, so it is important to keep a close eye on the inflationary pressures impacting Wyoming school districts to ensure that they can continue to afford their recommended basket of educational resources.

Since 2012, the Wyoming Legislature has relied on four distinct indices to monitor inflationary pressures and guide external cost adjustments to the state’s funding model. Each index corresponds to one of the four primary components of the funding model: professional staff resources, non-professional staff resources, energy, and educational supplies and materials. I recommend that this approach to external cost adjustment be continued.

Resource Components of the Wyoming Funding Model

The Wyoming funding model supports four major types of school district spending—professional staff, nonprofessional staff, utilities, and other educational materials. As Figure 1 illustrates, two thirds of the educational resources in Wyoming are dedicated to professional staff such as teachers, administrators and librarians. Another 13 percent of the resources are dedicated to nonprofessional staff such as secretaries, custodians and groundskeepers. The remaining 21 percent of funding model resources are dedicated to non-staff resources such as energy and educational materials.

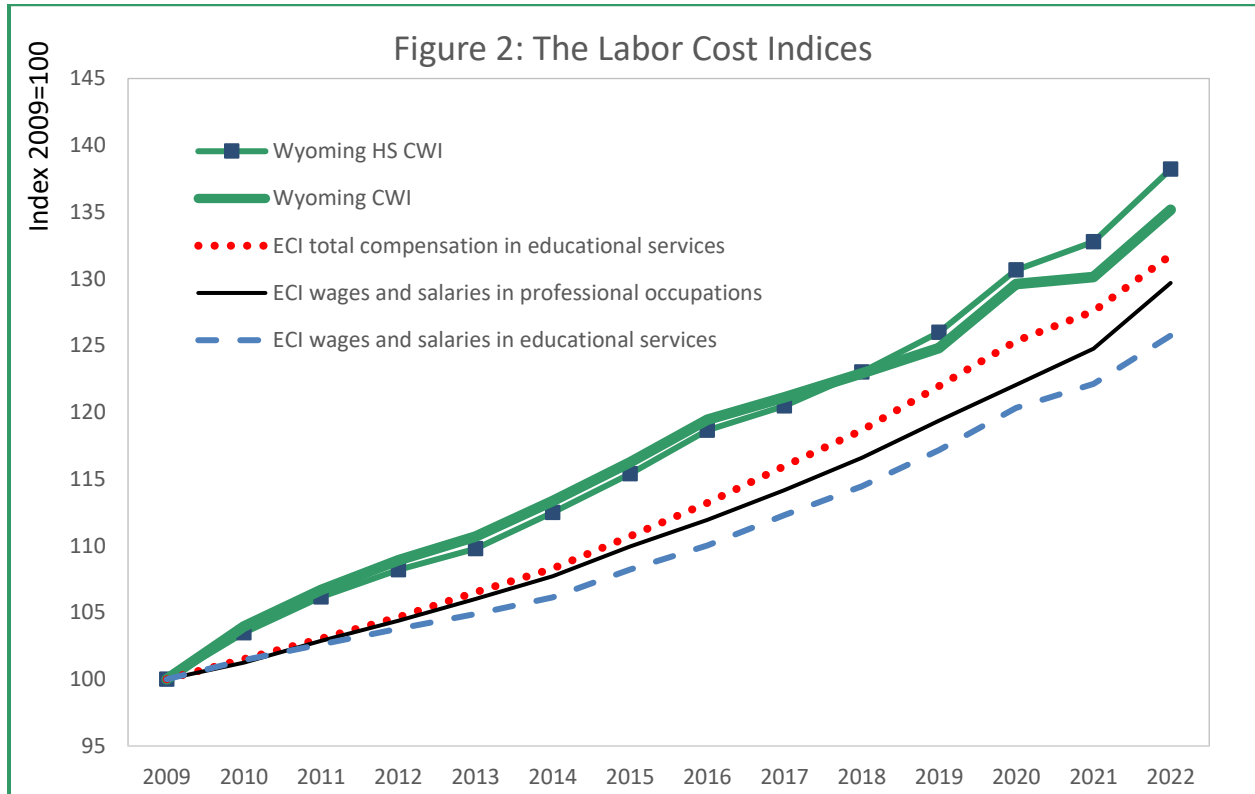


Source: Legislative Service Office

Cost Indices for Professional and Nonprofessional Labor

In previous reports (e.g., Taylor 2011 or Taylor 2020) I recommended that the Wyoming Legislature use an updated version of the NCES Comparable Wage Index (CWI) for college-educated workers as the ECA for professional labor, and a comparable wage index for high school graduates who have not completed college (HS CWI) as the ECA for non-professional labor. I stand by those recommendations.

The Wyoming comparable wage indices are particularly attractive tools for making inflation adjustments to the labor components of the funding model because they are Wyoming-specific labor cost indices. Labor costs are determined locally, not nationally, so state-based price indices are likely to be better than nationwide labor cost indices at measuring the cost pressures facing Wyoming school districts.



Sources: U.S. Bureau of Labor Statistics, National Center for Education Statistics and author's calculations.

Figure 2 illustrates the importance of using a Wyoming-specific labor cost index for external cost adjustment. The figure compares a variety of possible labor cost indices: the U.S. Bureau of Labor Statistics' Employment Cost Index (BLS ECI) for total compensation in educational services; the BLS ECI for wages and salaries in educational services; the BLS ECI for wages and salaries in all professional occupations; the Wyoming CWI and the Wyoming HS CWI.

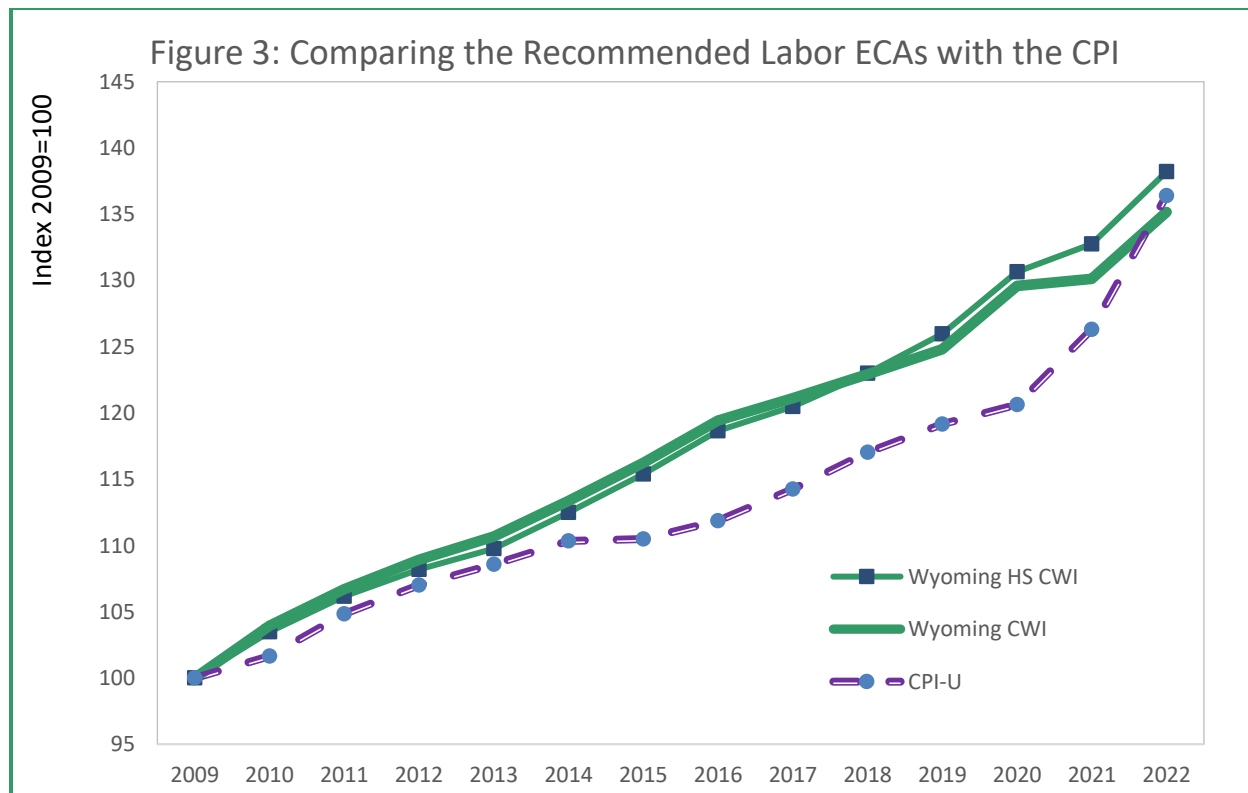
During the five-year period from 2009 through 2014, both the Wyoming CWI and the Wyoming HS CWI grew much more rapidly than any of the BLS ECIs presented in Figure 1. Over that five-year period, the Wyoming CWI and the Wyoming HS CWI grew more than 2.4 percent per year while none of the other indices grew by more than 1.6 percent per year. Clearly, the national labor cost indices understated the inflationary pressures facing Wyoming school districts at that time.

The period of exceptional wage growth in Wyoming appears to have passed. The BLS ECI for wages and salaries in education and the Wyoming CWI grew at roughly the same average annual

rate (2.3 and 2.2 percent, respectively) during the five-year period from 2017 through 2022. Meanwhile, the Wyoming HS CWI, the BLS ECI for wages and salaries in professional occupations and the BLS ECI for total compensation in education all grew at average annual growth rates between 2.6 and 2.8 percent. Over the most recent five years, the Wyoming HS CWI grew faster than all of the other labor cost indices under consideration while the Wyoming CWI grew slower.

If wages in Wyoming were to continue to grow at roughly the national rate, then it would not matter whether the ECA were based on a local wage index or a national one. However, there is no guarantee that the current pattern will persist and switching price indices can be tricky. Therefore, I recommend that the ECA continue to be based on Wyoming-specific comparable wage indices.

Figure 3 illustrates the importance of using a labor cost index rather than a consumer price index (CPI) like the commonly cited U.S. CPI for Urban Consumers (CPI-U) for external cost adjustments to the Wyoming funding model. As the figure makes clear, wage growth in Wyoming outstripped the growth in the CPI-U for years. An ECA based on the CPI-U would have failed to capture the price pressure that arose when labor markets were tight and real wages were rising. Similarly, wages can be slow to respond when prices are rising rapidly, which insulates employers—including school districts—from sharp changes in the general price level, as has been the case most recently.



Sources: U.S. Bureau of Labor Statistics, National Center for Education Statistics and author's calculations.

Cost Indices for Energy and Educational Materials

While labor costs can be heavily influenced by local conditions, the prices for energy and educational materials are largely determined at the national level. Therefore, national price indices are a good choice for cost adjustments for these model components. I recommend that the Wyoming Legislature continue to use a composite index based on the BLS producer price indices (BLS PPIs) for commercial electricity, commercial natural gas and light fuel oils (e.g., diesel and heating fuels) as the ECA for the energy components of the funding model, and the BLS PPI for office supplies and accessories as the ECA for the educational materials component of the Wyoming funding model.¹

Recommendations

Table 1 summarizes the recommended price indices for each of the four funding model cost components while Figure 4 illustrates the relationship among those indices. As the table and figure illustrate, the CWI and HS CWI have been rising steadily and at very similar rates for more than a decade. The educational materials cost index grew more slowly than either labor cost index for most of the period but has grown quite rapidly in the last couple of years. (Supply chain issues arising from the COVID19 pandemic undoubtedly contributed to the recent surge in the price of educational materials.) The energy cost index has been the most volatile of the four, which is consistent with recent swings in the price of natural gas and fuel oils (such as diesel).

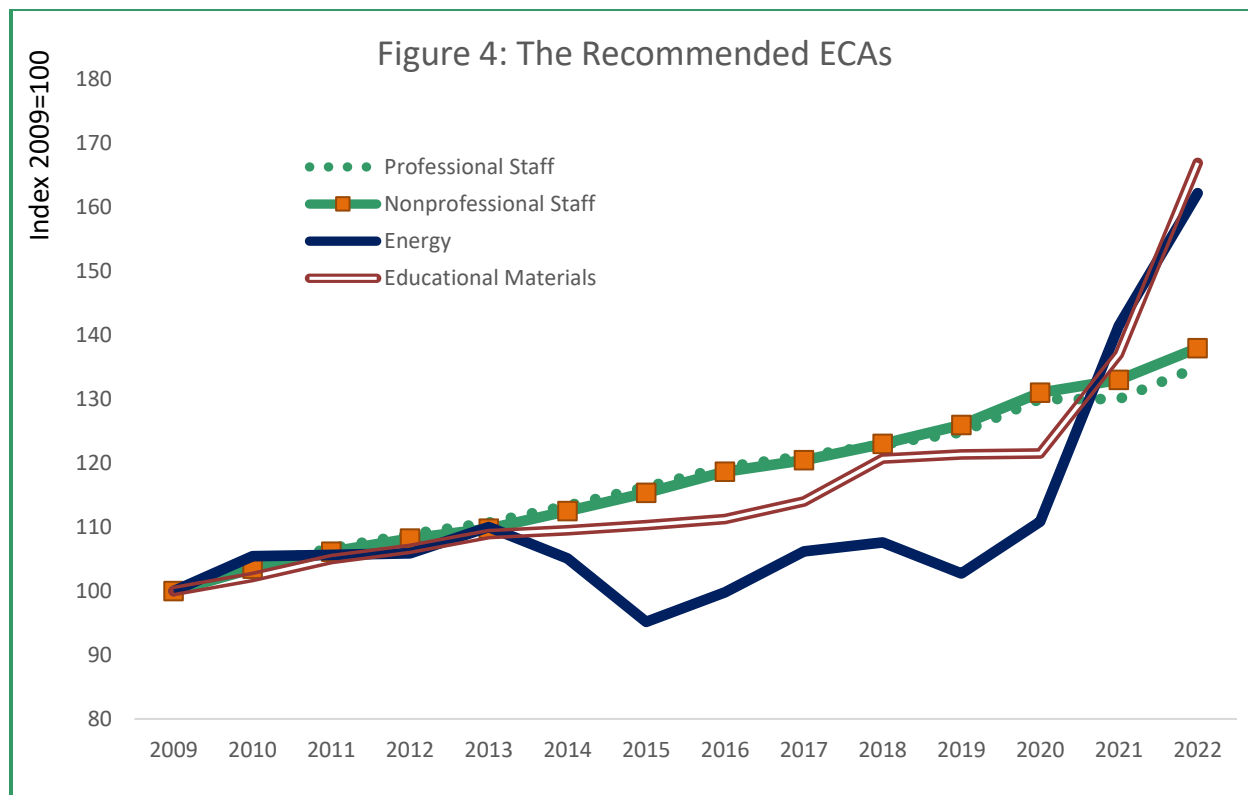
Table 1: The Recommended Cost Indices for Funding Model Components

Year	Professional Staff Cost Index	Nonprofessional Staff Cost Index	Composite Energy Cost Index	Educational Materials Cost Index
2014-15	113	112	105	110
2015-16	116	115	95	110
2016-17	119	119	100	111
2017-18	121	120	106	114
2018-19	123	123	108	121
2019-20	125	126	103	121
2020-21	130	131	111	122
2021-22	130	133	141	137
2022-23	135	138	162	167

Note: The Professional Staff Cost Index is the updated Wyoming CWI, while the Nonprofessional Staff Index is the Wyoming High School CWI. See Appendix for details on the construction of these indices. The Energy Cost Index is a regression-based aggregate of the annual average PPIs for commercial electricity, commercial natural gas and light fuel oils. The Educational Materials Cost Index is the annual average PPI for office supplies. All indices have been rebased so that 2009=100.

Sources: U.S. Bureau of Labor Statistics, National Center for Education Statistics and author’s calculations.

¹ The composite index is defined $0.568 \times \text{the PPI for electric power} + 0.191 \times \text{the PPI for commercial natural gas} + 0.040 \times \text{the PPI for light fuel oils} - 28.8$, where all the PPIs were indexed so that 1997=100. The weights were chosen to track the Bureau of Economic Analysis’ Chain-Type Price Index for Energy Inputs for the Educational Services Industry.



Sources: U.S. Bureau of Labor Statistics, National Center for Education Statistics and author's calculations.

Conclusions

Since 2012, the Legislature has used four separate indices to monitor inflationary pressures and guide appropriate external cost adjustments (ECAs)—one for each of the four major components of the funding model (professional staff resources, non-professional staff resources, utilities and educational materials). The indices currently in use remain the best available measures of the inflationary pressures in Wyoming, so this report provides updated estimates for each of those price indices. The updated indices imply that wage levels in Wyoming for both professional and nonprofessional labor increased by 3.8 percent between 2021-22 and 2022-23, while the prices for energy and educational materials increased by 14.7 and 21.9 percent, respectively. As such, the evidence suggests that all components of the funding model may require a significant cost adjustment.

That said, it is important to recognize that cost adjustments just maintain the status quo. If the baseline price estimates overstate actual costs for one or more of the funding components, then applying an ECA to those funding components would simply perpetuate that overfunding. If a baseline price estimate understates actual costs for a funding component, then applying an ECA to that baseline estimate could keep the problem from getting worse but would not eliminate the underfunding problem. As such, the appropriate use of any or all of the recommended ECAs depends on the extent to which existing funding levels were appropriate to begin with. .

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Appendix A: Extending the Wyoming CWI and HS CWI

The National Center for Education Statistics' Comparable Wage Index (NCES CWI) was constructed to measure the prevailing wage for college graduates for each state and for 800 U.S. Labor markets. The baseline estimates (for 1999) came from a regression analysis of individual earnings data from the 2000 U.S. Census. Annual updates to that baseline came from regression analyses of occupational earnings data published by the U.S. Bureau of Labor Statistics (BLS).²

Taylor and Fowler (2006) used data from what is now called the BLS Occupational Employment and Wage Statistics (OEWS) program to generate annual index values for 1997 through 2005. The OEWS is a BLS database that contains employment and average annual earnings by occupation for states and metropolitan areas. They reported that survey respondents typically employed nearly three quarters of the civilian, nonfarm workers in the United States.

Taylor and Fowler (2006) used the OEWS data to estimate an occupationally adjusted wage in each labor market area, and then adjusted the baseline NCES CWI to reflect the annual growth in those wage estimates for each location.³ For example, if their analysis of the OEWS data indicated that the wage level in Cheyenne increased by 5 percent between 1999 and 2001, they revised the baseline CWI for Cheyenne upward by 5 percent to generate an estimate of the Cheyenne CWI in 2001.

To generate a state-level CWI that could be used as an ECA, I followed their methodology and updated the state-level NCES CWI from 2005 through 2020. I used OEWS data to estimate the occupationally adjusted wage level in each U.S. state each year. Each model yielded a predicted wage for each occupation in each state. The state wage level was a weighted average of the predicted wages by occupation for that state, where the weights were each occupation's share of total employment among the national sample of college graduates in the 2000 census database. Thus, occupations that were held only rarely by college graduates were given little weight in the construction of the OEWS wage levels, while occupations that employed college graduates intensively were given greater weight. I then calculated the annual rate of change in the OEWS wage estimates and adjusted the Wyoming CWI accordingly.

Following same methodology as was used in the construction of the NCES-CWI and my extensions thereof, I also used data from the 2000 census to estimate the baseline prevailing wage for workers who held a high school diploma but not a bachelor's degree. I then generated the state-level HS CWI, and updated it annually with the OEWS data, using each occupation's share of total employment among the national sample of high school graduates without bachelor's degrees as the occupational weights. See Taylor 2011 for a description of the construction of the HS CWI.

² The methodological discussion in this appendix borrows heavily from Taylor and Fowler (2006). For more on the estimation of the NCES CWI, see Taylor and Fowler (2006).

³ See Appendix A of Taylor and Fowler (2006) for details.

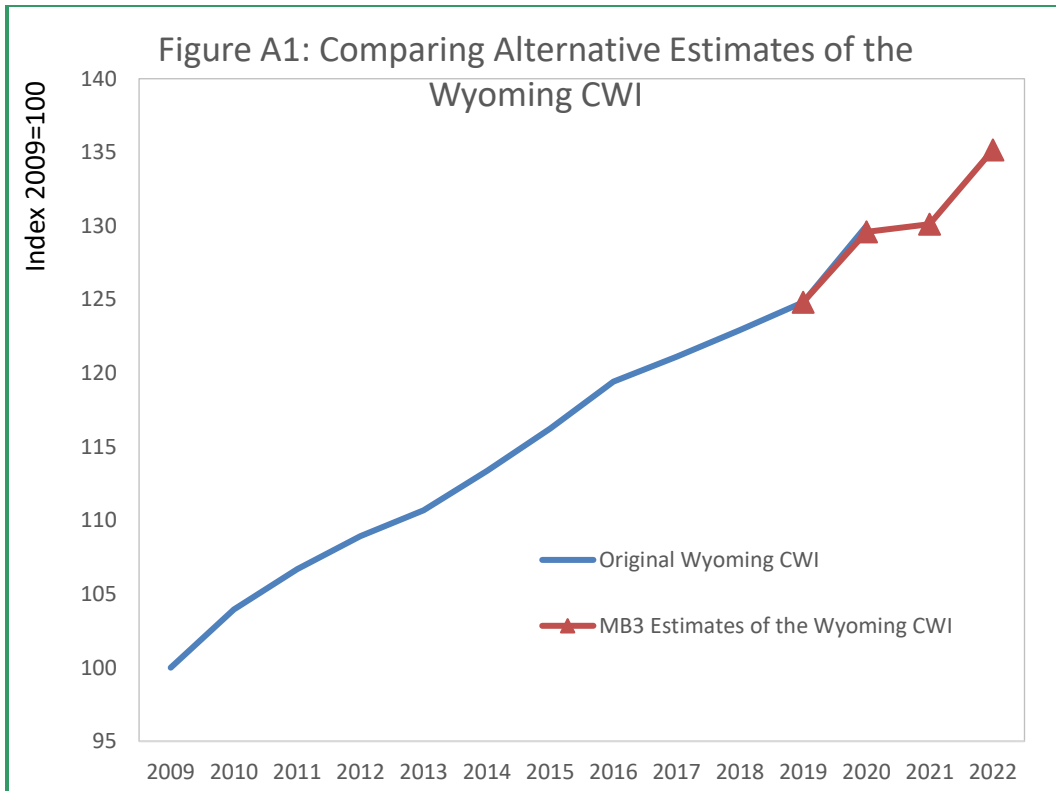
With the 2017 OEWS, however, the BLS began to transition to a new standardized occupational classification (SOC) system that provided for much more occupational detail. A number of occupations were combined in the 2018 SOC system that had not previously been combined while a number of increasingly important occupations were disaggregated in the 2018 SOC system.

Furthermore, in 2021, the OESW also adopted a new method for producing estimates of occupational employment levels and mean wages. The 2021 OEWS data were based solely on the new model-based estimation methodology (which they called MB3) and the new 2018 SOC codes (U.S. Bureau of Labor Statistics, n.d.).

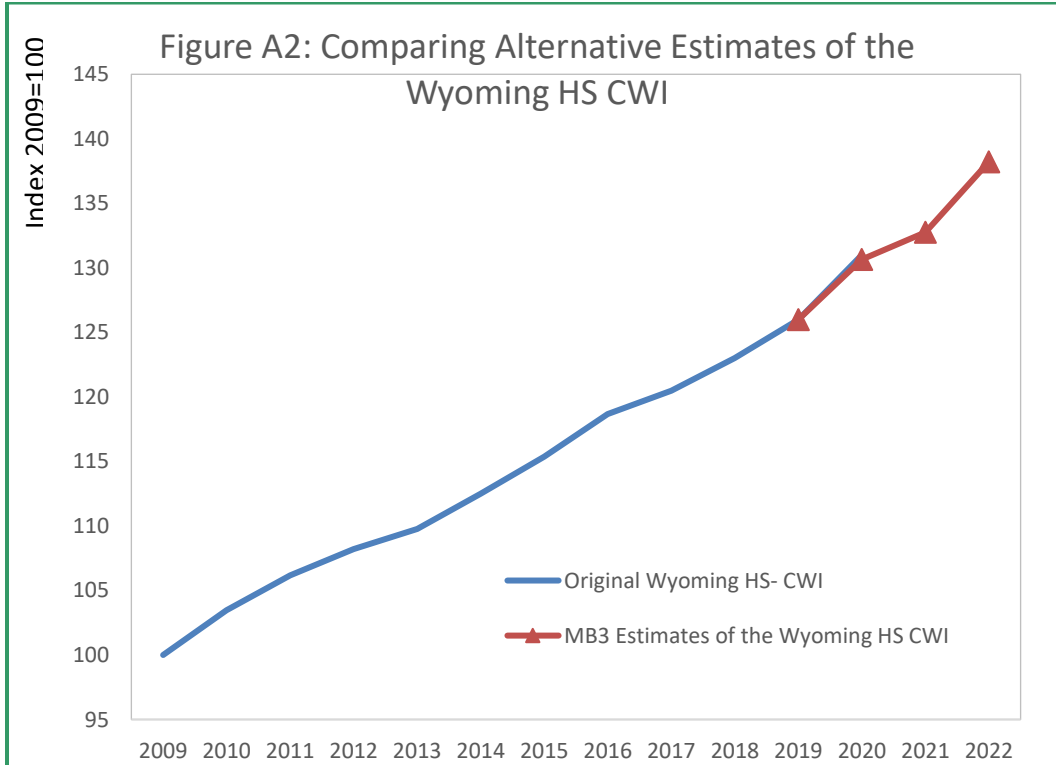
Fortunately, the OEWS also recalculated their data for the years 2015-2020 using the new estimation methodology and made those recalculated files available to researchers. The November 2018 and later panels were collected using the 2018 SOC system. Therefore, I re-estimated the wage level for Wyoming using the MB3 files and the new 2018 SOC coding scheme for the years 2019 and 2020.

Because the occupational redefinitions make it impossible to hold the occupational mix constant over time (as I had done for the period 2005-2020) I also updated the occupational mix used to construct the state-level estimates of the wage level in Wyoming using data from the American Community Survey for 2020.

Figure A1 presents the Wyoming CWI calculated in two ways: first, using the 2000 census occupation codes and weights and the official OEWS estimates of occupational employment levels and mean earnings, and second using the 2020 census (i.e., the 2018 SIC) occupation codes and weights, and the MB3 estimates of occupational employment and earnings. Figure A2 presents the same comparison for the HS CWI. As the figures make clear, the two sets of estimates track each other reasonably well for the years 2019 and 2020, suggesting that splicing the two data series would yield credible estimates of the Wyoming CWI and HS CWI. Therefore, this is the approach taken here.



Source: author's calculations.



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