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Comparable Wage Index

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Purpose

- …evaluate the current methodology used to calculate the Maryland Geographic Cost of Education Index and provide any recommendations to change the methodology
- Department then determines how and whether to alter the methodology
- Depending on the Department's decision, the final report, due June 30, 2016, will report on an update of the current GCEI or the results of a new method for adjusting for geographical cost differences.

Geographical Cost Variation

- Cost: the minimum amount of money necessary to buy the *inputs* required to produce one unit of *output*
  - Difficult to determine for educational outputs
- How costs vary:
  - By the quantity of inputs: staff, instructional materials, technology, other equipment
  - Input prices: how much all of these cost – staff salaries/benefits, price of textbooks, energy prices, etc.

Geographical Cost Variation

- Why costs vary:
  - Uncontrollable district/school characteristics: level of student need, climate, size, local cost of living
  - Controllable characteristics: class sizes, hiring practices, size of administration
  - GCEI should adjust for the former, but not the latter

Current Maryland GCEI

- A weighted index of four components:
  1. An index of uncontrollable wage variation for professional employees (both teaching and non-teaching)
  2. An index of uncontrollable wage variation for non-professional employees
  3. An index of uncontrollable energy costs
  4. A fixed amount for other expenditures (e.g. supplies, materials, equipment, and miscellaneous items)

Professional Cost Index

- Made up of the following factors:
  - Average home value
  - Violent crime rate
  - Commuting time
  - Percent of free & reduced price lunch students
  - Employee characteristics
  - Regional per capita income
  - Year of data indicator

Non-Professional Cost Index

- Made up of the following factors:
  - Average home value
  - Unemployment rate
  - Percent of free & reduced price lunch students
  - Employee characteristics
  - District wealth
  - Year of data indicator

Energy Cost Index

- Energy cost Index:
  - Total district energy expenditures
  - Heating and cooling degree days
  - Enrollment
  - District wealth
  - Energy costs as percent of total costs

Strengths and Weaknesses

- Accounts for multiple cost factors (geographic location, district characteristics, wages, other inputs)
- Does not account for all district cost variations
- Is influenced by costs under control of districts
- May adjust for costs already addressed by funding formula
- Is complex, requiring multiple data sources
- Is treated as a formula add-on, not applied to all aspects of the formula
- Truncated to eliminate values below 0
- Is fully funded by the state

Alternative Approaches

- Three generally accepted approaches to GCEIs:
  1. Cost of living adjustment – similar to CPI, heavily influenced by variation in housing costs
     - Straightforward, but does not account for local amenities, relies on multiple data sources
  2. Comparable wage index (CWI) – calculated by measuring variation in wages of workers similar to teachers
     - Considers worker preferences and local amenities
     - Easy to update (single data source)
     - Not influenced by district decisions
     - Assumes teacher preferences similar to other workers'
     - Does not adjust for working conditions
     - Only considers variation in wage costs

Alternative Approaches

- Generally accepted approaches to GCEIs:
  3. Hedonic wage index – accounts for variation in wage costs due to geographic location and student characteristics
     - Can break out impact of specific cost factors
     - Captures impact of student characteristics
     - May consider worker preferences and local amenities – although confounded by use of actual salary data
     - May be difficult to update due to multiple data sources
     - More complex formulas inappropriate for states with few districts like Maryland

Why CWI

- Isolates only wage costs
- Examines cost outside of districts control
- Uses readily available data
- Can easily be updated annually
- Could be applied both above and below 1.0
- Could be applied to all aspects of the formula

Data: American Community Survey

- Replacement for long-form on decennial census
- Identified down to Public Use Microdata Areas (PUMA): 100,000 + residents
  - In MD, some PUMAs contain multiple districts (or counties)
- For Maryland, split observations into "Professional" and "Non-Professional" groups
  - Both exclude those in 'Elementary and Secondary Schools'
  - "Professional" only includes those with BA or higher

Professional / Non-Professional CWI, 2014

Public Use Microdata Area (PUMA)	District	Professional CWI	Non-Professional CWI
100	Allegany	0.785	0.899
1200	Anne Arundel	1.145	1.104
800	Baltimore City	1.078	1.09
500	Baltimore	1.08	1.08
1500	Calvert	1.121	1.085
1300	Caroline	0.878	0.909
400	Carroll	0.979	0.91
700	Cecil	1.057	0.875
1600	Charles	1.014	1.115
1300	Dorchester	0.878	0.909
300	Frederick	1.01	1.028
100	Garrett	0.785	0.899

Public Use Microdata Area (PUMA)	District	Professional CWI	Non-Professional CWI
600	Harford	1.087	1.094
900	Howard	1.14	1.133
1300	Kent	0.878	0.909
1000	Montgomery	1.203	1.114
1100	Prince George's	1.121	1.166
1300	Queen Anne's	0.878	0.909
1400	Somerset	0.972	0.964
1500	St. Mary's	1.121	1.085
1300	Talbot	0.878	0.909
200	Washington	0.966	0.884
1400	Wicomico	0.972	0.964
1400	Worcester	0.972	0.964

Overall CWI

- CWI only adjusts for labor costs, which comprise 90% of district budgets (80% for professional workers, 10% non-professional)
- Can apply Professional and Non-Professional CWI to 80% and 10% of revenue, or combine into one overall CWI:

$$CWI_{overall} = 0.8*CWI_{prof} + 0.1* CWI_{non\text{-}prof} + 0.1$$

Overall CWI, 2014

Public Use Microdata Area (PUMA)	District	Overall CWI
100	Allegany	0.818
1200	Anne Arundel	1.126
800	Baltimore City	1.072
500	Baltimore	1.072
1500	Calvert	1.105
1300	Caroline	0.894
400	Carroll	0.974
700	Cecil	1.033
1600	Charles	1.023
1300	Dorchester	0.894
300	Frederick	1.011
100	Garrett	0.818

Public Use Microdata Area (PUMA)	District	Overall CWI
600	Harford	1.079
900	Howard	1.126
1300	Kent	0.894
1000	Montgomery	1.174
1100	Prince George's	1.113
1300	Queen Anne's	0.894
1400	Somerset	0.974
1500	St. Mary's	1.105
1300	Talbot	0.894
200	Washington	0.961
1400	Wicomico	0.974
1400	Worcester	0.974

Additional considerations

- To further smooth year-to-year changes, could use a three-year moving average

3-year moving average CWI, 2010-2014

Public Use Microdata Area (PUMA)	District	2010-2014
100	Allegany	0.811
1200	Anne Arundel	1.109
800	Baltimore City	1.066
500	Baltimore	1.065
1500	Calvert	1.079
1300	Caroline	0.923
400	Carroll	0.985
700	Cecil	1.000
1600	Charles	1.055
1300	Dorchester	0.923
300	Frederick	1.047
100	Garrett	0.811

Public Use Microdata Area (PUMA)	District	2010-2014
600	Harford	1.073
900	Howard	1.131
1300	Kent	0.923
1000	Montgomery	1.166
1100	Prince George's	1.129
1300	Queen Anne's	0.923
1400	Somerset	0.941
1500	St. Mary's	1.079
1300	Talbot	0.923
200	Washington	0.957
1400	Wicomico	0.941
1400	Worcester	0.941

Comparison of CWI and GCEI

Local Unit	3-Year Rolling Average CWI	3-Year Rolling Average CWI, Truncated	GCEI
Allegany	0.811	1.000	1.000
Anne Arundel	1.109	1.109	1.018
Baltimore City	1.066	1.066	1.042
Baltimore	1.065	1.065	1.008
Calvert	1.079	1.079	1.021
Caroline	0.923	1.000	1.000
Carroll	0.985	1.000	1.014
Cecil	1.000	1.000	1.000
Charles	1.055	1.055	1.020
Dorchester	0.923	1.000	1.000
Frederick	1.047	1.047	1.024
Garrett	0.811	1.000	1.000

Comparison of CWI and GCEI

Local Unit	3-Year Rolling Average CWI	3-Year Rolling Average CWI, Truncated	GCEI
Harford	1.073	1.073	1.000
Howard	1.131	1.131	1.015
Kent	0.923	1.000	1.010
Montgomery	1.166	1.166	1.034
Prince George's	1.129	1.129	1.048
Queen Anne's	0.923	1.000	1.011
St. Mary's	1.079	1.079	1.002
Somerset	0.941	1.000	1.000
Talbot	0.923	1.000	1.000
Washington	0.957	1.000	1.000
Wicomico	0.941	1.000	1.000
Worcester	0.941	1.000	1.000

Recommendations

- Adopt 3-year moving average CWI as regional cost adjustment
- Include only wage costs, eliminate energy and other cost components
- Stop truncating the index to allow values less than 1.0
- Apply the CWI to all aspects of the MD formula and include in wealth equalization

Questions?