Price and Real Output Measures for the Education Function of Government: Exploratory Estimates for Primary & Secondary Education

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What Quality Adjustments? U.S. Exploratory Estimates

- Enrollments as the Base Index
- Significant Research Has Been Done on Possible Quality Adjustments, But Still Only a Beginning
  - Teaching Staff Composition
  - Class Size
- Research Yet to be Done
  - High School Drop-Out Rate
  - College Enrollment Rate

What Quality Adjustments? U.S. Exploratory Estimates Teaching Staff Composition

- No Question That Teacher Quality Matters
  - Most Significant Source of Achievement Variation - Rivkin, Hanushek, & Kain (2001)
  - Can Result in a Difference of 1.5 Grade Levels of Achievement Within a Single School Year - Hanushek (1998)

What Quality Adjustments? U.S. Exploratory Estimates Teaching Staff Composition

- The National Center for Educational Statistics (NCES 2000) of 13 Factors of School Quality That Are Related to Learning Identifies 4 Related to Teacher Quality:
  - Teacher Academic Skills
  - Teacher Assignment
  - Teacher Experience
  - Professional Development

What Quality Adjustments? U.S. Exploratory Estimates Teaching Staff Composition

- National Education Association (NEA) and NCES Surveys
  - Currently Used by BEA to Create a Teaching Staff Composition Index for Primary & Secondary Public Ed
  - Is a Fixed Weight Labor Compensation Index
  - 6 Categories of Experience & 5 Categories for Highest Degree Obtained
    - From 1960-1990 the Number of Teachers With a Master's Degree Doubled
    - Some Categories Have a Small Number of Entries

What Quality Adjustments?
U.S. Exploratory Estimates - Class Size

- Intuition Says That at Some Level, at Some Point, Class Size Must Matter, BUT
- Hanushek (1998) - Krueger (1998, 2002) Debate
  - Hanushek
    - Only 14% of 277 Independent Studies Found a Statistically Significant Correlation
    - Notes Intra-School Class Sizes Not Determined at Random
  - Krueger Uses Same Data and Disagrees

What Quality Adjustments?
U.S. Exploratory Estimates - Class Size

- Greatest Evidence for Primary Grades Effect - See Finn (1998) & Ivor Pritchard (1999) Summaries
- BEA Exploratory Estimates Use Minus the Pupil-teacher Ratio with a .1 Weight for Primary Ed Only as a Proxy for Class Size
  - Many Factors Affect the Pupil-teacher Ratio
  - These Include the Possible Increase in the Number of Teacher Specialists and Special Classes

What Quality Adjustments? U.S. Exploratory Estimates - High School Completion

- A Decrease in High School (HS) Drop-out Rates is Indicative of Greater Success with at Least Those Students
- Drop-Out Rates Fall From 14% in 1980 to 11% in 2001
- But to What Extent are Drop-out Rates Determined by Non-school Factors, Such as Social Capital?
- Minus the Drop-out Rate with a .1 Weight Is Applied to HS Enrollments

- Further Research Needed

What Quality Adjustments? U.S. Exploratory Estimates - High School Completion

- College Enrollment Rate as a Proxy for the Quality of HS Ed Received
  - But These Rising Enrollments May Be Primarily a Function of Changing Labor Market Conditions
  - Accordingly, College Enrollment Rates Are Not Used as a Quality-Adjuster

U.S. Exploratory Estimates - Table 2
% Annual Rates of Growth in Perspective Volume Indicator Quality-Adjusters

	1980-2001	1980-1990	1990-2001
Teaching Staff Composition	**0.13**	**0.49**	**-0.20**
Pupil-teacher Ratio	**-.77**	**-.83**	**-0.71**
High School Drop-out Rate	**-1.31**	**-1.52**	**-1.11**
College Enrollment Rate	**1.07**	**2.00**	**0.24**

Price Change vs. Quantity Change
Table 3

- For Periods Listed
  - Price Change Always > than Quantity Change
  - Education Price Changes About 2X Gross Domestic Purchases Price Changes

- BUT Price Changes Probably Overestimated

Rates of Growth of Prices as a % of Rates of Growth of Nominal Expenditures

- If Not All Quality Changes Are Captured, Quantity Changes My Be Underestimated and Price Changes May be Overestimated
- Rise In Numbers of Special Ed Students
  - 30% Increase Over Last 10 Years
  - Average Ed Cost 2X Average Ed Cost Across All Students
- Education Inflation May Differ From General Inflation, e.g., for Compositional Reasons

Rates of Growth of Prices as a % of Rates of Growth of Nominal Expenditures

- For Available Periods in the 90's
  - UK 80%
  - Netherlands 75%
  - Australia 66%
  - US 75% Based on Quality-Unadjusted Index for Higher Education
- Rates of Growth of GDP Prices May Be < 50% of Rates of Growth of Nominal GDP

U.S. Exploratory Estimates
Table 3: % Annual Rates of Growth in Price & Volume Indicators - Quality Adjusted

- Show Quality-Adjustments Applied One-at-a-time
- Quality-Adjustment Impact On Prices For the Preferred Index Is:
  - 1980-2001 -.21%
  - 1980-1990 -.63%
  - 1990-2001 +0.17%
- However, All Are Exploratory

Conclusion
Research, Research, & More Research
And Feedback Needed

- Higher Ed, Libraries, & Other
- Primary & Secondary Ed
  - High School Completion Factors
  - Special Classes & Teaching Specialists
  - Scope of School-related Activities
  - Composition of the Student Body
- Approach of Stripping Non-school Factors From an Outcome Measure

- Exciting Area With Many Challenges