Developing Synthetic Worklife Earnings Estimates

Robert A. Kominski and Tiffany Julian, U.S. Census Bureau

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Research Question:

- How much money can someone expect to earn over the course of their working life?

Research Goal:

- Create Synthetic Worklife Earnings Estimates (SWE's) that account for various factors influencing earnings

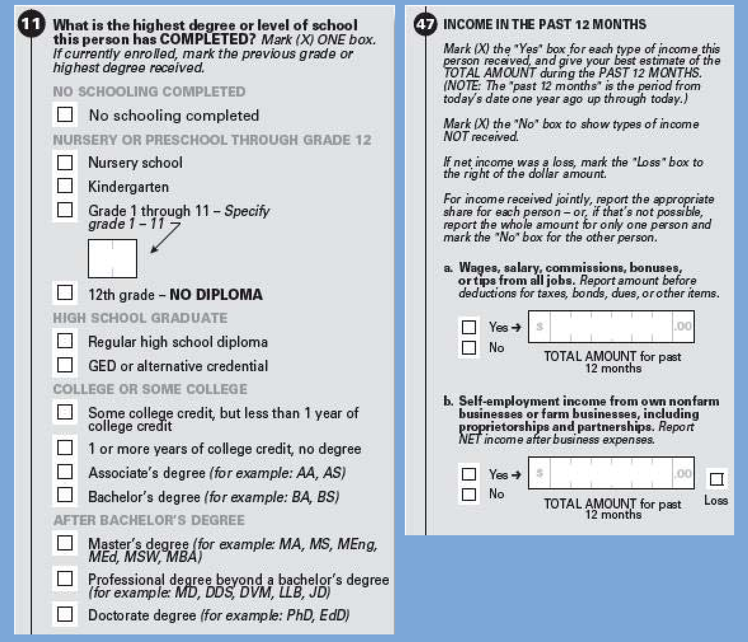
Issues in Answering that Question:

1. Is there a basic relationship between earnings and education?
2. What is the appropriate universe of study?
3. Medians or means?
4. What method of computation should be used?
5. Are there other factors that impact earnings?

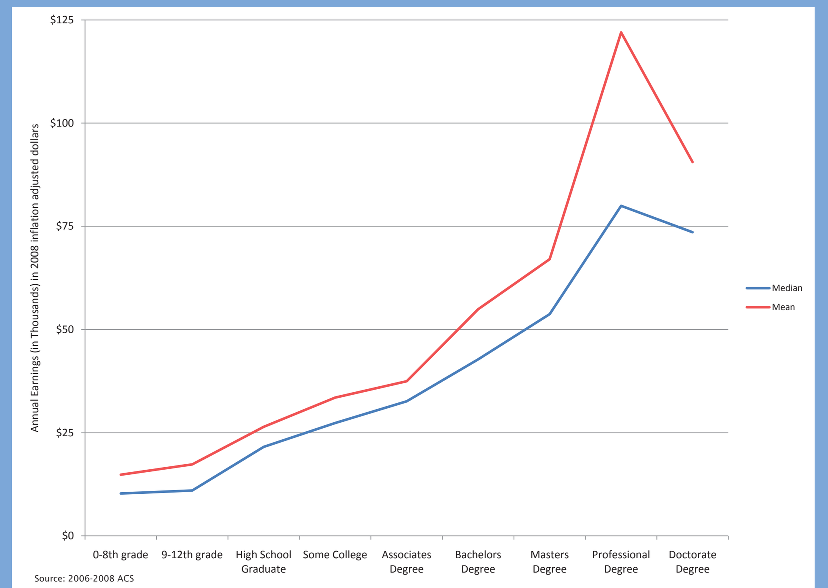
DATA

- The 2006-2008 American Community Survey (ACS) multi-year file
- ACS is a large national continuous survey designed to replace the Census long form.
- Mailout of 250,000 households a month; telephone and personal visit follow-up
- About 2 million interviews a year, weighted to July 1 population controls
- Provides socio-demographic data for many subpopulations and geographic areas
- Multi-year files provide ever larger samples.
- This 3-year file has 5,837,976 sample households and 13,676,996 sample persons.
- Why use ACS? The large sample allows disaggregation of important subtypes.

QUESTION

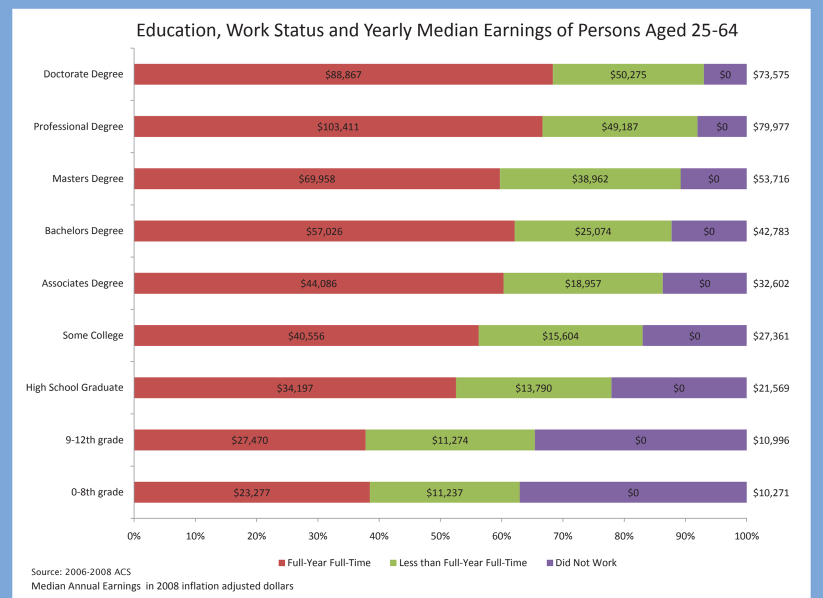


ISSUE 1: IS THERE A RELATIONSHIP BETWEEN EDUCATION AND EARNINGS?



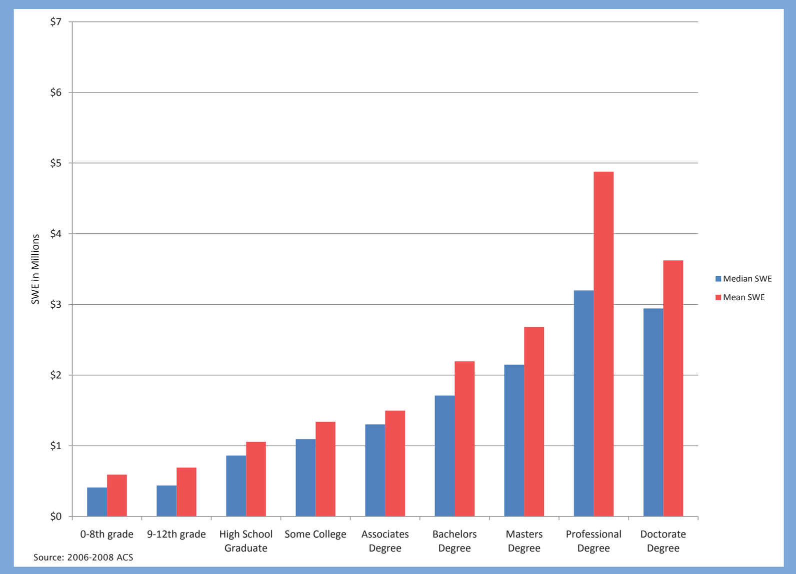
Yes! Annual earnings show a clear relationship with education, regardless of summary measure.

ISSUE 2: WHAT IS THE APPROPRIATE UNIVERSE?

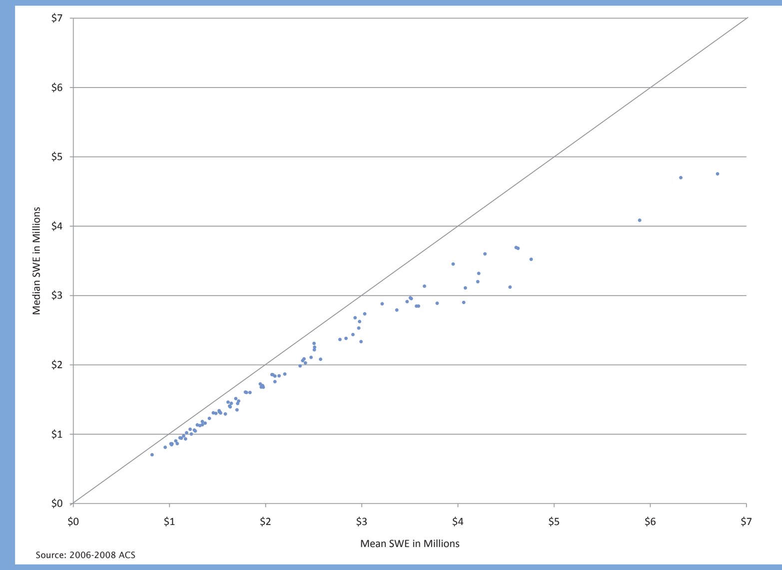


- Full-Year Full-time workers represent "purest" earnings relationship.
- BUT- Other groups constitute a sizeable proportion of the total population.

ISSUE 3: MEDIANS OR MEANS?



- At every level mean SWE estimates are higher.
- At high levels of education the gap between median and mean becomes much larger.
- For Professional degree holders the discrepancy is quite large.



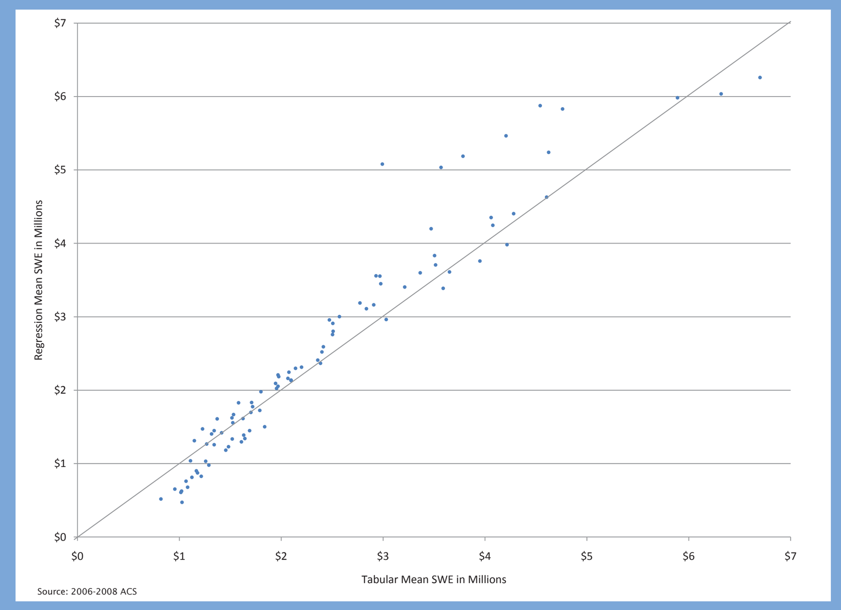
- For 90 different race/gender/education subgroups, the correlation of mean SWE and median SWE is .99
- Mean values are always higher.
  - Except other, non- hispanic males and females with doctorate degrees not significantly different from median

ISSUE 4: METHOD OF COMPUTATION

Tabular or Regression?

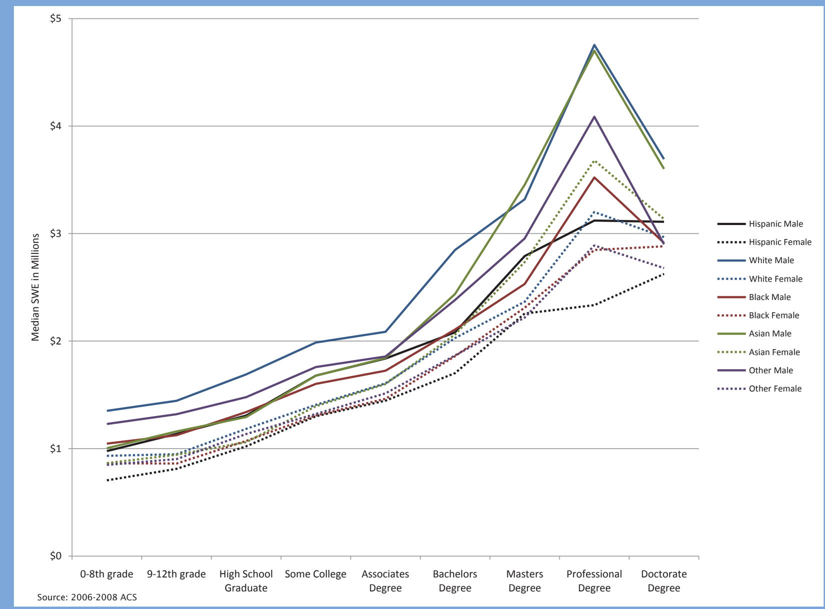
- Tabular Method:
  - Construct a table of:

    education (9) x race (5) x gender (2) x age (8) = 720 cells for each of the employment status groups.
  - For a single combination of education/race/gender add up the values for each of the 8 age groups and multiply by 5 to capture 40 years of worklife.
- Regression Method:
  - Calculate regression estimates for dummy variables representing each demographic characteristic.
  - For a single combination of education/race/gender, add the intercept, and regression estimate for the education level, race, and gender to each of the age group estimates and multiply by 5 to capture 40 years of work life.



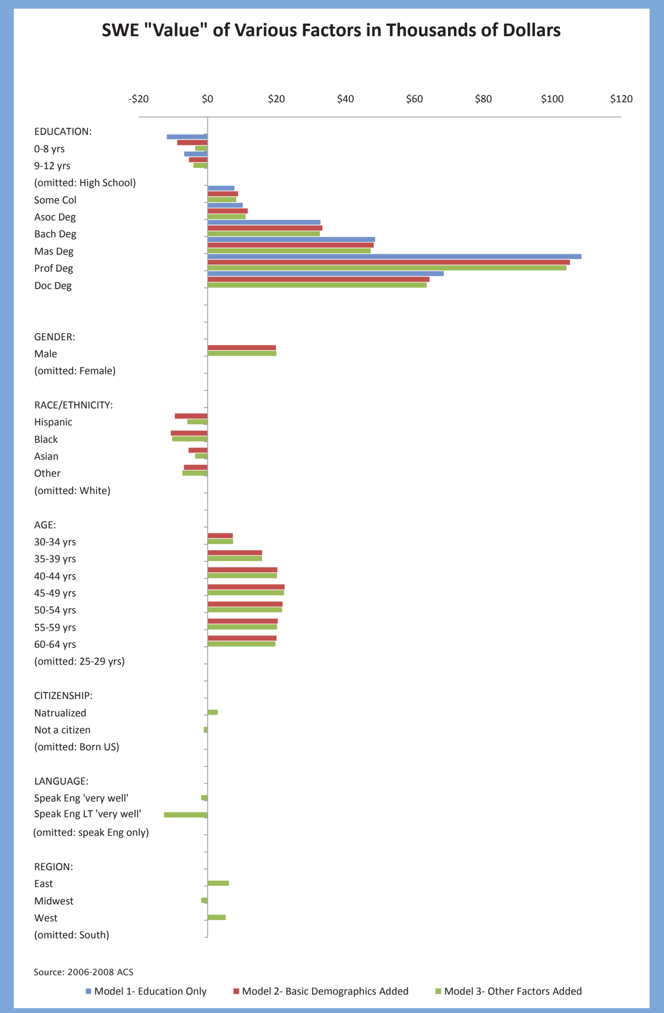
- For 90 demographic subgroups the correlation of mean SWE based on tabular method and mean SWE based on regression method is .96!
- In some cases, the regression mean SWE is larger than the tabular mean SWE. (dots above the line)
- BUT at lower levels of SWE the tabular mean is larger than the regression mean. (dots below the line)

ISSUE 5: OTHER FACTORS



- Examining SWE by basic demographics in the tabular approach shows variation:
  - Males generally higher than females
  - Race/ethnicity differences as well
  - Differences at many education levels
- The regression model can add these demographic characteristics, as well as other factors.
- We choose citizenship, English language ability and geographic region as three additional factors.
- Regression parameters show the average yearly *dollar value* of each variable category.

REGRESSION RESULTS



- Model 1- Education only (Blue)
  - Demonstrates a clear strong relationship between Education and SWE.
- Model 2- Basic Demographics Added (Red)
  - Reduces some but not all education effects.
  - Gender value (for males) is larger than any race/ethnicity effect.
- Model 3- Other Factors added (Green)
  - These factors dampen the negative impact of low education and Hispanic ethnicity.
  - Speaking English less than "very well" *costs* over $12,000 a year, or over a half-million dollars in a 40-year worklife!

ANSWERS TO ISSUES

1. There is an education-earnings relationship.
2. Full-year Full-time provides most robust estimates.
3. Means yield over-all higher values.
4. Tabular and regression methods yield similar results, with variation in tails of distribution.
5. Other factors appear highly useful in explaining additional variation.

SO, HOW MUCH DO DIFFERENT PEOPLE EARN OVER A LIFETIME?

- Among the Highest Median SWE:
  - Full-Year Full-Time, White, Male, Professional Degree -- $4,754,930
  - Full-Year Full-Time, Asian, Male, Professional Degree -- $4,700,782
  - Full-Year Full-Time, Other, Male, Professional Degree -- $4,086,575

  These estimates are not significantly different from one another
- Among the Lowest Median SWE:
  - Less than Full-Year Full-Time, White, Female, 0-8 years -- $326,209
  - Less than Full-Year Full-Time, Black, Female, 0-8 years -- $335,556
  - Less than Full-Year Full-Time, Hispanic, Female, 0-8 years -- $335,903

  These estimates are not significantly different from one another

WHERE DO YOU FIT IN?

		Male	Female
Race	*Education*	Median synthetic lifetime earnings	Median synthetic lifetime earnings
Hispanic	0-8th grade	$976,727	$704,005
Hispanic	9-12th grade	$1,136,694	$811,885
Hispanic	High School Graduate	$1,306,747	$1,021,242
Hispanic	Some College	$1,679,364	$1,301,068
Hispanic	Associates Degree	$1,837,607	$1,446,134
Hispanic	Bachelors Degree	$2,080,558	$1,701,767
Hispanic	Masters Degree	$2,791,370	$2,255,883
Hispanic	Professional Degree	$3,120,466	$2,334,295
Hispanic	Doctorate Degree	$3,109,666	$2,624,329
White, Not Hispanic	0-8th grade	$1,351,121	$932,641
White, Not Hispanic	9-12th grade	$1,443,984	$947,568
White, Not Hispanic	High School Graduate	$1,690,285	$1,183,917
White, Not Hispanic	Some College	$1,985,967	$1,406,249
White, Not Hispanic	Associates Degree	$2,086,488	$1,607,609
White, Not Hispanic	Bachelors Degree	$2,847,953	$2,028,096
White, Not Hispanic	Masters Degree	$3,318,658	$2,366,374
White, Not Hispanic	Professional Degree	$4,754,930	$3,200,311
White, Not Hispanic	Doctorate Degree	$3,692,684	$2,967,826
Black, Not Hispanic	0-8th grade	$1,045,580	$863,231
Black, Not Hispanic	9-12th grade	$1,124,778	$861,353
Black, Not Hispanic	High School Graduate	$1,340,407	$1,070,827
Black, Not Hispanic	Some College	$1,601,729	$1,308,183
Black, Not Hispanic	Associates Degree	$1,724,599	$1,463,652
Black, Not Hispanic	Bachelors Degree	$2,107,728	$1,859,380
Black, Not Hispanic	Masters Degree	$2,530,574	$2,310,171
Black, Not Hispanic	Professional Degree	$3,521,784	$2,847,709
Black, Not Hispanic	Doctorate Degree	$2,912,750	$2,881,587
Asian, Not Hispanic	0-8th grade	$1,003,783	$864,579
Asian, Not Hispanic	9-12th grade	$1,159,638	$942,418
Asian, Not Hispanic	High School Graduate	$1,292,822	$1,059,678
Asian, Not Hispanic	Some College	$1,678,196	$1,394,305
Asian, Not Hispanic	Associates Degree	$1,843,014	$1,600,797
Asian, Not Hispanic	Bachelors Degree	$2,437,516	$2,061,186
Asian, Not Hispanic	Masters Degree	$3,454,087	$2,735,465
Asian, Not Hispanic	Professional Degree	$4,700,782	$3,680,543
Asian, Not Hispanic	Doctorate Degree	$3,601,577	$3,134,482
Other, Not Hispanic	0-8th grade	$1,228,762	$848,544
Other, Not Hispanic	9-12th grade	$1,320,118	$902,420
Other, Not Hispanic	High School Graduate	$1,478,622	$1,135,015
Other, Not Hispanic	Some College	$1,757,852	$1,321,789
Other, Not Hispanic	Associates Degree	$1,857,056	$1,513,536
Other, Not Hispanic	Bachelors Degree	$2,381,770	$1,866,935
Other, Not Hispanic	Masters Degree	$2,954,449	$2,217,916
Other, Not Hispanic	Professional Degree	$4,086,575	$2,889,210
Other, Not Hispanic	Doctorate Degree	$2,900,245	$2,678,873

Source: 2006-2008 ACS

Note: Synthetic Worklife Earnings (SWE) estimates in 2008 inflation adjusted dollars

U S C E N S U S B U R E A U

Helping You Make Informed Decisions