

REAL EARNINGS BY EDUCATION, 1974 – 2012

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ABSTRACT

This paper rearranges the data from Census Bureau Personal Income (PINC) tables 32 – 35 showing earnings of full-time, rear-round workers from 1974 to 2012 to display the 39-year time series for real earnings by education and age group. Aggregated data show strong upward trends for all men and all women combined, for men and women with less than a bachelor's degree and for those with a bachelor's degree or more. However all trends have flattened since 2000 (*not* just since the great recession); moreover shifts in the composition of the work force over time lead to the conclusion that the trends in aggregated statistics are unlikely to be useful for projecting earnings growth for any individual plaintiff of a specific age and educational background. The paper gives summary statistics for log-linear regressions of real earnings on time for all education – age - sex combinations for the period 1974 – 1999 and for 2000 – 2012. Growth for the latter period is negative for most of those combinations. A Microsoft Excel workbook accessible from the NAFE website contains the underlying data and several charts.

1. INTRODUCTION

Forensic economists sometimes need to project earnings based on a person's sex, age, and education, for example to calculate the present value of a stream of future earnings given projected earnings measured in today's dollars, (y_1, \dots, y_n) by a formula such as:

$$PV = \sum_{t=1}^n y_t \cdot (1+g)^t / (1+r)^t$$

where g and r represent the rate of growth in earnings per period and the periodic rate of interest selected by the economist. The rates g and r may be in nominal or real terms, but this paper focuses on growth in real terms, where the y values are measured in today's dollars, and g is a projected rate of growth of earnings in today's dollars; the choice of the real discount rate r is not discussed.

The choice for g may be based on recent history. A standard source for this information is the Personal Income (PINC) Tables published by the Bureau of the Census. This paper provides in Table 1 a detailed table, part of a Microsoft Excel workbook available for download as from the NAFE website, organizing the earnings of full-time, year-

round male and female workers¹ in time series sorted by education and age so that the changes over time can be seen more easily than in the original Census tables.² The workbook also contains another table and charts described below.

The organization of Table 1 makes it possible to see how growth has varied by sex, age, and education and over time. It seems clear that real earnings growth for those with a bachelor's degree or more has fallen dramatically since the turn of the century; for those with less education the result is less dramatic, but only because many faced falling real earnings before 2000.

A summary table, Table 2, gives trend rates of growth of earnings and R-squared values by sex, age, and education for the period 1974 – 1999 and separately for the period 2000 – 2012; the statistics are for exponential trend lines fitted separately for these periods. Table 2 is reproduced at the end of this paper.

Section 2 gives data sources. Section 3 summarizes some aggregate data from the PINC tables, and addresses the question: why consider data disaggregated by age and education in forming a judgment on g ? Why not use more aggregated data? (The answer turns out to be: because the composition of the labor force changes over time). Section 4 explains the formatting of Tables 1 and 2, and associated charts.

2. DATA SOURCES

Table 1 combines “years of school completed — full-time, year-round, workers 18 years old and over by March of the following year” by mean earnings, age, and sex: 1974 to 1979 (Census Table P-35), 1980 to 1985 (Census Table P-34) and 1986 - 1990 (Census Table P-33) with “educational attainment — full-time, year-round, workers 18 years old and over by March of the following year” by mean earnings, age, and sex: 1991 to 2012 (Census Table P-32).³ The data are re-sorted from education level by year (each table sorted from latest to earliest) by age group to education level by age group by year (sorted from earliest to latest). From 1974 to 1990 (Census Tables P-33 to P-35), education level was defined by years of school completed. From 1991 to 2012 it is by educational attainment (degrees completed, not number of years). Data are reported separately for males and females.

Time series reported here are as follows (though the Census Bureau suppresses data for some sex–education–age groups due to small sample size):

¹ The data come from the Annual Social and Economic Supplement to the Current Population Survey. A full-time, year-round worker is a person who worked full time (35 or more hours per week) and 50 or more weeks during the calendar year previous to the year of collection. See the definition in <http://www.census.gov/cps/about/cpsdef.html>, filed under “worker.”

² URL: <http://nafe.net/resources/>. The filename is “Foster, Earnings statistics 1974 to 2012.xlsx”

³ Source for tables: URL: <http://www.census.gov/hhes/www/income/data/historical/people/index.html>

TABLE A. GROUPS COMBINED TO FORM TIME SERIES

Group label in Table 2	1974 – 1990 series	1991 – 2012 series
1. TOTAL	TOTAL	TOTAL
2. ELEMENTARY	Elementary, Less than 9 Years	Less than 9 th grade
3. HS DROPOUTS	High School, 1 to 3 Years	9 th to 12 th grade (no diploma)
4. HS GRADS / GED	High School, 4 Years	High School Graduate (includes equivalency)
5. < 4 YRS COLLEGE	College, 1 to 3 Years	Some College, No Degree, plus Associate Degree
5a. < 4 YRS COLLEGE	(Not available)	Some College, No Degree
5b. < 4 YRS COLLEGE	(Not available)	Associate Degree
6. ≥ 4 YRS COLLEGE	College, 4 Years or More	Bachelor's Degree or More
7. 4 YRS COLLEGE	College, 4 Years	Bachelor's Degree
8. GRAD SCHOOL	College, 5 Years or More	Bachelor's Degree or More minus Bachelor's Degree
8a. GRAD SCHOOL	(Not available)	Master's Degree
8b. GRAD SCHOOL	(Not available)	Professional Degree
8c. GRAD SCHOOL	(Not available)	Doctorate Degree

Two circumstances lead to estimates rather than exact mean earnings levels in current dollars recorded from the Current Population Survey for some cells in Table 1.

- Group labels 5 and 8 in Table 1 use data from two different series for 1991 to 2012: in group 5, for each age and sex cell, total earnings for those with some college, no degree is added to total earnings for those with associate degrees, then divided by the sum of earners in the two cells. In group 8, for each age and sex cell, total earnings for those with a bachelor's degree or more is subtracted from total earnings for the total population, then divided by the difference in the number of earners in the two cells. ("Total earnings" means number of earners times average earnings for the cell.)
- Some earnings in current dollars not reported in the Census tables due to small sample size are also estimated in Table 1 as residuals from other information in the Census tables; those cells are flagged with a red triangle that indicates a note in Table 1 (e.g. earnings for females with less than 9th grade education ages 18 - 24). Two sources are used to complete such omitted information: For the specific year, within the education class, calculate a residual from total earnings of that education class and the sum of earnings for all other age groups, or within an age group, calculate a residual from total earnings of all in the age group and the sum of earnings for all other education classes.

Combining groups in this way means losing some accuracy because the total number of individuals in each cell is reported only to the nearest thousand persons.

To convert earnings from current to 2012 dollars, the CPI-U-RS (research series) is used, as is true in the cited Census tables. The BLS explains: "the Consumer Price Index research series using current methods (CPI-U-RS) presents an estimate of the CPI for all

Urban Consumers (CPI-U) from 1978 to present that incorporates most of the improvements made over that time span into the entire series." While the official CPI-U-RS extends back only to 1978, the Census Bureau extrapolated further to 1974 to calculate earnings for 1974 - 1977 in 2012 dollars.⁴ I estimated CPI-U-RS values for 1974-1977 from the ratio of earnings in current dollars to earnings in 2012 dollars from Census Table P-35. My estimates of the extrapolated values of the CPI-U-RS for 1974 - 77 leads to earnings in 2012 dollars that differ by \$1 from those in Census Table P-35 in a few cases.

3. AGGREGATE PINC TRENDS

For the total population of full-time earners, the 39-year trend rate of growth in average earnings has been 0.65% per year for males and 1.34% per year for females, with high correlations ($R^2 = 86\%$ for males, 98% for females); however Chart 1 shows that the trends have flattened since 2000.

Over the period 2000 – 2012, for those with education below a bachelor's degree the trend for male earnings is almost flat, at 0.06% per year, $R^2 = 0.11$, but the trend for females shows growth of 0.77% per year, $R^2 = 0.92$; Chart 2 shows that the series for males has a slight downtrend starting in 2000, while the series for females turns flat starting in that year.

For those with a bachelor's degree or more, the trend for male earnings shows growth of 0.92% per year, $R^2 = 0.81$, and the trend for females shows stronger growth, 1.44% per year, $R^2 = 0.94$; Chart 3 shows even for these males with high education there is a downtrend starting in 2000, and for the highly educated females the trend has gone almost flat.

Is this not enough information to form a judgment on the future rate of growth of earnings for males or females with low or high education? The problem with such aggregated data is that the composition of the full-time year-round workforce has changed markedly over the 39-year period:

- Workers aged 45 and over were 40% of the full-time workforce in 1974, 31% in 1988, and 48% in 2012. The changes were almost identical for men and women.
- Workers with bachelor's degrees or more were 19% of the workforce in 1974, 38% in 2012, approximately doubling; for men the growth was 80%, for women it was 145%.
- Full-time year-round workers grew from 71% of employed civilians aged 16 and over in 1974 to 78% in 2012 for males, and from 50% to 65% for females.⁵

If relying on these long-term trends, the forensic economist needs to use disaggregated data that apply to the specific case.

⁴ URL: www.bls.gov/cpi/cpiurs.htm.

⁵ Civilian employment is taken from *Economic Report of the President, Transmitted to the Congress March 2013*, U.S. Government Printing Office, Washington: 2013, Table B36: Civilian Employment and Unemployment by Sex and Age, 1966 – 2012, p. 368.

The issue is significant even if limiting attention to experience since 2000. Over that period, the three shifts singled out above were as follows:

- Workers aged 45 and over were 38% of the full-time workforce in 2000 and 48% in 2012. The changes were almost identical for men and women.
- Workers with bachelor's degrees or more were 30% of the workforce in 2000, 38% in 2012, increasing by approximately 27%; for men the growth was 20%, for women it was 38%.
- Full-time year-round workers fluctuated as a percent of employed civilians aged 16 and over from 2000 to 2012, with a low and high of 76% and 81% for males, and of 65% and 67% for females.⁶

4. STRUCTURE OF DATA IN THE MICROSOFT EXCEL WORKBOOK

a. Table 1⁷

Rows 1 to 46 of Table 1 provide notes. Rows 47 to 49 provide column headings, and rows 50 to 3003 give the content of Census PINC Tables P-32 to P-35 in columns (1) to (9), sorted by years of school completed or educational attainment, age range, and calendar year for which earnings are recorded (the year before the survey is taken). The inflation index (CPI-U-RS, December 1977 = 100, extended to 1974) is in column (10), rows 50 to 88, and with base converted to 2012 = 100, rows 90 to 129.

Earnings in 2012 dollars are calculated in Table 1, not copied directly from the Census PINC tables, because Table 1 was first assembled several years ago, and updated year by year as earnings for additional years became available.

For each grouping of education and age, columns (11) and (12) report the exponential time trends for males from 1974 to 1999 and from 2000 to 2012 for real earnings (column 6) and number with earnings (column 4). Columns (13) and (14) give the same data for females data in columns (9) for earnings and (7) for number with earnings).

The time trends report the results of the standard Microsoft Excel LOGEST function, $y = b \cdot m^x$ where the dependent variable y represents either earnings or number of individuals, and x represents the year. For each regression, the LOGEST function reports a 2 X 5 array of statistics (I have added a sixth row as explained below):

⁶ See footnote 4, above.

⁷ See worksheet name tabs at bottom of workbook.

TABLE B. ORGANIZATION OF STATISTICS REPORTED FOR REGRESSIONS IN TABLE 1.

m	b
$se(m)$, standard error for m	$se(b)$, standard error for b
r^2 , coefficient of determination	$se(y)$, standard error of estimate for y
F, F statistic	df, degrees of freedom
$ss(reg)$, regression sum of squares	ss_{resid} , residual sum of squares
$ln(m)$, annual rate of growth	

For each 39-year series, notes in columns (11) – (14) explain the location of the statistics for the eight separate regressions (26-year series from 1974 to 1999 above the note, and 13-year series from 2000 to 2012 below). For those series that are available only from 1991, notes in columns (11) – (14) explain the location of the four separate regressions below the note. Each block of four regressions shows the following:

Trend in male real earnings	Trend in female real earnings
Trend in male number of earners	Trend in female number of earners

b. Table 2

Table 2 transcribes the annual rates of growth and associated r^2 values from the trends in male and female earnings described above (rates of growth in number of earners are reported only in Table 1). Two conventions are used to help the viewer assess the results:

- Results for negative rates of growth are reported in red, positive in black (when the rounded growth rate shown in Table 2 is zero, results are in red if the unrounded result is negative).
- Results with $r^2 \geq 0.5$ are in bold font, otherwise in regular font (the unrounded value is used to determine whether to use bold font if Table 2 shows $r^2 = 0.5$).

c. Charts

Chart 1: Full-time Earnings in 2012 \$s for all males and all females, 1974 – 2012, with fitted log-linear regression lines (Charts 1 – 3 are repeated in this document).

Chart 2: Full-time Earnings in 2012 \$s for males and females with education below a bachelor’s degree, 1974 – 2012, with fitted log-linear regression lines

Chart 3: Full-time Earnings in 2012 \$s for males and females with education of at least a bachelor’s degree, 1974 – 2012, with fitted log-linear regression lines

Remaining charts: Charts showing full-time earnings in 2012 \$s for males and separately for females for the following six pairs of 39-year time series:

- Less than 9th grade,
- High school, 1 – 3 years + 9th to 12th grade (no diploma)
- High school, 4 years + High school graduate (including equivalency)
- College, 1 to 3 years + Some college, no degree + Associate degree
- College, 4 years + Bachelor’s degree

- College, 5 years or more + Master's degree + Professional degree + Doctorate degree⁸

Each chart shows earnings and the associated log-linear regression line for age groups 18 – 24, 25 – 34, 45 – 54, and 55 – 64. These charts are not numbered, but labeled with the educational group followed by M (male) or F (female). The earnings are recorded from Table 1 columns (6) and (9) and the loglinear regressions are those displayed in Table 1.

⁸ Earnings for 1991 – 2012 are calculated as earnings for “College, 4 years or more” *minus* “College, 4 years”, rather than by adding the three separate degree categories listed in the text; that cannot be done because of omitted data due to small sample size.

APPENDIX TABLE 2. LOG-LINEAR TREND % ANNUAL CHANGE IN REAL EARNINGS,
FULL-TIME YEAR-ROUND EARNERS, 1974 - 1999 AND 2000 - 2012

	Male				Female			
	% ch. earn '74 - '99 R sq.		% ch. earn '00 - '12 R sq.		% ch. earn '74 - '99 R sq.		% ch. earn '00 - '12 R sq.	
1. TOTAL	1. Total labor force							
18 to 24 years	-0.7%	0.61	-0.5%	0.29	0.0%	0.01	-0.7%	0.27
25 to 34 years	-0.1%	0.10	-0.4%	0.42	0.8%	0.94	-0.2%	0.09
35 to 44 years	0.3%	0.48	-0.3%	0.47	1.6%	0.96	0.7%	0.91
45 to 54 years	0.9%	0.84	-0.5%	0.51	1.7%	0.94	0.3%	0.36
55 to 64 years	1.2%	0.82	-0.2%	0.11	1.4%	0.92	1.2%	0.72
65 years and over	2.0%	0.86	0.7%	0.16	1.7%	0.66	1.7%	0.58
Total	0.6%	0.72	-0.1%	0.15	1.4%	0.97	0.6%	0.74
	2. Elem < 9 yrs +		2. Elem < 9 yrs +		2. Elem < 9 yrs +		2. Elem < 9 yrs +	
2. ELEMENTARY	< 9th grade							
18 to 24 years	-0.3%	0.02	-0.2%	0.03	0.4%	0.04	-4.2%	0.24
25 to 34 years	-1.3%	0.75	-1.1%	0.40	-0.2%	0.06	-1.5%	0.29
35 to 44 years	-1.1%	0.55	-1.5%	0.70	0.0%	0.00	-0.8%	0.09
45 to 54 years	-1.0%	0.67	-0.6%	0.21	0.0%	0.00	-1.7%	0.55
55 to 64 years	-0.4%	0.28	-0.2%	0.02	0.2%	0.07	-1.3%	0.46
65 years and over	1.1%	0.23	-0.3%	0.00	0.8%	0.14	-0.9%	0.06
Total	-1.0%	0.73	-0.7%	0.59	0.0%	0.01	-1.4%	0.54
	3. HS, 1 - 3 yrs + 9 -		3. 9-12 yrs, no		3. HS, 1 - 3 yrs + 9 -		3. 9-12 yrs, no	
3. HS DROPOUTS	12 yrs , no diploma		diploma		12 yrs , no diploma		diploma	
18 to 24 years	-1.0%	0.72	-1.1%	0.23	-0.2%	0.01	-2.5%	0.23
25 to 34 years	-1.2%	0.81	-0.7%	0.31	-0.1%	0.02	-3.3%	0.45
35 to 44 years	-1.0%	0.88	-1.0%	0.26	-0.1%	0.02	0.0%	0.00
45 to 54 years	-0.6%	0.32	-1.2%	0.32	0.1%	0.05	-1.4%	0.68
55 to 64 years	-0.1%	0.01	-0.8%	0.12	0.7%	0.17	0.01%	0.00
65 years and over	0.3%	0.04	-1.0%	0.13	1.4%	0.33	-0.1%	0.00
Total	-0.9%	0.81	-0.6%	0.63	0.1%	0.07	-1.1%	0.35
	4. HS, 4 yrs + HS		4. HS grad / GED		4. HS, 4 yrs + HS		4. HS grad / GED	
4. HS GRADS / GED	grad / GED							
18 to 24 years	-0.9%	0.66	-1.1%	0.54	-0.3%	0.33	-0.6%	0.19
25 to 34 years	-0.7%	0.70	-0.8%	0.57	0.1%	0.04	-1.2%	0.59
35 to 44 years	-0.6%	0.68	-0.6%	0.49	0.4%	0.74	-0.5%	0.44
45 to 54 years	-0.2%	0.25	-0.4%	0.31	0.5%	0.70	-0.3%	0.26
55 to 64 years	-0.1%	0.11	-0.6%	0.41	0.6%	0.60	0.2%	0.03
65 years and over	0.7%	0.13	1.2%	0.12	0.5%	0.24	0.7%	0.11
Total	-0.4%	0.48	-0.4%	0.69	0.5%	0.87	-0.2%	0.16

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TABLE 2 CONTINUED

	Male				Female			
	% ch. earn '74 - '99 R sq.		% ch. earn '00 - '12 R sq.		% ch. earn '74 - '99 R sq.		% ch. earn '00 - '12 R sq.	
5. < 4 YRS COLLEGE	5. Col, 1-3 yrs + No degree + Assoc.		5. Col, No degree + Assoc. degree		5. Col, 1-3 yrs + No degree + Assoc.		5. Col, No degree + Assoc. degree	
18 to 24 years	-0.8%	0.56	-0.9%	0.43	-0.4%	0.48	-1.3%	0.59
25 to 34 years	-0.3%	0.32	-0.9%	0.83	0.3%	0.56	-0.5%	0.19
35 to 44 years	-0.3%	0.28	-0.9%	0.77	0.9%	0.84	-0.5%	0.58
45 to 54 years	0.0%	0.00	-0.6%	0.50	1.1%	0.81	-0.2%	0.03
55 to 64 years	0.3%	0.08	-0.6%	0.28	0.7%	0.57	-0.1%	0.01
65 years and over	0.7%	0.06	-0.5%	0.04	1.1%	0.31	-1.2%	0.10
Total	0.0%	0.01	-0.6%	0.74	0.9%	0.91	-0.3%	0.22
Note: All data are for	% ch. earn		% ch. earn		% ch. earn		% ch. earn	
'00 - '12	'00 - '12 R sq.		'00 - '12 R sq.		'00 - '12 R sq.		'00 - '12 R sq.	
5a, b. < 4 YRS COLLEGE	5a. Some col., no degree		5b. Assoc. degree		5a. Some col., no degree		5b. Assoc. degree	
18 to 24 years	-0.8%	0.41	-1.3%	0.45	-1.5%	0.57	-1.1%	0.46
25 to 34 years	-0.9%	0.81	-0.6%	0.51	-1.0%	0.44	-0.1%	0.01
35 to 44 years	-1.0%	0.75	-0.5%	0.33	-0.6%	0.59	-0.5%	0.26
45 to 54 years	-0.7%	0.41	-0.2%	0.07	-0.3%	0.25	-0.2%	0.03
55 to 64 years	-0.1%	0.01	-1.6%	0.58	-0.2%	0.03	0.0%	0.00
65 years and over	-0.4%	0.02	-0.2%	0.00	-1.7%	0.12	0.0%	0.00
Total	-0.6%	0.58	-0.5%	0.69	-0.5%	0.42	-0.2%	0.06
6. ≥ 4 YRS COLLEGE	6. Col, ≥ 4 yrs + ≥ Bachelor's		6. Col, ≥ Bachelor's		6. Col, ≥ 4 yrs + ≥ Bachelor's		6. Col, ≥ Bachelor's	
18 to 24 years	0.1%	0.02	-0.5%	0.09	0.5%	0.49	-0.9%	0.19
25 to 34 years	0.6%	0.64	-0.8%	0.56	1.3%	0.92	-0.7%	0.49
35 to 44 years	0.7%	0.43	-1.0%	0.79	1.8%	0.90	0.1%	0.03
45 to 54 years	0.6%	0.48	-0.4%	0.22	1.5%	0.87	0.2%	0.15
55 to 64 years	0.9%	0.53	-0.7%	0.38	1.3%	0.80	0.7%	0.38
65 years and over	1.3%	0.50	-0.3%	0.01	2.0%	0.31	2.5%	0.70
Total	1.0%	0.75	-0.6%	0.84	1.7%	0.94	0.1%	0.10
7. 4 YRS COLLEGE	7. Col, 4 yrs + Bachelor's		7. Col, Bachelor's		7. Col, 4 yrs + Bachelor's		7. Col, Bachelor's	
18 to 24 years	0.1%	0.01	-0.5%	0.06	0.5%	0.47	-1.1%	0.25
25 to 34 years	0.7%	0.66	-1.2%	0.57	1.3%	0.92	-1.2%	0.62
35 to 44 years	0.3%	0.17	-1.1%	0.80	1.7%	0.92	-0.1%	0.04
45 to 54 years	0.1%	0.04	-0.4%	0.21	1.6%	0.80	0.2%	0.05
55 to 64 years	0.4%	0.18	-1.3%	0.47	1.4%	0.67	0.5%	0.12
65 years and over	0.9%	0.26	-1.0%	0.09	2.8%	0.32	2.6%	0.53
Total	0.6%	0.59	-0.9%	0.88	1.6%	0.94	-0.2%	0.14

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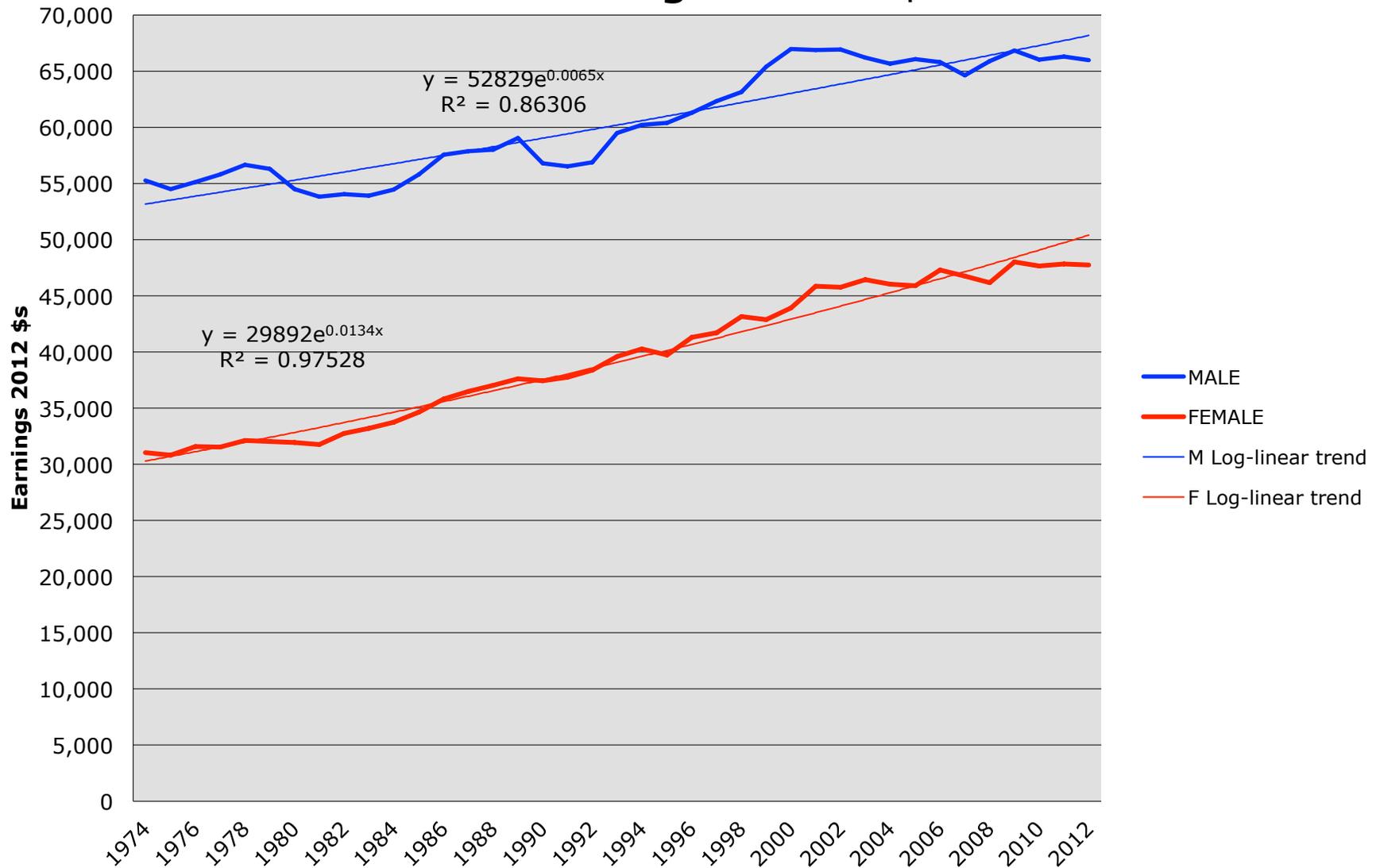
TABLE 2 CONTINUED

	Male				Female			
	% ch. earn '74 - '99 R sq. 8. Col, ≥ 5 yrs + ≥ Bach.		% ch. earn '00 - '12 R sq. 8. Col, ≥ Bach.		% ch. earn '74 - '99 R sq. 8. Col, ≥ 5 yrs + ≥ Bach.		% ch. earn '00 - '12 R sq. 8. Col, ≥ Bach.	
8. GRAD SCHOOL								
18 to 24 years	0.6%	0.05	-2.3%	0.30	1.3%	0.45	0.9%	0.04
25 to 34 years	1.1%	0.71	-0.1%	0.01	1.7%	0.89	-0.3%	0.08
35 to 44 years	1.5%	0.64	-1.0%	0.60	2.3%	0.81	-0.2%	0.05
45 to 54 years	1.2%	0.57	-0.2%	0.05	1.6%	0.88	0.5%	0.22
55 to 64 years	1.3%	0.51	0.0%	0.00	1.3%	0.77	1.2%	0.44
65 years and over	1.6%	0.40	-0.2%	0.00	2.1%	0.28	2.3%	0.49
Total	1.7%	0.80	-0.4%	0.49	2.0%	0.91	0.3%	0.12
Note: All data are for	% ch. earn		% ch. earn		% ch. earn		% ch. earn	
'00 - '12	'00 - '12 R sq.		'00 - '12 R sq.		'00 - '12 R sq.		'00 - '12 R sq.	
8 a, b. GRAD SCHOOL	8 a. Master's		8 b. Professional		8 a. Master's		8 b. Professional	
18 to 24 years	Not available		Not available		Not available		Not available	
25 to 34 years	-0.5%	0.13	0.4%	0.03	-0.3%	0.07	0.4%	0.03
35 to 44 years	-0.8%	0.26	-0.5%	0.16	-0.3%	0.06	1.5%	0.25
45 to 54 years	0.7%	0.24	-1.2%	0.36	0.3%	0.07	Not available	
55 to 64 years	-1.0%	0.17	0.3%	0.02	0.5%	0.12	Not available	
65 years and over	Not available		Not available		Not available		Not available	
Total	-0.2%	0.05	-0.6%	0.27	0.1%	0.01	1.9%	0.47
Note: All data are for	% ch. earn				% ch. earn			
'91 - '12	'91 - '12 R sq.				'91 - '12 R sq.			
8 c. GRAD SCHOOL	8 c. Doctorate				8 c. Doctorate			
18 to 24 years	Not available				Not available			
25 to 34 years	Not available				Not available			
35 to 44 years	-0.4%	0.07			-0.5%	0.02		
45 to 54 years	0.0%	0.00			Not available			
55 to 64 years	2.5%	0.66			Not available			
65 years and over	Not available				Not available			
Total	0.4%	0.14			0.2%	0.14		

Source: Growth rates and R sq. values come from exponential trend lines fitted to 26 years (1974 to 1999) and 13 years (2000 to 2012) of data for each age range, education, and sex displayed in Table 1 of this workbook. Real earnings are measured in 2012 \$s using the CPI-U-RS index (see Appendix Table 1). The fitted function is the logest function in Excel, $y = b \cdot m^x$ where x is the year. Components of each fitted trend are shown in cols. (11) and (12), for males, and (13) and (14), for females, in Table 1. Statistics reported by the software are explained in Section 4 of the accompanying text. Regressions for real earnings from Table 1, col. (6) or (9) are followed by regressions for number of workers from Table 1, col. (4) or (7).

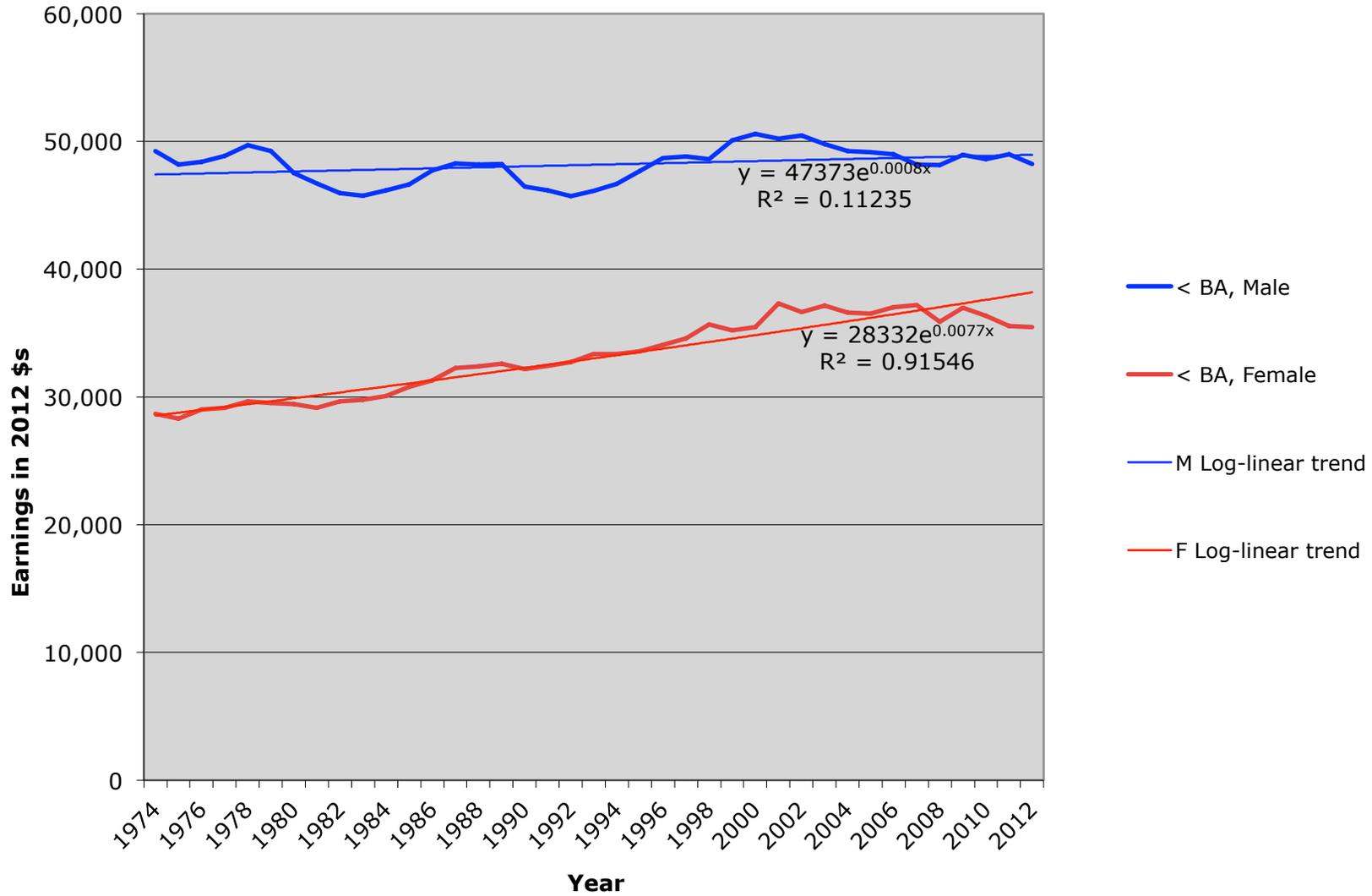
A few of the fitted trends are based in part on data estimated as a residual from other information in the Census Bureau table; In those cases I have added a comment to the cell for the earnings growth rate to alert the reader to that fact (see red triangle in upper right-hand corner of the cell).

Chart 1. FT Earnings in 2012 \$s



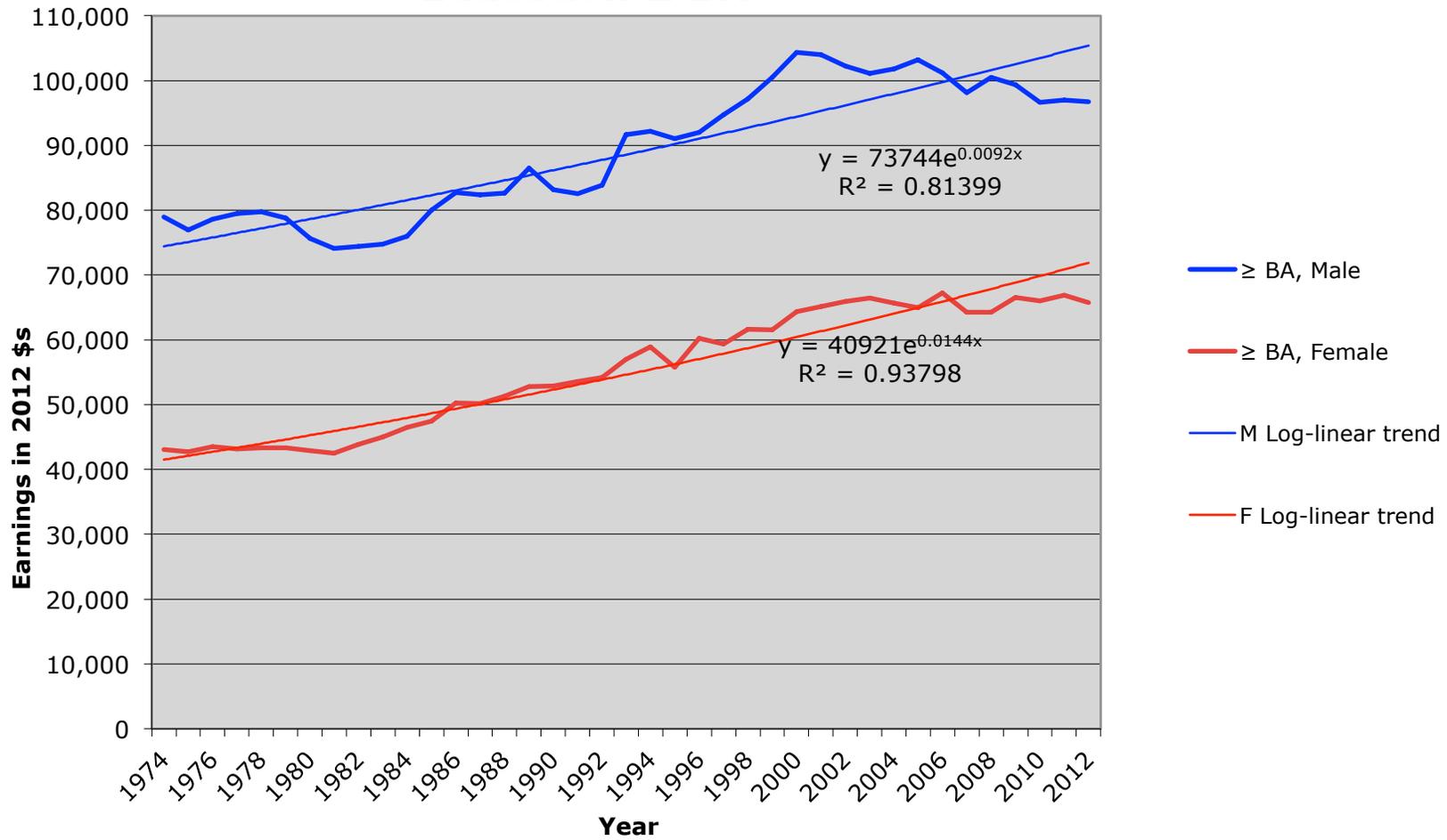
Click on series for location of source data in the "Detail" page.

Chart 2. FT Earnings in 2012 \$s
Education < BA



Click on series for location of source data in the "Detail" page.

**Chart 3. FT Earnings in 2012 \$s
Education ≥ BA**



Click on series for location of source data in the "Detail" page.