Is the United States Still a Land of Opportunity? Recent Trends in Intergenerational Mobility

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Introduction

- Growing public perception that intergenerational mobility has declined in the United States

- Vast literature has investigated whether this is true empirically [e.g., Aaronson and Mazumder 2008, Lee and Solon 2009, Auten, Gee, and Turner 2013]

- Results debated partly due to limitations in data [Black and Devereux 2011]

This Paper

- We analyze trends in mobility for 1971-1993 birth cohorts using administrative data on more than 50 million children and their parents

- Two main empirical results

    1. Relationship between parent and child percentile ranks (i.e. the *copula*) is extremely stable

        - Chance of moving from bottom to top fifth of income distribution no lower for children entering labor market today than in the 1970s

    2. Inequality increased in this sample, consistent with prior work

        - Consequences of the "birth lottery" – the parents to whom a child is born – are larger today than in the past

Data

- We use de-identified data from federal income tax returns

    - Includes non-filers via information forms (e.g. W-2's)

Linking Children to Parents

- Parent(s) defined as first person(s) who claim child as a dependent

  - Can reliably link children to parents up to age 16, after which some children leave the house

- We link approximately 90% of children to parents overall

Two Samples

1. Population tax records starting in 1996

    - Data on children and parents for the 1980-1993 birth cohorts

    - 40 million children, age 20-31 in 2011

2. Statistics of Income 0.1% Stratified Random Samples 1987-1997

    - Data on children and parents for the 1971-1982 birth cohorts

Income Definitions

- Parent Income: mean pre-tax household income (AGI+SSDI)

- Child Income: mean pre-tax household income ages 26 or 29-30

- For non-filers, use W-2 wage earnings + SSDI + UI income

  - If no 1040 and no W-2, code income as 0

- These **household** level definitions capture total resources in the household

  - Results robust to using individual-level income measures

Measuring Intergenerational Mobility

Measuring Mobility

- Previous literature has measured mobility using various statistics

    - Log-log intergenerational elasticity

    - Rank-rank correlations

    - Transition matrices

- Each of these could potentially exhibit different time trends

- Begin by formalizing how we measure mobility

Measuring Mobility

- We decompose joint distribution of parent and child income into two components

  1. Joint distribution of parent and child percentile ranks (i.e., copula of distribution)

  2. Marginal distributions of parent and child income

- Marginal distributions determine inequality within generations

- Copula is the key determinant of mobility across generations

  - Rank-rank and transition matrix depend purely on copula

  - Log-log IGE combines copula and marginal distributions

Rank-Rank Specification

- We study all three measures, but use a *rank-rank* specification as our primary measure

    - Rank children based on their incomes relative to other children in same birth cohort

    - Rank parents of these children based on their incomes relative to other parents in this sample

- In our companion paper on geography of mobility, we show that rank-rank has statistical advantages over other measures

Mean Child Percentile Rank vs. Parent Percentile Rank
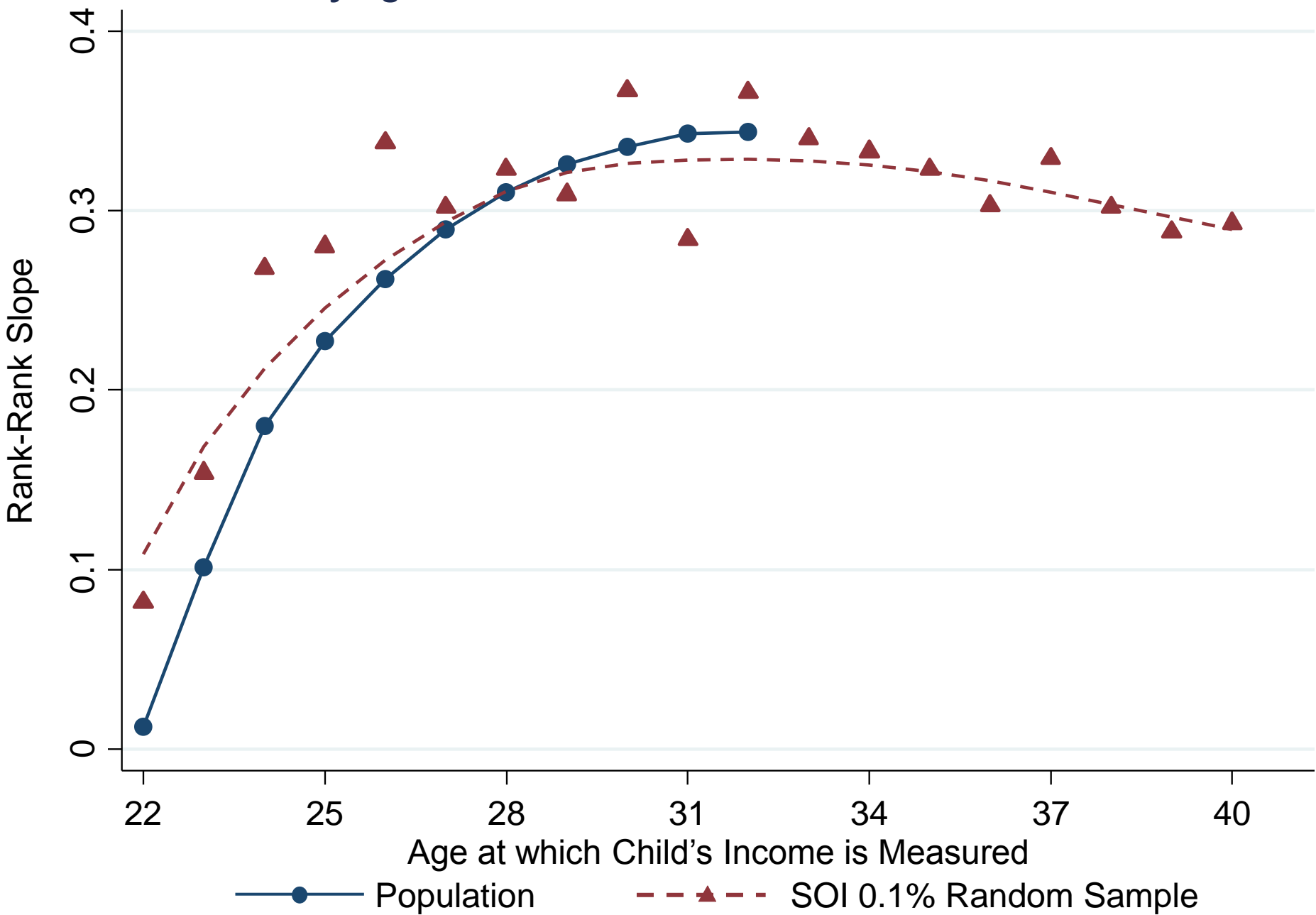

Rank-Rank Slope (U.S) = 0.341
(0.0003)
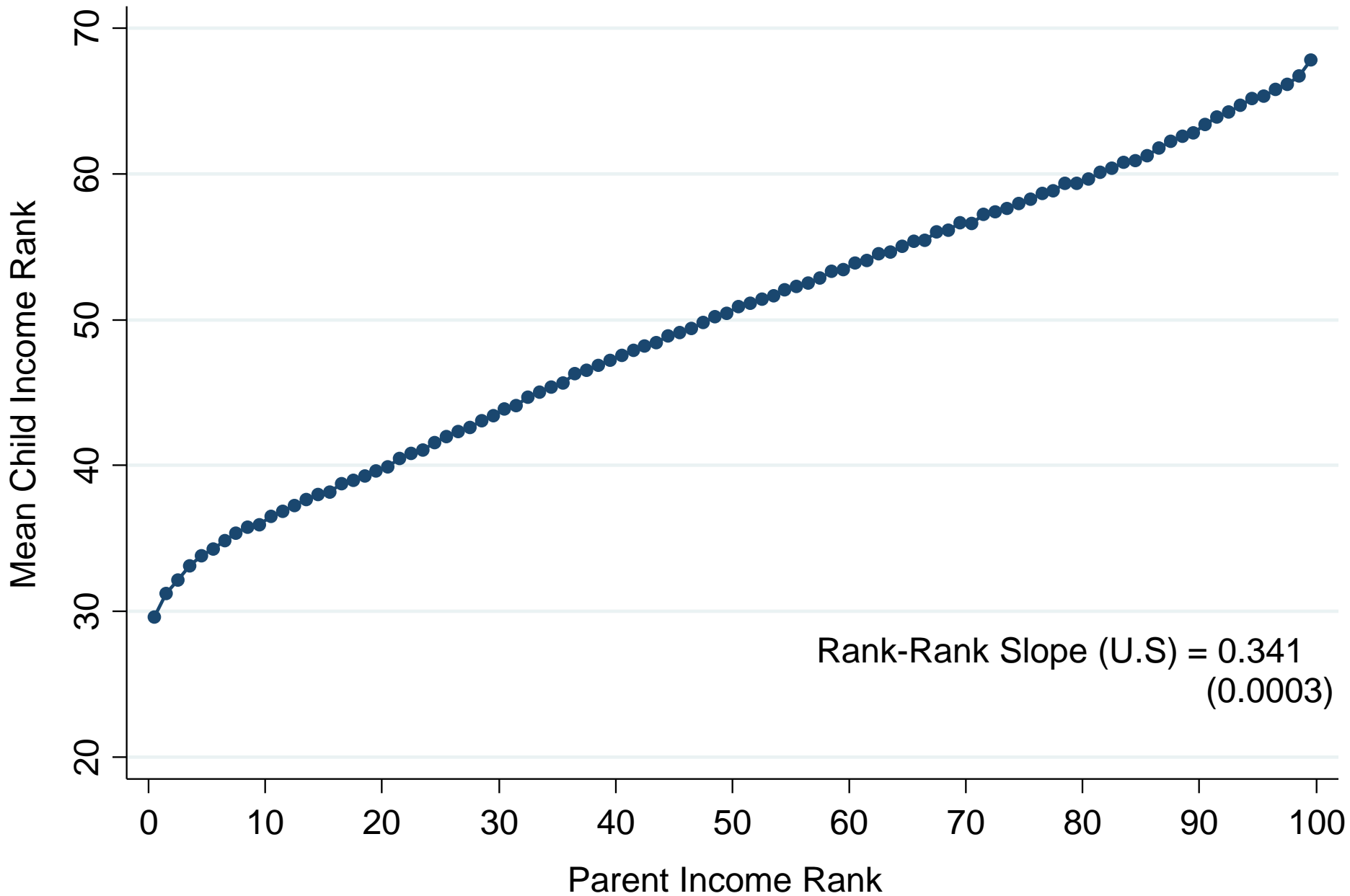
Lifecycle and Attenuation Bias

- Literature has emphasized two sources of potential bias in estimates of intergenerational elasticities

    1. Lifecycle bias: measuring earnings too early or too late

   2. Attenuation bias: measuring transitory rather than permanent income

Lifecycle Bias: Intergenerational Income Correlation by Age at Which Child's Income is Measured

Rank-Rank Slope (y-axis): 0, 0.1, 0.2, 0.3, 0.4

Age at which Child's Income is Measured (x-axis): 22, 25, 28, 31, 34, 37, 40

Population

Lifecycle Bias: Intergenerational Income Correlation by Age at Which Child's Income is Measured

Rank-Rank Slope vs. Age at which Child's Income is Measured
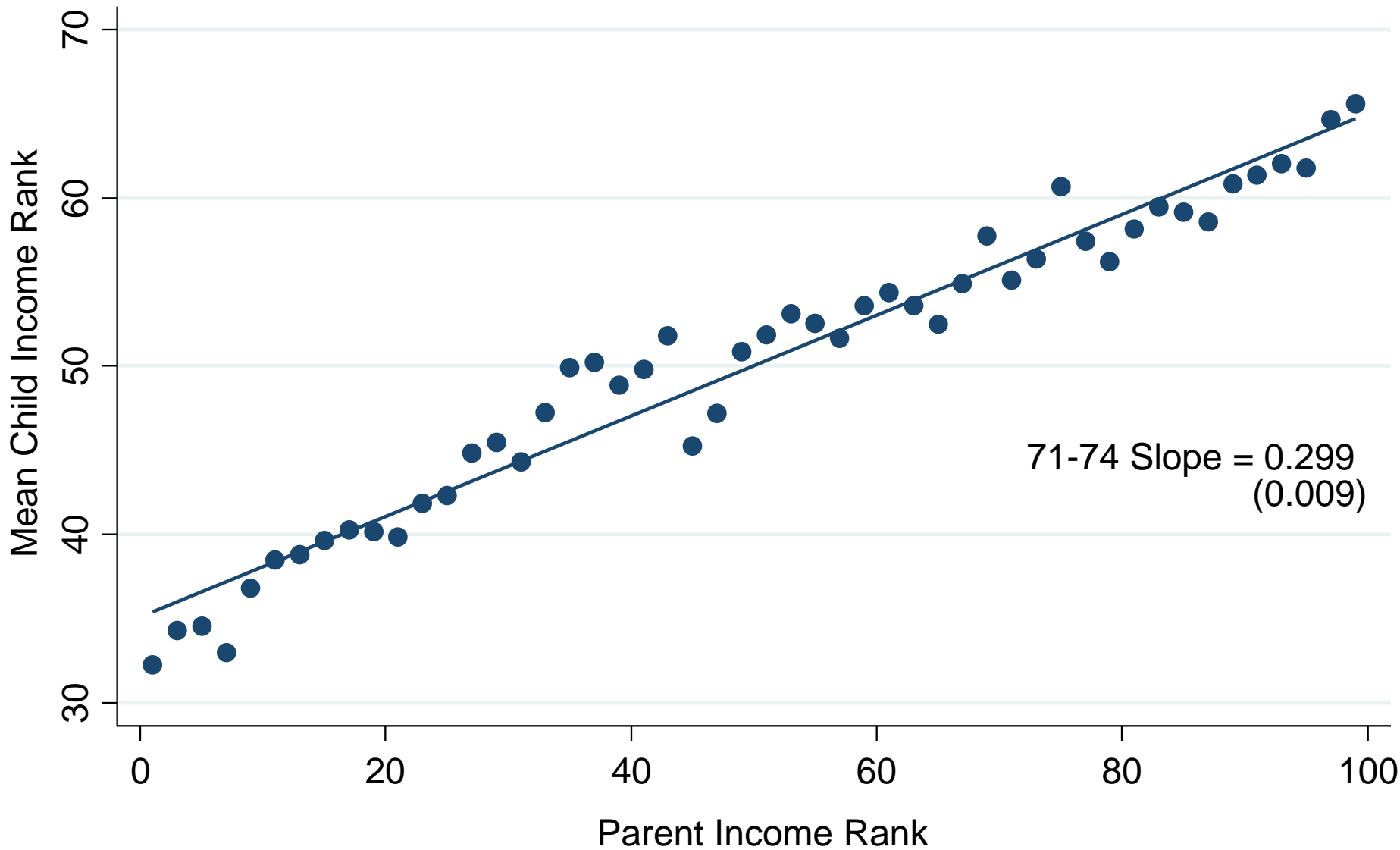
Legend:
- Population
- SOI 0.1% Random Sample
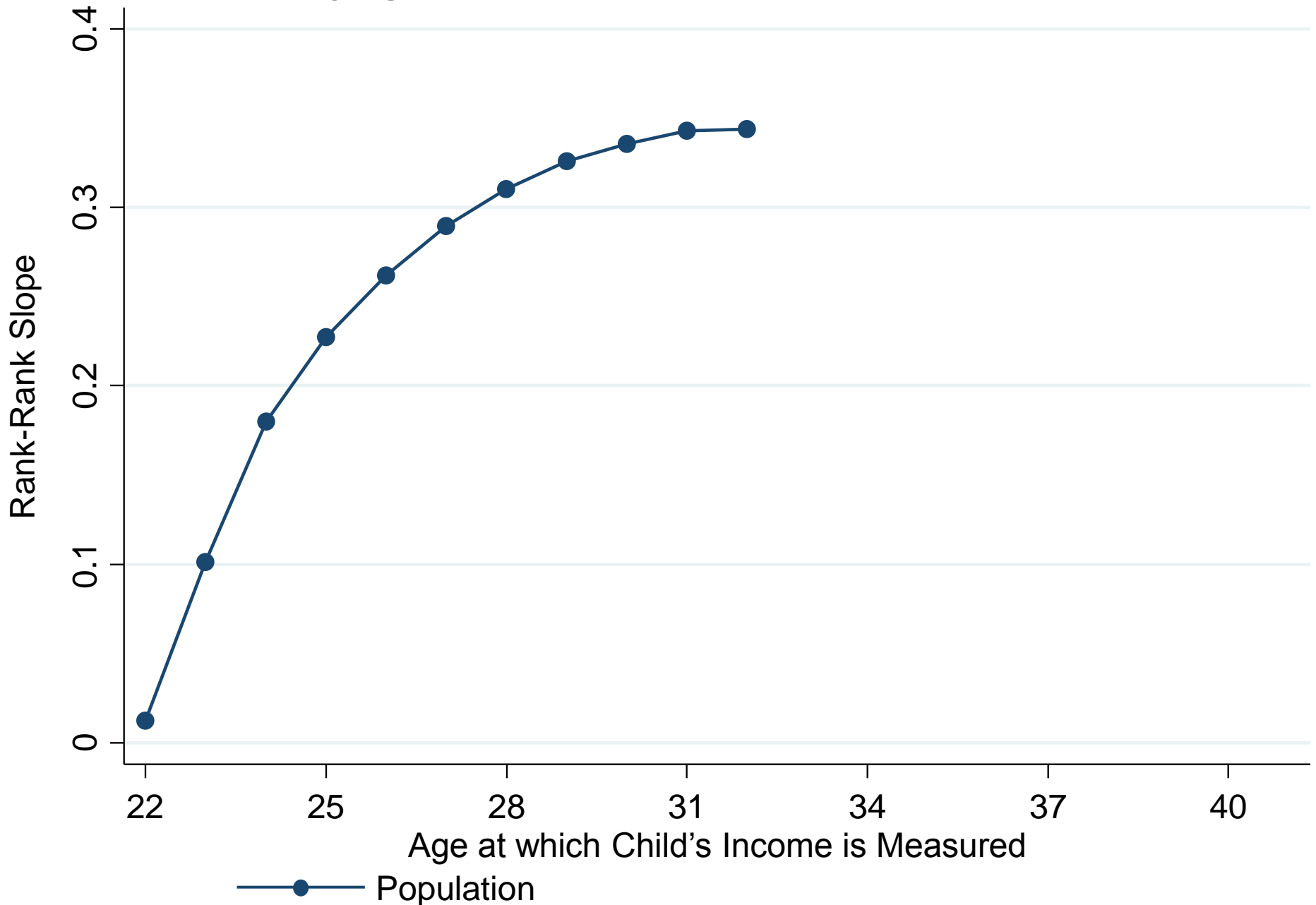
Attenuation Bias: Rank-Rank Slopes
by Number of Years Used to Measure Parent Income
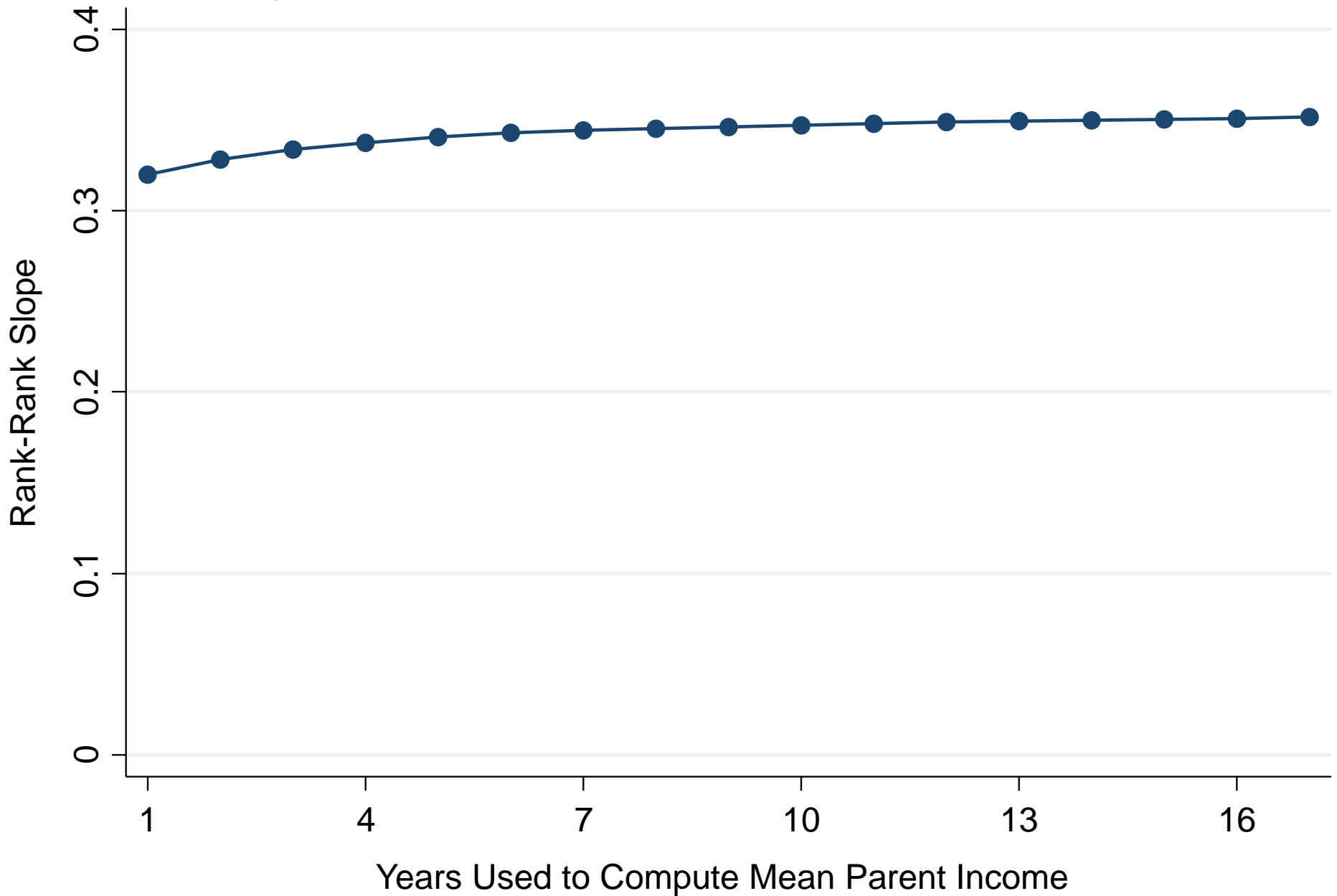
Time Trends

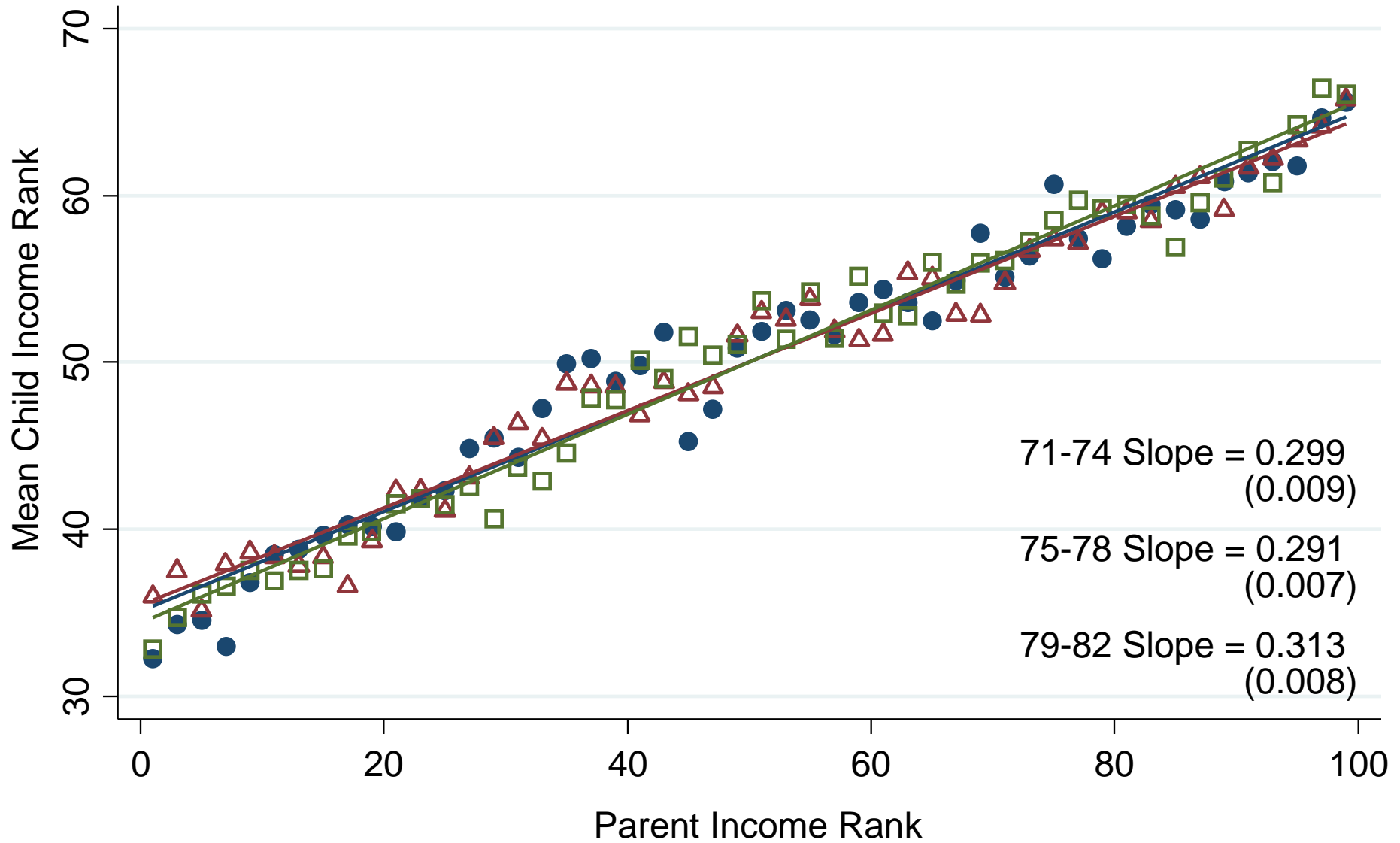**Child Income Rank vs. Parent Income Rank by Birth Cohort**

71-74 Slope = 0.299
(0.009)

Mean Child Income Rank (y-axis)

Parent Income Rank (x-axis)

1971-74

Child Income Rank vs. Parent Income Rank by Birth Cohort

71-74 Slope = 0.299
(0.009)

75-78 Slope = 0.291
(0.007)

Mean Child Income Rank (y-axis) vs. Parent Income Rank (x-axis)

1971-74   1975-78

Child Income Rank vs. Parent Income Rank by Birth Cohort

71-74 Slope = 0.299
(0.009)

75-78 Slope = 0.291
(0.007)

79-82 Slope = 0.313
(0.008)

Mean Child Income Rank (y-axis)
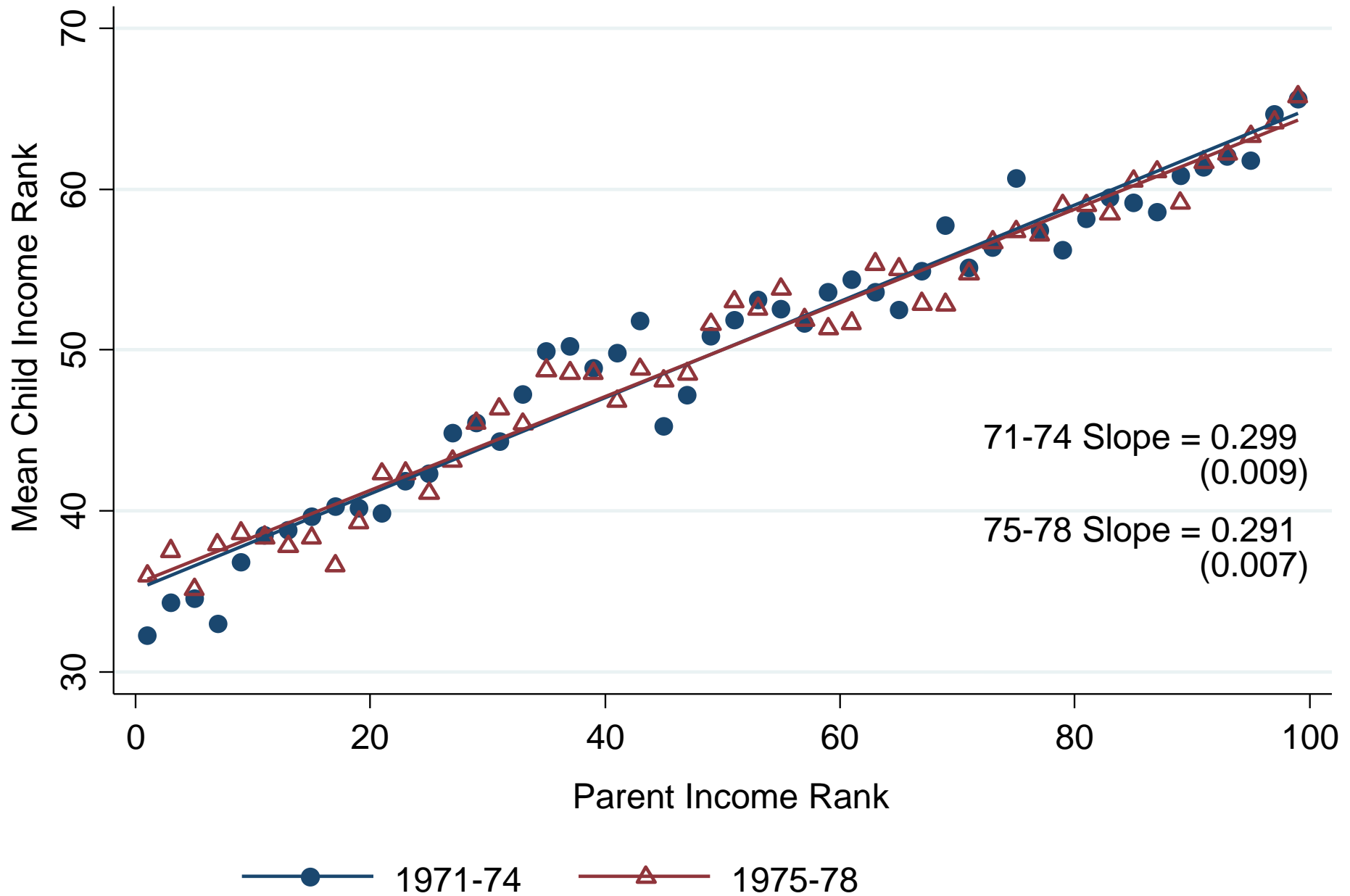
Parent Income Rank (x-axis)

● 1971-74   △ 1975-78   □ 1979-82

Intergenerational Mobility Estimates for the 1971-1993 Birth Cohorts

Rank-Rank Slope

Child's Birth Cohort

Income Rank-Rank
(Child Age 30)

Intergenerational Mobility Estimates for the 1971-1993 Birth Cohorts

College Gradient

- For younger cohorts, it is too early to measure earnings
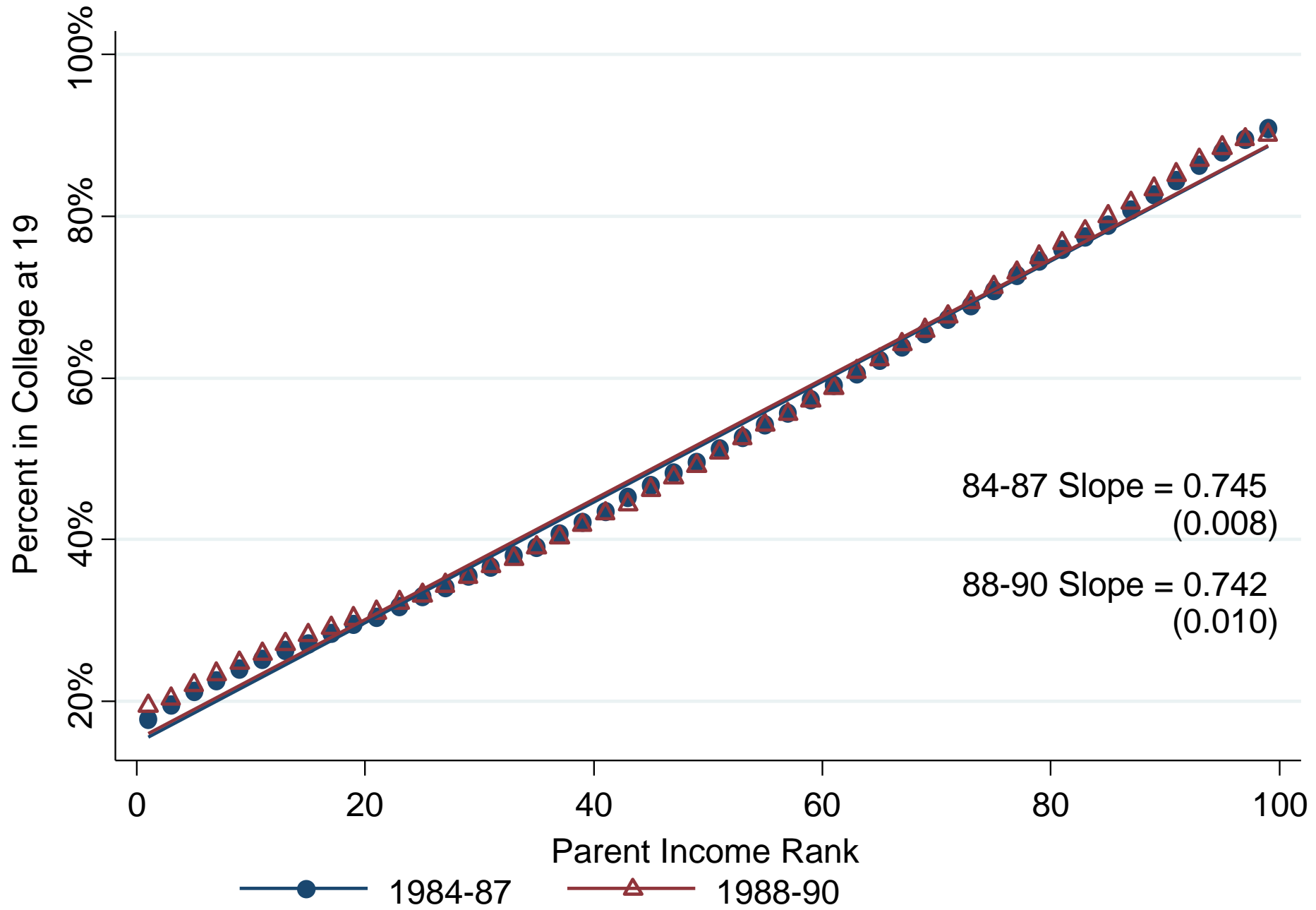
- But we can measure college attendance, which is a strong predictor of earnings

- Moreover, college-income gradient is highly correlated with income rank-rank slope across areas of the U.S. [Chetty et al. 2014]

- Define college attendance as attending when age 19

  - Results similar if attendance measured at later ages

College Attendance Rates vs. Parent Income Rank by Cohort
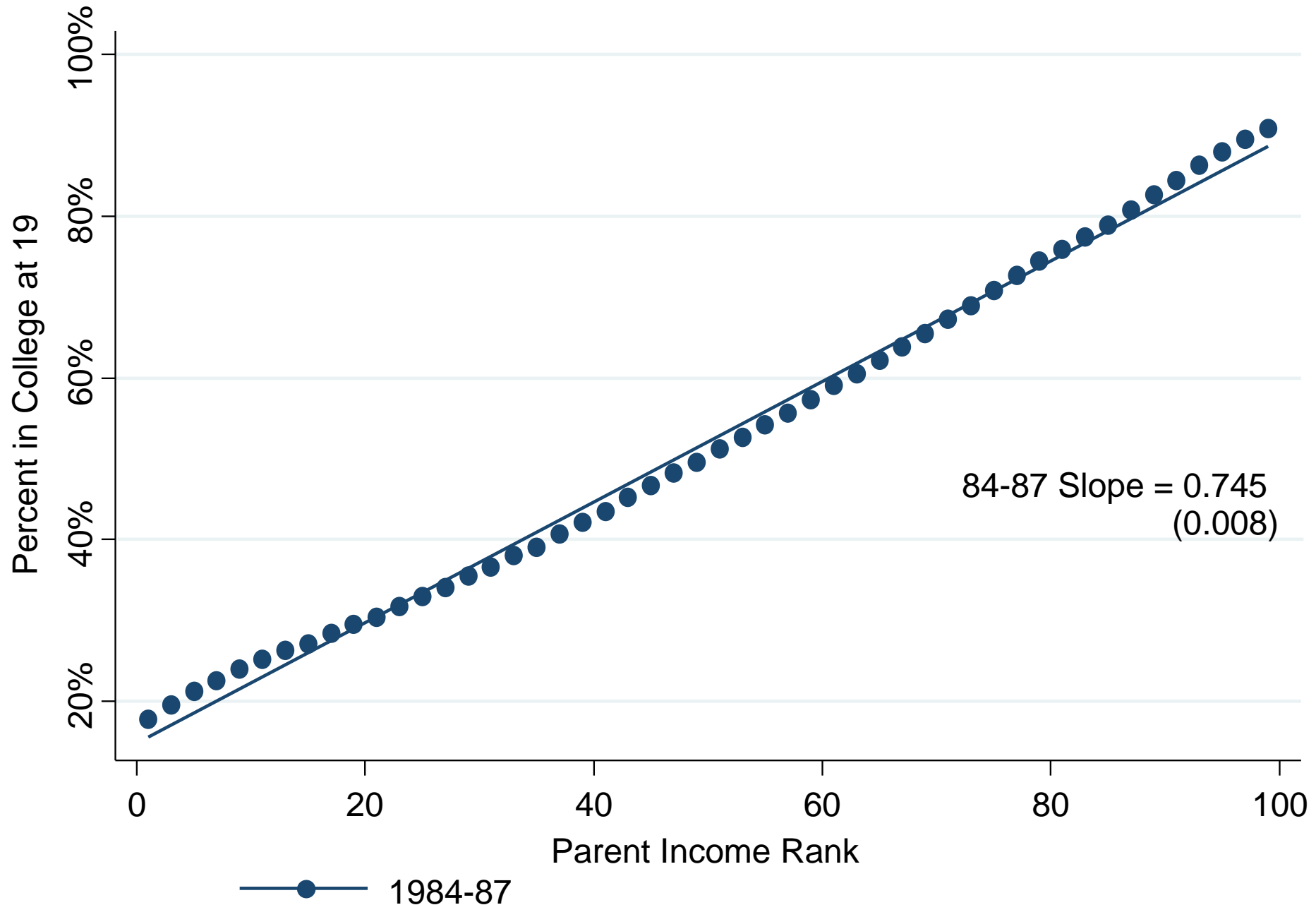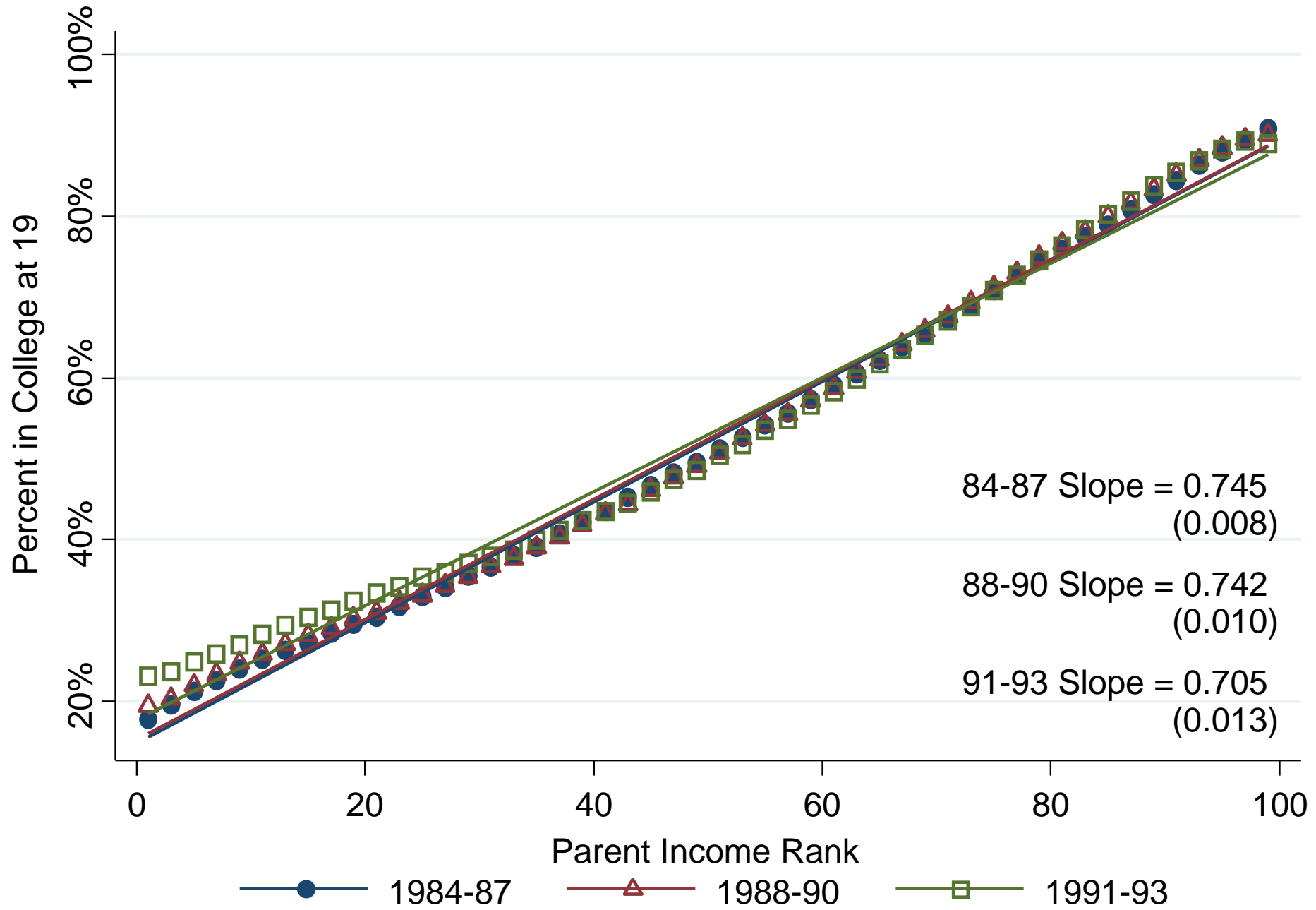
84-87 Slope = 0.745
(0.008)

College Attendance Rates vs. Parent Income Rank by Cohort

84-87 Slope = 0.745
(0.008)

88-90 Slope = 0.742
(0.010)

Percent in College at 19

Parent Income Rank

● 1984-87 △ 1988-90

College Attendance Rates vs. Parent Income Rank by Cohort

84-87 Slope = 0.745
(0.008)

88-90 Slope = 0.742
(0.010)

91-93 Slope = 0.705
(0.013)

Percent in College at 19

Parent Income Rank

●——— 1984-87   △——— 1988-90   □——— 1991-93

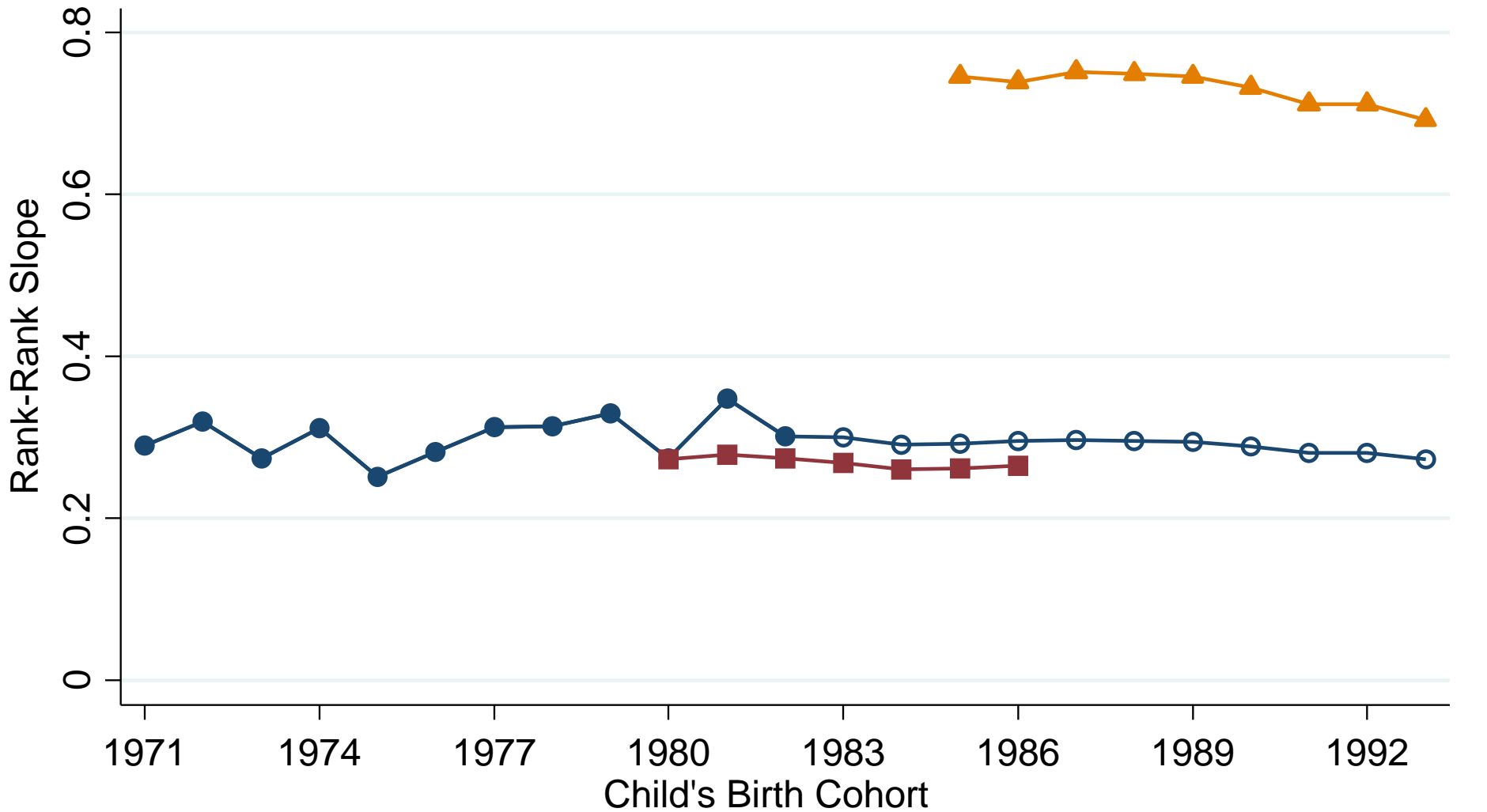**Intergenerational Mobility Estimates for the 1971-1993 Birth Cohorts**
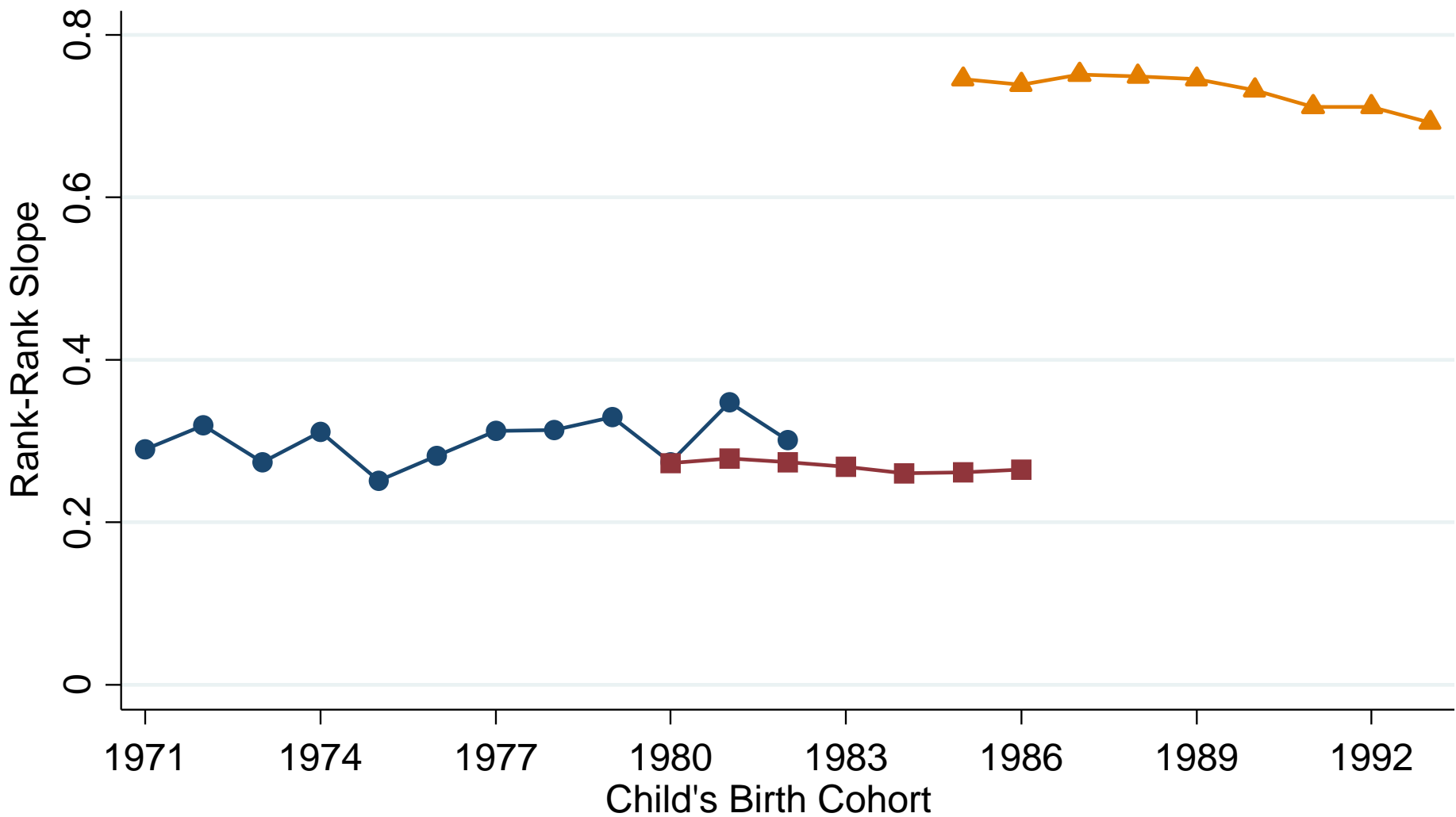
Income Rank-Rank
(Child Age 30; SOI Sample)

Income Rank-Rank
(Child Age 26; Pop. Sample)

College-Income Gradient
(Child Age 19; Pop. Sample)

Intergenerational Mobility Estimates for the 1971-1993 Birth Cohorts

Legend:
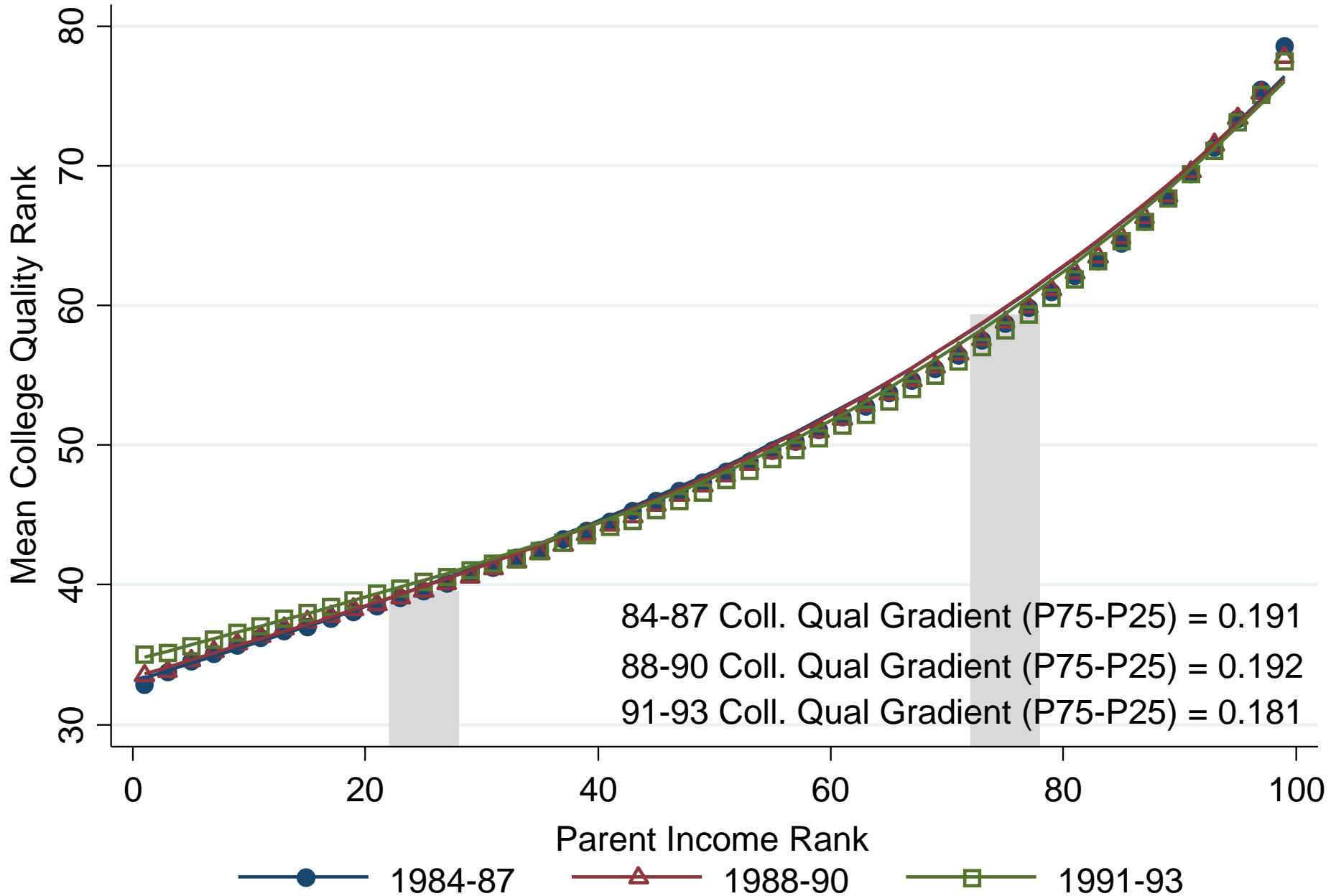- Income Rank-Rank (Child Age 30; SOI Sample)
- Forecast Based on Age 26 Income and College Attendance
- Income Rank-Rank (Child Age 26; Pop. Sample)
- College-Income Gradient (Child Age 19; Pop. Sample)

X-axis: Child's Birth Cohort
Y-axis: Rank-Rank Slope

College Quality

- Can obtain a richer prediction of earnings by using information on which college student attended

- Define "college quality" as mean earnings at age 31 of children born in 1979-80 based on the college they attended at age 20

College Quality Rank vs. Parent Income Rank by Cohort

Mean College Quality Rank (y-axis) vs. Parent Income Rank (x-axis)

84-87 Coll. Qual Gradient (P75-P25) = 0.191
88-90 Coll. Qual Gradient (P75-P25) = 0.192
91-93 Coll. Qual Gradient (P75-P25) = 0.181

1984-87   1988-90   1991-93

Trends in College Attendance vs. College Quality Gradients

College Quality Gradient (P75-P25) *(left axis)*

College Attendance Gradient *(right axis)*

Child's Birth Cohort

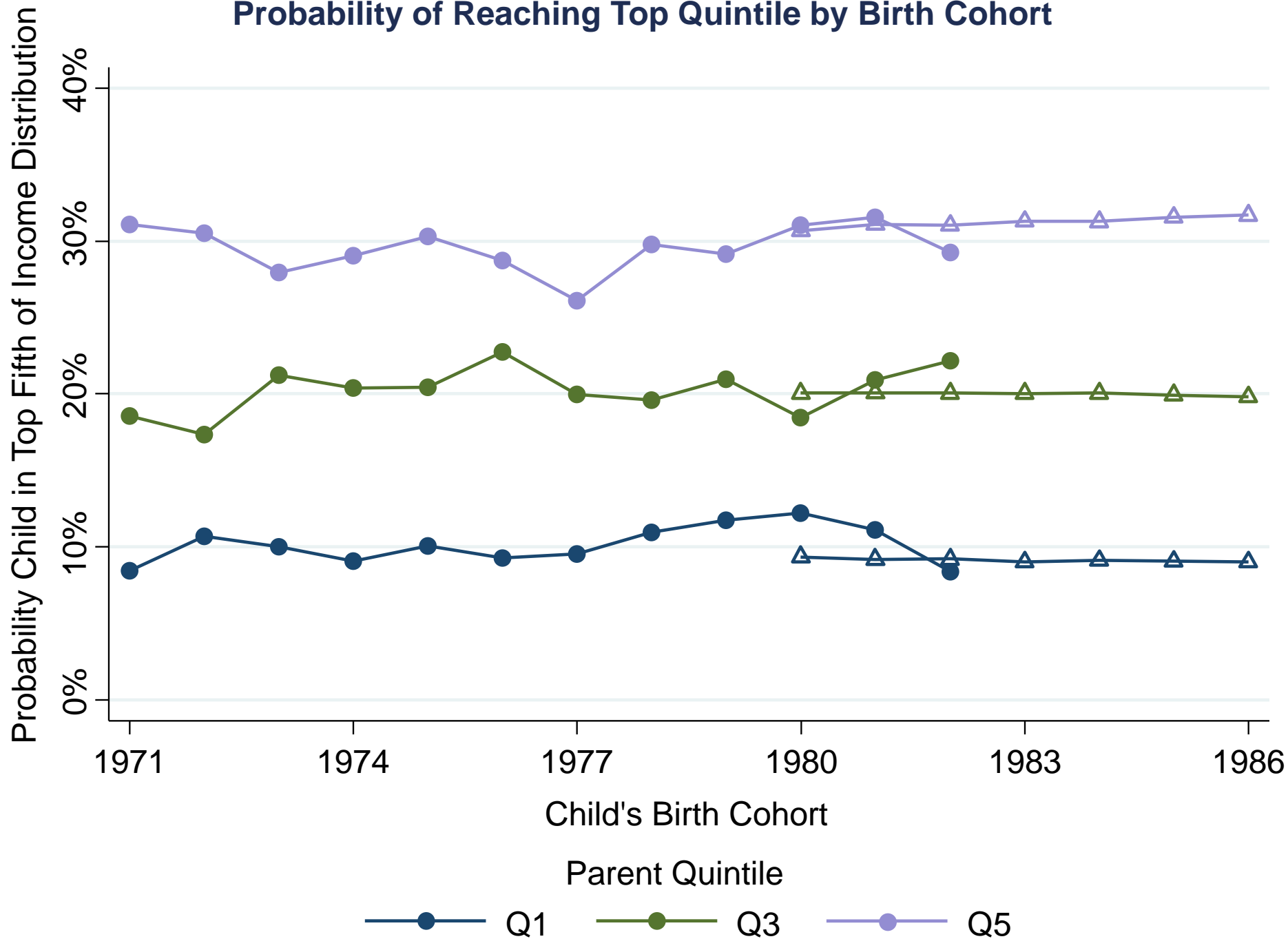Legend: ● College Quality   △ College Attendance
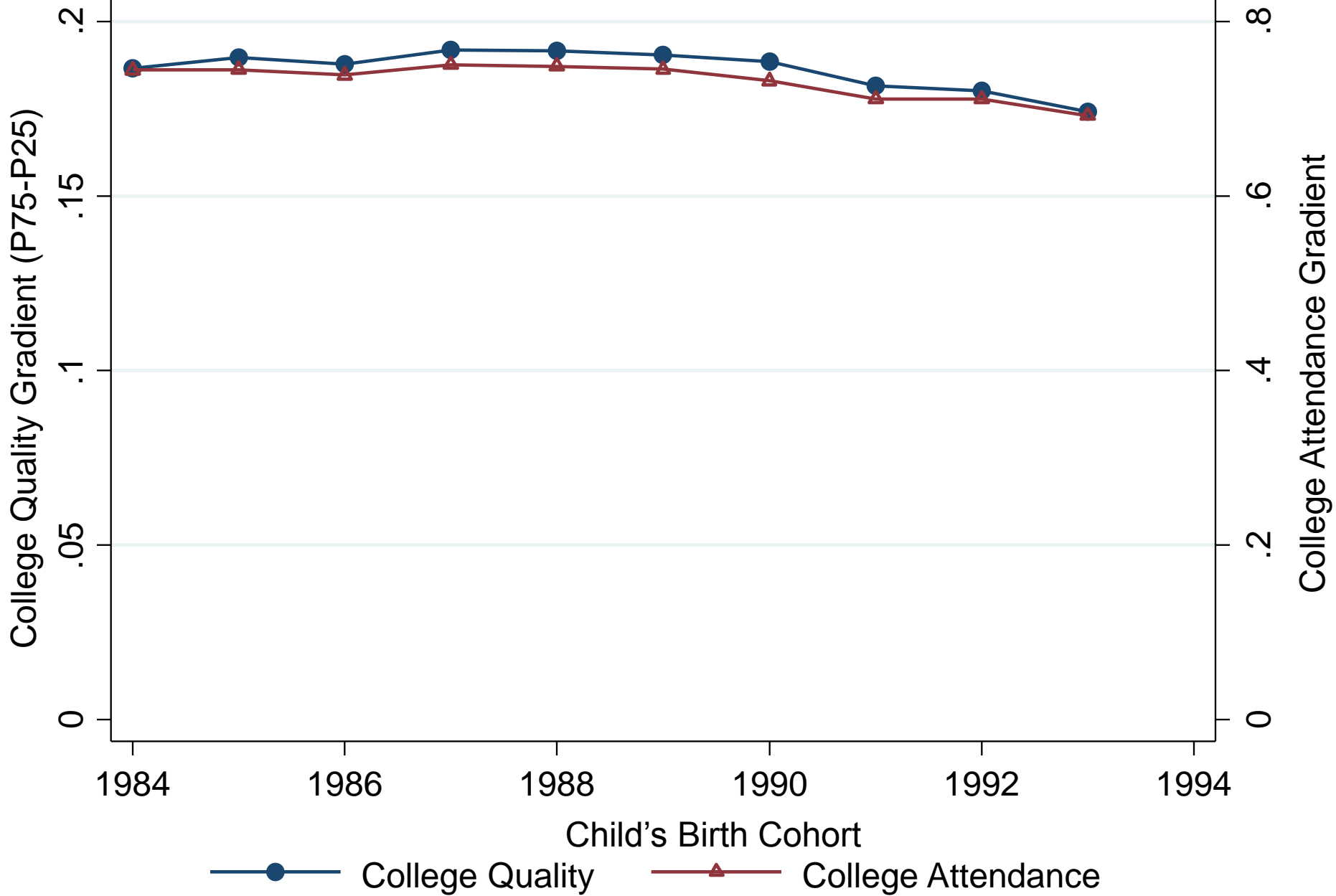
Quintile Transition Probabilities

- Mobility also stable using other statistics

  - Ex: fraction of children who reach the top quintile

Probability of Reaching Top Quintile by Birth Cohort

Parent Quintile

Q1   Q3   Q5

Regional Heterogeneity

- Substantial heterogeneity in mobility across areas
  [Chetty, Hendren, Kline, Saez 2014]

- Do these differences persist over time?

Intergenerational Mobility Estimates by Parent's Census Division

College Attendance

Age 26 Income Rank

Rank-Rank Slope

Child's Birth Cohort
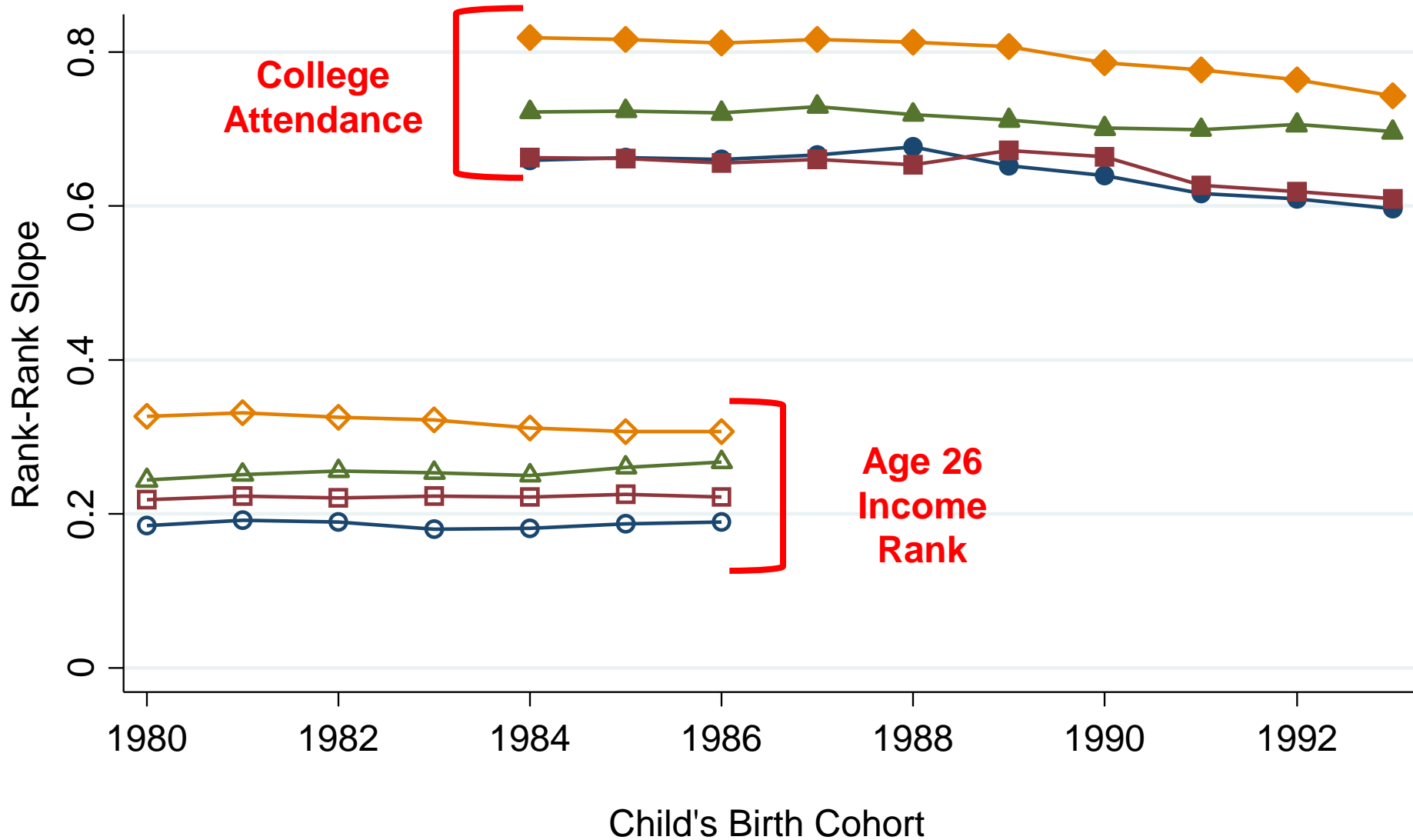
Pacific · Mountain · New England · East South Central

Discussion

- Rank-based mobility is not declining in the U.S. as a whole

  - Combined with evidence from Lee and Solon (2009), mobility appears to be roughly stable over past half century

- But mobility is (and has consistently been) low in the U.S. relative to most other developed countries (Corak 2013)

- Increased inequality → consequences of the "birth lottery" larger

  - Low mobility matters more today than in the past

Discussion

- Results may be surprising given negative correlation between mobility and inequality in cross-section [Corak 2013]

    - Based on "Great Gatsby Curve," one would predict that mobility should have fallen by 20% [Krueger 2012]

- One explanation: much of the increase in inequality is driven by extreme upper tail (top 1%)

    - But top 1% income shares are not strongly correlated with mobility across countries or across areas within the U.S. [Chetty et al. 2014]

    - Predicted increase in rank-rank slope based on bottom 99% Gini coefficient ("middle class inequality") is only 0.3 to 0.32

Future Research

- Key open question: why do some parts of the U.S. have persistently low rates of intergenerational mobility?

  - Mobility statistics by birth cohort by commuting zone available on project website (www.equality-of-opportunity.org)

Download Data on Social Mobility
www.equality-of-opportunity.org/data

The Geography of Intergenerational Mobility

| Data Description		
Preferred Mobility Measures by Commuting Zone	Stata file	Excel file
Online Data Table 1: National 100 by 100 Transition Matrix	Stata file	Excel file
Online Data Table 2: Marginal Income Distributions by Centile	Stata file	Excel file
Online Data Table 3: Intergenerational Mobility Statistics and Selected Covariates by County	Stata file	Excel file
Online Data Table 4: Intergenerational Mobility Statistics by Metropolitan Statistical Area	Stata file	Excel file
Online Data Table 5: Intergenerational Mobility Statistics by Commuting Zone	Stata file	Excel file
Online Data Table 6: Quintile-Quintile Transition Matrices by Commuting Zone	Stata file	Excel file
Online Data Table 7: Income Distributions by Commuting Zone	Stata file	Excel file
Online Data Table 8: Commuting Zone Characteristics	Stata file	Excel file
Online Data Table 9: Commuting Zone Characteristics Definitions and Data Sources		Excel file
Geographic Crosswalks (Tolbert and Sizer 1996, Autor and Dorn 2009 & 2013)	Zip file	
Replication Stata Code and Datasets	Zip file	
Downloadable Map of Absolute Upward Mobility		

Time Trends in Intergenerational Mobility

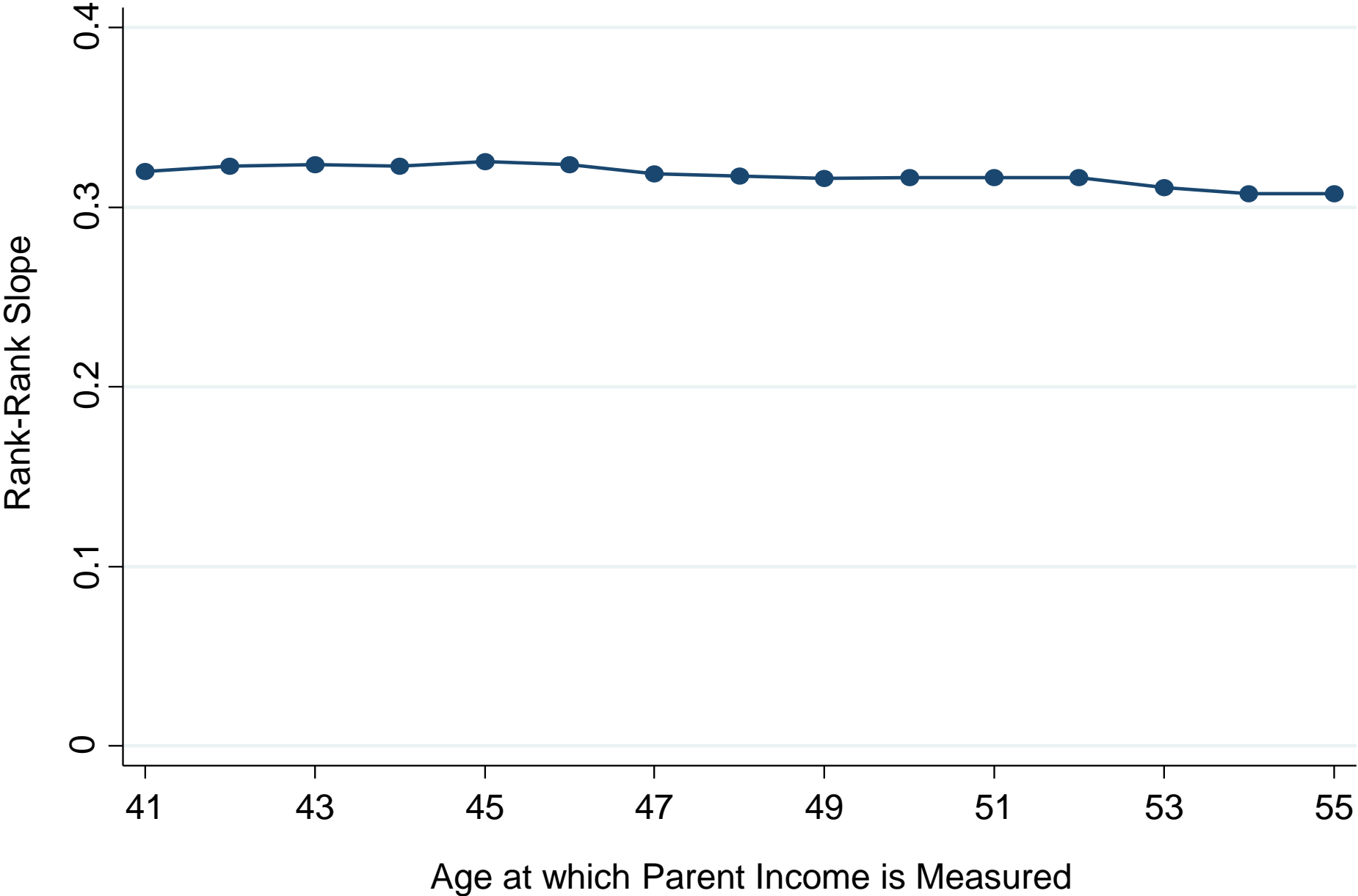| Data Description		
Online Data Table 1: Intergenerational Mobility Estimates by Commuting Zone and Birth Cohort	Stata file	Excel file
Appendix Tables: National Estimates of Mobility and Inequality by Cohort		Excel file

Appendix Figures

Slope of College Attendance Gradient by
Age of Child when Parent Income is Measured
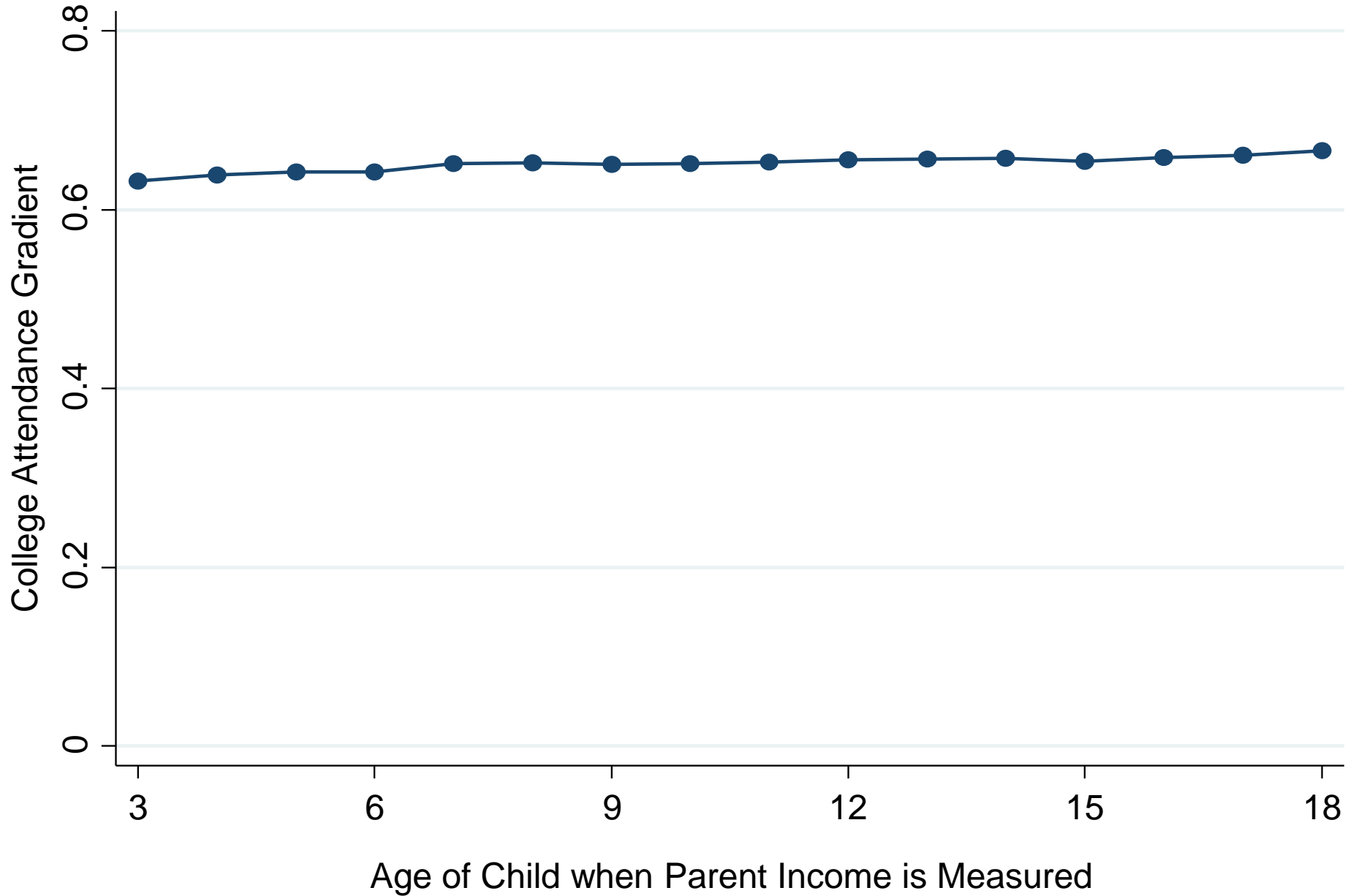
Attenuation Bias: Rank-Rank Slopes by Number of Years Used to Measure Child Income
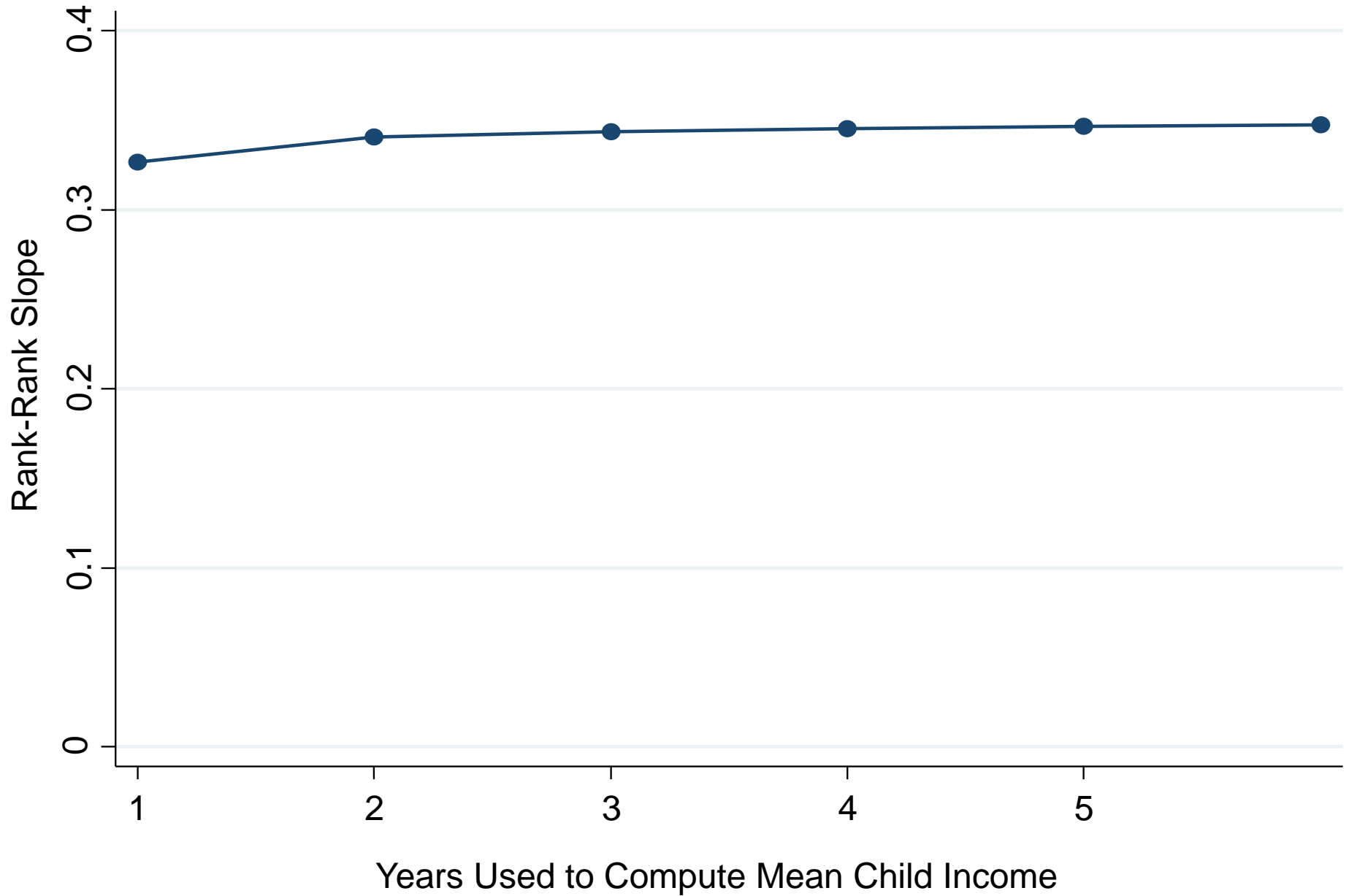
Rank-Rank Slope by Age at which Parent Income is Measured

Rank-Rank Slope (y-axis, 0 to 0.4)

Age at which Parent Income is Measured (x-axis, 41 to 55)

Robustness of College Attendance Gradient by Age at which College Attendance is Measured

Y-axis: Slope of Coll. Attendance by Par. Income Gradient

X-axis: Child's Birth Cohort

Legend:
- Before Age 19
- Before Age 20
- Before Age 22
- Before Age 25