Global Income Dynamics: Team USA

Kevin L McKinney and John M Abowd

U.S. Census Bureau

November 19, 2020

Virtual Conference

Acknowledgements and Disclaimer

United States™ Census Bureau

U.S. Department of Commerce
Economics and Statistics Administration
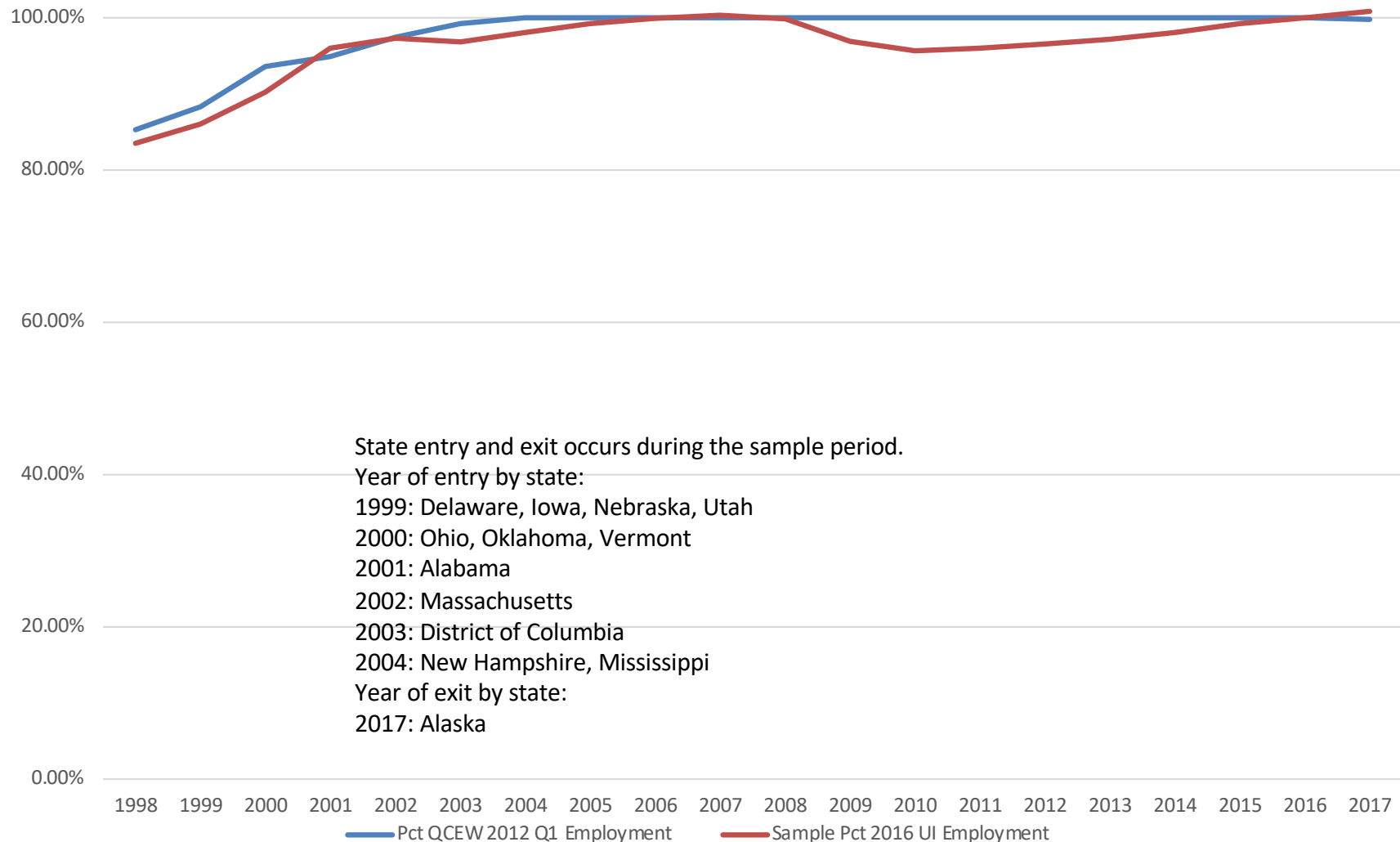U.S. CENSUS BUREAU
census.gov

Data

- U.S. Census Bureau's Longitudinal Employer Household Dynamics (LEHD) linked employer-employee data (private, state, local)

- Analysis Variable: real annual earnings at all jobs (2018 Personal Consumption Expenditures Price Index)

- Analysis Period: 1998-2017

Data (continued)

- Sample inclusion criteria:
  - Valid Social Security Number (reliable person ID)
  - No more than 12 active jobs during the year
  - SSN active/worker not reported dead by SSA
  - Ages 25 to 55, inclusive
  - Annual earnings are greater than 260*US min hourly wage or about $1,900 2018 PCE dollars
  - Worker is employed with at least one Unemployment-Insurance-covered firm in a state-year with data received by LEHD (state entry/exit)
- Sample size
  - Approximately 1.8 billion person-year records

LEHD State Entry and Exit

Percent of Reference Year Employment

State entry and exit occurs during the sample period.
Year of entry by state:
1999: Delaware, Iowa, Nebraska, Utah
2000: Ohio, Oklahoma, Vermont
2001: Alabama
2002: Massachusetts
2003: District of Columbia
2004: New Hampshire, Mississippi
Year of exit by state:
2017: Alaska

Pct QCEW 2012 Q1 Employment   Sample Pct 2016 UI Employment

United States Census Bureau

U.S. Department of Commerce
Economics and Statistics Administration
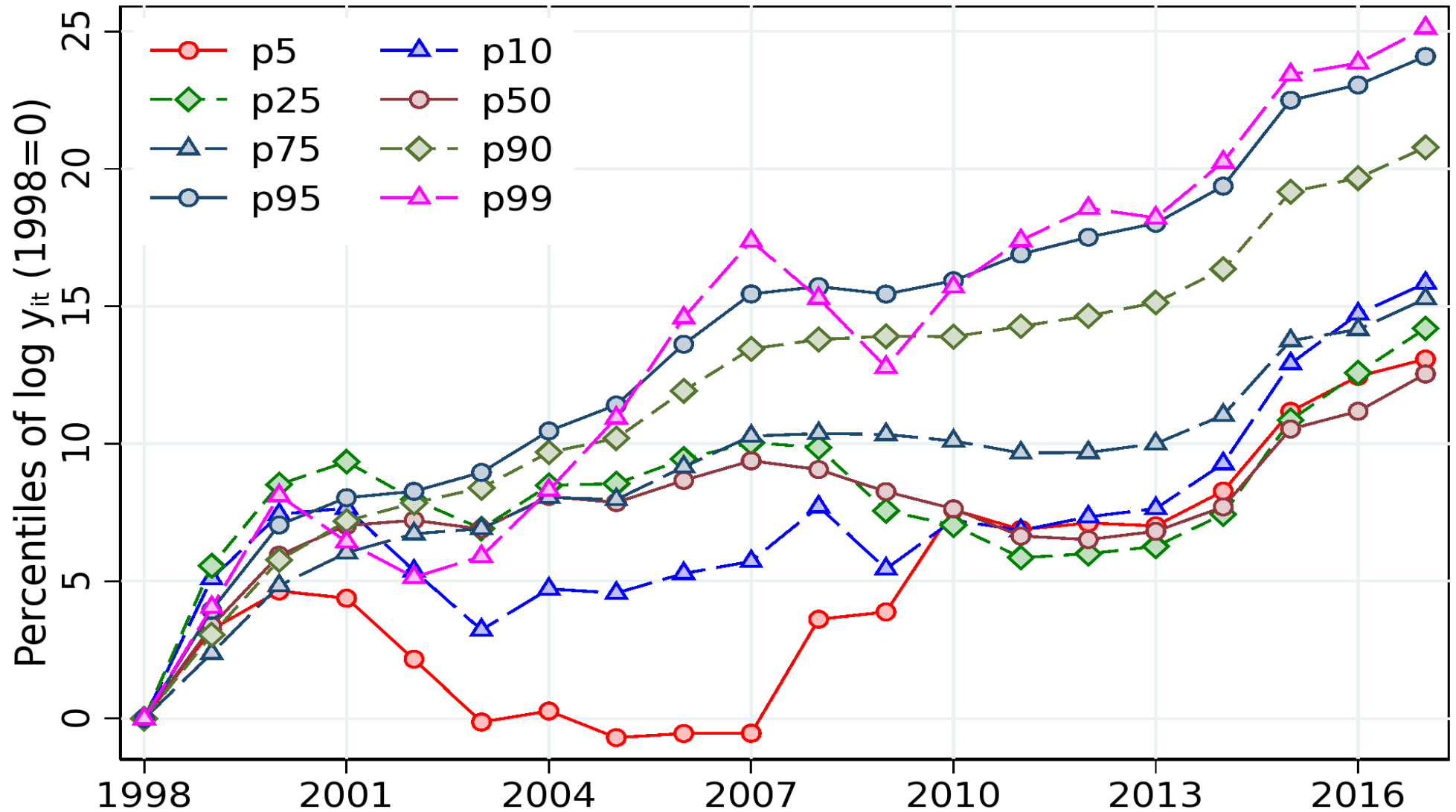U.S. CENSUS BUREAU
census.gov

Part A

Results are for all workers, unless stated otherwise. Estimates have not been updated since the first conference.

Earnings Inequality

Percentiles of log y_{it}
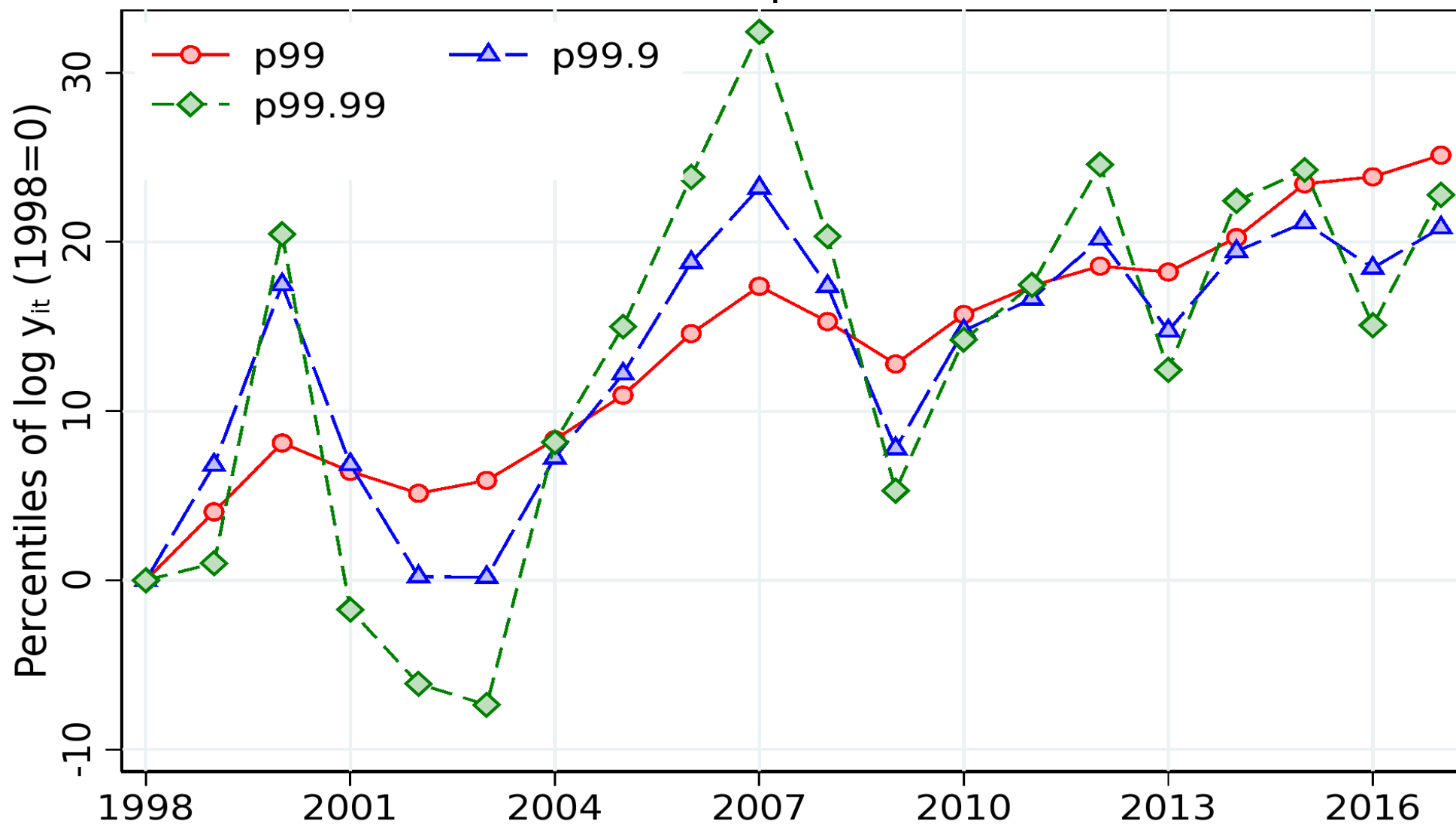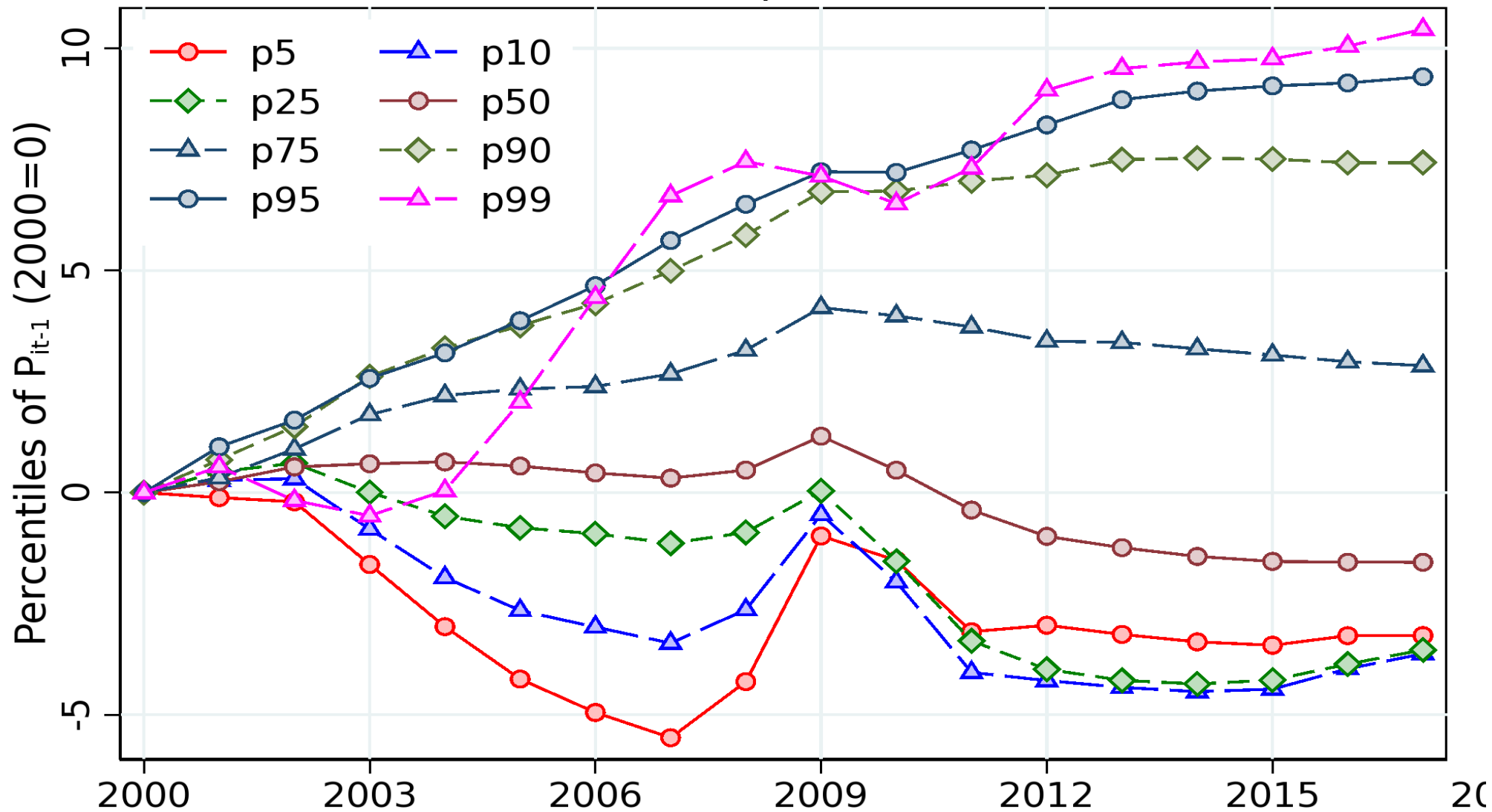
Sample: all

Percentiles of log y_{it}

Sample: all

Percentiles of P_{it-1}

Sample: all

Legend: p5, p10, p25, p50, p75, p90, p95, p99

Y-axis: Percentiles of P_{it-1} (2000=0)

Percentiles of P_{it-1}
Sample: all
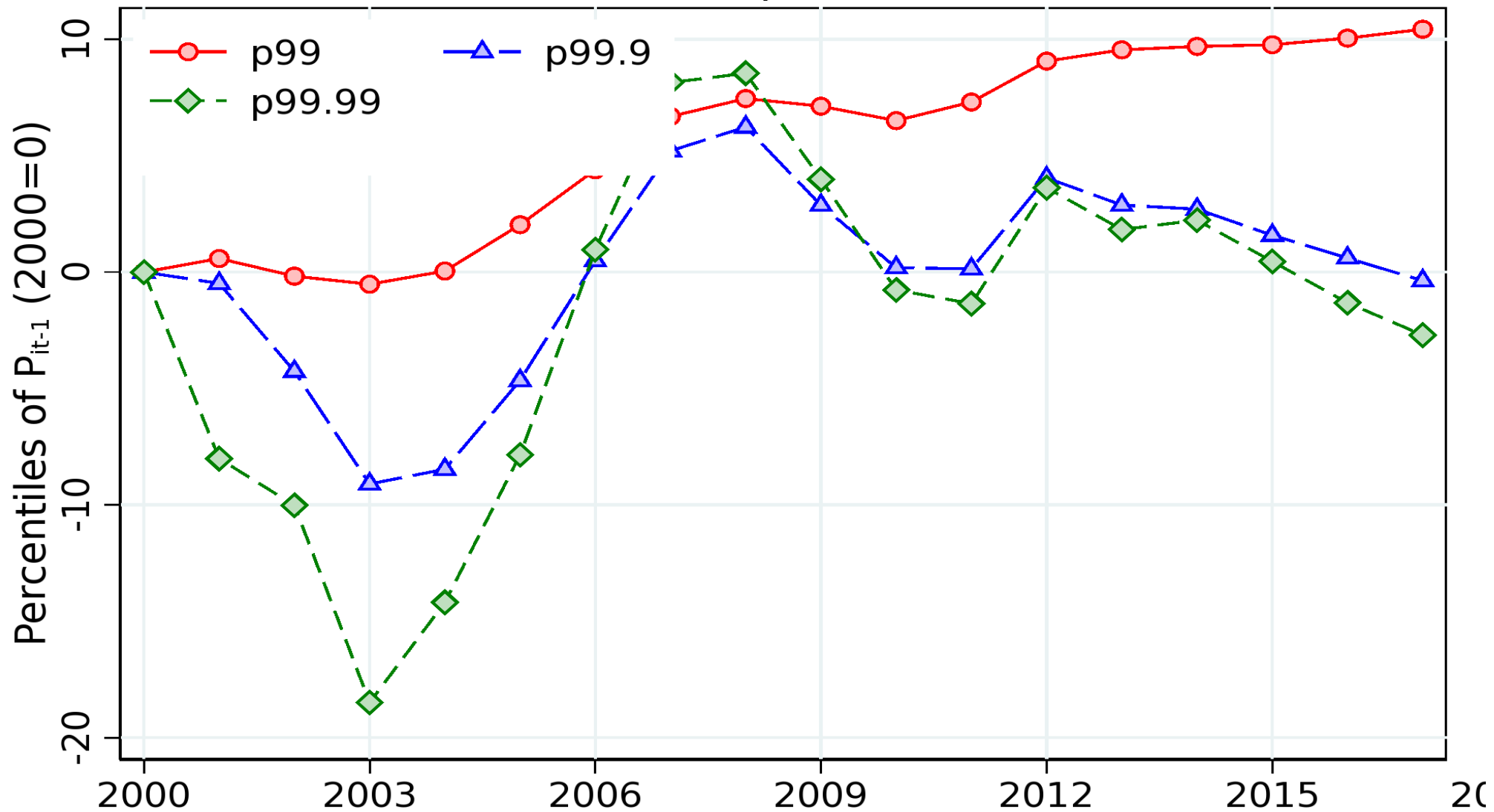
Summary

- Inequality generally increasing over time (or at least not decreasing).
  - Annual earnings for the 90th percentile and above increased much faster than the lower percentiles before the great recession (growth in 90-10 slows down or stops post great recession).
  - Permanent income inequality is similar, but real earnings percentiles at the median and below declined (even the 75th percentile declined post great recession).

Volatility

Dispersion of $\Delta^1 \varepsilon_{it}$

P9010 of $\Delta^1 \varepsilon_{it}$

Legend: ○ p9010

X-axis: 1998, 2001, 2004, 2007, 2010, 2013, 2016

Y-axis: 80, 85, 90, 95, 100

Dispersion of $\Delta^5 \varepsilon_{it}$

Measures of Skewness of $\Delta^1\varepsilon_{it}$

Legend: Kelley Skewness (red, solid line with circles); Coeff. of Skewness (blue, dashed line with circles)

Left axis: Kelley Skewness of $\Delta^1\varepsilon_{it}$ (11.4, 5.64, -.12, -5.88, -11.64, -17.4)

Right axis: Coeff. of Skewness of $\Delta^1\varepsilon_{it}$ (-.1, -.24, -.38, -.52, -.66, -.8)

X-axis: 1998, 2001, 2004, 2007, 2010, 2013, 2016

Measures of Skewness of $\Delta^5 \varepsilon_{it}$

Legend:
- Kelley Skewness (red, solid line with circles)
- Coeff. of Skewness (blue, dashed line with circles)

Left axis — Kelley Skewness of $\Delta^5 \varepsilon_{it}$: 13, 9.4, 5.8, 2.2, -1.4, -5

Right axis — Coeff. of Skewness of $\Delta^5 \varepsilon_{it}$: 0, -.08, -.16, -.24, -.32, -.4

X-axis: 1998, 2001, 2004, 2007, 2010, 2013

Summary

- Overall dispersion is decreasing, although skewness of the right tail is increasing.

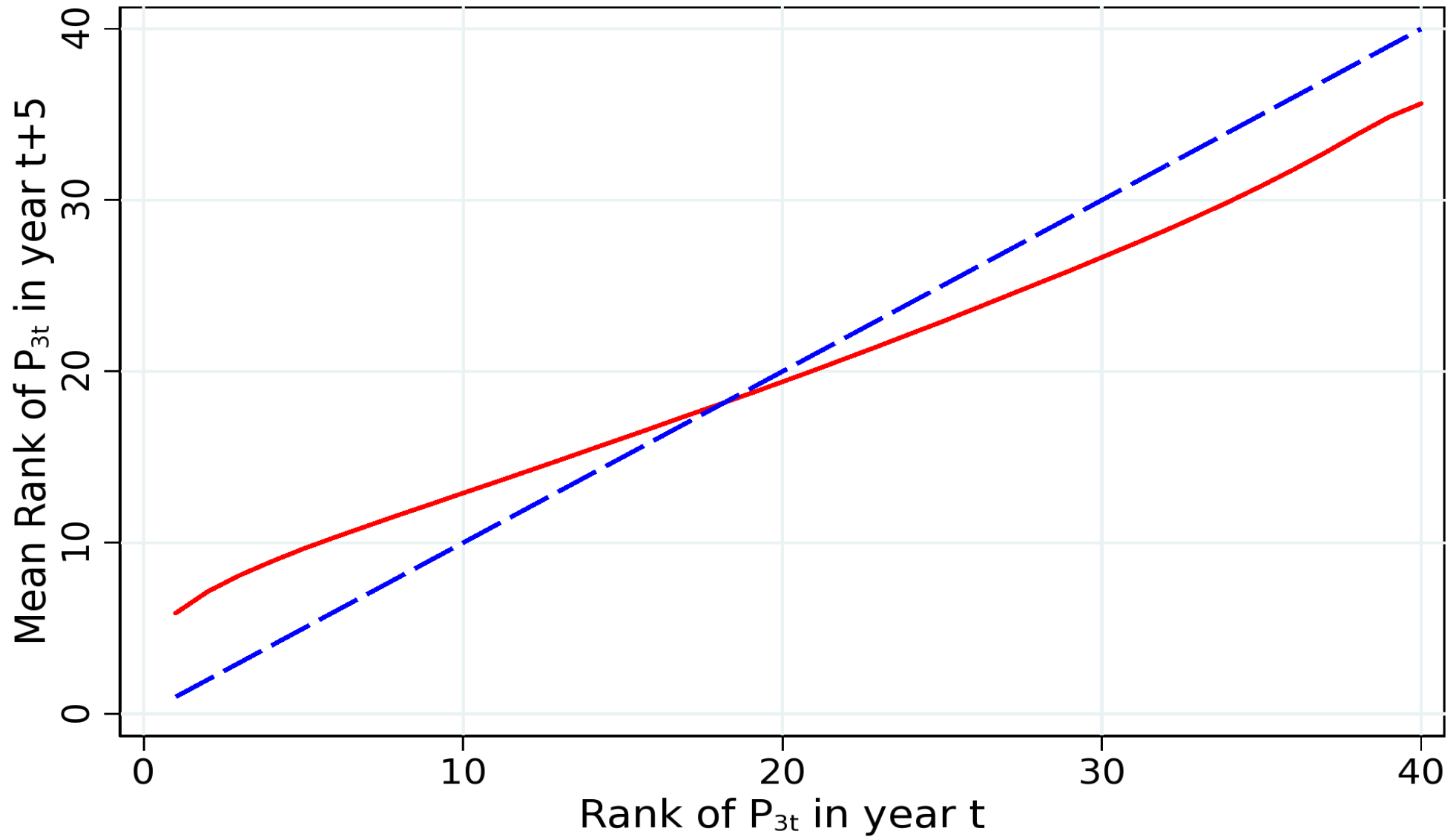- The decreasing dispersion shown here is consistent with our prior research results (McKinney and Abowd 2020) using the variance of the one-year difference in log earnings

Mobility

Year 2000 permanent earnings compared with permanent earnings in years 2005, 2010, and 2014

Permanent Income Mobility
Year: 2000

Mean Rank of P_{3t} in year t+5 (vertical axis, values 0, 10, 20, 30, 40)

Rank of P_{3t} in year t (horizontal axis, values 0, 10, 20, 30, 40)

Permanent Income Mobility
Year: 2000

Y-axis: Mean Rank of P_{3t} in year t+10

X-axis: Rank of P_{3t} in year t
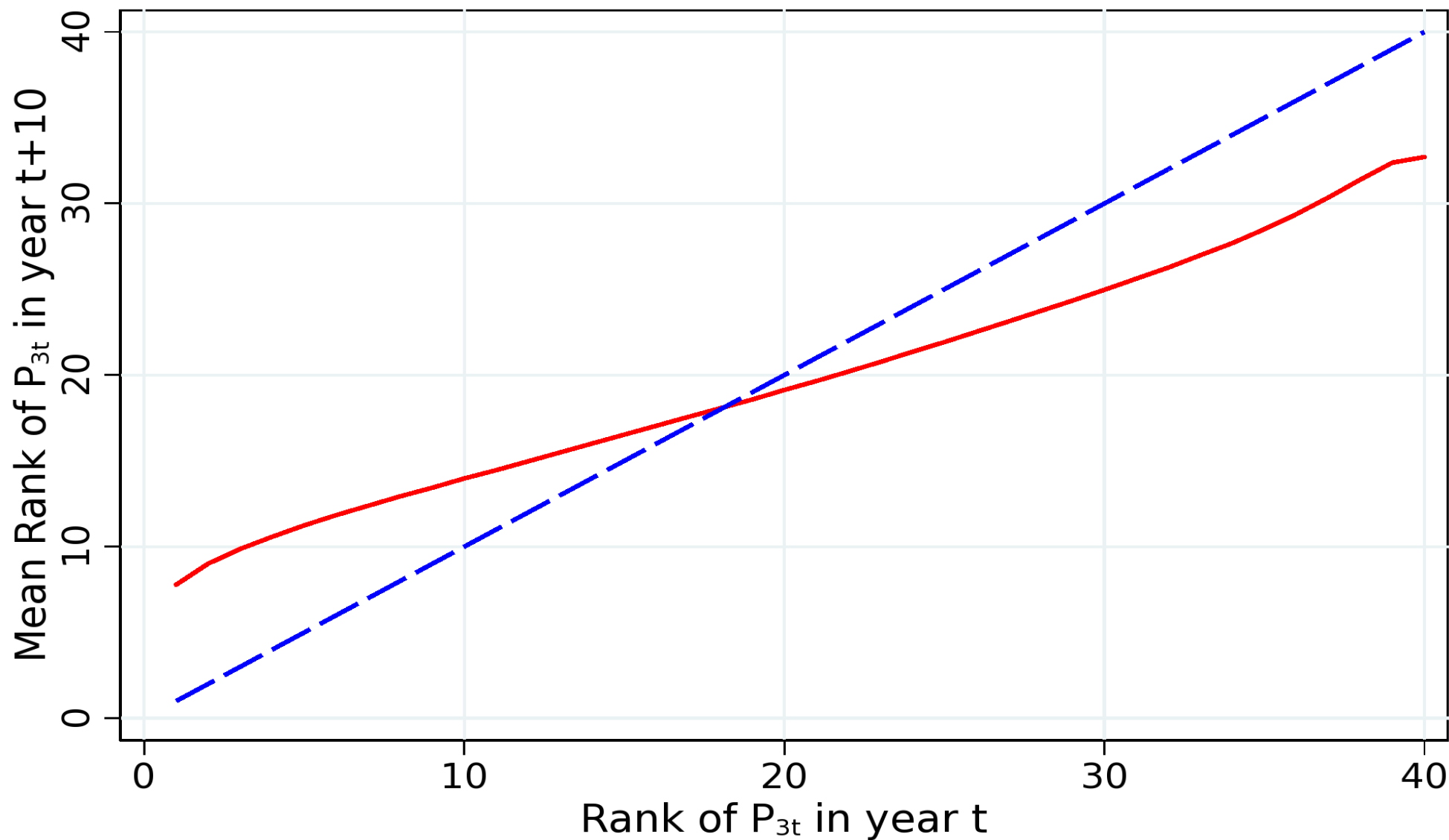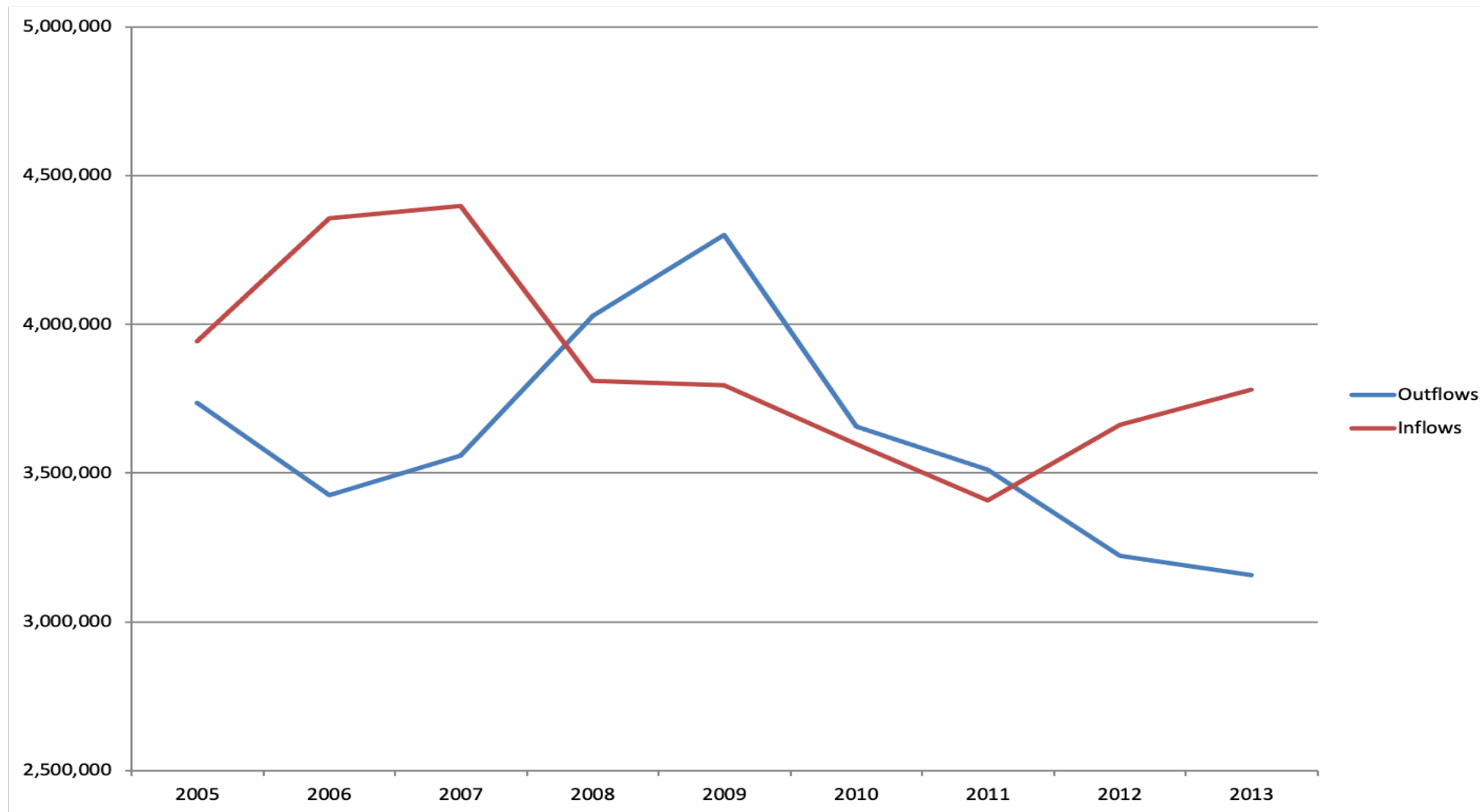
Decline in Flows Into and Out of the Top 20% of the Earnings Distribution

Summary

- There is mean reversion in future income

  - Dependence on current income declines as the time horizon increases.

- Overall

  - Inequality increasing, volatility decreasing, mobility decreasing (especially in/out of the top part of the earnings distribution)

Part B

Long Term Earnings by Demographic Groups

- Examine long-term earnings outcomes for a single cohort of workers by 20 demographic groups (foreign born*sex*race/ethnicity)

- Labor force attachment (work history) varies significantly across groups

- Earnings differences across demographic groups remain large, even for workers within the same work history category

Background

- Previous research on earnings inequality shows differences in labor supply explain a large amount of earnings inequality, especially for workers in the bottom 20% of the earnings distribution (Abowd, McKinney, Zhou 2018)

- The 35% of workers in a two-year period who change employers and/or have gaps in quarterly earnings reports explain about 95% of overall year-to-year earnings volatility (McKinney and Abowd 2020)

Labor Market Attachment

- These results suggest heterogeneity in worker's labor supply is an important component of both within year and multiple year measures of earnings inequality.

- If a worker experiences a single break or gap in reported earnings, that person is much more likely to experience additional gaps in reported earnings.

- The non-random assignment of zero or low earning years increases long-term earnings inequality.

Data

- LEHD linked employer-employee data
  - Similar basic sample selection rules as Part A
- Analysis period: 2004 to 2015
  - All 50 states plus DC continuously report data to LEHD (no state entry/exit)
  - Includes the period before, during, and after the Great Recession
- Follow a single cohort of eligible workers age 24-54 in 2004 for 12 years
  - Workers must be active at least one year and eligible all 12 years (never reported dead by SSA)

Age by Years in Sample

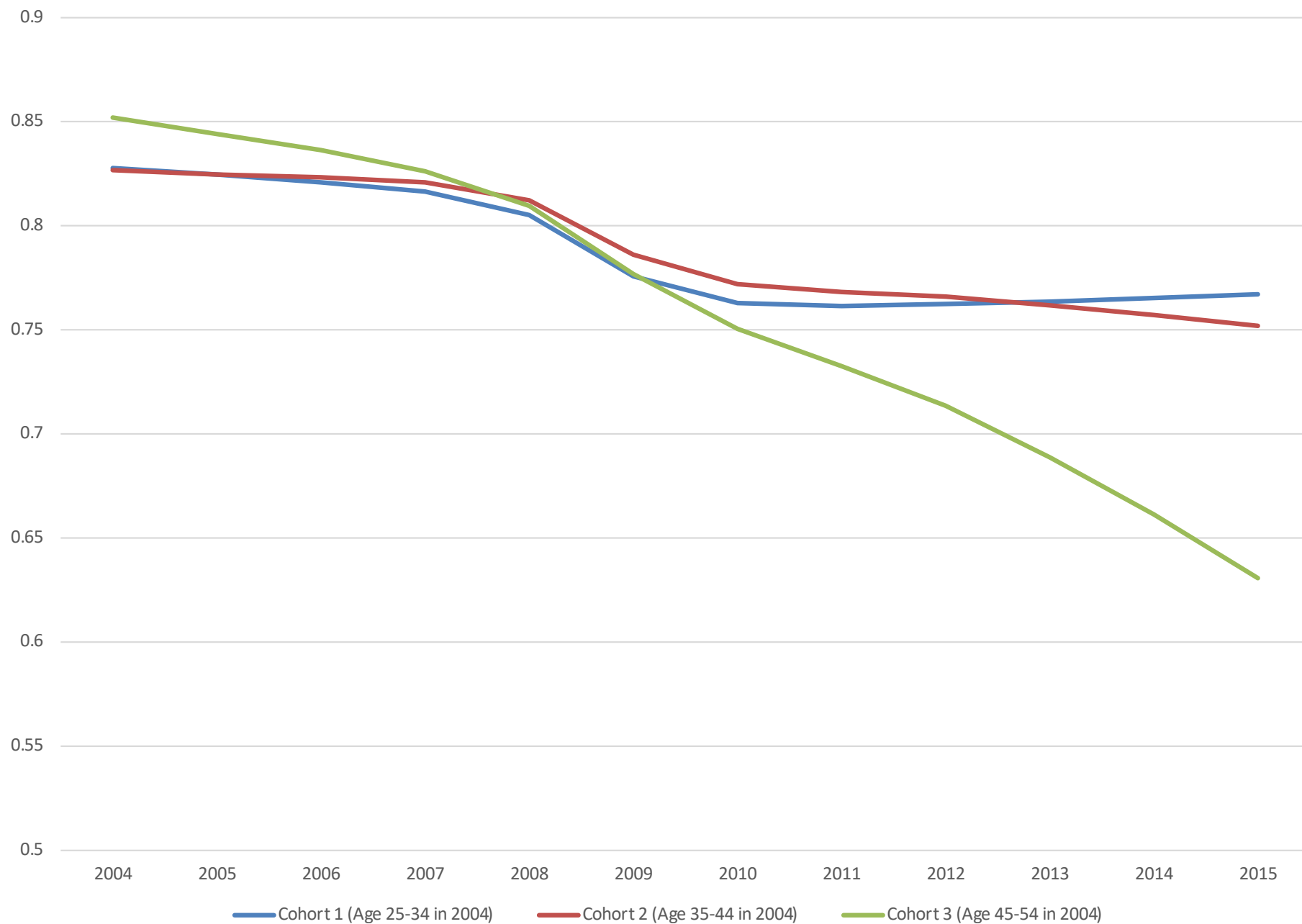| Cohort	Years in Sample / Calendar Year											
	1	2	3	4	5	6	7	8	9	10	11	12
	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
1	25	26	27	28	29	30	31	32	33	34	35	36
1	26	27	28	29	30	31	32	33	34	35	36	37
1	27	28	29	30	31	32	33	34	35	36	37	38
1	28	29	30	31	32	33	34	35	36	37	38	39
1	29	30	31	32	33	34	35	36	37	38	39	40
1	30	31	32	33	34	35	36	37	38	39	40	41
1	31	32	33	34	35	36	37	38	39	40	41	42
1	32	33	34	35	36	37	38	39	40	41	42	43
1	33	34	35	36	37	38	39	40	41	42	43	44
1	34	35	36	37	38	39	40	41	42	43	44	45
2	35	36	37	38	39	40	41	42	43	44	45	46
2	36	37	38	39	40	41	42	43	44	45	46	47
2	37	38	39	40	41	42	43	44	45	46	47	48
2	38	39	40	41	42	43	44	45	46	47	48	49
2	39	40	41	42	43	44	45	46	47	48	49	50
2	40	41	42	43	44	45	46	47	48	49	50	51
2	41	42	43	44	45	46	47	48	49	50	51	52
2	42	43	44	45	46	47	48	49	50	51	52	53
2	43	44	45	46	47	48	49	50	51	52	53	54
2	44	45	46	47	48	49	50	51	52	53	54	55
3	45	46	47	48	49	50	51	52	53	54	55	56
3	46	47	48	49	50	51	52	53	54	55	56	57
3	47	48	49	50	51	52	53	54	55	56	57	58
3	48	49	50	51	52	53	54	55	56	57	58	59
3	49	50	51	52	53	54	55	56	57	58	59	60
3	50	51	52	53	54	55	56	57	58	59	60	61
3	51	52	53	54	55	56	57	58	59	60	61	62
3	52	53	54	55	56	57	58	59	60	61	62	63
3	53	54	55	56	57	58	59	60	61	62	63	64
3	54	55	56	57	58	59	60	61	62	63	64	65

Analysis Variables

- Annual real earnings from all reported jobs (2010 PCE)

- Average annual real earnings: Sum of annual real earnings from all reported jobs over all analysis years divided by 12

- Annual activity status (active=annual earnings from all reported jobs>0)

- Work History (pattern of full year active, partial year active, and inactive years)
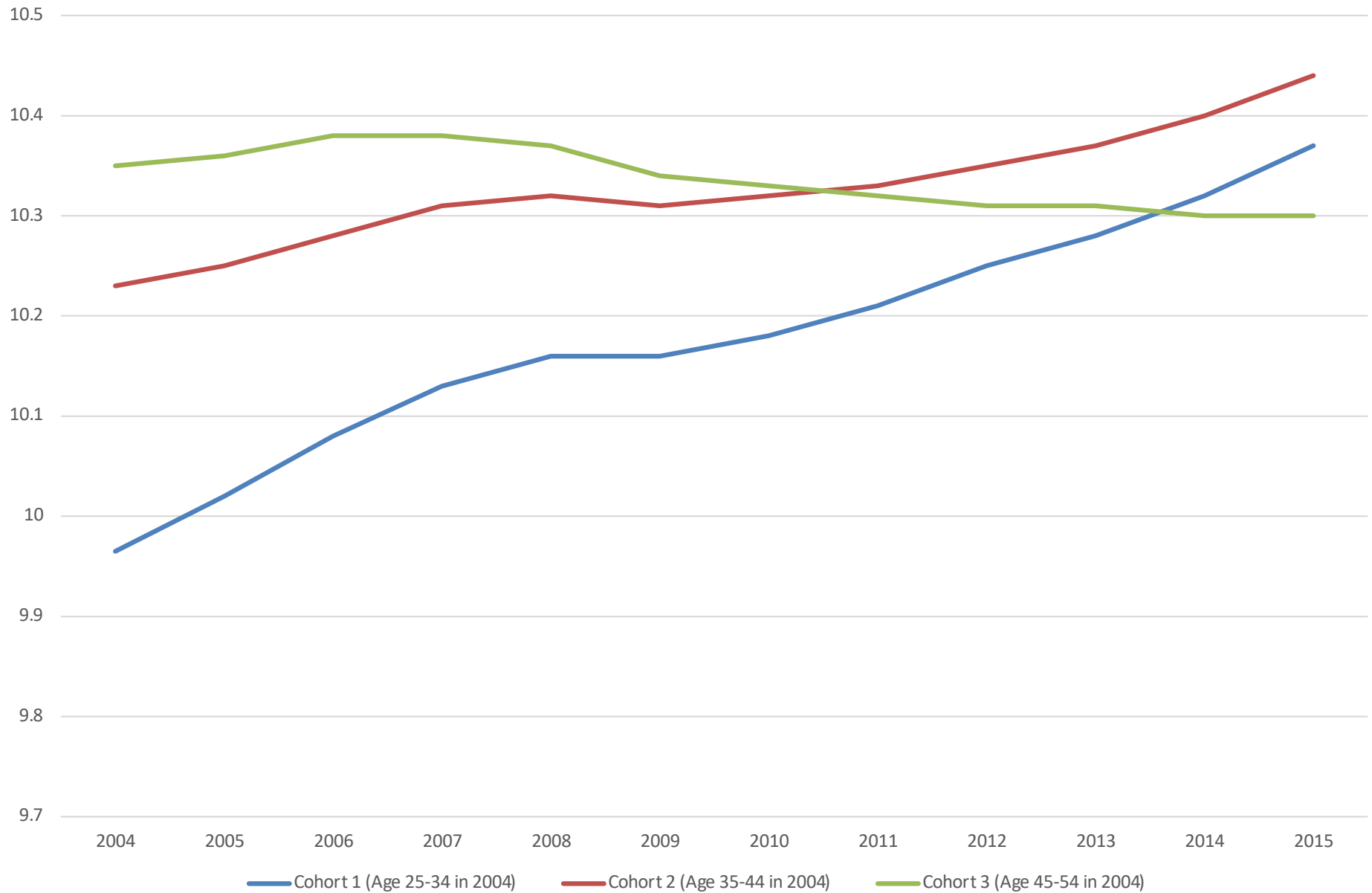
Activity and Earnings

- Sample Size / Activity
  - Persons: 109 million
  - Eligible Person Years: 12*109=1.308 billion
  - Active Person Years: 1.018 billion
  - Average Annual Share of Persons Active: 78%
- Earnings
  - Log Annual Real Earnings
    - Mean: 10.28, SD: 1.274
  - Log Average Annual Real Earnings
    - Mean: 9.737, SD: 1.744
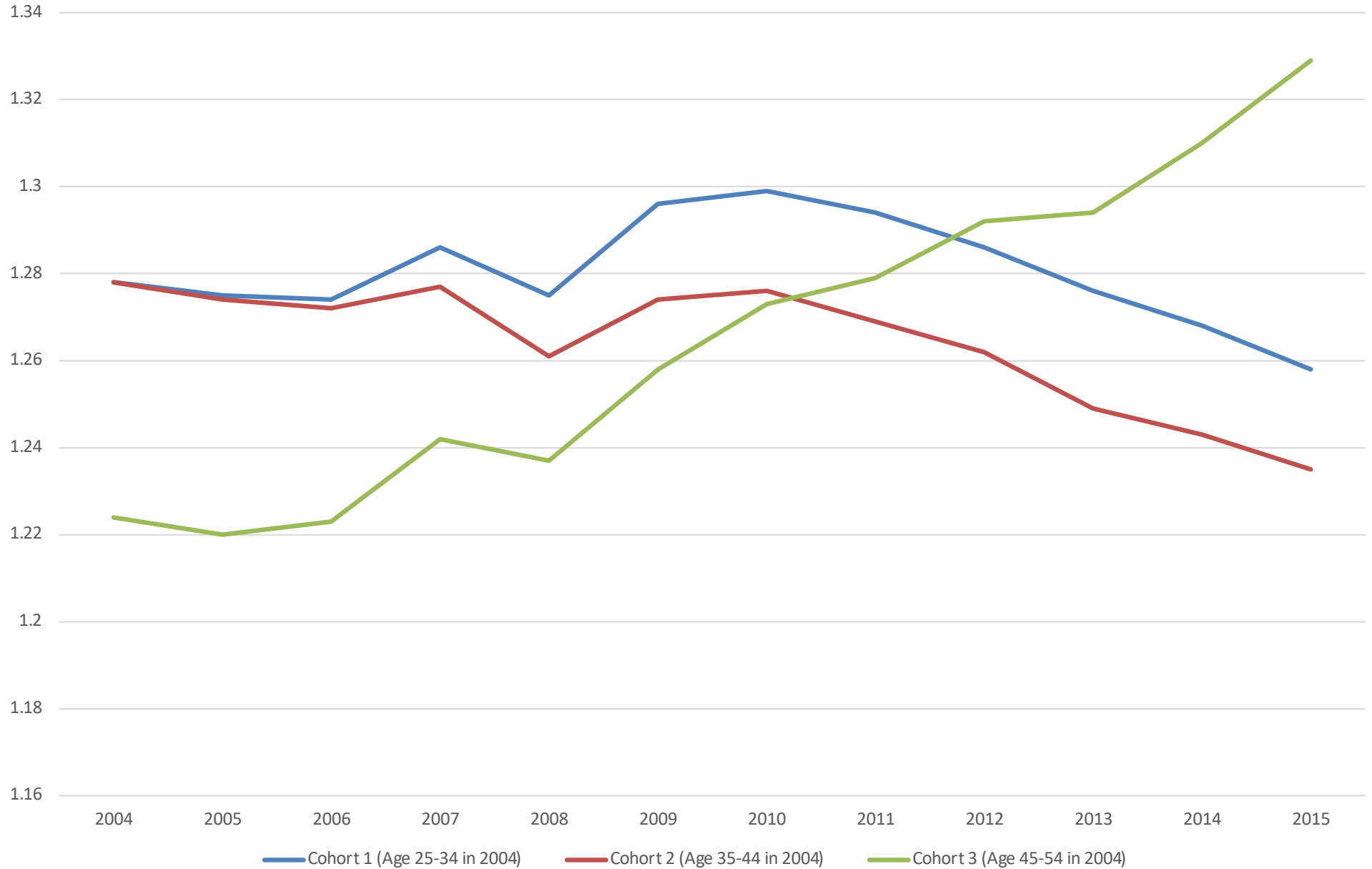 - Zero earning years reduce the mean and increase the SD

Percent Active by Age Cohort and Year

Legend:
- Cohort 1 (Age 25-34 in 2004)
- Cohort 2 (Age 35-44 in 2004)
- Cohort 3 (Age 45-54 in 2004)

Mean Log Annual Real Earnings by Age Cohort and Year

Cohort 1 (Age 25-34 in 2004)   Cohort 2 (Age 35-44 in 2004)   Cohort 3 (Age 45-54 in 2004)

SD Log Annual Real Earnings by Age Cohort and Year

Legend:
- Cohort 1 (Age 25-34 in 2004)
- Cohort 2 (Age 35-44 in 2004)
- Cohort 3 (Age 45-54 in 2004)

Long Term Earnings

- Distribution of average annual real earnings by twenty demographic categories based on foreign born status (0,1), sex (M,F) and race/ethnicity

- Race/Ethnicity detail
  - WN: White Non-Hispanic
  - WH: White Hispanic
  - BN: Black Non-Hispanic
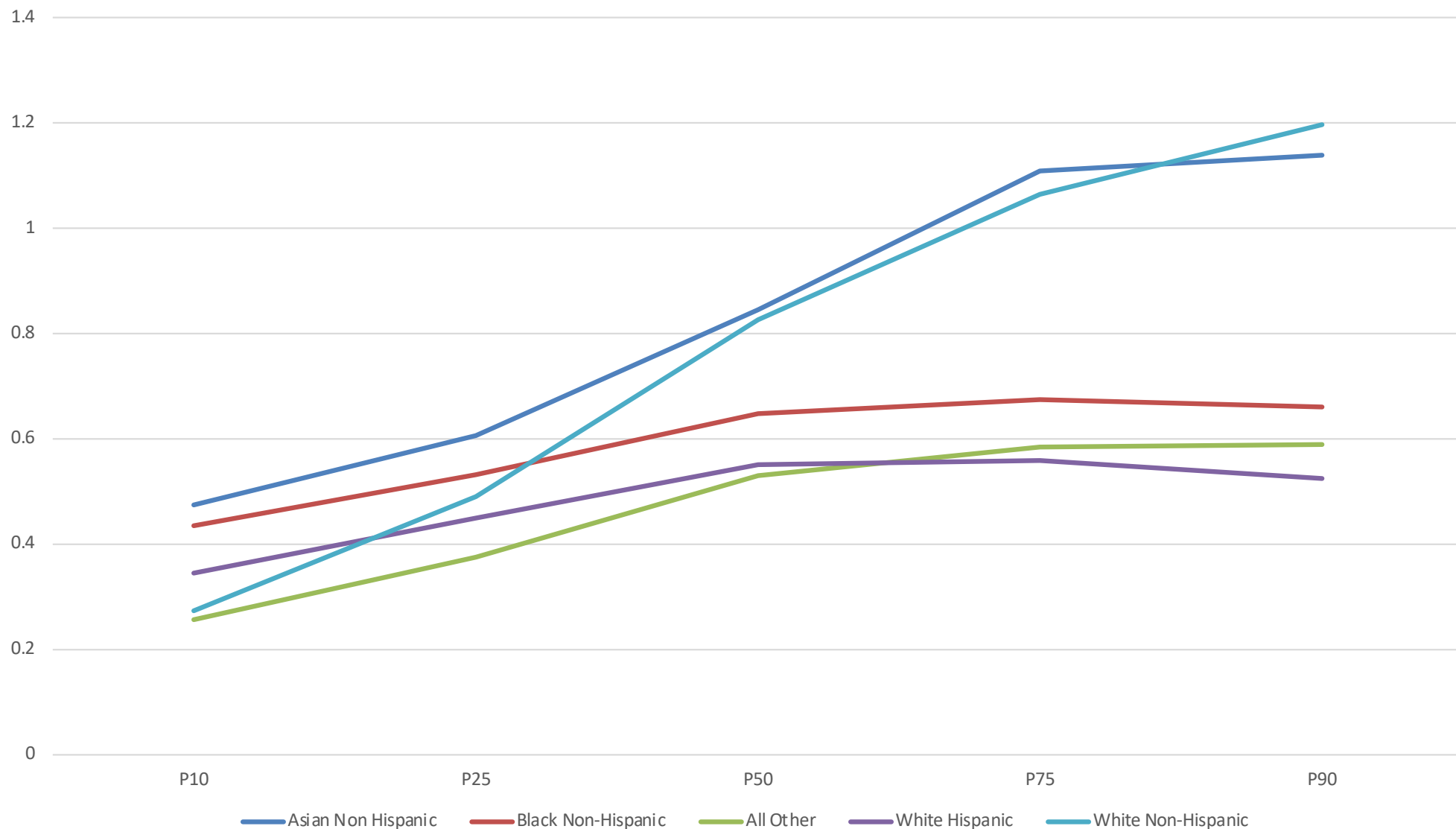 - AN: Asian Non-Hispanic
  - OA: All Other

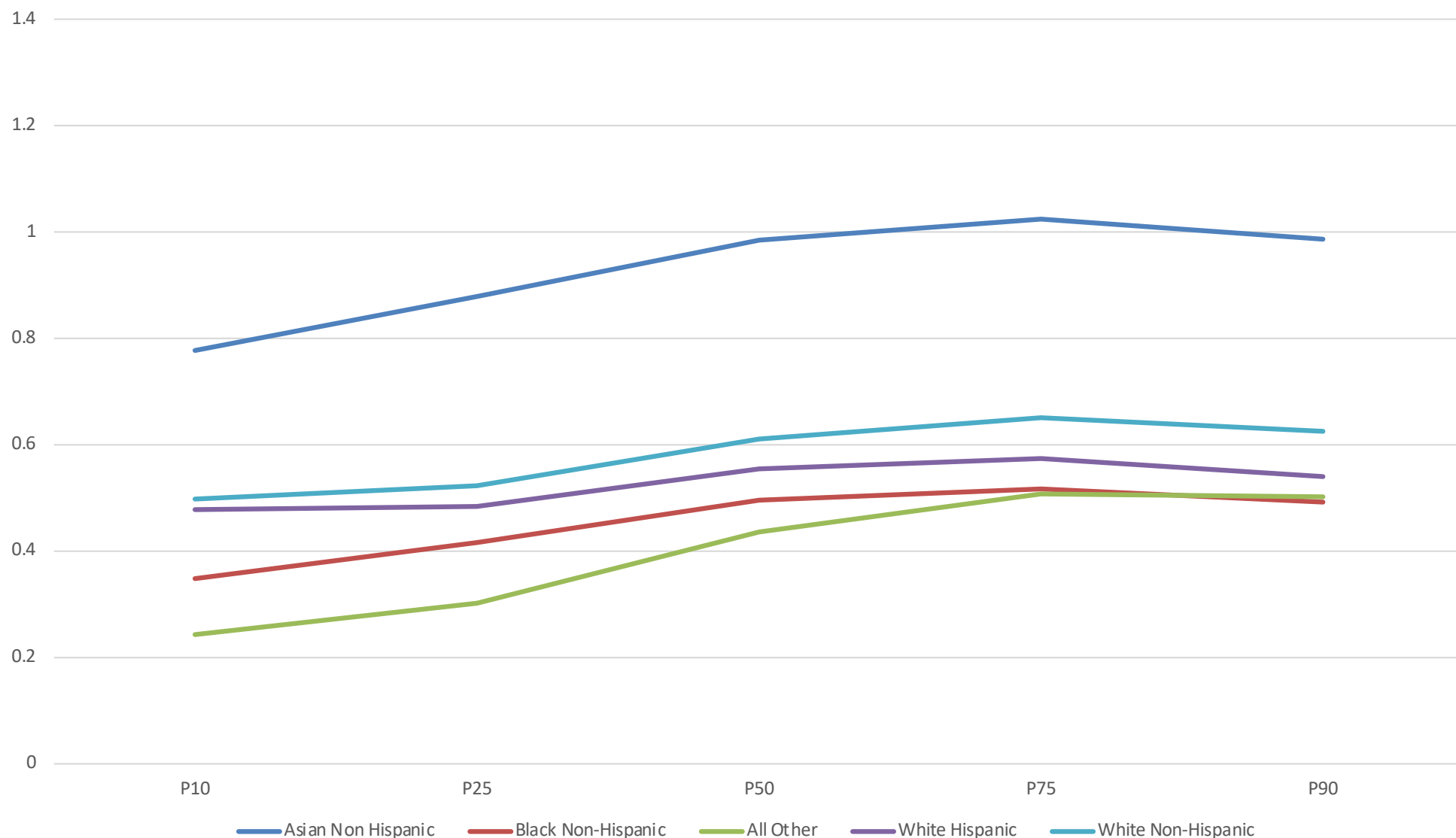# Native White Non-Hispanic Males: Selected Percentiles of Average Annual Real Earnings

$3,469

$16,370

$38,960

$67,890

$110,400

Native Males by Race/Ethnicity: Ratio of Percentile X of Average Annual Real Earnings to Percentile X of Average Annual Real Earnings for Native White Non-Hispanic Males

Legend: Asian Non Hispanic, Black Non-Hispanic, All Other, White Hispanic, White Non-Hispanic
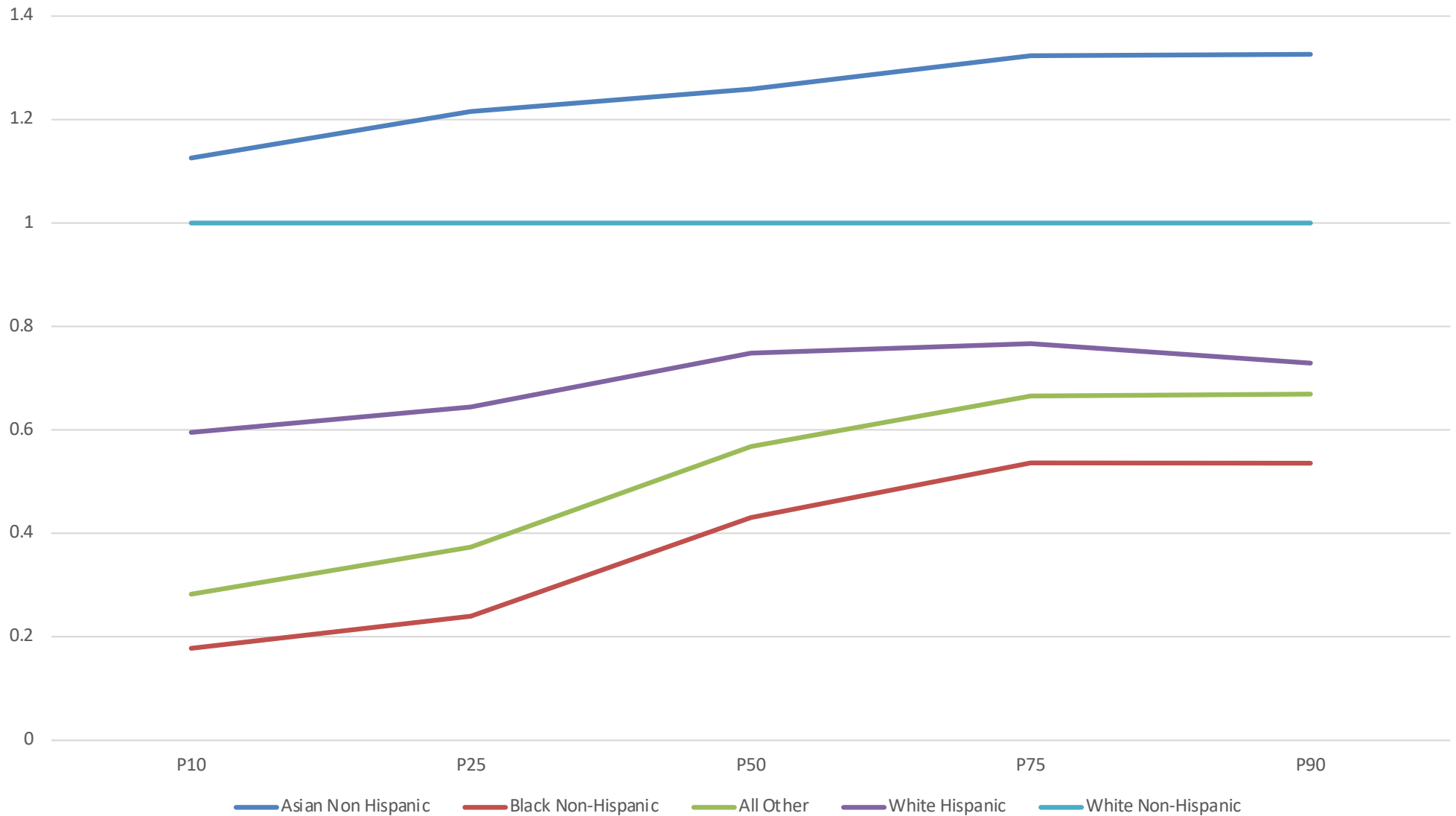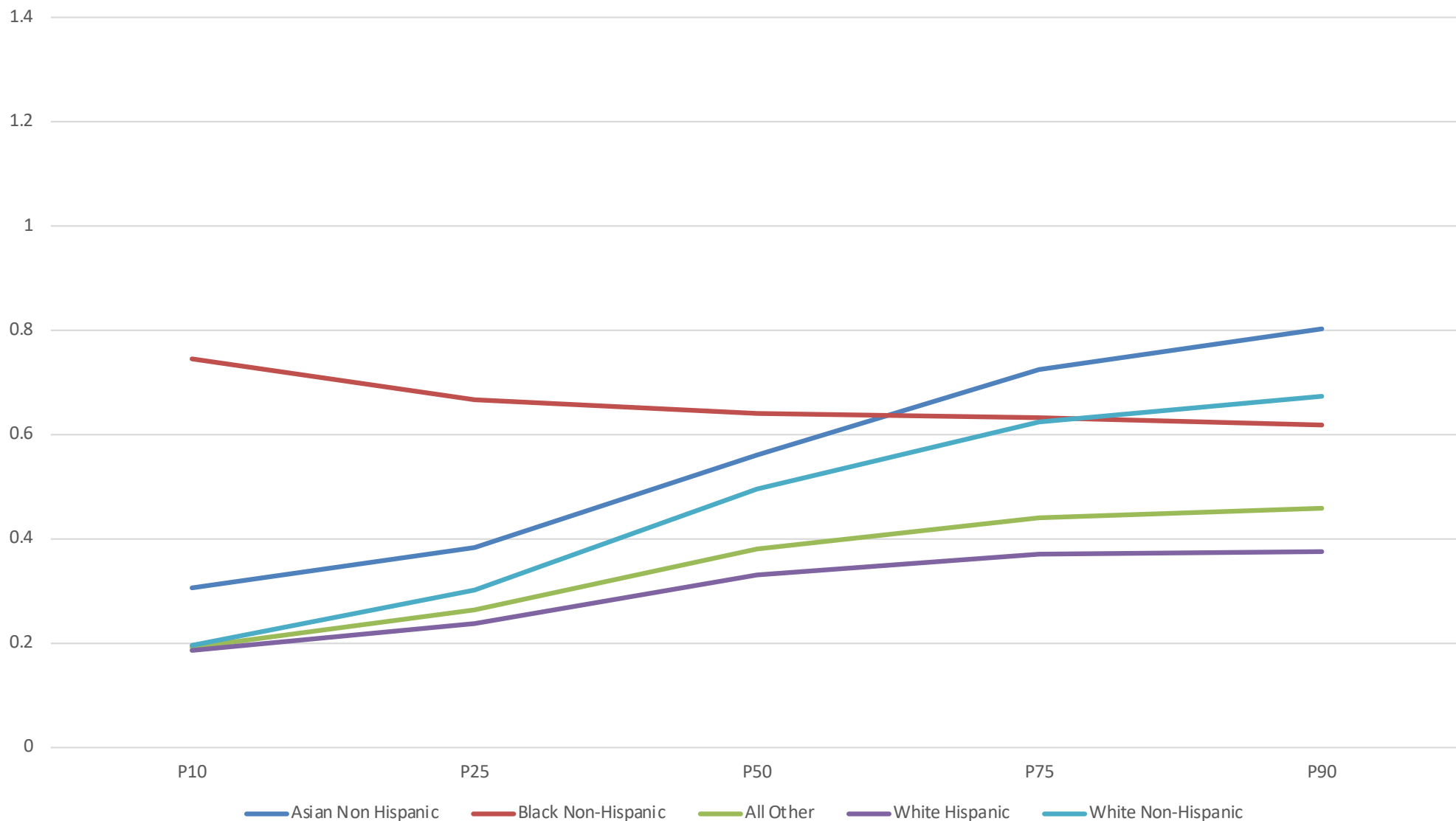
Foreign Born Males by Race/Ethnicity: Ratio of Percentile X of Average Annual Real Earnings to Percentile X of Average Annual Real Earnings for Native White Non-Hispanic Males

Legend:
- Asian Non Hispanic
- Black Non-Hispanic
- All Other
- White Hispanic
- White Non-Hispanic

X-axis: P10, P25, P50, P75, P90
Y-axis: 0, 0.2, 0.4, 0.6, 0.8, 1, 1.2, 1.4

Native Females by Race/Ethnicity: Ratio of Percentile X of Average Annual Real Earnings to Percentile X of Average Annual Real Earnings for Native White Non-Hispanic Males

Asian Non Hispanic · Black Non-Hispanic · All Other · White Hispanic · White Non-Hispanic

Foreign Born Females by Race/Ethnicity: Ratio of Percentile X of Average Annual Real Earnings to Percentile X of Average Annual Real Earnings for Native White Non-Hispanic Males

Legend: Asian Non Hispanic — Black Non-Hispanic — All Other — White Hispanic — White Non-Hispanic
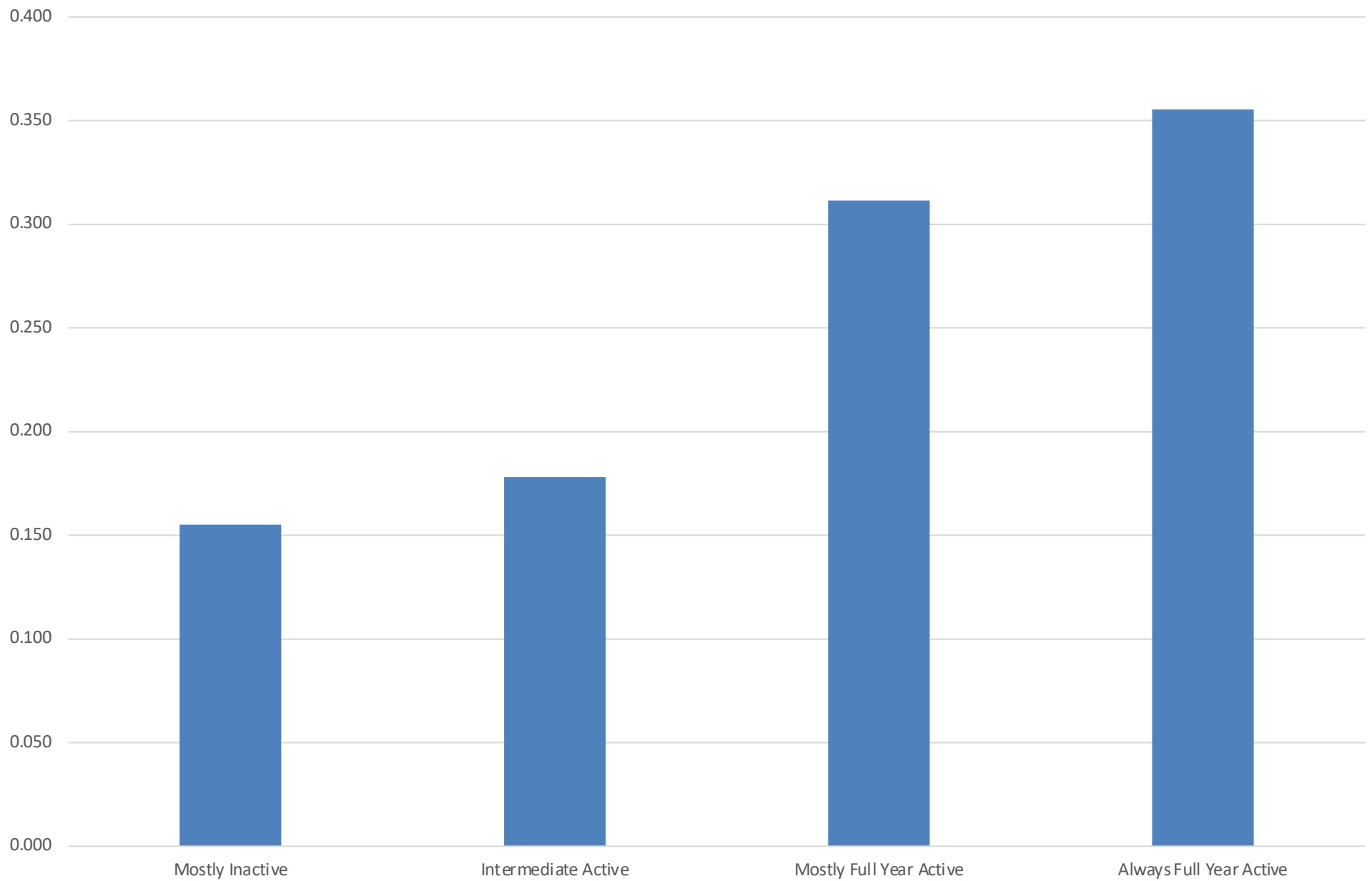
Summary

- Large differences in long term earnings across demographic groups
- Earnings for a worker at a given point of their own group earnings distribution are typically less than for a Native White Non-Hispanic Male (NWNM) at the same point in their earnings distribution (Asians are an exception)
  - The disparity is typically greatest for low wage/low attachment workers
- Native Black Non-Hispanic Males (NBNM) long-term earnings are extremely low relative to NWNM
  - Almost all NBNM workers earn half or less of the average real earnings of a NWNM worker at a similar point in their own average real earnings distribution
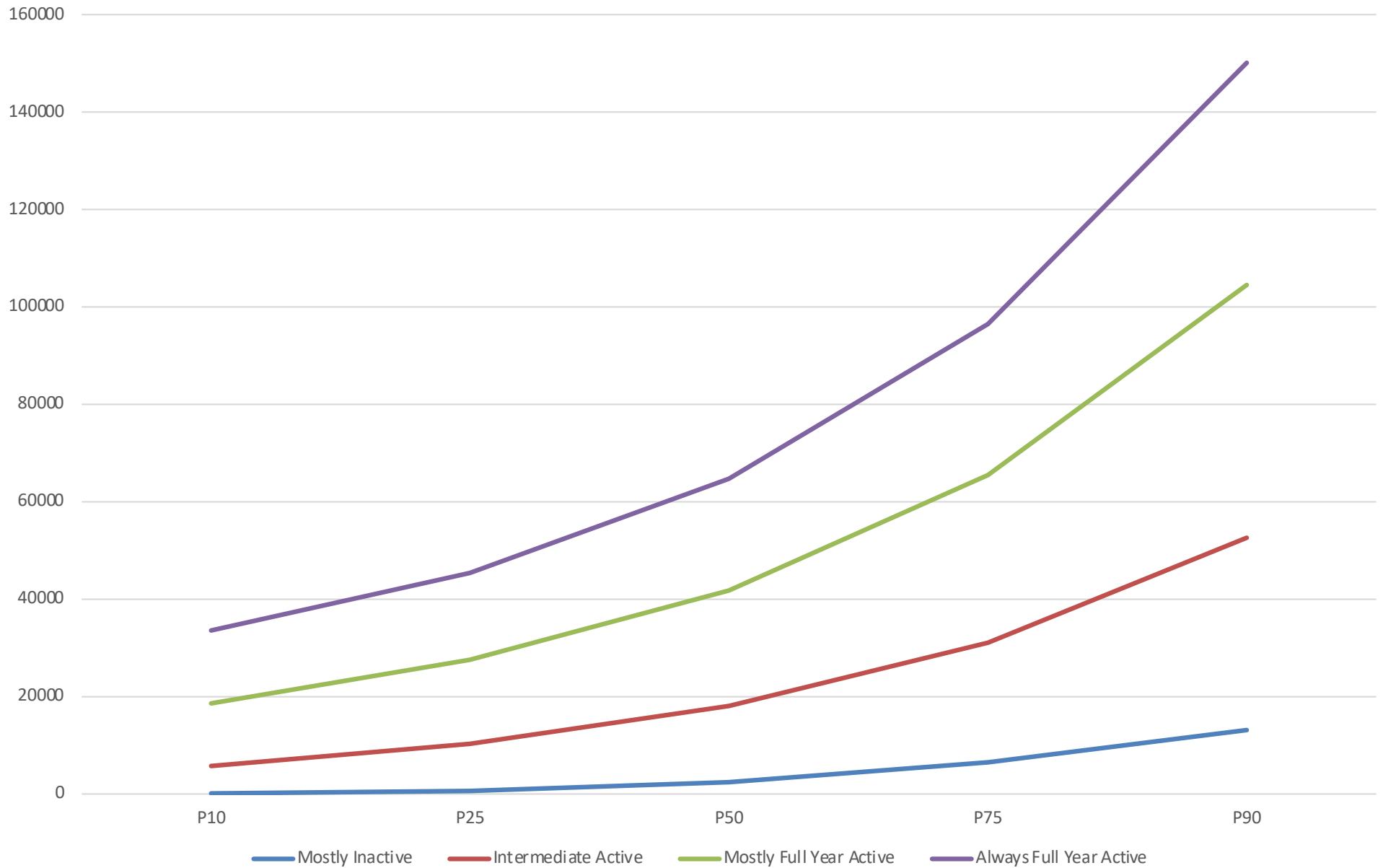
Work History

- Create a long-term measure of labor supply based on annual firm reports of employee quarterly earnings
  - Full Year: Earnings in all four quarters
  - Partial Year: Earnings in one to three quarters
  - Inactive Year: No reported earnings
- Four Categories
  - 1. (20%) Mostly Inactive
  - 2. (20%) Intermediate Active
  - 3. (30%) Mostly Full Year Active
 - 4. (30%) Always Full Year Active

Native White Non-Hispanic Males: Work History

	Mostly Inactive	Intermediate Active	Mostly Full Year Active	Always Full Year Active
0.400				
0.350				
0.300				
0.250				
0.200				
0.150				
0.100				
0.050				
0.000				

Native White Non-Hispanic Males: Selected Percentiles of Average Annual Real Earnings by Work History

Legend: Mostly Inactive — Intermediate Active — Mostly Full Year Active — Always Full Year Active
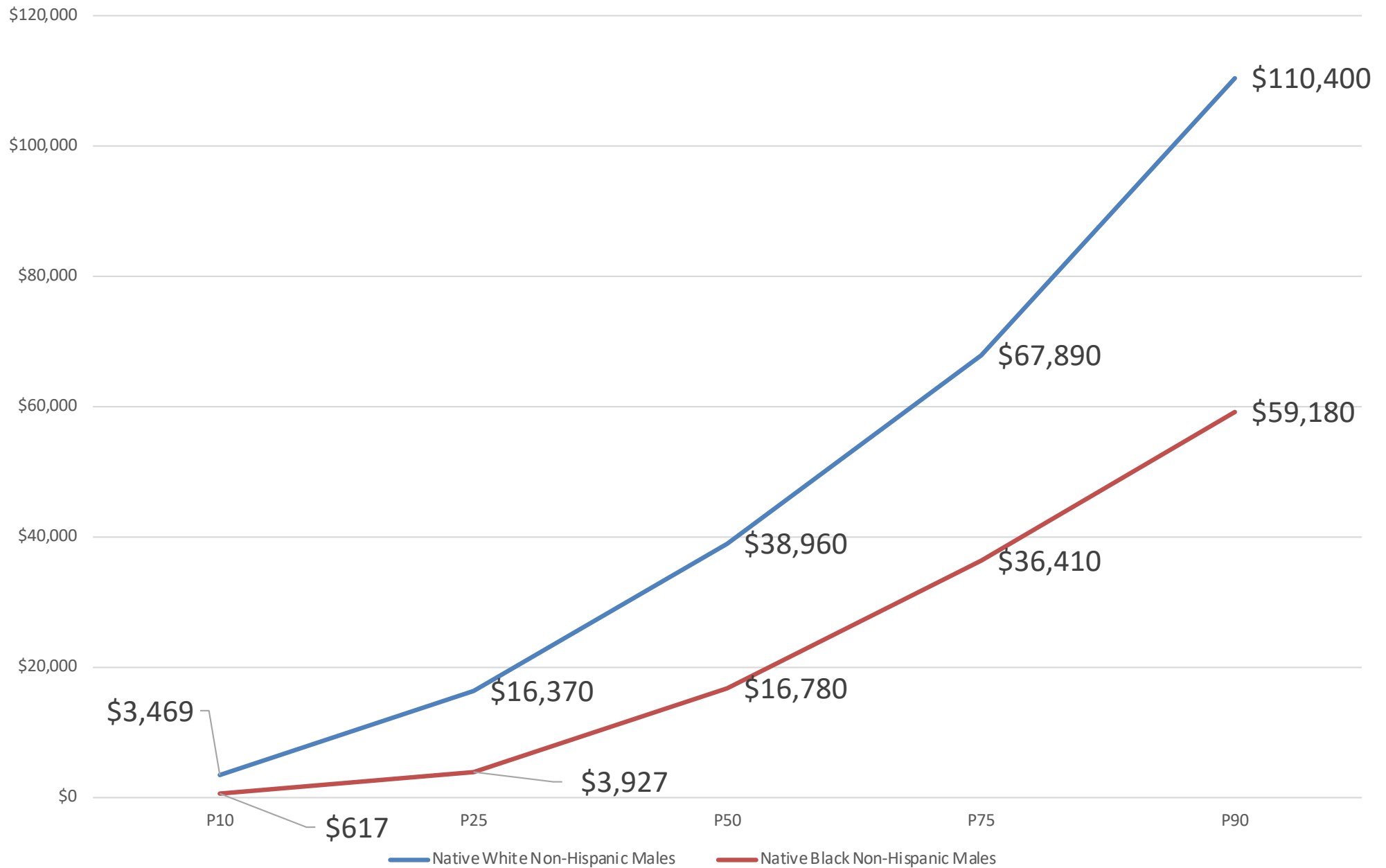
Native Black Non-Hispanic Males: Ratio of Work History Type Share to the Same Native White Non-Hispanic Male Type Share
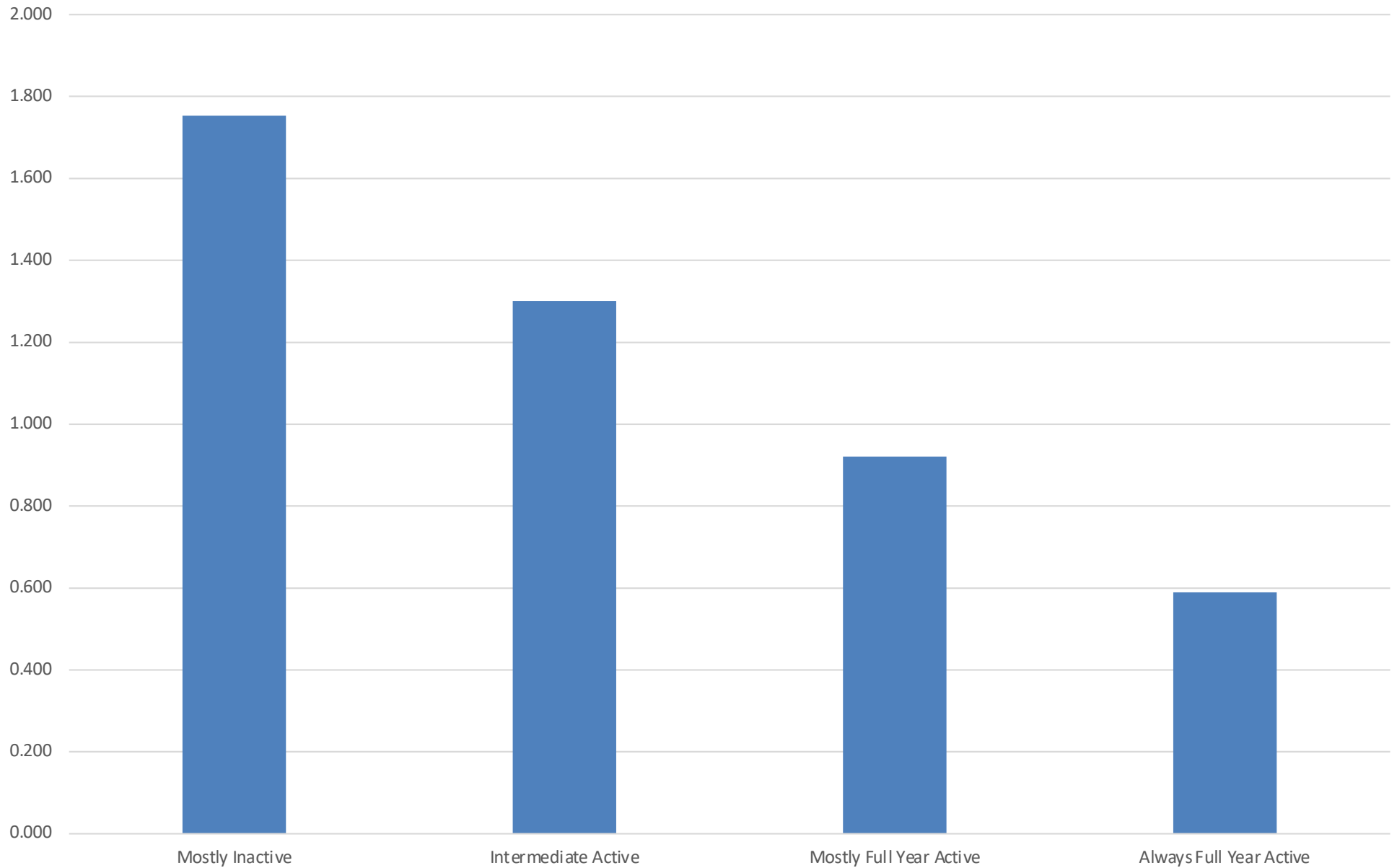
Native Black Non-Hispanic Males: Ratio of Percentile X of Average Annual Real Earnings to Percentile X of Average Annual Real Earnings for Native White Non-Hispanic Males by Work History Type

Selected Percentiles of Average Annual Real Earnings

$3,469

$617

$16,370

$3,927

$38,960

$16,780

$67,890

$36,410

$110,400

$59,180

Native White Non-Hispanic Males   Native Black Non-Hispanic Males

P10   P25   P50   P75   P90

$0 $20,000 $40,000 $60,000 $80,000 $100,000 $120,000
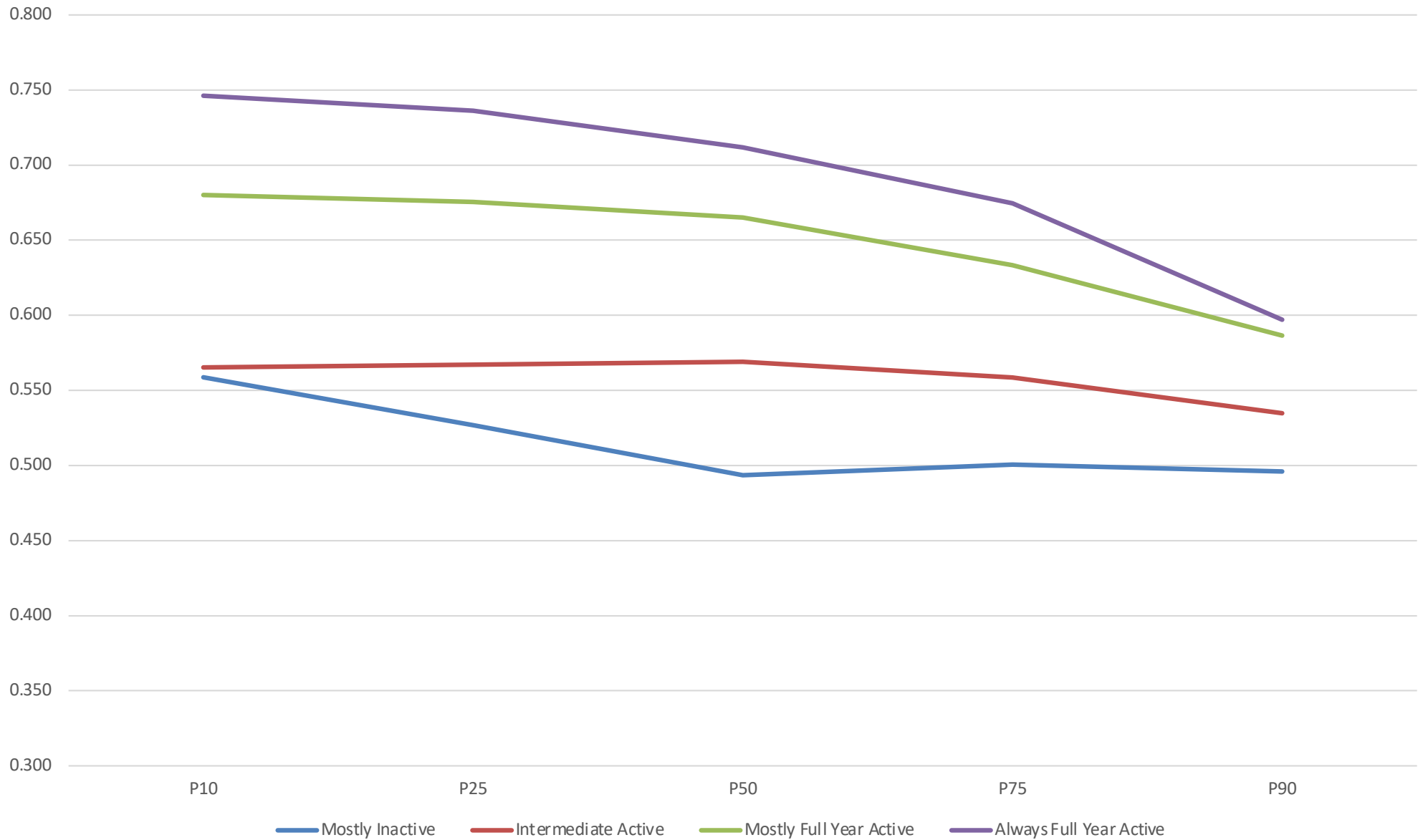
Summary

- Native Black Non-Hispanic Male (NBNM) earnings are relatively low compared with NWNM
  - This is due to two factors: labor supply/work history and earnings
  - NBNM's have a much larger share of workers who are mostly inactive (1.7x NWNM) or intermediate active (1.3x NWNM), while the share of workers always active is only 60% of NWNM
  - Relative earnings for NBNM conditional on work history type are low, but higher than the unconditional results. Earnings for NBNM workers always full year active are 70-75% of NWNM levels for low earning workers (P10, P25, P50), but only 60% for high earning workers (P90)

Foreign Born Asian Non-Hispanic Males: Ratio of Work History Type Share to the Same Native White Non-Hispanic Male Type Share

Foreign Born Asian Non-Hispanic Males: Ratio of Percentile X of Average Annual Real Earnings to Percentile X of Average Annual Real Earnings for Native White Non-Hispanic Males by Work History Type
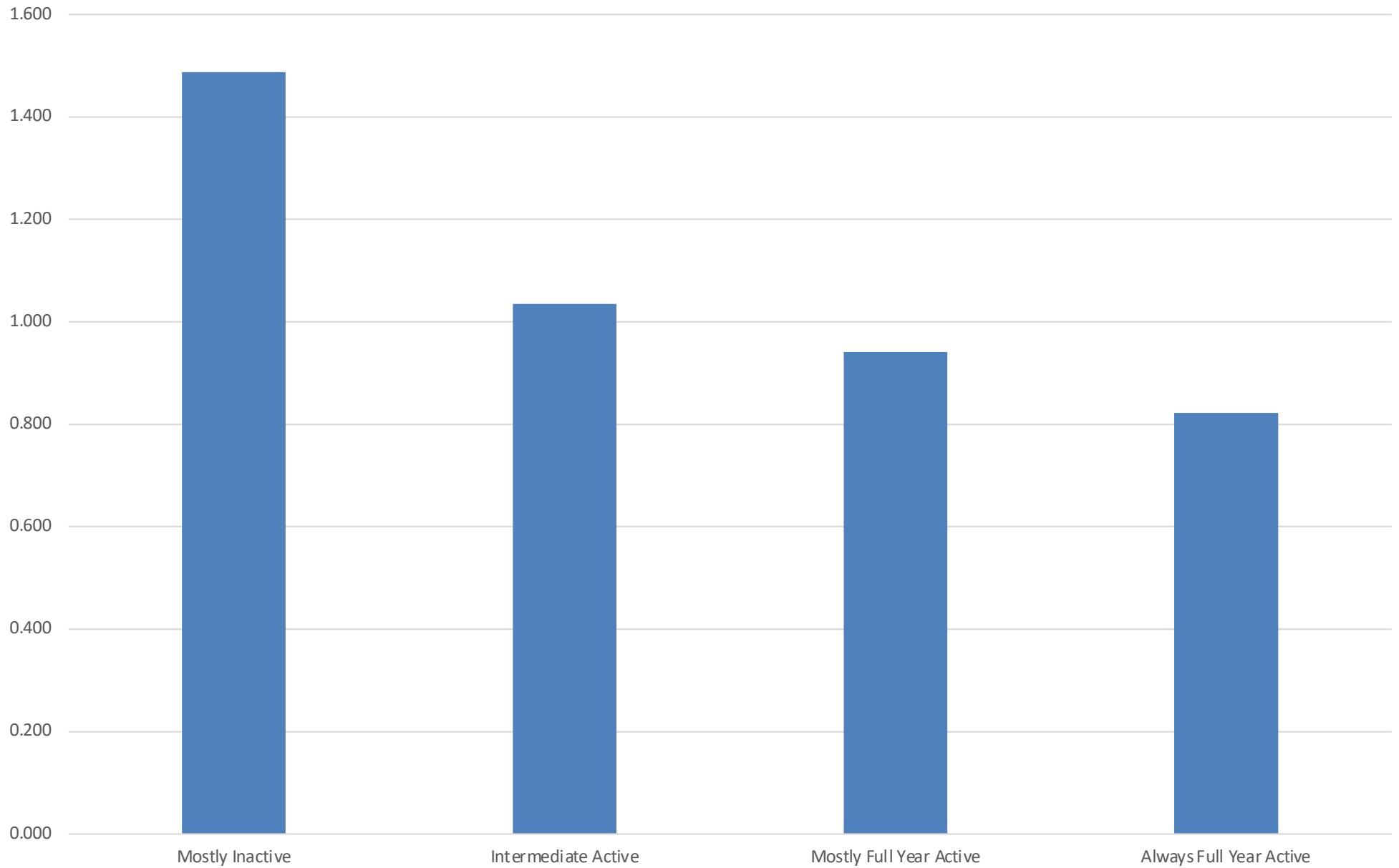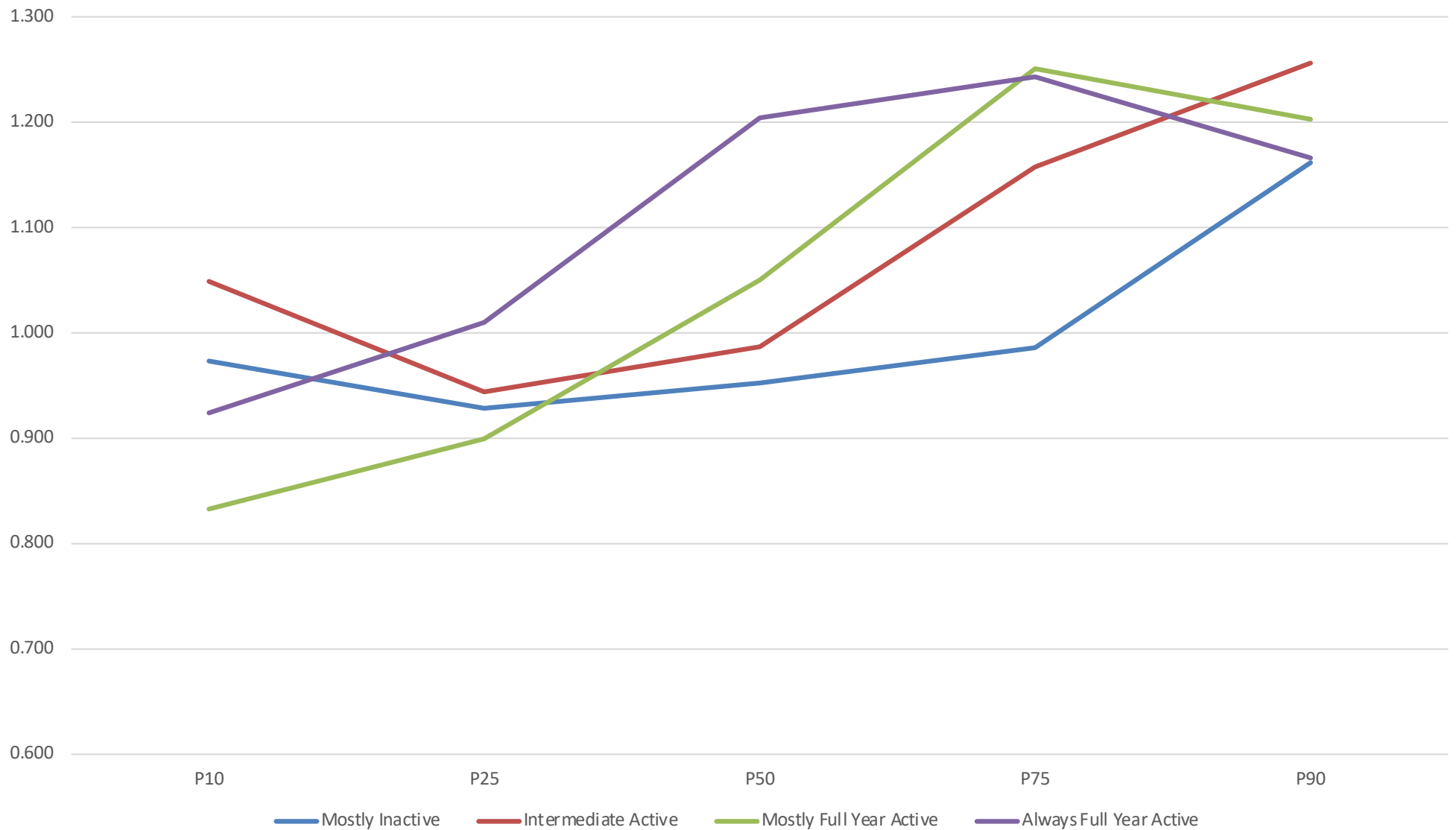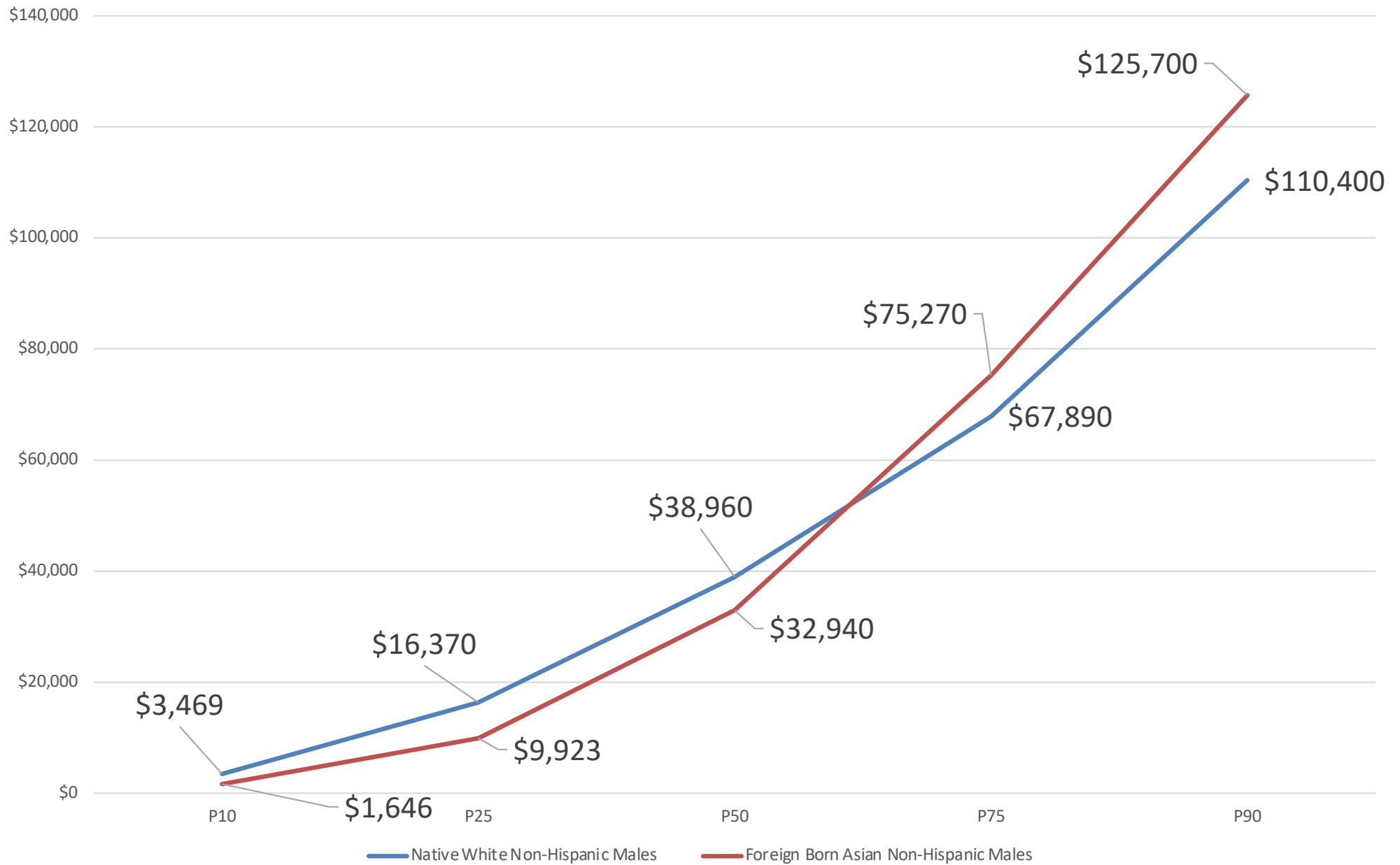

Legend: Mostly Inactive — Intermediate Active — Mostly Full Year Active — Always Full Year Active

Selected Percentiles of Average Annual Real Earnings

$140,000

$125,700

$120,000

$110,400

$100,000

$80,000

$75,270

$60,000

$67,890

$40,000

$38,960

$32,940

$20,000

$16,370

$9,923

$3,469

$0

$1,646

P10   P25   P50   P75   P90

Native White Non-Hispanic Males   Foreign Born Asian Non-Hispanic Males

Can We Explain Long-Term Across Group Earnings Differences?

- To Do: Take advantage of ACS and LEHD data to better understand the differences across demographic groups

  - ACS – Skill Measures (Education and Occupation)

  - Person Firm Match – Firm location, Industry, Size, AKM Person and Firm effects

  - Length of Person Firm Matches – Tenure

Top 20%: Average Earnings by Worker, Firm, and Flow Type

Average Current Year Earnings (y-axis): $40,000 – $180,000

Average Previous Year Earnings (x-axis): $40,000 – $180,000

- Top Top 4_4, $143,296
- Top Middle 4_4, $92,507
- Top Bottom 4_4, $80,717
- Middle Top 4_4, $67,457
- Middle Middle 4_4, $61,625