Employment Dynamics for Economists: Empirical Evidence by Gender and Race

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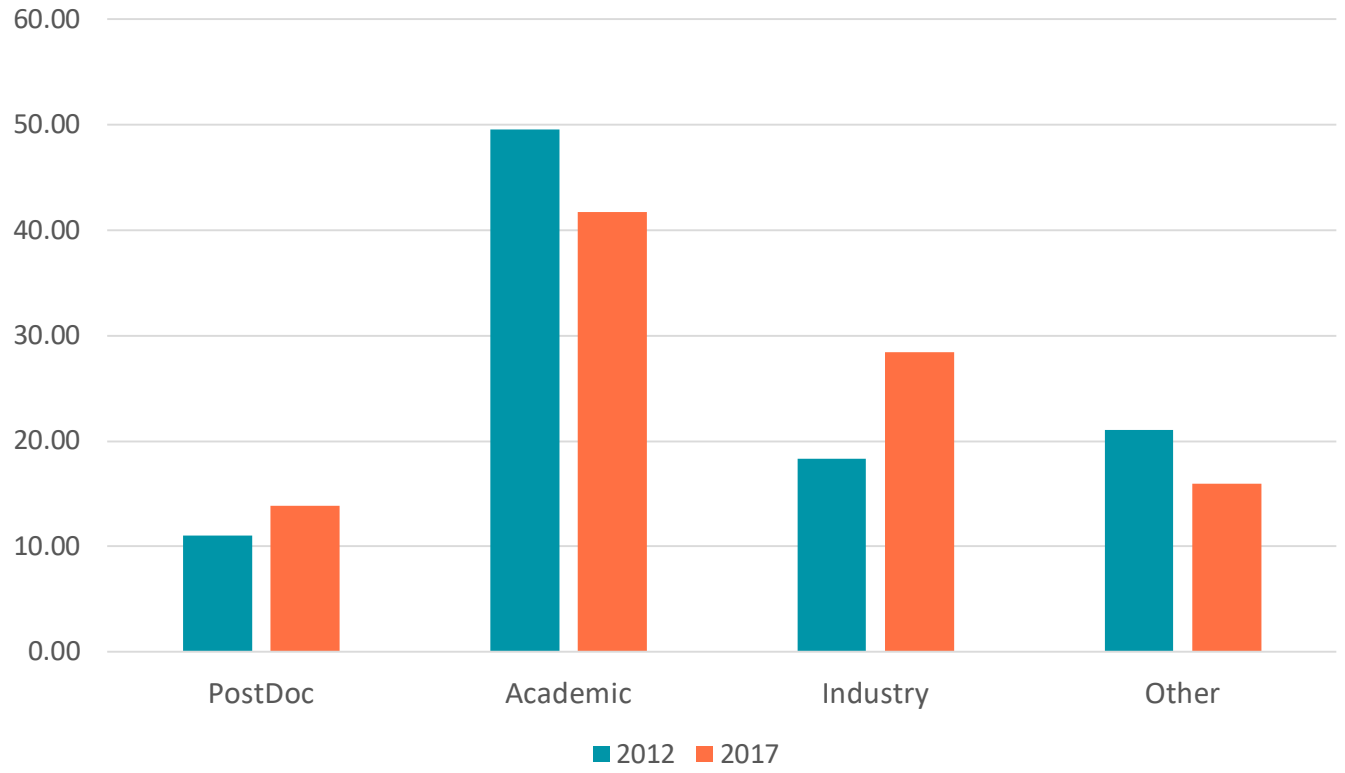
Diversity and Inclusion in Economics

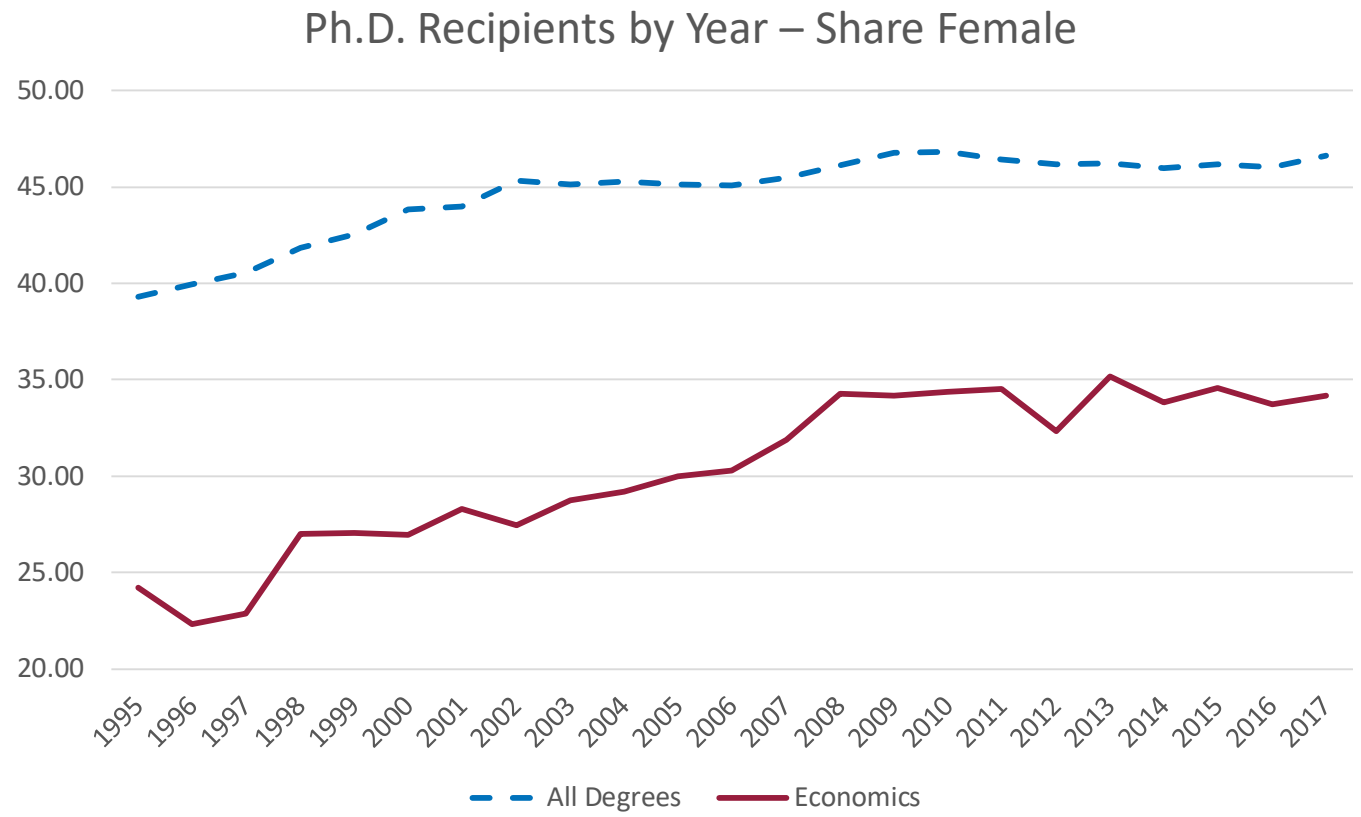
- Diversity and inclusion in the economics profession has been an important topic of discussion and research over the last several years (Lundberg and Sterns 2019, Wu 2019, Antecol, Bedard, and Sterns 2018, Sarsons 2017, Hengel 2017, Bayer and Rouse 2016, …)
- This project will expand this literature in several directions:
  - **Sectors**: Results in the public and private sectors for U.S. economists.
  - **Characteristics**: Examine gender, race, and the interaction between the two on diversity.
  - **Outcomes**: Earnings differences by race*gender groups (Mincer regressions)
  - **Scale**: Eventually will be able to examine outcomes for all U.S. Ph.D. economists working in private, non-farm sectors.

New Ph.D. Economists: Employment Sector



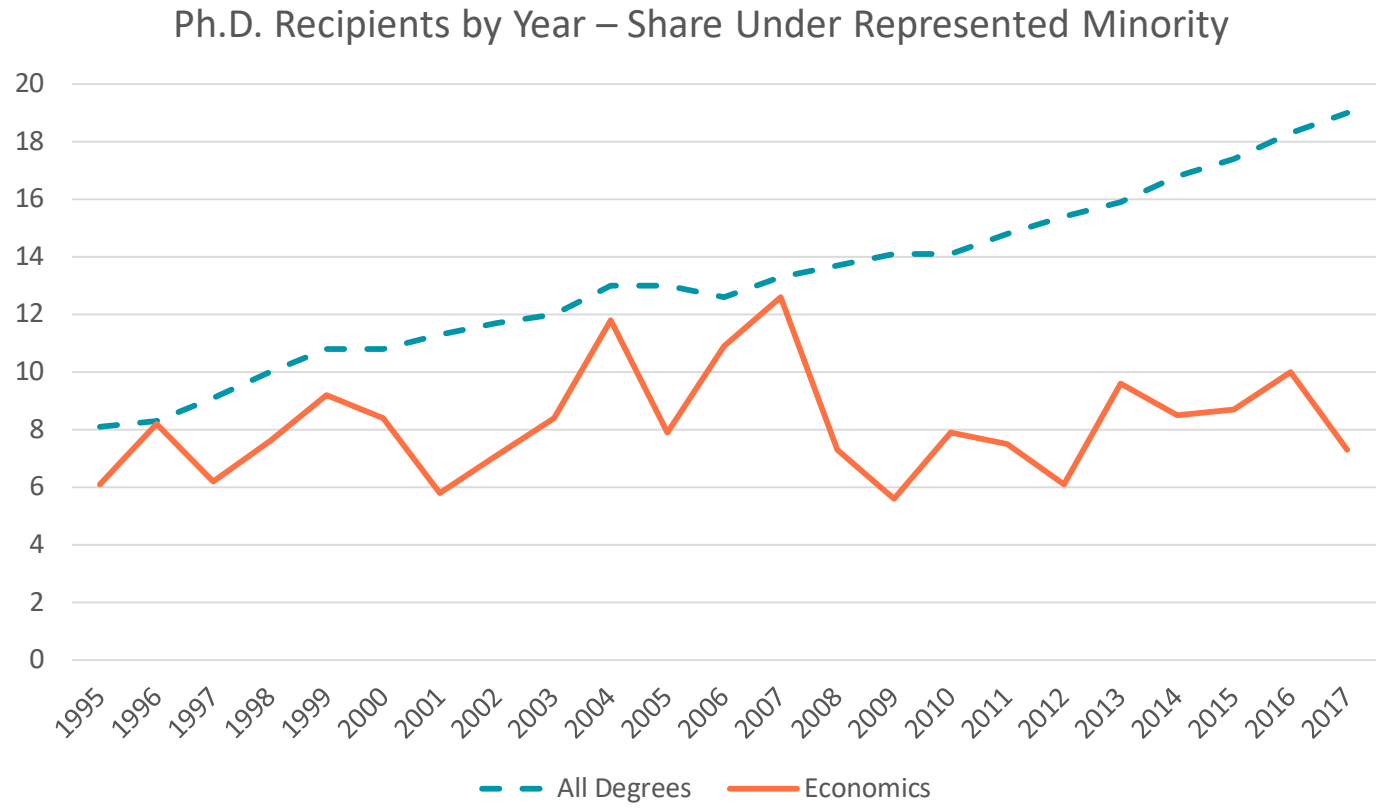
Source: Survey of Earned Doctorates (2018, 2013)

New Ph.D. Economists: Gender



Source: Survey of Earned Doctorates (2006, 2013, 2018)

New Ph.D. Economists: Race



Source: CSMGEP Annual Report 2018

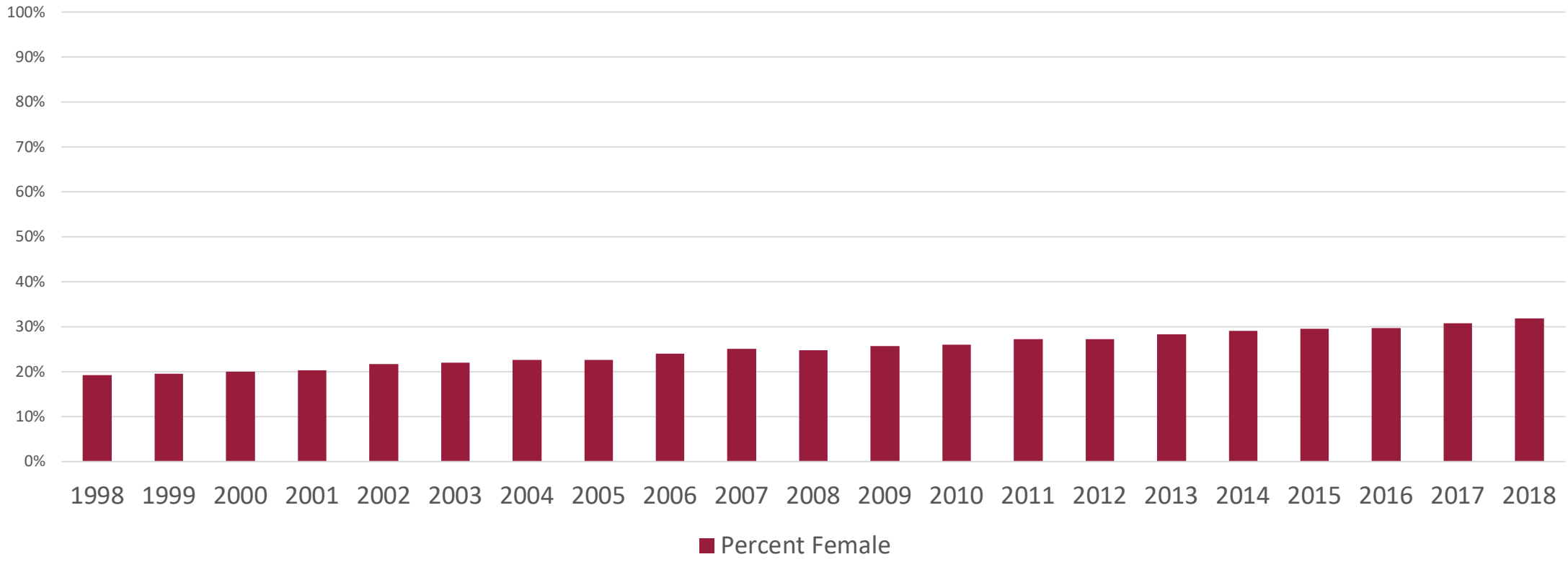
Data: Federal Government Economists

- Data Restriction: Currently can identify Ph.D. economists that work for the Federal Government using variables available in OPM data.
  - Does not include government economists not in OPM, such as those at the Federal Reserve and banks.
- Office of Personnel Management (OPM) Files
  - Years covered: 2000-2015
  - Demographic variables: Sex, Age, Race
  - Education variables: Educational level, Field of Degree, Year of Degree Receipt
  - Employment variables: Earnings, Agency identifiers
- Identifying Economists
  - Educational Level = Ph.D. or Post-Doc
  - Field of Degree = Economics
  - Occupational Series = 0110 (Economist)

Data: Work Histories

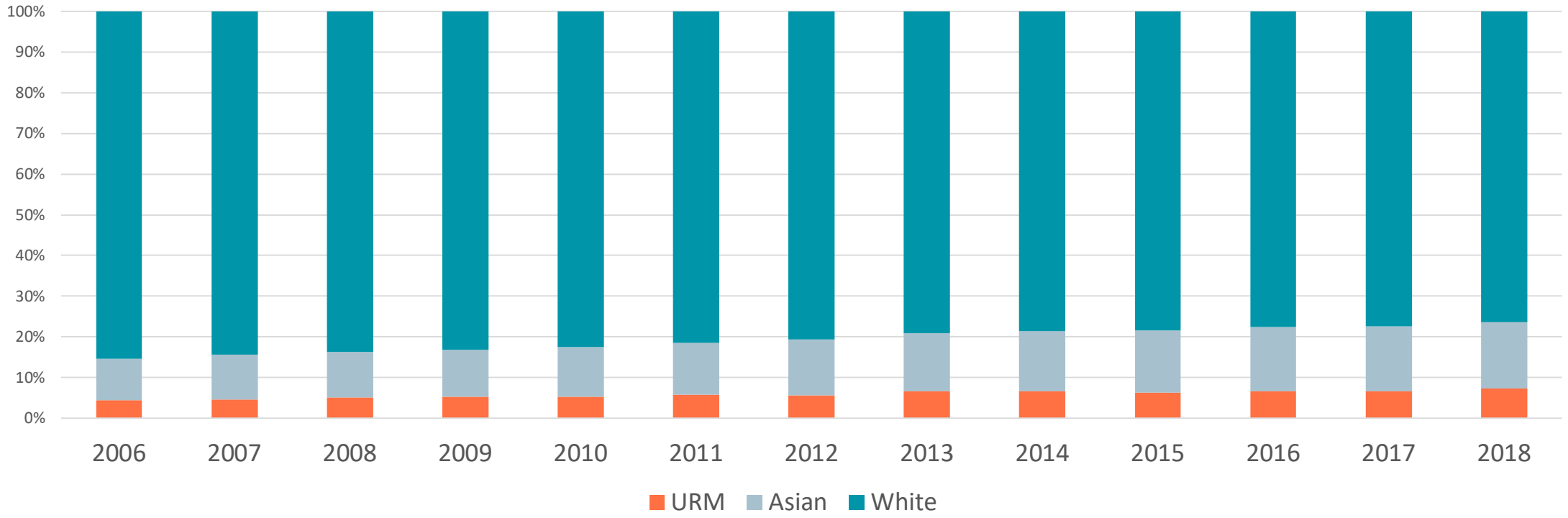
- The Longitudinal Employer-Household Dynamics (LEHD) data is an administrative dataset on employment and earnings that comes from state UI records and other administrative data sources. LEHD data cover 96% of employment in the US, including the federal workforce.
- Match OPM economists to their pre- and post-OPM employers
  - Earnings: Average annual earnings (2015 dollars)
  - Industry: 6-digit NAICS of “primary” (highest paying) employer
  - Demographic and educational variables from OPM file

OPM Economists Over Time: by Gender



Source: OPM, FedScope Federal Workforce Data, September 1998-2018

OPM Economists Over Time: by Race



Source: OPM, FedScope Federal Workforce Data, September 2006-2018

Average Earnings of OPM Employees by Gender & Race

	Real Earnings	Log Real Earnings
Asian Male	-2349	-0.0405
	(2544)	(0.0251)
URM Male	-10550***	-0.105***
	(1822)	(0.0192)
White Female	-1127	-0.0141
	(1197)	(0.0116)
Asian Female	537.8	-0.00846
	(2787)	(0.0259)
URM Female	-5557	-0.0579
	(2933)	(0.0296)
Constant	105500***	11.50***
	(596)	(0.0057)
Year FE	No	No
Agency FE	No	No
R-squared	0.005	0.005
Obs	3300	3300

Note: Regression of real earnings from 2000-2015 OPM data on Race*Gender indicators, with White Male as excluded category

Average Real Earnings (2015 $)	
White Male	$105,500
Asian Male	$103,151
URM Male	$94,950
White Female	$104,373
Asian Female	$106,038
URM Female	$99,943

Note: Calculation from regression of real earnings on Race*Gender indicators, with White Male average earnings equal to constant coefficient and others equal to constant+ Race*Gender indicator coefficient

Mincer Regressions: Specification

Base: $\ln(real\ earnings_{it}) = \alpha + \beta(Race * Gender) + \varepsilon_{it}$

Year FE: $\ln(real\ earnings_{it}) = \alpha + \beta(Race * Gender) + \gamma Year_{it} + \varepsilon_{it}$

Agency FE: $\ln(real\ earnings_{it}) = \alpha + \beta(Race * Gender) + \gamma Year_{it} + \theta Agency_{it} + \varepsilon_{it}$

Exp Control: $\ln(real\ earnings_{it}) = \alpha + \beta(Race * Gender) + \delta_1 Exp_{it} + \delta_2 Exp_{it}^2 + \delta_3 Exp_{it}^3 + \gamma Year_{it} + \varepsilon_{it}$

Exp_{it} is experience, measured in years since Ph.D.

$Year_{it}$ and $Agency_{it}$ are year and agency fixed effects

Standard errors clustered at the person level

Expanded specification allows returns to experience to vary by Race*Gender subgroups

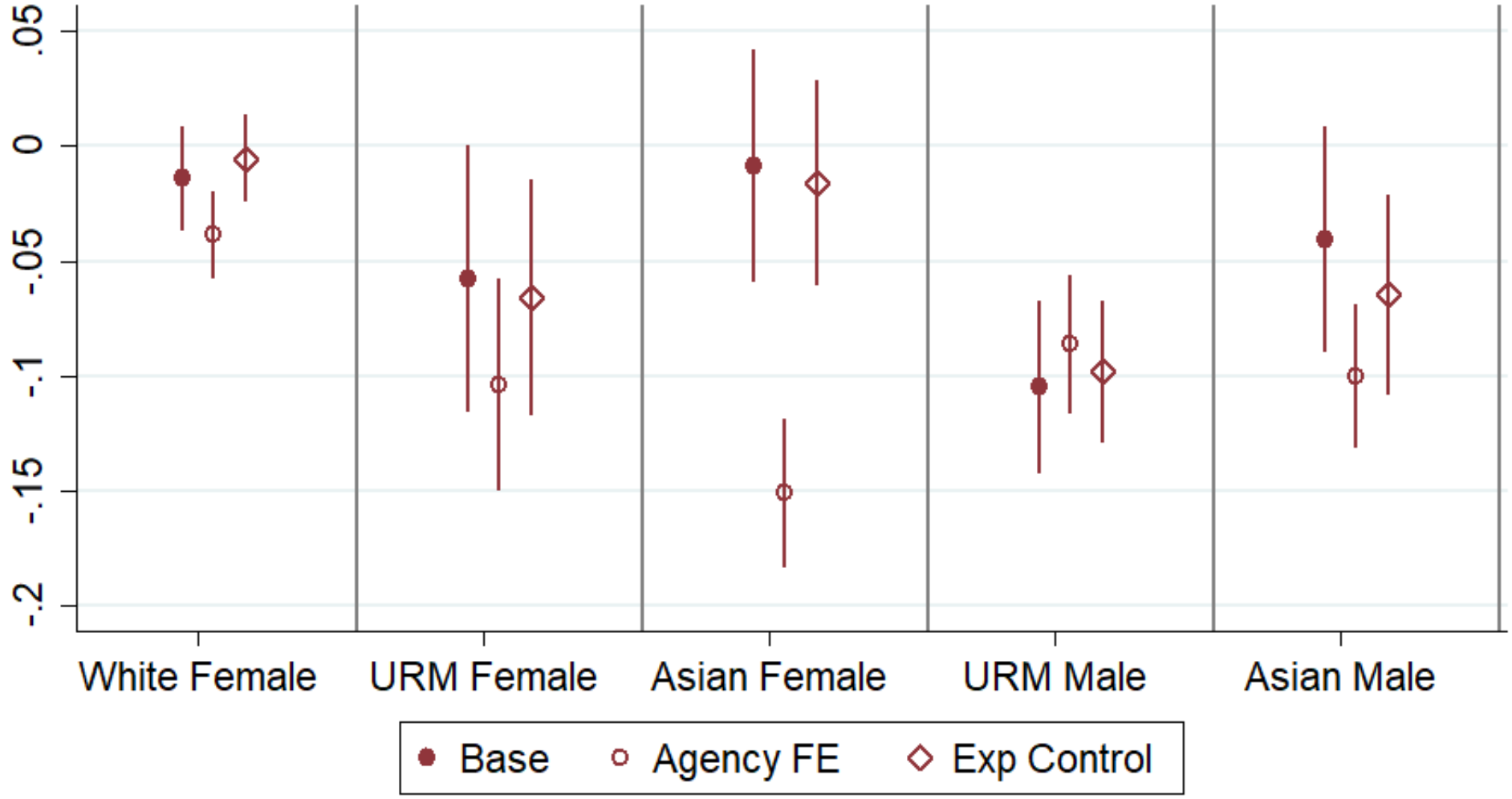
Mincer Regressions: OPM Employees

	Base	Year FE	Agency FE	Exp Control
Asian Male	-0.0405	-0.132***	-0.100***	-0.0648**
	(0.0251)	(0.0222)	(0.0160)	(0.0223)
URM Male	-0.105***	-0.104***	-0.0863***	-0.0983***
	(0.0192)	(0.0181)	(0.0155)	(0.0158)
White Female	-0.0141	-0.0493***	-0.0386***	-0.00534
	(0.0116)	(0.0113)	(0.0098)	(0.0098)
Asian Female	-0.00846	-0.139***	-0.151***	-0.0159
	(0.0259)	(0.0234)	(0.0165)	(0.0227)
URM Female	-0.0579	-0.138***	-0.104***	-0.0659*
	(0.0296)	(0.0303)	(0.0235)	(0.0261)
Exp				0.0399***
				(0.0024)
Exp X Exp				-0.00110***
				(0.0001)
Exp X Exp X Exp				0.0000103***
				(0.0000)
Constant	11.50***	11***	10.84***	10.63***
	(0.0057)	(0.0076)	(0.0391)	(0.0106)
Year FE	No	Yes	Yes	Yes
Agency FE	No	No	Yes	No
R-squared	0.005	0.549	0.699	0.685
Obs	3300	3300	3300	3300

Standard errors, clustered by individual, in parentheses. *p<0.05 **p<0.01 ***p<0.001

Log Earnings of Ph.D. Economists

Differences by Race and Gender, in OPM



Coefficient of estimates of log earnings on indicators for gender and race for Ph.D. economists, with white male economists as excluded category. First estimate in each group is the baseline estimate with no controls, the second controls for year and agency/industry fixed effects, and third controls for year fixed effects and a polynomial of experience, measured by years since Ph.D.

Flows In/Out of OPM

- Pre-OPM Sample
  - Economists that have LEHD earnings after Ph.D. receipt and before starting at OPM
  - 1200 of 3300 identified OPM economists have pre-OPM earnings
- Post-OPM Sample
  - Economists that have LEHD earnings after leaving OPM
  - 850 of 3300 identified OPM economists have post-OPM earnings
    - Of those that moved to new employer within a year: 65% of these moved to private sector or other public sector employment, 35% moved to academia
    - Slightly higher proportion of white men moved into academia (37.5%) relative to other groups

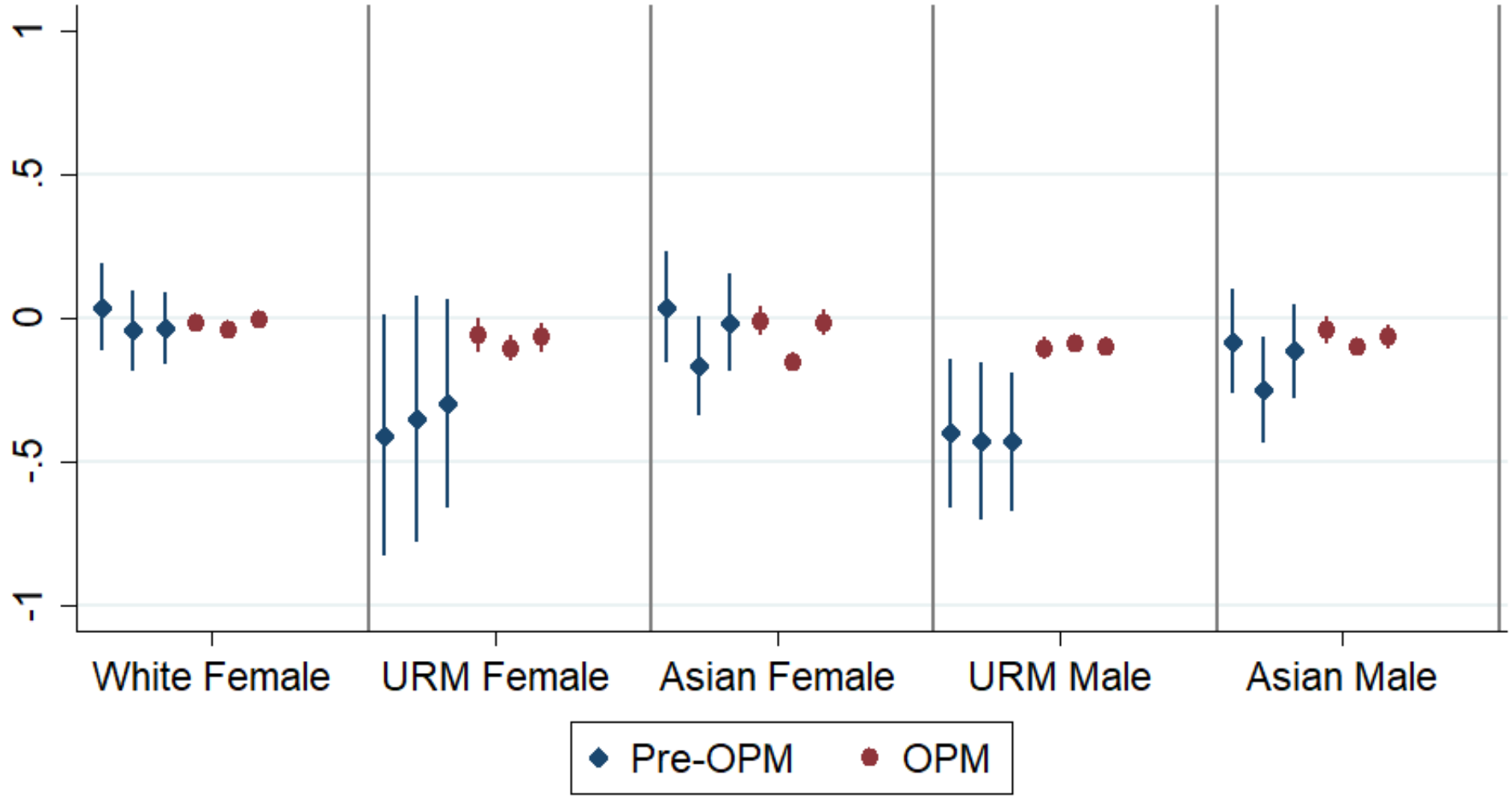
Average Earnings of OPM Economists, with Pre- and Post-OPM Earnings

Average Earnings (2015 $)	Pre-OPM	OPM	Post-OPM
White Male	$104,100	$105,500	$166,100
Asian Male	$72,620	$103,151	$130,100
URM Male	$57,930	$94,950	$92,210
White Female	$84,520	$104,373	$121,360
Asian Female	$79,060	$106,038	$139,880
URM Female	$58,440	$99,943	$149,690
Obs	1200	3300	850

Note: Calculation from regression of real earnings on Race*Gender indicators, with White Male average earnings equal to constant coefficient and others equal to constant+ Race*Gender indicator coefficient

Log Earnings of Ph.D. Economists

Differences by Race and Gender



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Log Earnings of Ph.D. Economists

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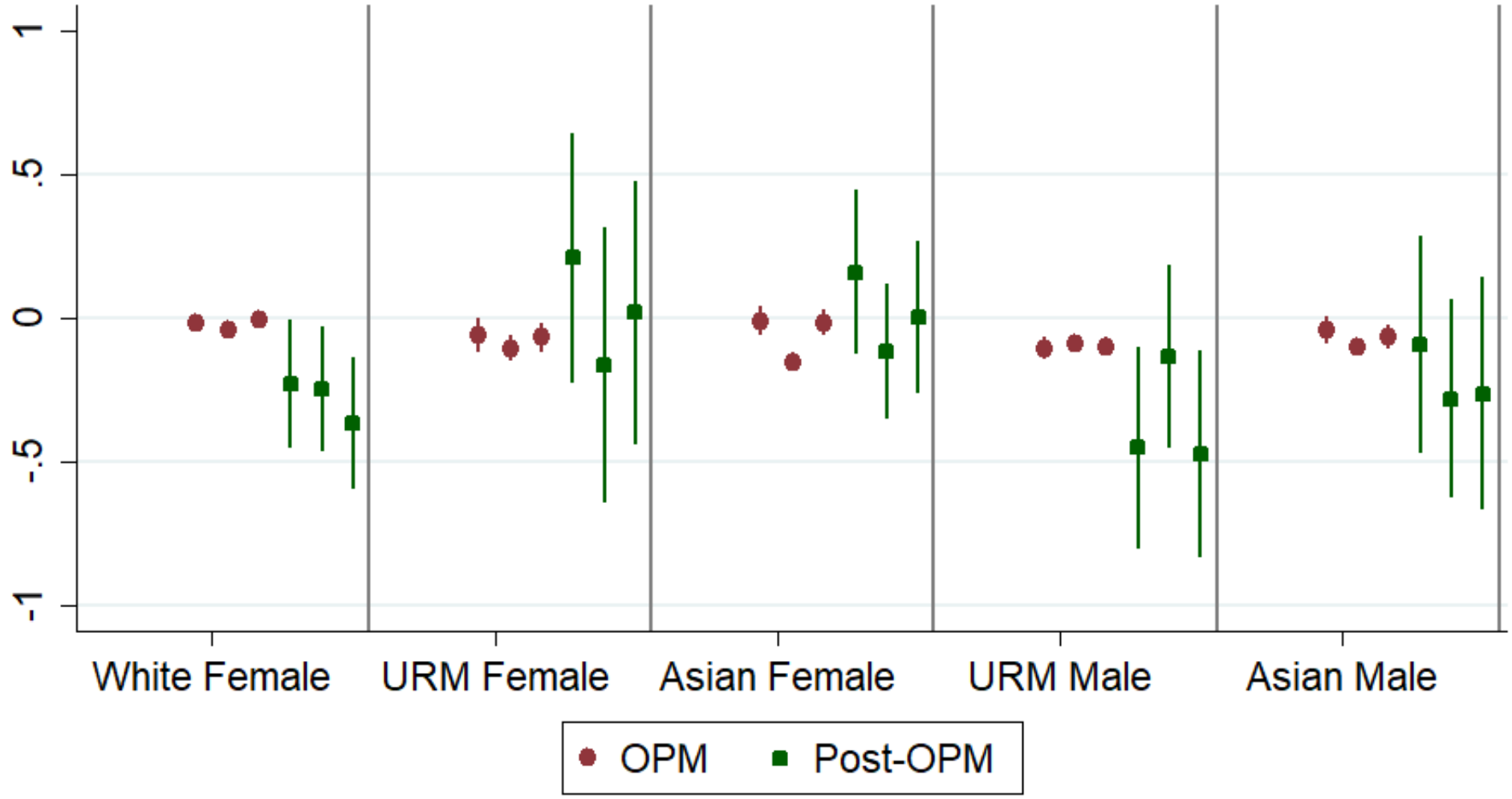

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Log Earnings of Ph.D. Economists

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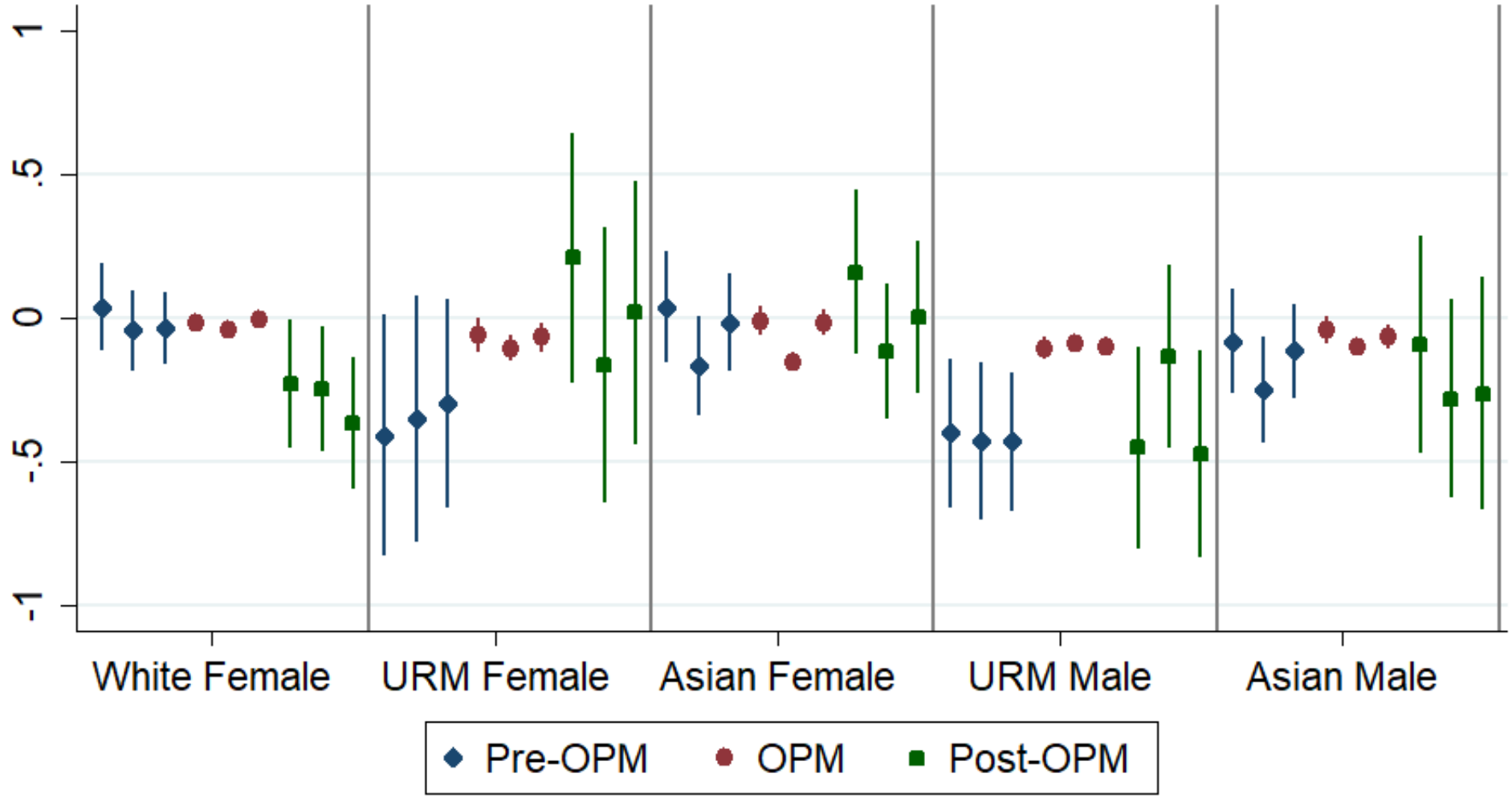

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Summary of Current Findings

- The diversity of government economists is growing over time, both in terms of gender and race
- There are differences in earnings between white male economists and other race*gender groups, particularly for URM men
- The differences in earnings between race*gender groups appear to be larger for non-OPM employment

Next Step: Comprehensive Dataset on Ph.D. Economists

- Survey of Earned Doctorates (SED): Annual survey conducted by NSF since 1957. Collects information on research (as opposed to professional) doctorates. There are about 55,000 research doctorates granted by U.S. institutions every year.
- The SED asks about employment plans at time of Ph.D. completion.
- Data will be PIK'ed and linked to LEHD data.
- Empirical exercises will follow full employment trajectory for all Ph.D. economists who earned degrees in US and work in jobs covered by LEHD.

Potential Value Added from SED-LEHD Linkage

- Expansion of current analysis to include diversity statistics and earnings patterns in major employment sectors for Ph.D. economists
- Other possibilities:
  - Program evaluation of mentorship, diversity programs (CSWEP, CSMGEP)
  - Evaluate other fields that are struggling with diversity

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