

# Measuring Systematic Wage Misreporting by Socio-demographic Groups

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# Overview

- ▶ **Measurement error** is an important issue for data providers and data users
  - ▶ Data users: can reduce model efficiency & bias estimates
  - ▶ Data providers: reduces quality of data released
- ▶ Understanding the sources and socio-demographic correlates of measurement can help:
  - ▶ Data users account for measurement error to avoid making misleading inferences and estimating parameters inaccurately
  - ▶ Data providers improve reliability (e.g. improving editing and imputation)

# Why Wages?

- ▶ Data use: impacts of **socio-demographic characteristics** on **income** or **wages**
  - ▶ Black-White wage gap
  - ▶ Returns to schooling
- ▶ If measurement error for income is correlated with socio-demographic variables, estimates will be inaccurate
- ▶ We examine sources of **non-zero mean, systematic measurement error** by **demographics** in **survey wage data**

# What We Do

- ▶ Validate responses to the Current Population Survey Annual Social and Economic Supplement (CPS ASEC) against administrative wage records
- ▶ We link the CPS ASEC between 2001-2016 with:
  - ▶ Internal Revenue Service (IRS) 1040 tax returns, 2000-2015
  - ▶ Social Security Administration (SSA) Detailed Earnings Record (DER), 2000-2012
  - ▶ IRS W-2s, 2005-2015
- ▶ We rely on the accuracy of SSA/IRS wage data as a benchmark
  - ▶ Interpret differences as misreporting on the CPS

# Data

- ▶ Sample restrictions:
  - ▶ Individuals 25-55 with non-zero survey and administrative records wage amounts
  - ▶ We drop imputed cases and individuals with self-employment income
- ▶ Final samples: 283,000 cases for DER-CPS, 161,000 for W-2-CPS

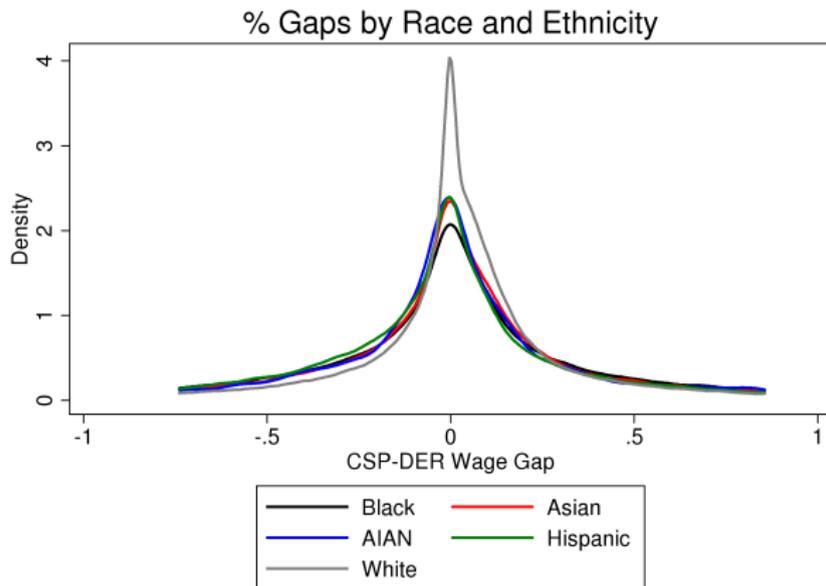
# Wage Gap

- ▶ Our analysis will center on the wage reporting differential (wage gap) between survey and administrative records
- ▶ We construct the wage gap as:

$$G_{ist} = \log(Y_{ist,CPS}) - \log(Y_{ist,A})$$

- ▶  $Y_{ist,CPS}$  are wages reported to CPS
- ▶  $Y_{ist,A}$  are wages in administrative records
- ▶ Positive gap: reported more wages to CPS
- ▶ Hypotheses:
  - ▶ Do highly educated individuals misreport less?
  - ▶ Is there heterogeneity by race?

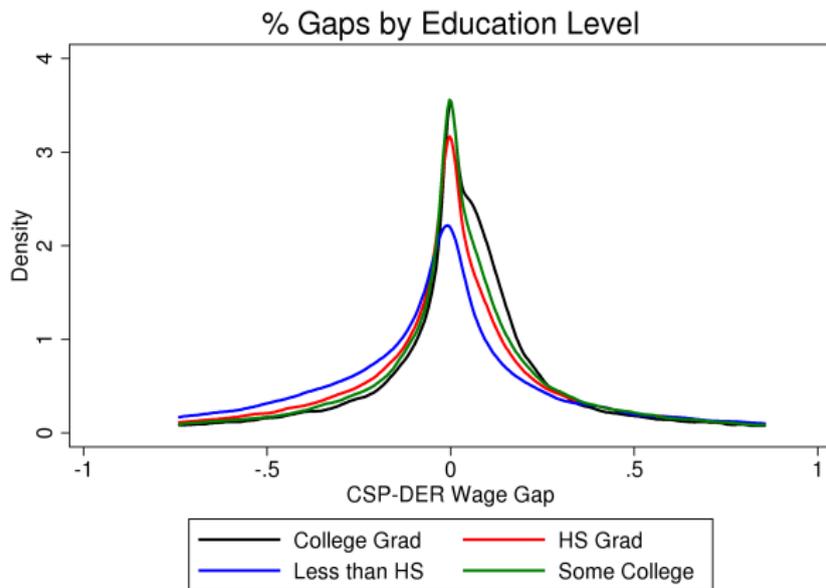
# Wage Gaps by Race and Ethnicity



Source: CPS ASEC, IRS 1040, SSA DER, IRS W-2 2000-2015

Note: The Hispanic group includes Hispanics of any race, other race groups include only non-Hispanics

# Wage Gaps by Education



Source: CPS ASEC, IRS 1040, SSA DER, IRS W-2 2000-2015

# Wage Gap Regressions

- ▶ We further explore this heterogeneity in a regression context:
- ▶ The model:

$$G_{ist} = \alpha + \delta Demogs_{it} + \phi FE_{st} + \epsilon_{ist}$$

- ▶  $Demogs_{it}$  are socio-demographic characteristics (age, gender, marital status, race and ethnicity, education)
- ▶  $FE_{st}$  are state and year fixed effects

# W-2 and DER Wage Gap Regressions

Wage Gap:	(1) DER	(2) W-2	(3) DER	(4) W-2
Married	0.0042 (0.0061)	0.0050 (0.0079)	-0.0005 (0.0028)	-0.0000 (0.0033)
Female	0.0191** (0.0079)	0.0279** (0.0116)	0.0029 (0.0035)	0.0068 (0.0047)
Black	0.0048 (0.0143)	-0.0013 (0.0209)	-0.0123** (0.0052)	-0.0143** (0.0072)
Asian	-0.0110 (0.0240)	0.0115 (0.0276)	-0.0282** (0.0113)	-0.0118 (0.0137)
AIAN	0.0062 (0.0398)	0.0456 (0.0579)	0.0065 (0.0218)	0.0288 (0.0254)
Hispanic	-0.0504*** (0.0118)	-0.0459*** (0.0155)	-0.0353*** (0.0060)	-0.0386*** (0.0085)
Less Than High School	-0.0212 (0.0149)	-0.0162 (0.0186)	-0.0044 (0.0064)	-0.0024 (0.0087)
Some College	0.0128 (0.0095)	0.0215* (0.0115)	0.0137*** (0.0039)	0.0187*** (0.0050)
Bachelor's Degree	0.0165** (0.0073)	0.0212** (0.0098)	0.0171*** (0.0035)	0.0243*** (0.0047)
Age	-0.0027*** (0.0003)	-0.0028*** (0.0004)	-0.0015*** (0.0001)	-0.0017*** (0.0002)
Observations	283,000	161,000	254,000	145,000
State Fixed Effects	Y	Y	Y	Y
Year Fixed Effects	Y	Y	Y	Y
Percentile Range	0-100	0-100	5-95	5-95

Source: CPS ASEC, IRS 1040, SSA DER, IRS W-2 2000-2015

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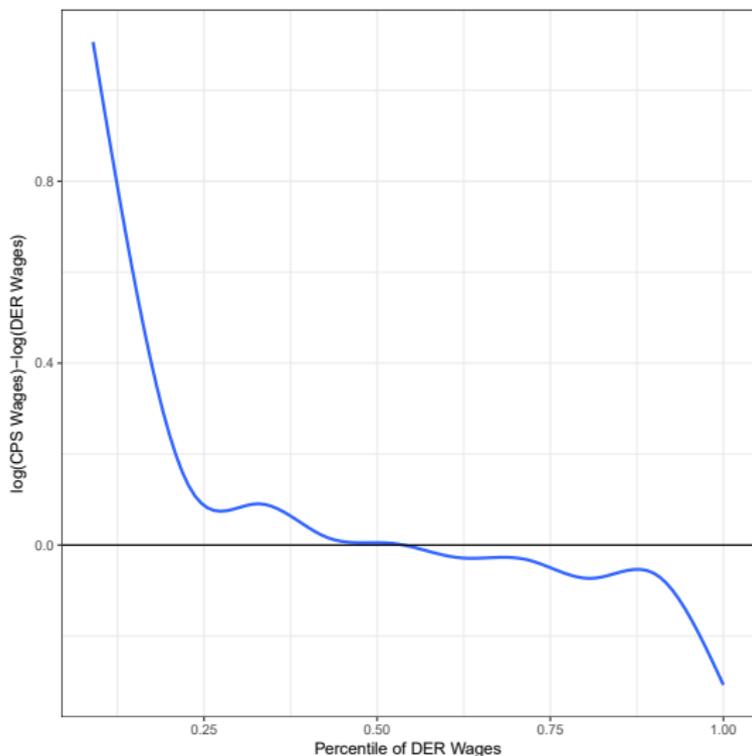
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# Heterogeneity Across the Wage Distribution

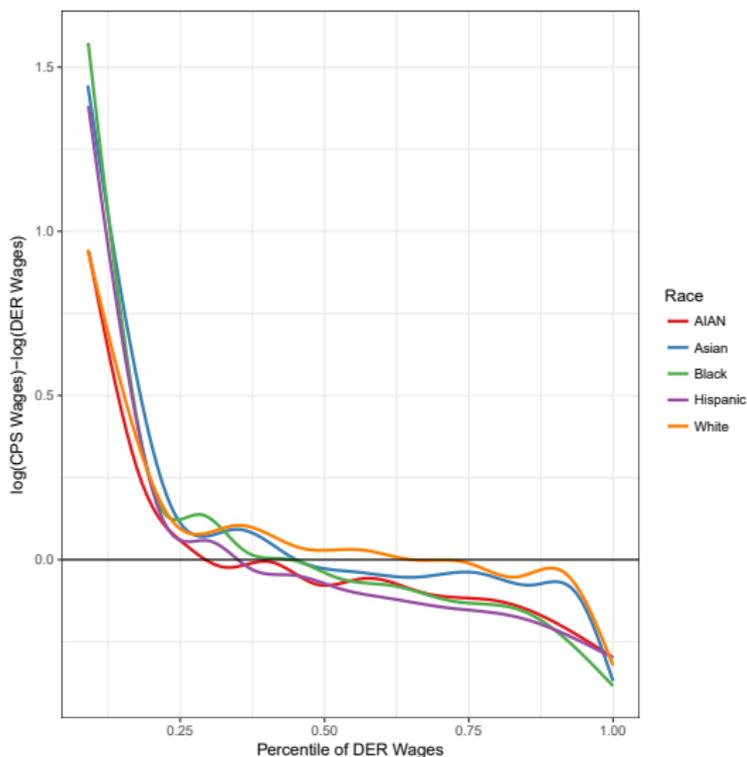
- ▶ Mis-reporting may systematically differ across the wage distribution alongside heterogeneity across groups
- ▶ To examine this, estimate average wage gaps by percentile of the DER wage distribution
  - ▶ We visualize this by fitting a bivariate Generalized Additive Model to the wage gap and wage percentile data

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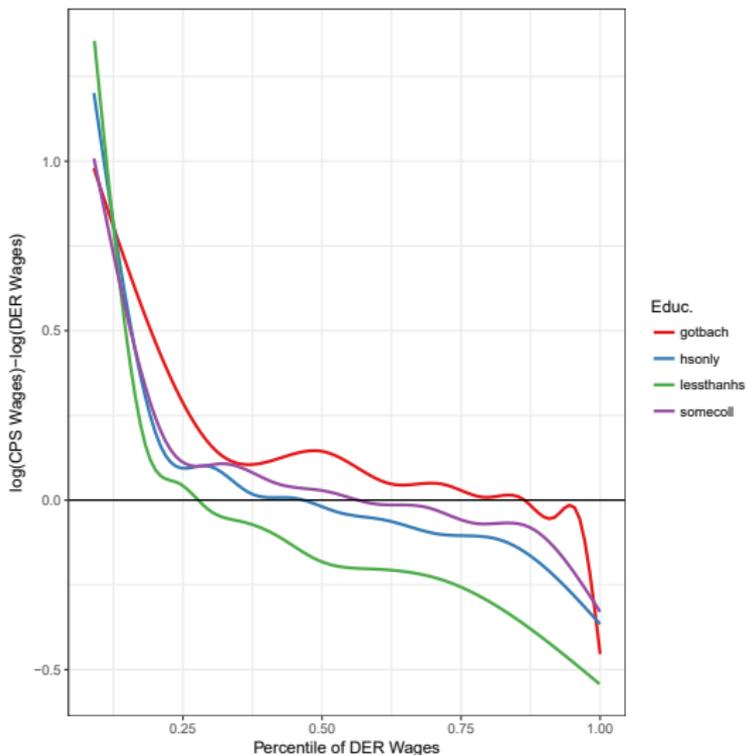
Source: CPS ASEC, IRS 1040, SSA DER, IRS W-2 2000-2015

# Heterogeneity Across the Wage Distribution, by Race



Source: CPS ASEC, IRS 1040, SSA DER, IRS W-2 2000-2015

# Heterogeneity Across the Wage Distribution, by Education



Source: CPS ASEC, IRS 1040, SSA DER, IRS W-2 2000-2015

# Conclusion

- ▶ We provide evidence of systematic variation in misreporting across several Socio-demographic dimensions
  - ▶ Both on average and across the wage distribution
  - ▶ Educational attainment seems particularly important
- ▶ A note:
  - ▶ “wages” have become a fuzzy concept as independent contracting has increased
  - ▶ Follow-up work: looking at individuals or tax units with self-employment income

# Conclusion

Thanks!

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