

# Measuring the Gig Economy

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# Disclaimer

Any opinions and conclusions expressed herein are those of the authors and do not necessarily represent the views of the U.S. Census Bureau.

All results have been reviewed to ensure that no confidential information is disclosed.

# What is Gig Employment?

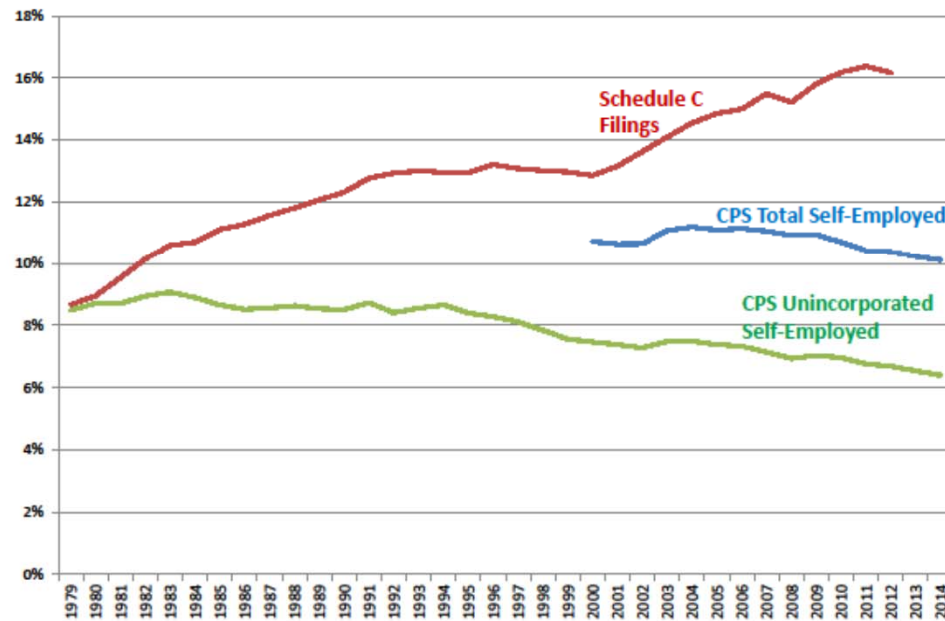
Borrowed from the music industry, a “gig” refers to a job with no long-term connection to a particular business. Workers are employed on a particular task or for a defined time.

Where might gig workers show up in Federal Statistics?

- Survey responses on self-employment activity
- In administrative data from tax reports to IRS and SSA:
  - 1040 Schedule C (sole proprietorship business)
  - 1040 Schedule SE (self employment)
  - 1099 MISC (box 7 nonemployee compensation)

# Katz & Krueger (March 2016 WP)

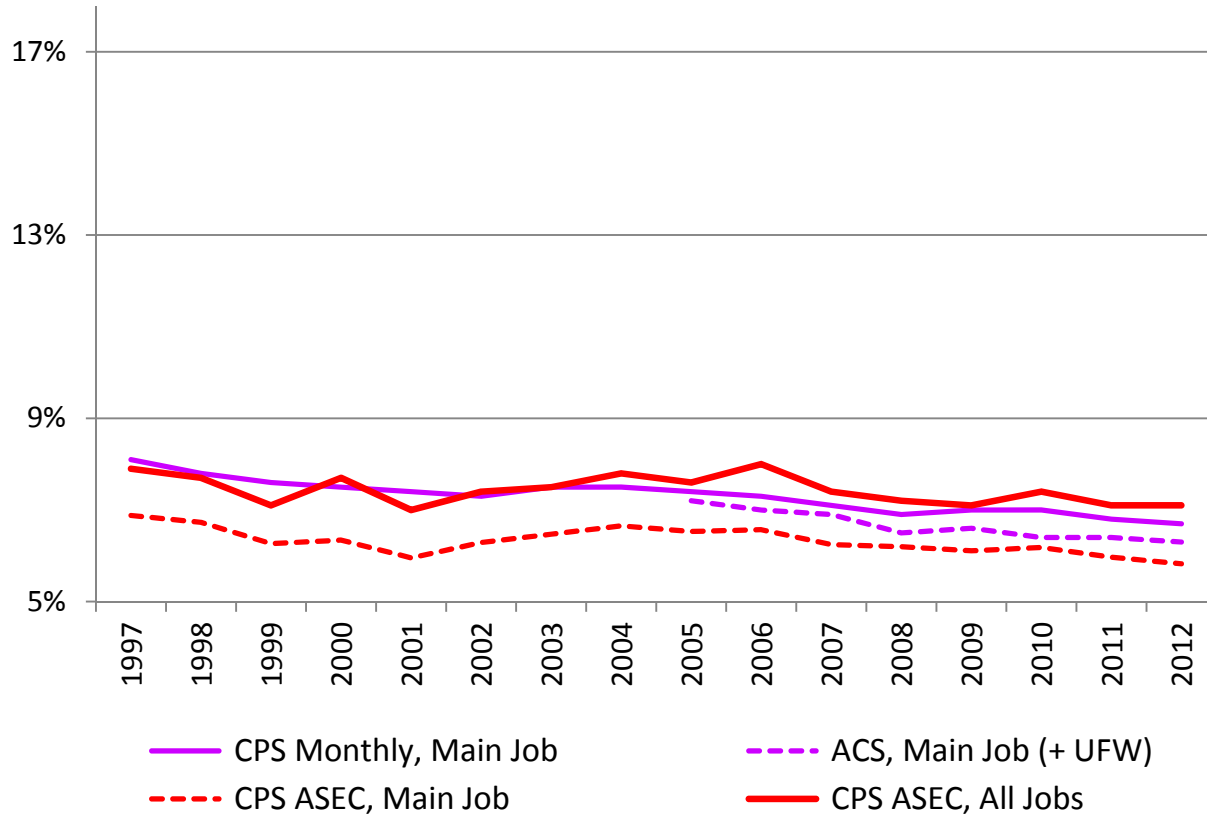
Figure 1: Percent of Employment in Self-Employment, Based on IRS Schedule C Filings and CPS Data, 1979-2014



Source: Authors calculations based on Statistics of Income publication 1304 Table 1.3 and CPS.

“It is clear that the IRS and CPS data show divergent trends in the number of self-employed individuals” (page 9)

# Estimates of SE: Household Surveys



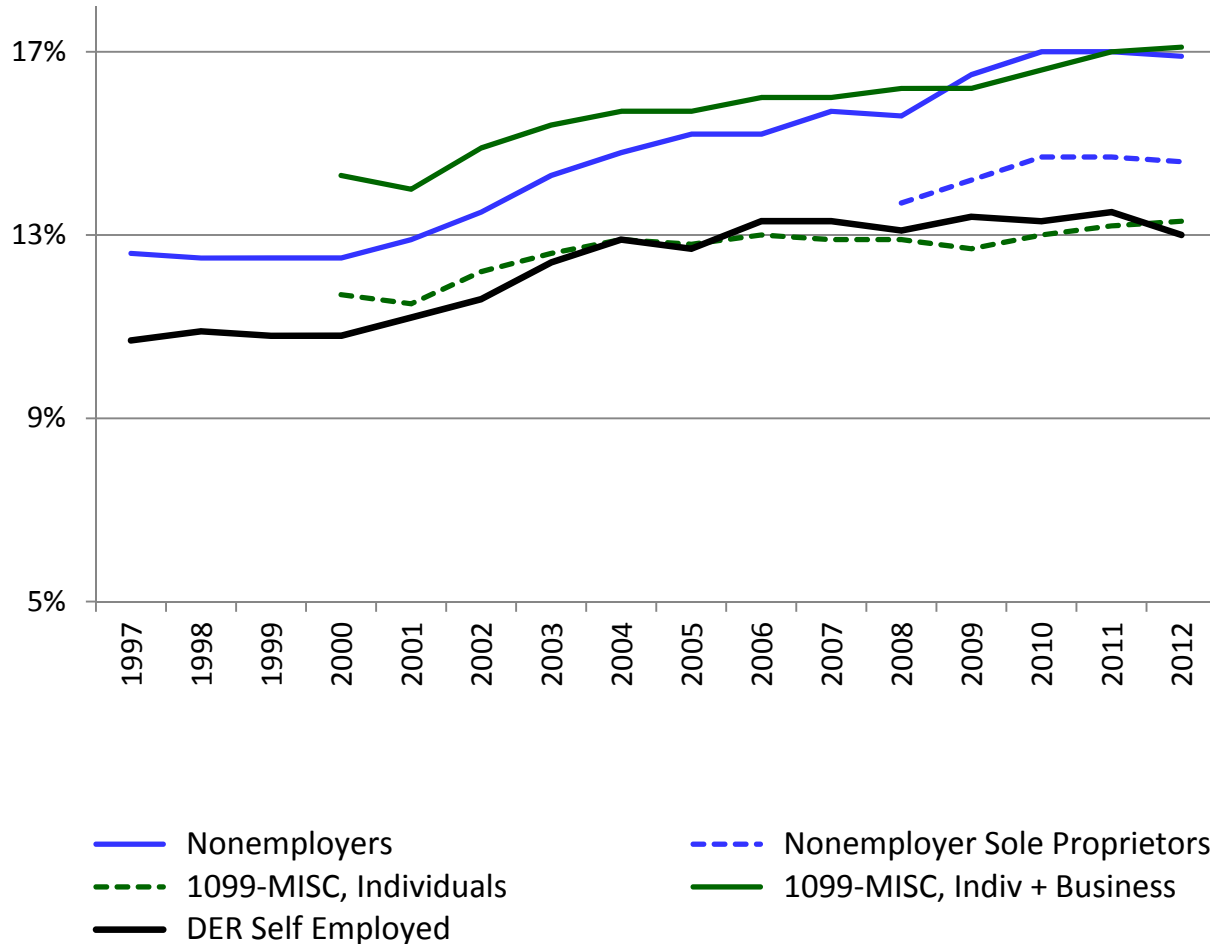
CPS Monthly, Main Job: from BLS website

ACS, Main Job (+ unpaid family workers): from Census website

CPS ASEC, Main Job: authors' tabulations of microdata

CPS ASEC, All Jobs: authors' tabulations of microdata

# Estimates of SE: Administrative Data

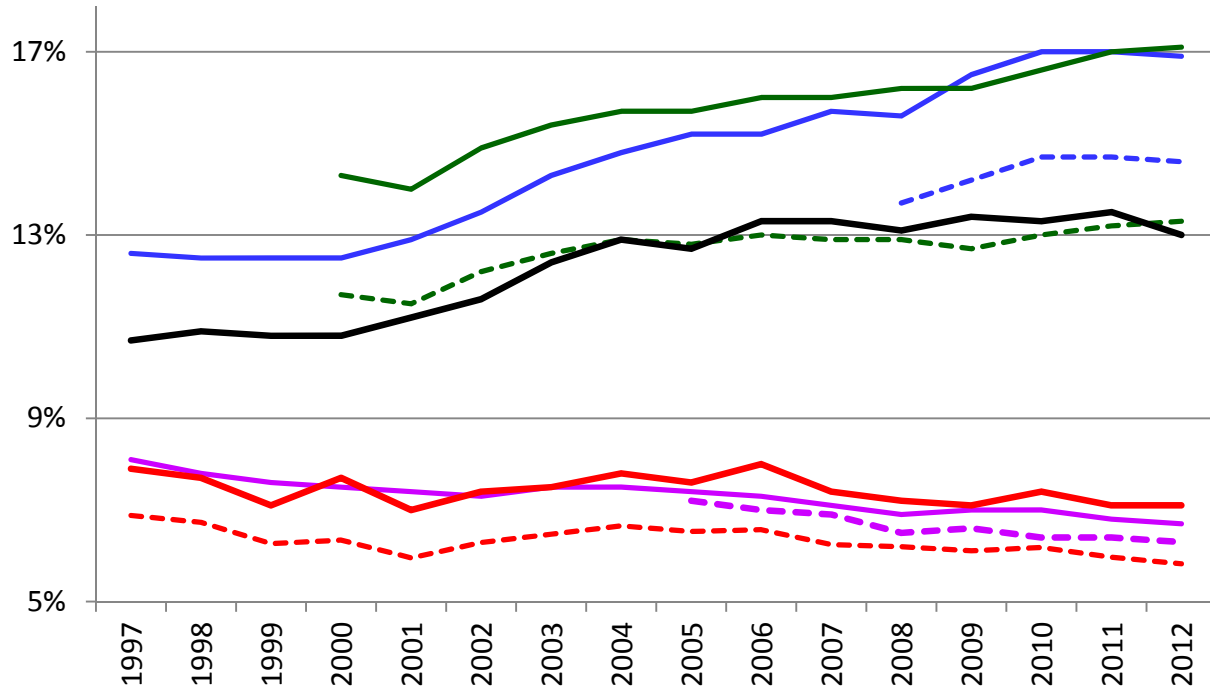


Nonemployers (businesses with no paid employees and receipts >\$1000) and Nonemployer Sole Proprietors (unincorporated businesses owned by an individual): from Census website

1099-MISC (counts of individuals or businesses receiving at least one 1099-MISC with box 7): from publication *Tax Notes*

DER (Detailed Earnings Records, an extract from the IRS Master Earnings File, which records SE net income >\$433 from IRS Schedule SE): authors' tabulations of microdata

# Estimates of Self Employment



Estimates of self-employment from household surveys and administrative data differ in both level and trend

# Why is this Important?

Accurate measurement of self-employment is important for understanding current labor market trends:

- Employment - population ratio
- Multiple jobholding rate
- Labor market dynamism
- Real wages and the earnings distribution
- Productive inputs of businesses

Accurate measurement of self-employment is important for understanding the magnitude and growth of the gig economy

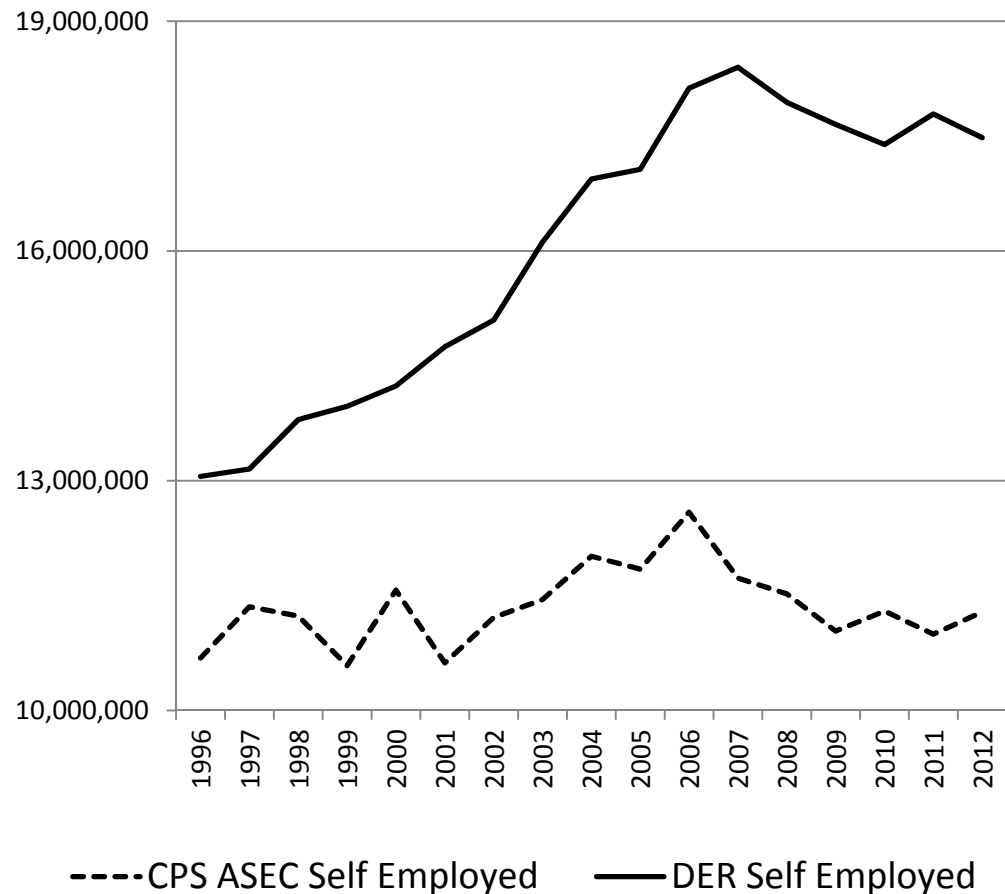


# Our Goals in This Presentation

In this presentation, we

- link the CPS-ASEC and the DER microdata
- analyze differences in self-employment levels and trends

*In the future, we hope to expand our analysis with nonemployer and 1099-MISC microdata*



# Preview of Our Findings

- 1) There is a large and increasing fraction of individuals who have self-employment in the DER but no self-employment in the CPS ASEC
  - A large fraction of these individuals (>80%) report they are wage and salary workers in the CPS ASEC
    - About half are also W&S in DER → missing SE in CPS
    - About half are not W&S in DER → misclassification
- 2) Observable factors account for about 20% of the increasing divergence of CPS & DER self employment

# Data: CPS ASEC

## CPS Annual Social and Economic Supplement (ASEC)

- Often known as the “March Supplement”
- Information on work histories during the prior calendar year

## An individual is self-employed:

- If the longest job held during the previous year was self-employment
- or if the longest job held during the previous year was wage and salary and they report some self-employment income from other work

# Data: DER

The Detailed Earnings Records (DER) is an extract from the SSA's Master Earnings File, which contains information from individual income tax filings:

- Wage and salary payments received from all employers during the past calendar year
- Any self-employment income during the past calendar year reported on Form 1040 Schedule SE (a form that anyone with more than \$433 in annual self-employment net earnings is required to file)

# Linking CPS ASEC and DER

We match the DER and the CPS ASEC by PIK

- PIK = Protected Identity Key (Census Bureau's internal individual identifier)

The PIK is nonmissing for approximately 70-80% of March CPS respondents

- We use propensity score methods to modify the CPS ASEC weights to account for nonmissing PIKs
- Our analysis sample is approximately 70,000 – 135,000 persons per year (varies by year)

# Self-Employment, CPS-ASEC & DER

averaged over all years

Row %	DER	DER	
Column %	SE = 0	SE = 1	
CPS SE = 0			
CPS SE = 1			

# Self-Employment, CPS-ASEC & DER

averaged over all years

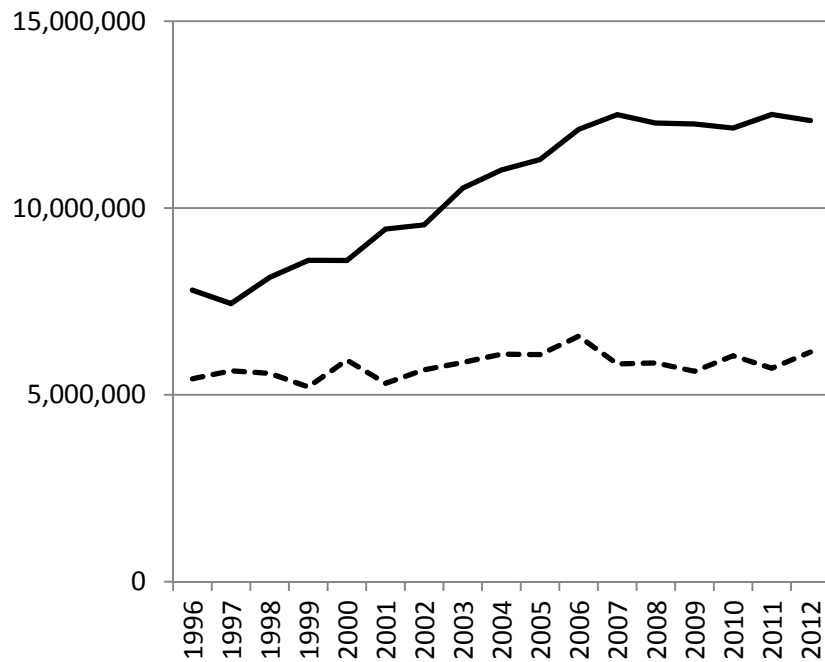
Row % Column %	DER SE = 0	DER SE = 1	
CPS SE = 0	203,078,047 95.1%	10,501,914 4.9%	213,579,961 95.0%
CPS SE = 1	5,799,710 51.1%	5,554,222 48.9%	11,353,932 5.0%
	208,877,757 92.9%	16,056,136 7.1%	224,933,893

65.4% of self-employed persons in the DER are not self-employed in the CPS

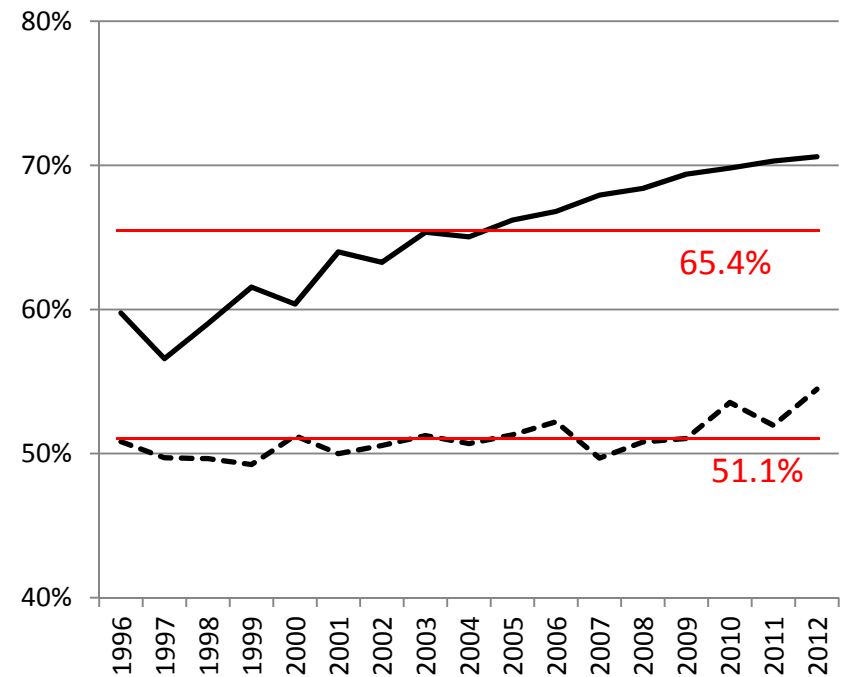
51.1% of self-employed persons in the CPS are not self-employed in the DER

*Equivalent statistics for a 2x2 matrix of W&S employment are 9.3% and 12.4%*

# Divergence results from persons who are SE in the DER but not SE in the CPS



- - - - CPS {SE=1} DER {SE=0}  
 ——— CPS {SE=0} DER {SE=1}

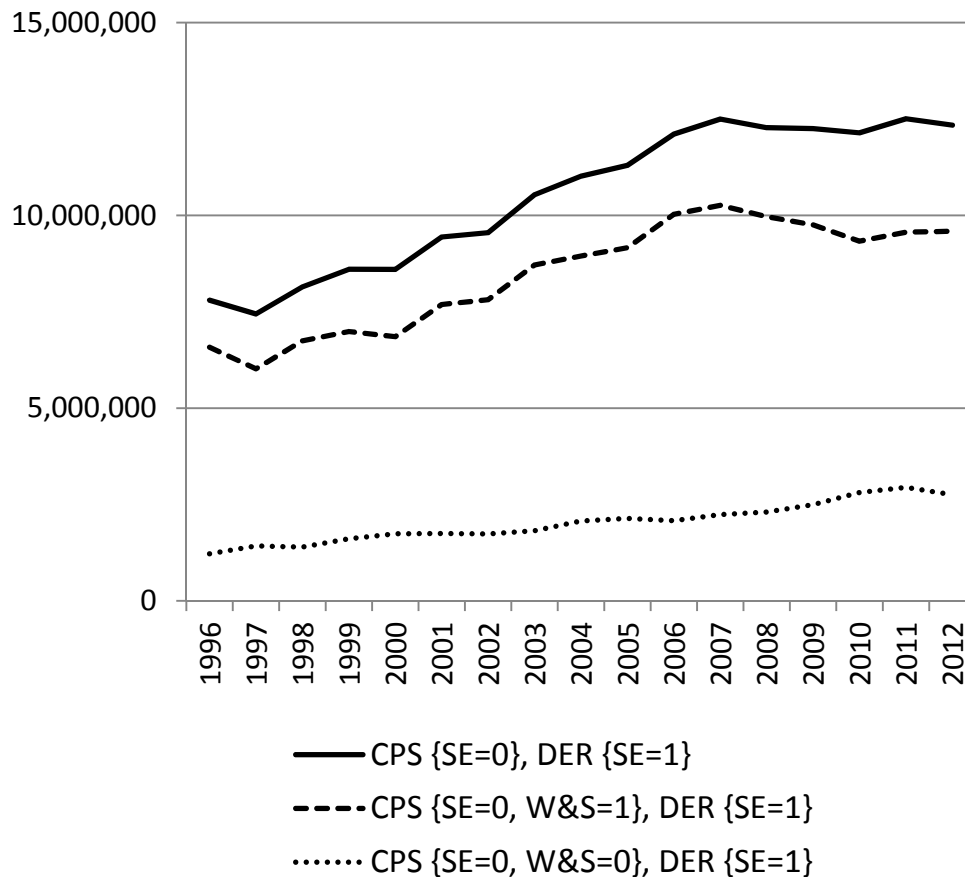


- - - - CPS {SE=1}, DER {SE=0} | CPS {SE=1}  
 ——— CPS {SE=0}, DER {SE=1} | DER {SE=1}



# CPS {SE=0}, DER {SE=1}

## What are they doing in CPS?



$$\text{CPS}\{\text{SE}=0\}, \text{DER}\{\text{SE}=1\} =$$

$$\text{CPS}\{\text{SE}=0, \text{W}\&\text{S}=1\}, \text{DER}\{\text{SE}=1\} +$$

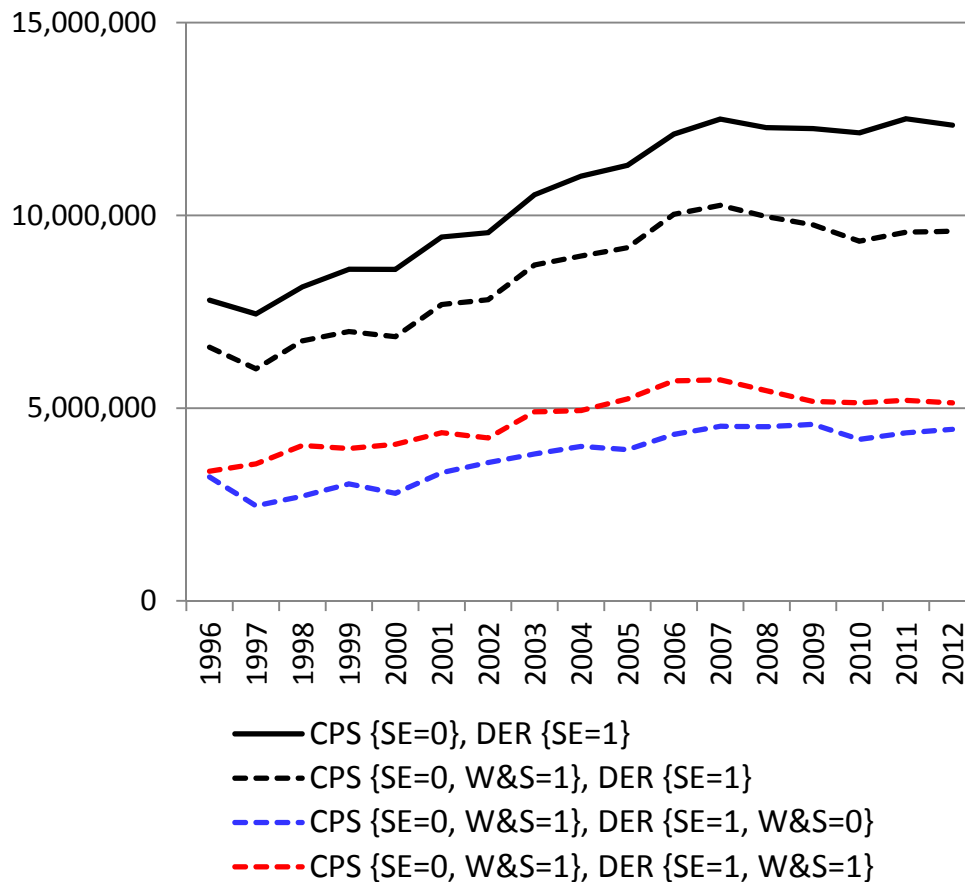
$$\text{CPS}\{\text{SE}=0, \text{W}\&\text{S}=0\}, \text{DER}\{\text{SE}=1\}$$

81% of individuals self-employed in DER but not self-employed in CPS are wage & salary in CPS

Roughly 2/3 of the growth in the off-diagonal occurs amongst those who are wage & salary in CPS (with 1/3 amongst those who have no employment in CPS)

# CPS {SE=0, W&S=1}, DER {SE=1}

## Missing SE or misclassification?



$$\text{CPS}\{\text{SE}=0, \text{W\&S}=1\}, \text{DER}\{\text{SE}=1\} = \\ \text{CPS}\{\text{SE}=0, \text{W\&S}=0\}, \text{DER}\{\text{SE}=1, \text{W\&S}=1\} + \\ \text{CPS}\{\text{SE}=0, \text{W\&S}=0\}, \text{DER}\{\text{SE}=1, \text{W\&S}=0\}$$

The red line is individuals with both SE and W&S in DER, but only W&S in CPS → missing SE in CPS

The blue line is individuals with only SE in DER, and only W&S in CPS → misclassification

The growth in the off-diagonal is coming from both

# Explaining the Diverging Off-Diagonals

Dependent Variable = {CPS SE=0, DER SE=1 | DER SE=1}  
 Mean of Dependent Variable = 65.4%

	(1)	(2)	(3)
Year	Yes	Yes	Yes
Demographics	Yes	Yes	Yes
DER SE \$, 1 <sup>st</sup> quartile		.278 *	.137 *
DER SE \$, 2 <sup>nd</sup> quartile		.171 *	.074 *
DER SE \$, 3 <sup>rd</sup> quartile		.081 *	.043 *
CPS W&S Indicator			.564 *
R-squared	.0434	.0877	.3948

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R-squared	.0434	.0877	.3948

The demographics with the most explanatory power:

- $\beta$  from column (1)
- Age 15-24 (.229)
- Black (.134)
- Foreign Born (.078)
- Age 25-34 (.077)
- Age 65+ (.075)

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More likely to be in the off-diagonal if DER SE earnings are low

# Explaining the Diverging Off-Diagonals

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A good predictor of being SE in DER but not SE in CPS is being a wage and salary worker in CPS

# Explaining the Diverging Off-Diagonals

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R-squared	.0434	.0877	.3948
$\Delta X\beta/\Delta Y$ (X≠year)	18.1%	17.0%	20.0%

Bottom line:

- we can explain some of the cross-sectional variation
- we can explain a non-trivial amount (20%) of the rising off-diagonal

# Explaining the Diverging Off-Diagonals

Dependent Variable = {CPS SE=0, DER SE=1 | DER SE=1}  
 Mean of Dependent Variable = 65.4%

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$\Delta X\beta/\Delta Y$ (X≠year)	18.1%	17.0%	20.0%

The demographics with the most explanatory power:

$\Delta X\beta/\Delta Y$  from col (1)

Foreign Born (6.7%)

Black (6.6%)

Age 15-24 (2.6%)

Age 65+ (1.3%)

Age 25-34 (-0.3%)



# Summary

- 1) Estimates of self-employment from household surveys and administrative data differ in level and trend
  - Discrepancy important for understanding changing role of gig economy
- 2) We match CPS-ASEC and DER microdata, and show the trend discrepancy results from individuals SE in DER but not SE in CPS
  - A very large fraction of these individuals report W&S income in the CPS
    - about half are also W&S in the DER → missing SE in the CPS
    - about half are not W&S in the DER → misclassification
- 3) Changes in demographics account for substantial (about 20 percent) amount of increasing divergence

# Summary

- 4) The Federal Statistical System has two initiatives to measure gig employment:
  - a. The Annual Survey of Entrepreneurs (ASE)
    - 290,000 employer firms, with approximately 47% in business < 10 years
    - 2015 survey includes questions on types of workers (full time, part time, ..., “contractors, independent contractors, or outside consultants”) and types of tasks performed by each type of worker [see Foster & Norman, 2016]
  - b. The Contingent Worker Supplement (CWS) to the CPS
    - The BLS is preparing to rerun the CWS in May 2017
    - Proposed new questions at the end of the CWS include
      - “Some workers find short, in-person jobs or tasks through companies that connect them directly with customers using a website or mobile app. ...”
      - “Some workers select short, paid tasks through companies that maintain online lists of tasks. ...”