

Explaining the Decline in the U.S. Employment-to-Population Ratio: *A Review of the Evidence*

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Goals of Paper

Central question: What does the evidence tell us about the main causes of the 1999-2016 decline in the U.S. employment-to-population ratio?

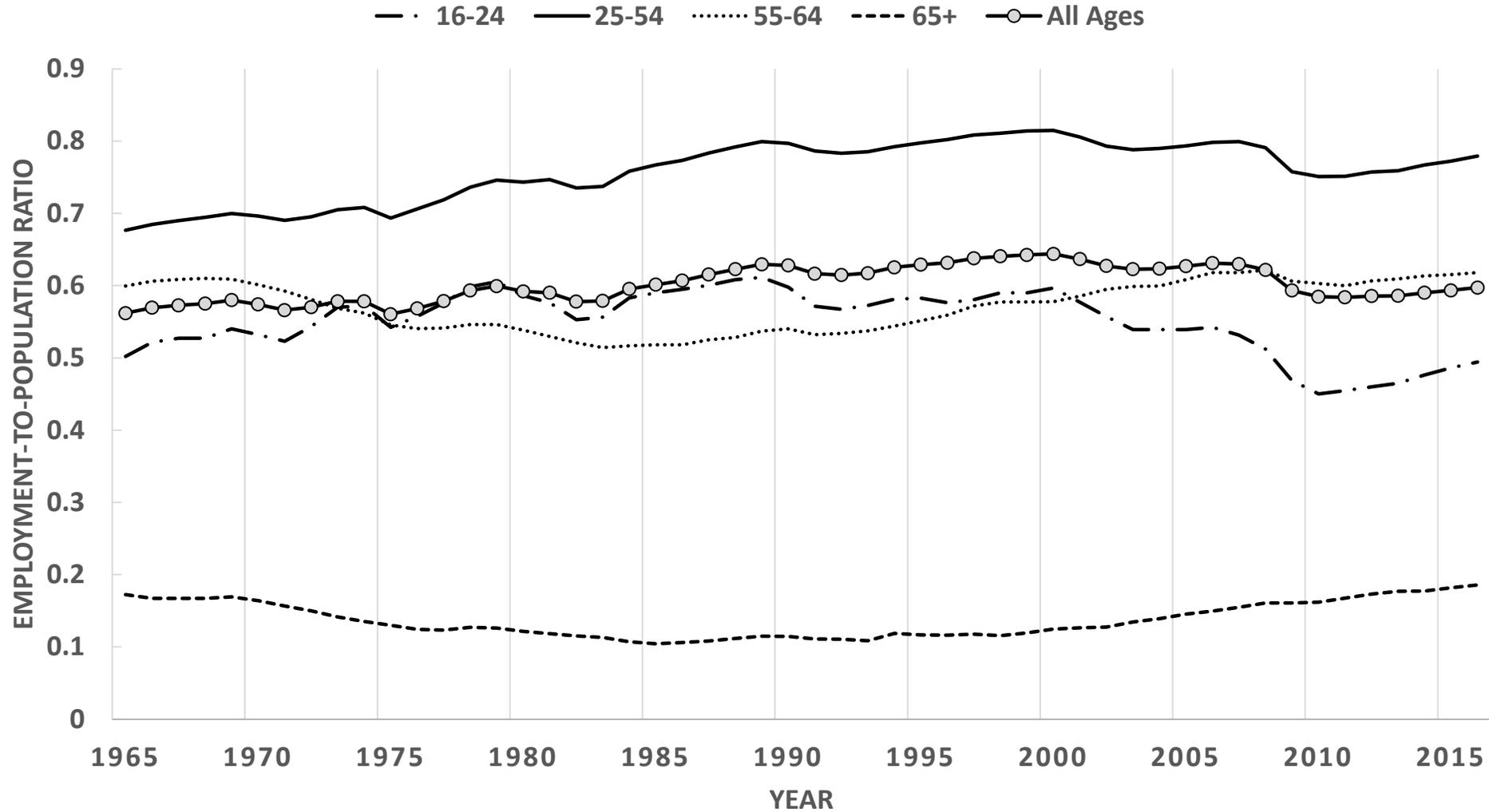
Overall E/POP for adults age 16+ fell from 64.3% in 1999 to 59.7% in 2016 (4.5 pp. decline)

- Document demographic and group-specific trends for this period
 - Population aging has contributed to falling employment rates
 - Within-group E/POP declines among those age 16-54 even more important
 - Within-group E/POPs have *risen* for those age 55+
- Consider broad set of potential explanatory factors for within-group declines
 - Focus on long-term decline, not effects of the Great Recession

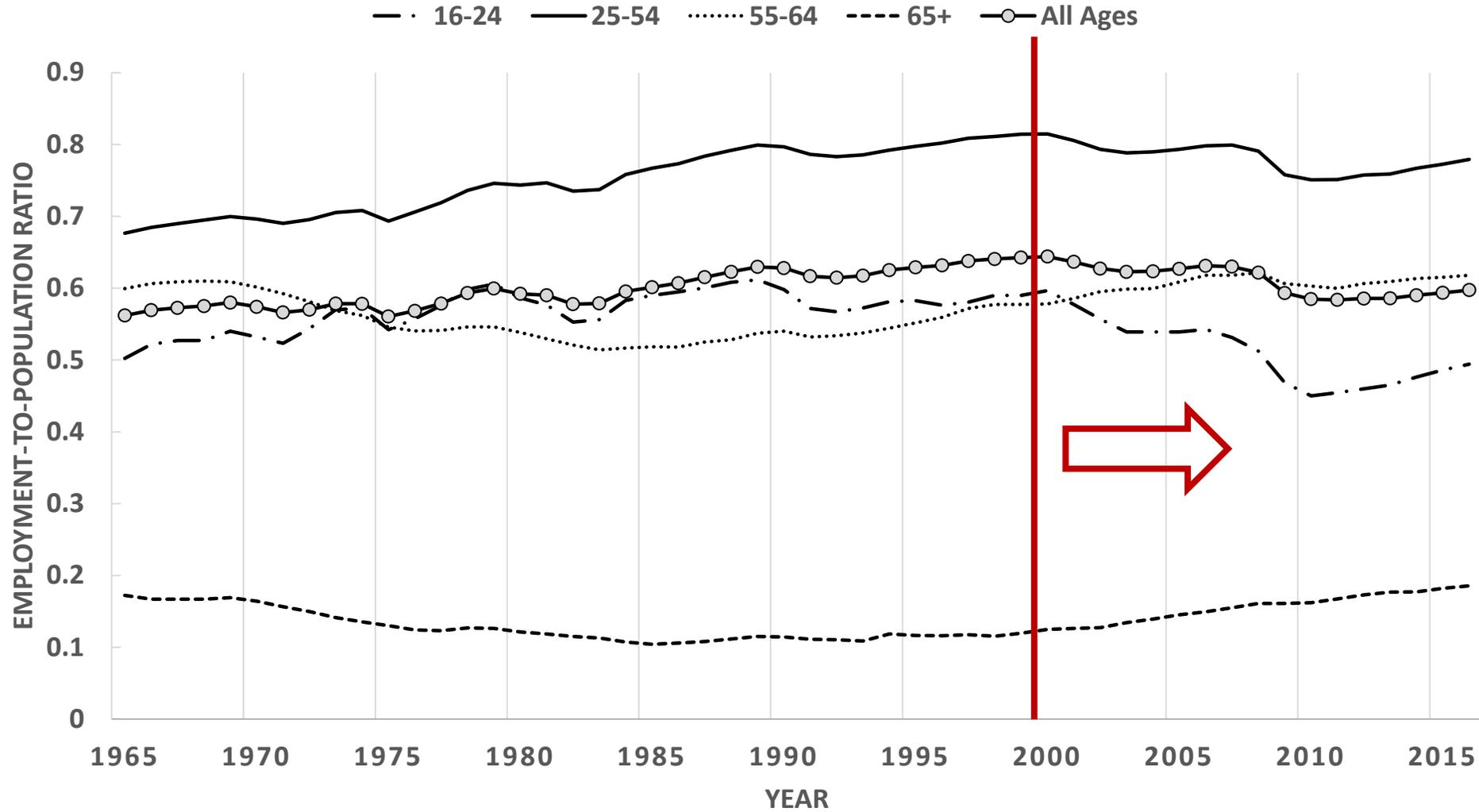
In reviewing evidence about causes of within-group E/POP declines, ask:

1. What is causal link between factor and employment?
2. Might changes in this factor have led to lower employment during the period?

Employment-to-Population Ratio by Age, 1965-2016



Employment-to-Population Ratio by Age, 1965-2016



	TOTAL		MALE		FEMALE	
	E/P ₁₉₉₉	ΔE/P ₉₉₋₁₆	E/P ₁₉₉₉	ΔE/P ₉₉₋₁₆	E/P ₁₉₉₉	ΔE/P ₉₉₋₁₆
<i>Age 16-24</i>	0.590	-0.096	0.610	-0.110	0.570	-0.082
<i>Age 25-54</i>	0.814	-0.035	0.890	-0.040	0.741	-0.030
<i>Age 55+</i>	0.310	0.076	0.385	0.060	0.249	0.086
<i>Age 16-24</i>						
<i>Not In School</i>	0.726	-0.046	0.778	-0.072	0.672	-0.021
<i>In School</i>	0.443	-0.116	0.424	-0.121	0.461	-0.111
<i>Age 25-54</i>						
<i>Less than HS</i>	0.639	-0.030	0.769	-0.027	0.502	-0.046
<i>HS</i>	0.796	-0.071	0.878	-0.075	0.718	-0.086
<i>Some College</i>	0.838	-0.051	0.903	-0.049	0.781	-0.052
<i>College</i>	0.882	-0.024	0.941	-0.021	0.822	-0.017
<i>Age 55+</i>						
<i>Less than HS</i>	0.171	0.047	0.236	0.053	0.120	0.035
<i>HS</i>	0.301	0.033	0.380	0.026	0.250	0.027
<i>Some College</i>	0.364	0.048	0.426	0.032	0.315	0.061
<i>College</i>	0.464	0.024	0.516	0.013	0.395	0.051
<i>TOTAL</i>	0.643	-0.045	0.716	-0.059	0.574	-0.033

(A Simple) Decomposition

What are the contributions of changes in within-group employment rates versus changes in population shares to the overall E/POP decline?

$$(1) \quad \Delta(E / P)_{t_0, t_1} = \sum_i s_{i, t_0} \Delta(E / P)_{i, t_0, t_1} + \sum_i (E / P)_{i, t_0} \Delta s_{i, t_0, t_1} + \sum_i \Delta s_{i, t_0, t_1} \Delta(E / P)_{i, t_0, t_1}$$

which can be rewritten as

$$(2) \quad \Delta(E / P)_{t_0, t_1} = \sum_i s_{i, t_0} \Delta(E / P)_{i, t_0, t_1} + \sum_i [(E / P)_{i, t_0} - (E / P)_{t_0}] \Delta s_{i, t_0, t_1} \\ + \sum_i \Delta s_{i, t_0, t_1} \Delta(E / P)_{i, t_0, t_1}$$

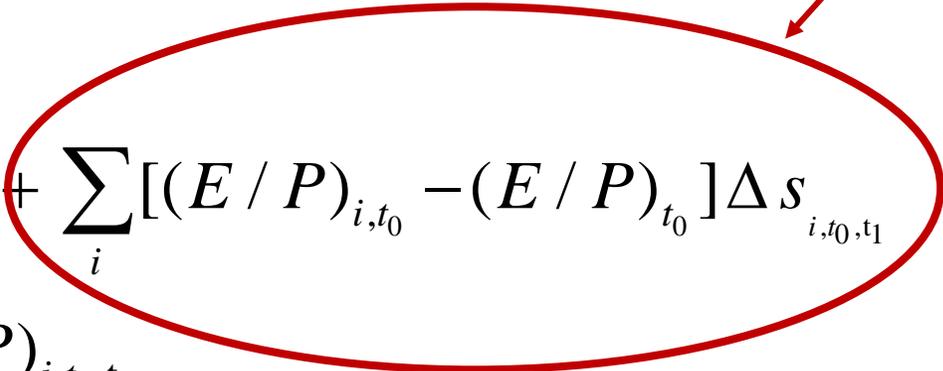
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Changes in shares of different groups

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Changes in within-group employment rates

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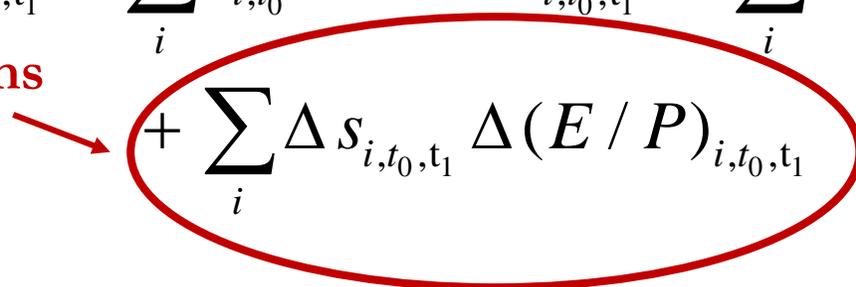
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Interaction terms


$$+ \sum_i \Delta s_{i, t_0, t_1} \Delta(E / P)_{i, t_0, t_1}$$

(A Simple) Decomposition (continued)

Decomposition by age and sex:

Aging of the population	3.1 pp decline
Employment declines among those age 16-54	3.7 pp decline
Employment increases among those age 55 plus	1.3 pp increase
<u>Interaction terms</u>	<u>0.9 pp increase</u>
Total	4.5 pp decline

Note: Age groups used for decomposition are 16-19, 20-24, 25-29, 30-34, 35-39, 40-44, 45-49, 50-54, 55-59, 60-64, 65-69, 70-74, and 75+ years

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(A Simple) Decomposition (continued)

Decomposition by age, sex and education:

Changes in population shares	2.1 pp decline
Employment declines among those age 16-54	4.1 pp decline
16-24 year olds in school	1.0 pp decline
25-54 year olds with high school or some college	2.0 pp decline
Employment increases among those age 55 plus	0.7 pp increase
<u>Interaction terms</u>	<u>1.0 pp increase</u>
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Note: Age groups used for decomposition are 16-19, 20-24, 25-29, 30-34, 35-39, 40-44, 45-49, 50-54, 55-59, 60-64, 65-69, 70-74, and 75+ years. Education groups are in/out of school for those under age 25, else less than high school, high school, some college or college graduate.

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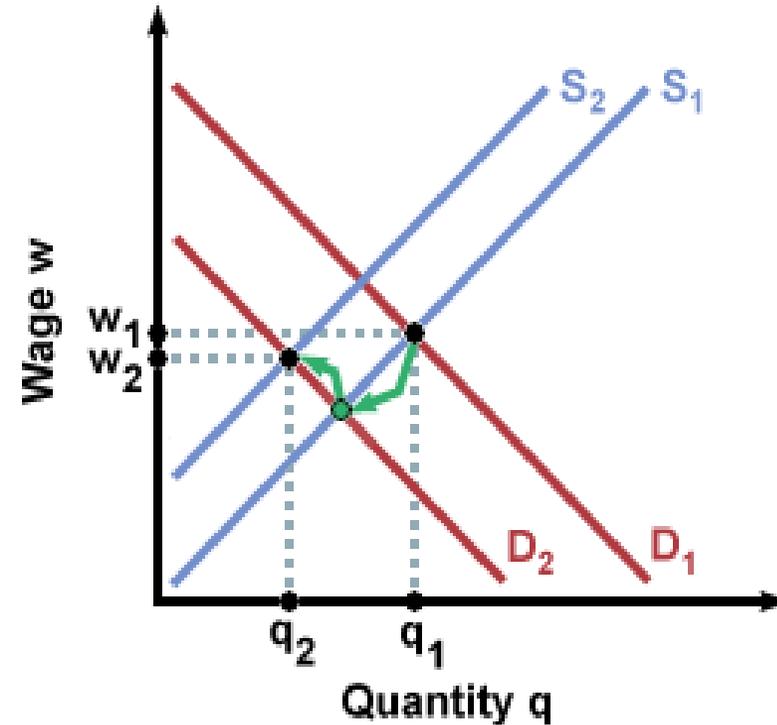
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Potential causes of within-group E/POP declines

1. Shifts in labor demand
2. Shifts in labor supply
3. Institutional factors and labor market frictions



Summarizing the evidence (1 of 3)

<i>Factors</i>	Estimated reduction in E/POP (pp.)
<u><i>Major contributing factors</i></u>	
<i>Growth in imports from China</i>	1.04
<i>Adoption of industrial robots</i>	0.55
<u><i>Significant contributing factors</i></u>	
<i>Increased receipt of disability benefits (SSDI, VDC)</i>	(0.14+0.06=) 0.20
<i>Higher minimum wages</i>	0.20
<i>Increased rate of incarceration</i>	0.13

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2.12

Summarizing the evidence (2 of 3)

<i>Factors</i>	Estimated reduction in E/POP (pp.)
<u><i>Insignificant factors</i></u>	
<i>SNAP expansions</i>	~0
<i>Public health insurance expansions</i>	~0
<i>More generous EITC</i>	~0
<i>Increased rates of spousal employment</i>	~0
<i>Increased difficulties due to lack of family leave</i>	~0
<i>Expanded immigration</i>	~0
<i>Changes in unionization</i>	~0

Summarizing the evidence (3 of 3)

<i>Factors</i>	Estimated reduction in E/POP (pp.)
<u><i>Indeterminate given state of evidence</i></u>	
<i>Changes in leisure options/social norms</i>	unclear
<i>Opioid addiction</i>	unclear
<i>Increased difficulties due to lack of child care</i>	unclear
<i>Rise in occupational licensing</i>	unclear
<i>Increases in skill mismatch</i>	unclear
<i>Increases in geographic mismatch/declining mobility</i>	unclear

Trade and robots

TRADE

- Considerable evidence links manufacturing employment declines to China imports
- *Key citation for magnitude: Acemoglu, Autor, Dorn, Hanson and Price (2016)*
 - Consider industry level exposure to Chinese imports in local markets
 - Incorporate reallocation affects and aggregate demand effects
 - Estimate growth in Chinese imports from 1999 to 2011 reduced employment by 2.37 million
- Extrapolation through 2016 yields estimated 2.65 million employment reduction

ROBOTS

- Best available evidence suggests little dis-employment due to computerization, but notable effects of industrial robots on manufacturing employment
- *Key citation for magnitude: Acemoglu and Restrepo (2017)*
 - Consider industry level exposure to robots in local labor markets
 - Allow for trade across local markets
 - Estimate net displacement of ~5.6 workers per robot
- IFR data show ~250,000 robots installed in United States as of 2016; applying Acemoglu and Restrepo (2017) impact factor yields estimated 1.40 million employment reduction

Disability insurance

SOCIAL SECURITY DISABILITY INSURANCE (SSDI)

- Many papers find negative employment effects; share of adults on SSDI has grown
- *Key citation for magnitude:* Maestes, Mullen, and Strand (2013)
 - Effect identified based on random assignment to administrative law judges
 - Estimate that benefits lower participation rate for marginal SSDI recipient by 28 percentage points on average
- Estimate added marginal SSDI recipients as actual beneficiary growth minus growth holding reciprocity rates within 5-year age groups constant; apply age-specific Maestes, Mullen and Strand (2013) impact factors, estimate 0.36 million employment reduction

VETERANS DISABILITY COMPENSATION (VDC)

- Several papers suggest receipt of VDC lowers employment; share of veterans on VDC has grown
- *Key citation for magnitude:* Autor, Duggan, Greenberg and Lyle (2016)
 - Effect identified based on expanded eligibility related to Agent Orange exposure
 - Estimate that benefits reduced eligible veterans' participation by 18 percentage points
- Assume excess growth in VDC caseload equals actual growth minus growth holding reciprocity rates within broad age groups constant; assume effect on employment 18 percentage points for excess caseload age 35-54, half that for those under age 35 or age 55-74; and zero for those age 75 plus; very rough estimate 0.15 million employment reduction

Minimum wages

MINIMUM WAGES

- Literature on employment effects of minimum wages extremely contentious
- *Key citations for magnitude*: Dube, Lester and Reich (2010), Allegretto, Dube and Reich (2011), Allegretto, Dube, Reich and Zipperer (2013), Dube and Zipperer (2015), and Neumark, Salas and Wascher (2013)
 - All cited studies exploit minimum wage differences across states
 - First four (and others) find no detectable employment effects of higher minimum wages; Neumark, Wascher and Wascher (2013) estimate 0.3 employment elasticity for teenagers (on high end of available estimates)
- Give 2/3 weight to studies showing no effect and 1/3 weight to Neumark, Salas and Wascher (2013); assume elasticity for adults 1/3 that for teenagers (assumption borrowed from Congressional Budget Office); effective real minimum wage rose 9.0 percent from 1998 to 2016; yields estimate that higher minimum wages reduced employment by 0.2 percentage point

Incarceration

INCARCERATION

- Available research suggests that serving time in prison harms subsequent employment prospects for those with significant prior earnings; incarceration rate has increased dramatically
- *Key citation for magnitude: Mueller-Smith (2015)*
 - Effect identified using random assignment of criminal defendants to courtrooms with different judges and prosecutors
 - Reduction in subsequent employment 39 percentage points for those with significant prior earnings and a two-plus year term; 24 percentage points for those with significant prior earnings and a one year term; smaller effects for those with lower levels of prior earnings
- Use Bucknor and Barger's (2016) estimates of the number of adults with prior prison time plus informed guesses about the length of time those adults had served and whether they had significant prior earnings; very rough estimate that growth in number of people with prison records since 1999 yielded 0.3 million employment reduction

Important areas for additional research

- Long-run effects of falling employment among in-school 16-24 year olds
- Social norms and the decision to participate in the labor force
- Causes and consequences of opioid addiction
- Access to child care
 - Know that child care costs matter, but less clear how affordability and availability may have changed
- Occupational licensing
 - Recent state reforms and efforts to ease licensing requirements for military spouses should provide new evidence
- Skill mismatch
 - New data on job postings (e.g., Burning Glass) and worker experience (e.g. Linked In) may yield valuable insights
- Geographic mismatch and worker mobility
 - Mobility clearly has fallen, but less clear why or how employment rates affected
- Interactions among different contributing factors

Summary

- Over the period from 1999 to 2016, within-group declines in employment among those age 16-54 have had a larger effect on overall E/POP than aging of the population
- Based on available evidence about why within-group employment rates have fallen, conclude:
 - Imports from China and use of robots have been major contributing factors
 - Disability insurance, veterans disability compensation, higher minimum wages and increasing incarceration have played significant but less important roles
 - Other than disability benefits, social insurance benefits have not worked significantly to lower within-group employment rates
 - Immigration also has not been an important factor in falling employment rates
- Would like to know more about changing social norms; opioid addiction; child care access and affordability; occupational licensing; skill mismatch; and geographic mismatch

Thank you!