Causes and Consequences of Inequality
Herbert M. Singer Conference Series

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Rising Inequality in Industrialized Nations: Causes, Concerns, and Policy Responses

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MIT and NBER

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Rising Inequality in Industrialized Nations: Causes, Concerns, and Policy Responses

1. Inequality – Causes
   • Technological revolutions
   • International competition
   • The ‘education race’

2. Inequality – Concerns
   • Inequality and economic mobility
   • Household structure and investments in children

3. Inequality – Policy responses
   • Education
   • Taxation
   • Labor standards
   • Macroeconomic policies

4. Conclusions
Not One but Two Technological Revolutions: The Green Revolution and the Industrial Revolution

Johnston 2012
Automation of ‘Routine Tasks:’ Jacquard Loom (1801)

Two Centuries of Productivity Growth in Computing: 2+ Trillion Fold Decline in Cost of Computing v. Labor

Figure 2. The cost of computer power for different technologies

Nordhaus 2007
Information Technology Accounted for ~40% of Business Investment as of 2010

Information Processing Equipment + Software Share of All Private Non-Residential Investment, 1959 - 2010 (Source: BEA NIPA)
### Substitution, Complementarity: Tasks and Technology

<table>
<thead>
<tr>
<th>Task Description</th>
<th>Example Occupations</th>
<th>Potential Impact of Computerization</th>
</tr>
</thead>
</table>
| **Routine Tasks** | • ‘Rules-based’  
• Repetitive  
• Procedural | • Bookkeepers  
• Assembly line workers | • Direct Substitution |
| **Abstract Tasks** | • Abstract problem-solving  
• Mental flexibility | • Scientists  
• Attorneys  
• Managers  
• Doctors | • Strong Complementarity |
| **Manual Tasks** | • Environmental Adaptability  
• Interpersonal Adaptability | • Truck drivers  
• Security guards  
• Flight attendants  
• Home health aides  
• Waiters  
• Cleaners | • Limited Complementarity or Substitution |
U.S. Job Task Input by Education Group in 1980

Autor, Levy and Murnane, 2003
Employment Polarization, 1979 – 2010
Percent Growth in Employment by Occupation

- Personal Care
- Food/Cleaning Service
- Protective Service
- Operators/Laborers
- Production
- Office/Admin
- Sales
- Technicians
- Professionals
- Managers

1979-1989
1989-1999
1999-2007
2007-2010

Legend:
Changes in Employment Share by Job Skill Tercile, 1993-2006
Comparison of U.S. and European Union Countries

Source: Goos, Salomons and Manning (2009)
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4. **Conclusions**
Chinese Imports Surge Following its 2001 WTO Accession — U.S. Manufacturing Employment Declines Simultaneously
Many High Income Countries Experience a “China Shock” in the Last Two Decades

Trade Flows: China ↔ US, Other High Income Countries
(Billions of 2007 US Dollars)

<table>
<thead>
<tr>
<th>Year</th>
<th>United States Imports</th>
<th>United States Exports</th>
<th>Australia, Denmark, Finland, Germany, Japan, New Zealand, Spain, and Switzerland Imports</th>
<th>Australia, Denmark, Finland, Germany, Japan, New Zealand, Spain, and Switzerland Exports</th>
</tr>
</thead>
<tbody>
<tr>
<td>1991</td>
<td>$26 bil</td>
<td>$10 bil</td>
<td>$122 bil</td>
<td>$197 bil</td>
</tr>
<tr>
<td>2000</td>
<td>$28 bil</td>
<td>$57 bil</td>
<td>$94 bil</td>
<td>$68 bil</td>
</tr>
<tr>
<td>2007</td>
<td>$330 bil</td>
<td>$23 bil</td>
<td>$263 bil</td>
<td>$197 bil</td>
</tr>
</tbody>
</table>
Defining Local Labor Markets: “Commuting Zones”

Based on commuting patterns among countries in 1990

- Cluster all mainland U.S. counties in 722 commuting zones (CZ), characterized by strong commuting ties within a CZ and weak commuting across CZs
- Can map Census Public Use Micro Areas to CZs
Figure 2. Change in Import Exposure per Worker and Decline of Manufacturing Employment: Added Variable Plots of First Stage and Reduced Form Estimates

Effect of an $1000 Per Worker Increase in Imports from China during 1990-2007 on the Change in Manufacturing Employment as a Percentage of the Working age Population

<table>
<thead>
<tr>
<th>Period</th>
<th>Percentage Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>1990-2000</td>
<td>-0.9%</td>
</tr>
<tr>
<td>2000-2007</td>
<td>-0.7%</td>
</tr>
</tbody>
</table>
Negative Impacts Begin with China’s Rise in the 1990s


Effect of an $1000 Per Worker Increase in Imports from China during 1990-2007 on the Change in Manufacturing Employment as a Percentage of the Working age Population

<table>
<thead>
<tr>
<th>Period</th>
<th>Change in Employment (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1970-1980</td>
<td>0.4%</td>
</tr>
<tr>
<td>1980-1990</td>
<td>-0.1%</td>
</tr>
<tr>
<td>1990-2000</td>
<td>-0.9%</td>
</tr>
<tr>
<td>2000-2007</td>
<td>-0.7%</td>
</tr>
</tbody>
</table>
Imports from China and Employment Status of Working Age Population within Commuting Zones (1990-2007)

Effect of an $1000 Per Worker Increase in Imports from China during 1990-2007 on Share of Population in Employment Categories

- Manufacturing
- Non-Manufacturing
- Unemployment
- Not in Labor Force

<table>
<thead>
<tr>
<th>All Education Levels</th>
<th>College Education</th>
<th>No College Education</th>
</tr>
</thead>
<tbody>
<tr>
<td>-0.2 %</td>
<td>0.2 %</td>
<td>0.3 %</td>
</tr>
<tr>
<td>-0.6 %</td>
<td>0.2 %</td>
<td>0.1 %</td>
</tr>
<tr>
<td>-0.6 %</td>
<td>-0.6 %</td>
<td>-0.5 %</td>
</tr>
</tbody>
</table>

Education Levels:
- College Education
- No College Education

Impacts on Manufacturing Emp, Non-Manufacturing Emp, Unemployment, NILF
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Composition Adjusted College/High-School Weekly Wage Ratio, 1963-2008

Composition Adjusted College/High-School Log Weekly Wage Ratio, 1963-2008
Predicted and Actual College/High-School Wage Gap, 1963 - 2008

Katz-Murphy Prediction Model for the College-High School Wage Gap

Log Wage Gap


Observed CLG/HS Gap
Gains in Post-Secondary Education over 30 Years: Fraction of Adults with ‘Tertiary’ Education in 2009

Source: OECD 2011
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Changes in Real Hourly Wage Levels 1979-2010, by Education and Sex (Ages 25 – 39)

Source: Autor and Wasserman, 2013
△ Real Earnings and △ Emp/Pop, 1979 – 2008:
U.S. Males by Education and Race (Ages 25-39)

Source: Autor and Wasserman, 2013
Figure 8. Top 1 Percent Share: English Speaking Countries (U-shaped), 1910–2005

Atkinson, Piketty, Saez 2011
Figure 10. Top 1 Percent Share: Nordic and Southern Europe (U/L-shaped), 1900–2006

Atkinson, Piketty, Saez 2011
Top 1% Income Share: Middle Europe and Japan

Figure 9. Top 1 Percent Share: Middle Europe and Japan (L-shaped), 1900–2005

Atkinson, Piketty, Saez 2011
Top 1% Income Share: ‘Developing Countries’

Figure 11. Top 1 Percent Share: Developing Countries, 1920–2005

Atkinson, Piketty, Saez 2011
Analogy by Dutch Economist Jan Pen (1921 – 2010)

• Imagine people’s height being proportional to their income, so that someone with an average income is of average height.
• Now imagine that the entire adult population of America is walking past you in a single hour, in ascending order of income.
• The first passers-by, the owners of loss-making businesses, are invisible: their heads are below ground.
• Then come the jobless and the working poor, who are midgets.
• After half an hour the strollers are still only waist-high, since America’s median income is only half the mean.
• It takes nearly 45 minutes before normal-sized people appear.
• But then, in the final minutes, giants thunder by.
• With six minutes to go they are 12 feet tall.
• When the 400 highest earners walk by, right at the end, each is more than two miles tall.
The Great Gatsby Curve: More Inequality is Associated with Less Mobility across the Generations

Source: Corak (2013) and OECD.
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Source: Autor and Wasserman, 2013

Source: Autor and Wasserman, 2013
Percentage of Births to Unmarried Women by Race, 1980 - 2009

Source: Autor and Wasserman, 2013
Disparities in Weekly Time Spent in Literacy Activities by Age and Household Income Quintile

Source: Meredith Phillips, 2013

Source: Meredith Phillips, based on Panel Study of Income Dynamics, 2009. Bars show difference relative to children whose family is in the top quintile, adjusted for child’s age in month and gender. *Denotes statistically significant difference at the p<0.05 level.
Per Capita Enrichment Expenditures on Children ($2008) Top versus Bottom Quartile of Households

Source: Duncan and Murnane, 2011
Gap in years of Completed Schooling: Students with family Income in the Top vs. Bottom quintiles (by Year of Birth-14)

Source: Duncan and Murnane, 2011
Figure 3: Fraction of Students Completing College, by Income Quartile and Year of Birth 

Commuting Zones with Higher Fraction of Mother-Headed HH’s Have Lower Mobility

Fraction of Kids w/Single Mom and Income Immobility

Commuting Zone Level Correlation

Source: Chetty, Hendren, Kline, and Saez, 2013
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Higher Returns to Schooling are Associated with Lower Intergenerational Earnings Mobility

Source: Author using data from OECD (2011b, table A8.1), and Corak (2013).
The Higher the Return to College, the Lower the Degree of Intergenerational Mobility: United States, 1940 to 2000

Source: Adapted by the author from Mazumder (2012, Figure 1).

Source: Corak, 2013
Gains in Post-Secondary Education over 30 Years: Fraction of Adults with ‘Tertiary’ Education in 2009

Source: OECD 2011
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Source: Piketty, Saez and Stantcheva, forthcoming
Changes in Top Marginal Rates and GDP per Capita Growth Rates, 1960/64 – 2006/10

Source: Piketty, Saez and Stantcheva, forthcoming
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Note: Annual data on state and federal minimum wages and log percentiles. Minimum wages are in 2011 dollars.
Decades of study and debate

- Remarkably little evidence of adverse employment impacts of minimum wages
- Yet minimum wages do reduce inequality
- Polarization of occupations provides greater opportunities for labor standards to “work” effectively
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Minorities, Youth and Low Education Adults Suffer Most in a Recession

Effect of State Unemployment Rate on Group Employment Rate, by Single Year of Age

(percentage points)


Source: Hoynes, Miller and Schaller 2012
Minorities, Youth and Low Education Adults Suffer Most in a Recession

Effect of State Unemployment Rate on Group Unemployment Rate, by Race/Sex and Education

(percentage points)

Minorities, Youth and Low Education Adults Suffer Most in a Recession

Decomposition of labour market slack in unemployment and inactivity by detailed socio-demographic groups

Percentage-points change in the number of persons in a given labour market status as a share of population of the indicated group, OECD average,\(^a\) Q4 2007-Q4 2012

<table>
<thead>
<tr>
<th>Category</th>
<th>Non-employment rate</th>
<th>Inactive-to-population ratio</th>
<th>Unemployment-to-population ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low Medium High Men Youth (aged 15-24)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low Medium High Women</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low Medium High Men Prime-age (aged 25-54)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low Medium High Women</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low Medium High Men Older persons (aged 55-64)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low Medium High Women</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

\(^a\) OECD is the weighted average of 28 countries: Austria, Belgium, Canada, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Luxembourg, Mexico, the Netherlands, Norway, Poland, Portugal, the Slovak Republic, Slovenia, Spain, Sweden, Switzerland, Turkey, the United Kingdom and the United States.

Source: OECD calculations based on national labour force surveys.
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• Many forces contributing to rising inequality in industrialized nations

• Countries can have too little inequality – and can also probably have too much

• Policy options available that push back against inequality without imposing large economic costs

• Short and medium run policies: Taxation, labor standards, macro policy

• Long run responses: Investment in education, infrastructure, good governance
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