Why Has Inequality Been Rising? (based on work with M. Kremer)

E. Maskin

I.S.E.O. Summer School June 2017 • In last 30 years, significant increase in income inequality

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- Increases are theoretically puzzling

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- Why not?

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 - leads to greater *relative segregation* of skill within firms

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- segregation prediction borne out by evidence for U.S., U.K., and France

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- globalization (increase in trade) *aggravated* inequality

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- trade should *decrease* inequality in Mexico

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- But first return to inequality in U.S. (also U.K. and France)

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• p(q) = proportion of workers having skill q

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- formula incorporates 3 critical features
 - (i) workers of different skills *imperfect substitutes*
 - (ii) different tasks within firm *complementary*
 - (iii) different tasks *differentially sensitive* to skill

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 - 2 -so inequality between *q*-worker and
 - $\frac{q}{2}$ -worker can't increase

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• so again no prediction about *combination* of skill levels in firm

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implies $q_m > q_s$

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- equality if $\pi^*(q,q') > 0$ (no profit in equilibrium)

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claim: if low dispersion $(H < \sqrt{2}L)$, then

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- if $\pi^*(L,L) > 0$ (*L*-workers "self-matched") then

 $\pi^*(M,M) = 0$ from (1)

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- $LM^{2} = w^{*}(L) + w^{*}(M),$ $LH^{2} = w^{*}(L) + w^{*}(H),$ $MH^{2} = w^{*}(M) + w^{*}(H)$

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$$w^*(L) = \frac{LM^2 + LH^2 - MH^2}{2}$$

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• Notice
$$\frac{\partial w^*(L)}{\partial M} > 0$$
 $\frac{\partial w^*(H)}{\partial M} < 0$

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• Notice $\frac{\partial w^*(L)}{\partial M} > 0$ $\frac{\partial w^*(H)}{\partial M} < 0$

Proposition 1: Starting from low skill dispersion, $H < \sqrt{2} L$, increase in median skill *reduces* inequality in wages (and raises mean and median wage)

But opposite occurs if skill distribution dispersed

Proposition 2: Starting from sufficiently dispersed skill distribution $\left(M > \frac{4}{3}L \text{ and } H > \sqrt{\frac{3}{2}}M\right)$, increase in median *M* magnifies inequality:

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$$\frac{\partial w^*(L)}{\partial M} \le 0 \quad \text{and} \quad \frac{\partial w^*(H)}{\partial M} \ge 0,$$

and if either *L*-workers or *M*-workers not selfmatched, at least one equality strict

Proof: Suppose
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 $p(M) = \frac{3}{5}$

Proof: Suppose $p(L) = p(H) = \frac{1}{5}$ $p(M) = \frac{3}{5}$ (2) $2LM^2 > L^3 + M^3$ $2MH^2 > M^3 + H^3$

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- $\pi^*(L,H) = 0$ because H >> L
- $\pi^*(L,L) = \pi^*(H,H) = 0$ from (2)

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$$\pi^*(L,L) = \pi^*(H,H) = 0$$
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 (from self-matching)

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$$w^*(M) = \frac{M^3}{2}$$
 (from self-matching)
• $w^*(L) = LM^2 - \frac{M^3}{2}, \quad w^*(H) = MH^2 - \frac{M^3}{2}$

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$$w^*(M) = \frac{M^3}{2}$$
 (from self-matching)

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$$w^*(L) = LM^2 - \frac{M^3}{2}, \quad w^*(H) = MH^2 - \frac{M^3}{2}$$

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$$\frac{\partial w^*(L)}{\partial M} = 2LM - \frac{3M^2}{2} < 0$$
, since $M > \frac{4}{3}L$

Proof: Suppose
$$p(L) = p(H) = \frac{1}{5}$$
 $p(M) = \frac{3}{5}$
(2) $2LM^2 > L^3 + M^3$ $2MH^2 > M^3 + H^3$

•
$$\pi^*(L,L) = \pi^*(H,H) = 0$$
 from (2)

•
$$\pi^*(L,M) = \pi^*(M,H) = \frac{2}{5}$$
 $\pi^*(M,M) = \frac{1}{5}$

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, since $H > \sqrt{\frac{3}{2}}M$

Segregation

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then mean-preserving spread in distribution *increases* segregation index ρ

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- So $\frac{B}{B+W}$ increasing in ε
- intuitively, *B* rises as weight in tails increases

Return to globalization and Mexico

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- hence, U.S. and Malawi should trade more than U.S. and Mexico (Malawi more different than Mexico from U.S.)
- but Mexico trades much more than Malawi with U.S.

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• due to lower communication/transport costs

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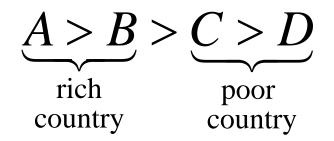
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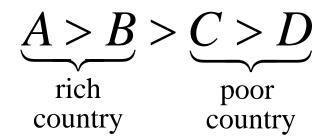
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- production output $= q_s q_m^2$
- before globalization (i.e., in autarky), workers can match only *domestically*
- after globalization, *international* matching possible

 $\underbrace{A > B}_{} > \underbrace{C > D}_{}$ rich poor country country

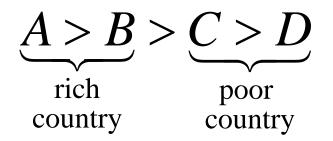


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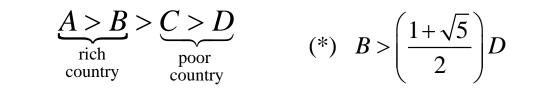
then globalization *increases* inequality in poor country



Proof: 2 cases

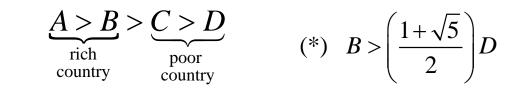


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- Case I p(D) > p(C)
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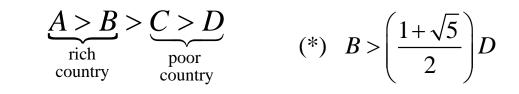
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• $\pi_a^*(D,D)>0,$

• $\pi_{g}^{*}(D,D) > 0$ (because, from (*), *D*-worker can't match with *A*- or *B*-worker)

$$w_a^*(D) = w_g^*(D) = \frac{D^3}{2}$$

a = autarky g = post-globalization



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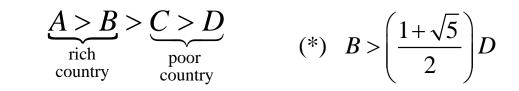
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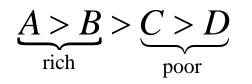
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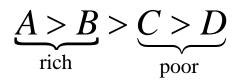
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- $w_g^*(C) \ge w_a^*(C)$ because of possible matching with *B* or *A*
- Hence, $w_g^*(C) w_g^*(D) \ge w_a^*(C) w_a^*(D)$ - globalization causes rise in inequality

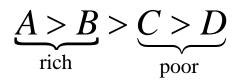


Case II p(D) < p(C)



•
$$\pi_a^*(C,C) > 0 \implies w_a^*(C) = \frac{C^3}{2}$$

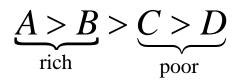
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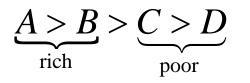


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• Hence, $\operatorname{again} w^*(C) - w^*(D)$ rises with globalization

Model also explains Malawi:

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 workers in Malawi have very low skills ⇒ no international matching opportunities



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 - role for investment by *third parties* domestic government international agencies, NGOs foreign aid private foundations