The Future of Jobs is Facing the Biggest Policy Induced Price Distortion in History

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Blavatnik School of Government
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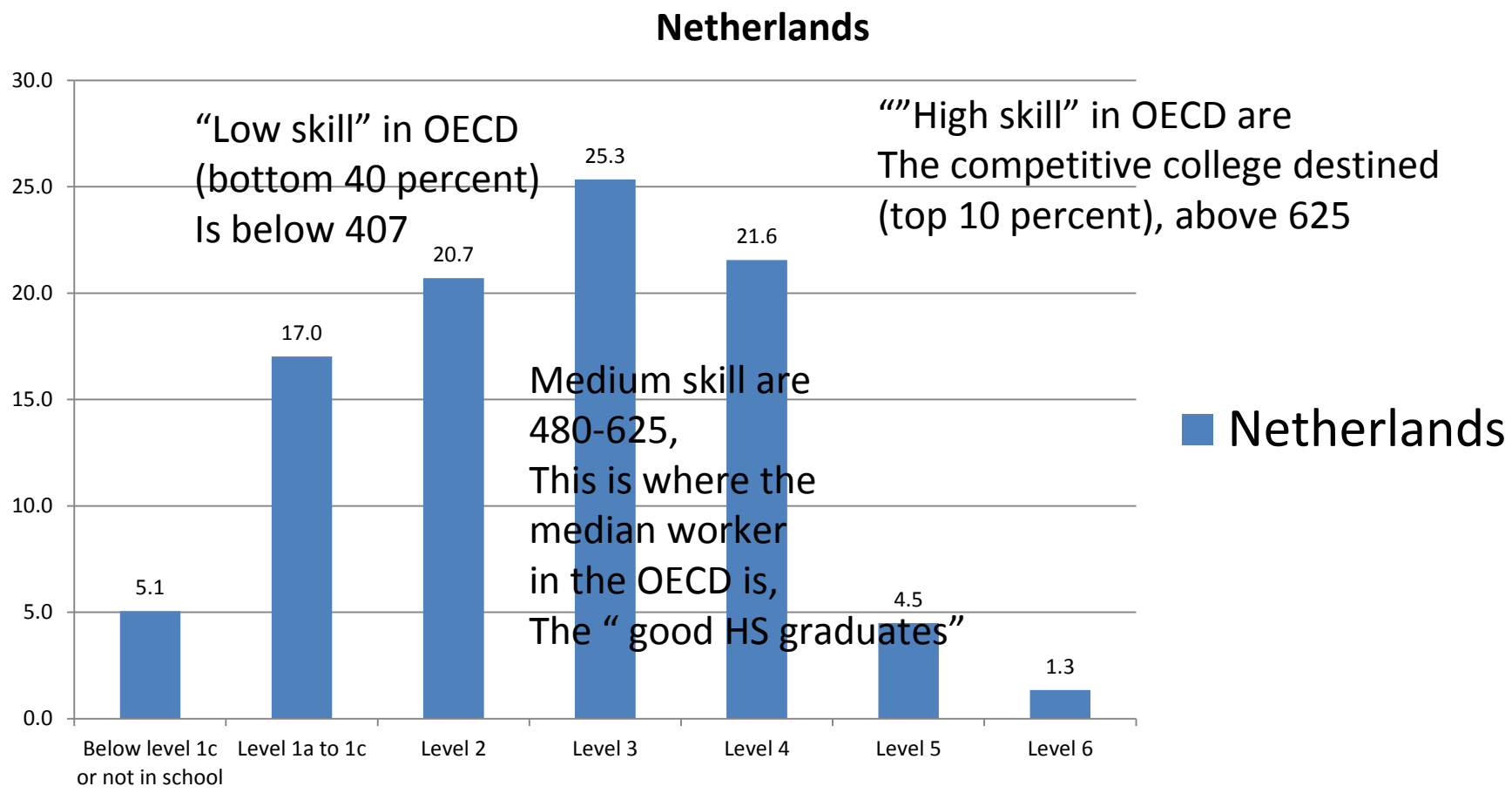
ERF 25th Anniversary

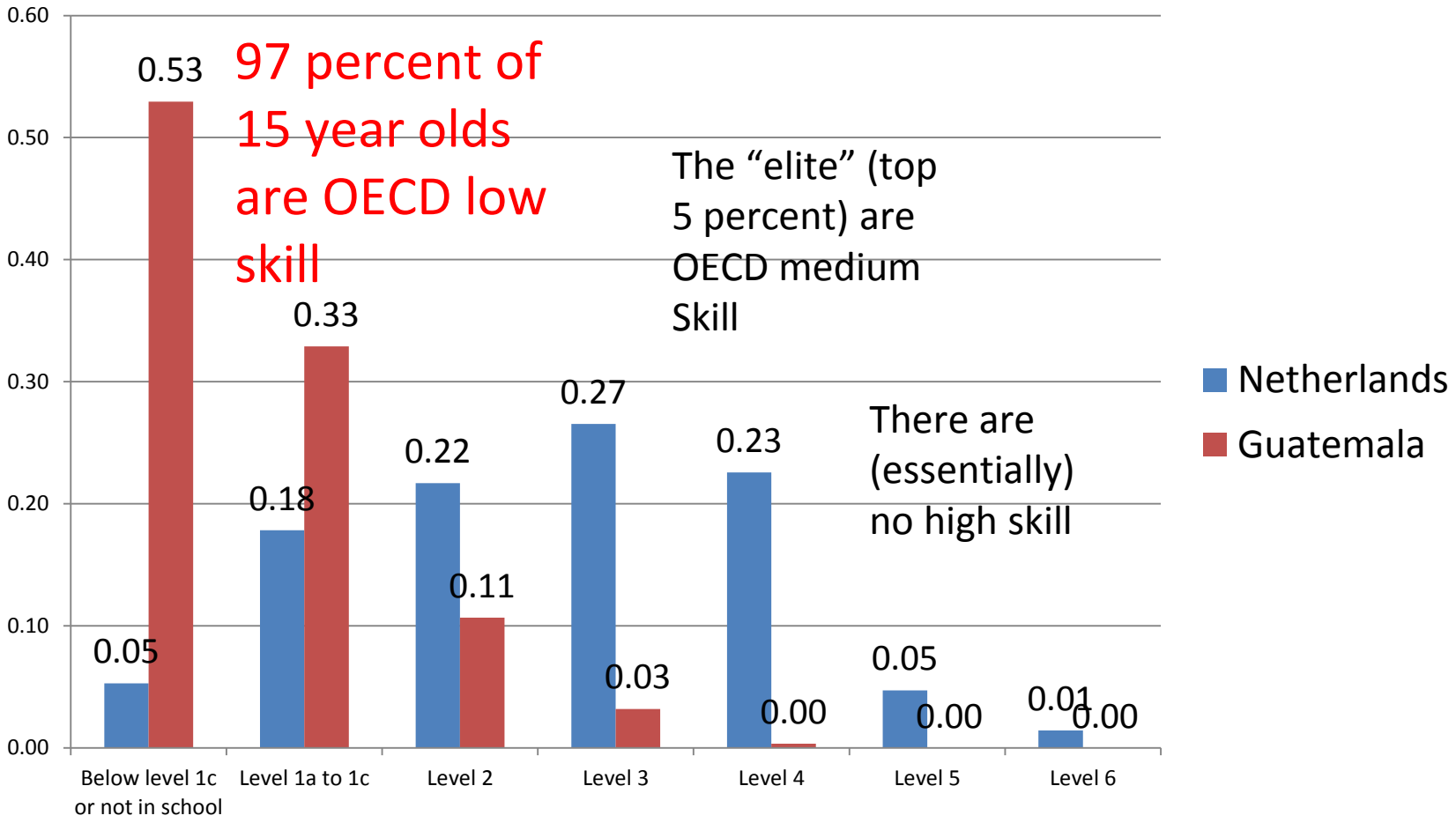
Many countries, globally and in MENA, face the challenge of large and growing numbers of *very* low skilled (on academic basics) youth

Demographic future	Low (<425)	Medium (425<S<475)	High (most OECD)	Very high (High East Asia)
Inverted pyramid (declining absolute numbers in labor force)			Most of Europe (Western and Eastern)	Japan, China
Stable populations	Indonesia, India, most of Latin America	Turkey	Vietnam	
Thick demographic pyramid, large proportion of young, rising population	Zambia (most of Africa)			

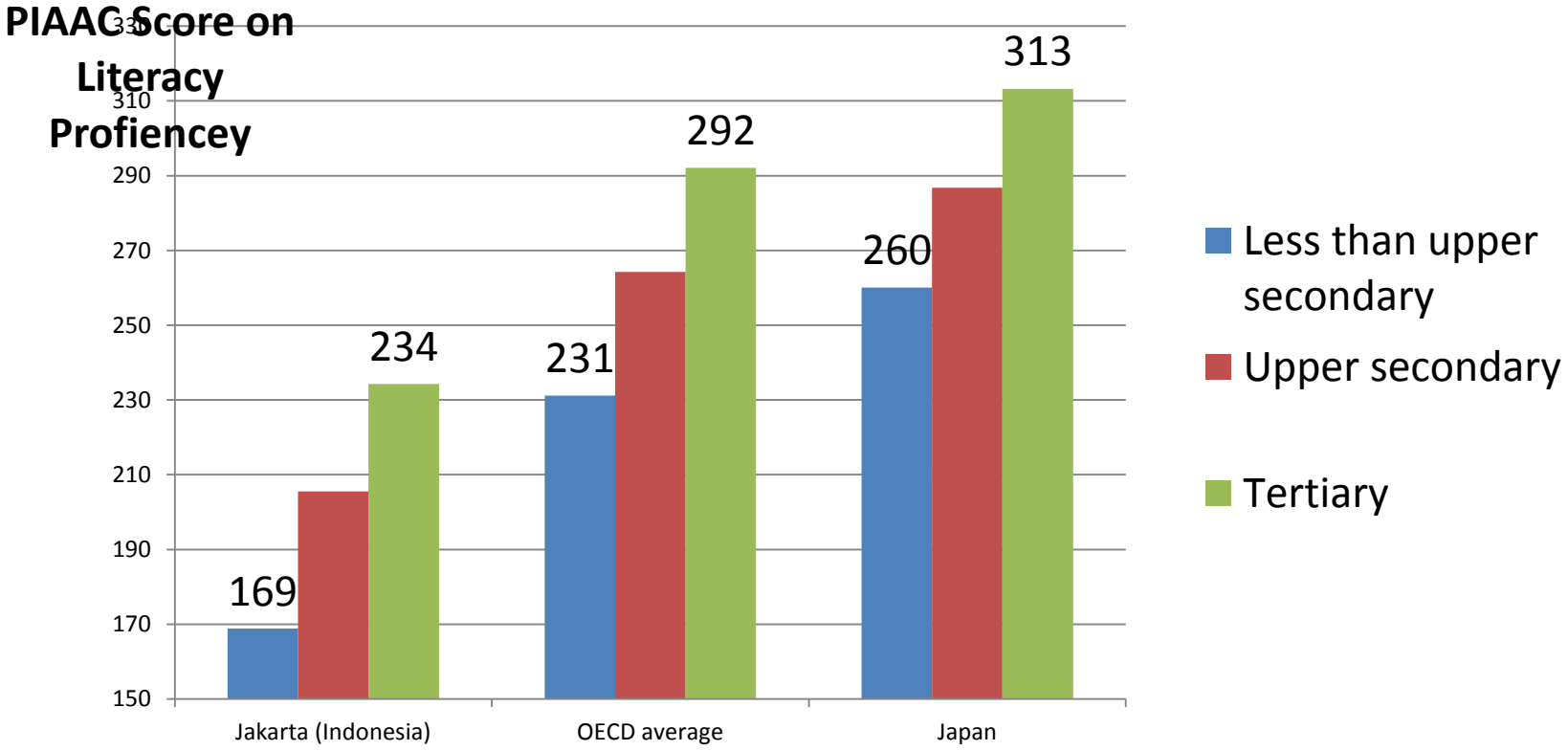
OECD countries are worried about the future job prospects of low and medium skill workers (PISA) as they might be replaced by “robots”



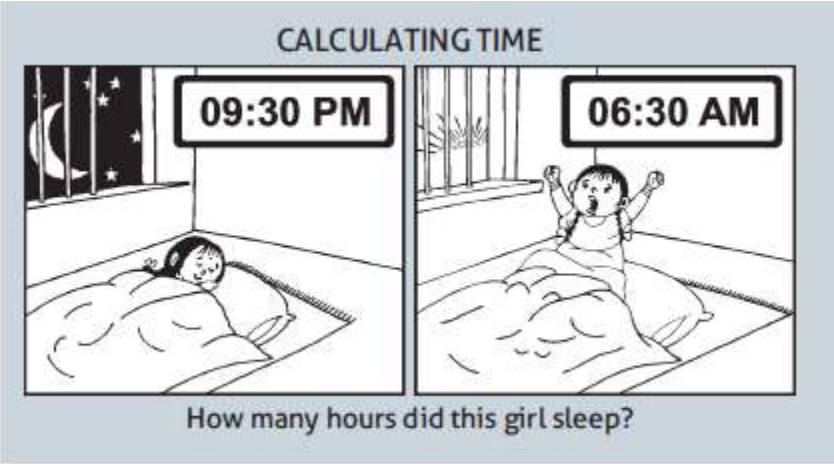
The situation in Guatemala (in the range of most MENA countries) is completely different—massive left shift of schooling and learning distribution



University graduates in *the capital city* (Jakarta) of Indonesia (PISA around 400) had the same adult literacy as *high school drop-outs* in Denmark

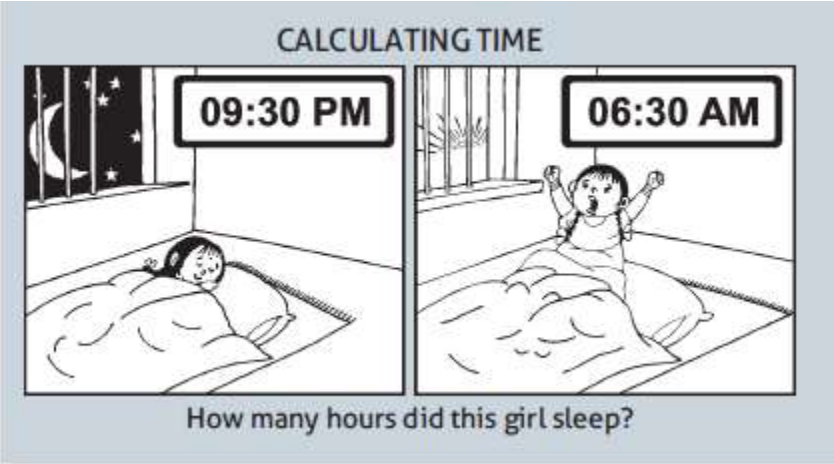


Survey of youth aged 14 to 18



Level of Schooling	Percent correct
Less than 8 years complete	
8 or more years of school complete	
Enrolled as undergraduate	

Survey of youth aged 14 to 18



Level of Schooling	Percent correct
Less than 8 years complete	26.8
8 or more years of school complete	41.4
Enrolled as undergraduate	54.4

The challenge (economic, social, political) over the next 20 to 30 years for many developing countries is to:

a) employ productively a youth bulge (magnitude depending on stage of demographic transition)

b) labor that is (globally) *very low* skill

c) and generate at least some exports (depending on natural endowment)

My first two points are that:

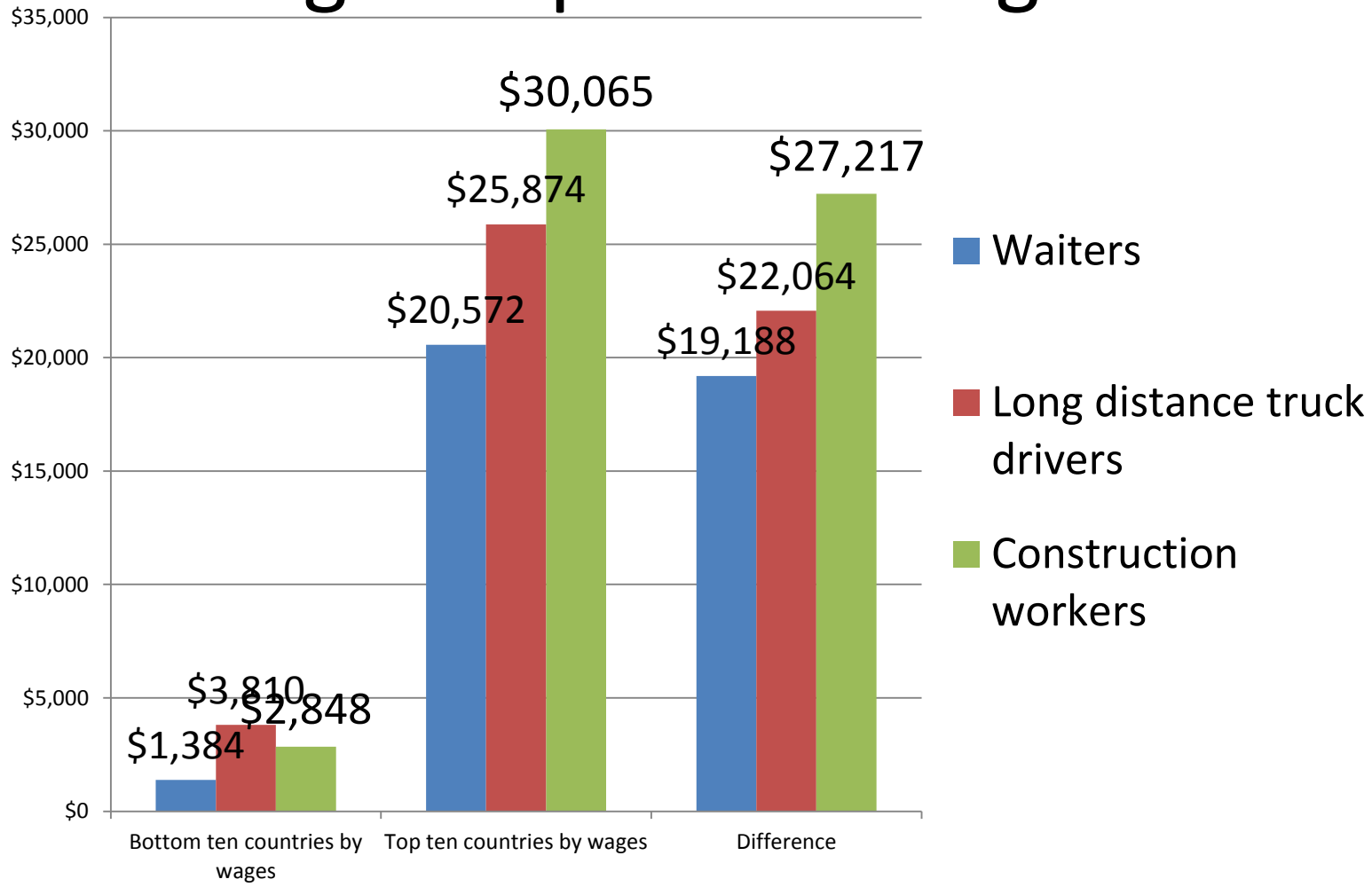
- The border based barriers to the mobility of (especially) low-skill labor by the rich industrial countries create the largest price distortion (bigger by *two orders of magnitude* than border based trade barriers) today—maybe the largest in history
- This price distortion creates motivation for the world's *scarcest* resources (high end entrepreneurial and technological talent) to create technology that displaces a globally abundant resource—low skill labor

The Place Premium (with Michael Clemens and Claudio Montenegro)

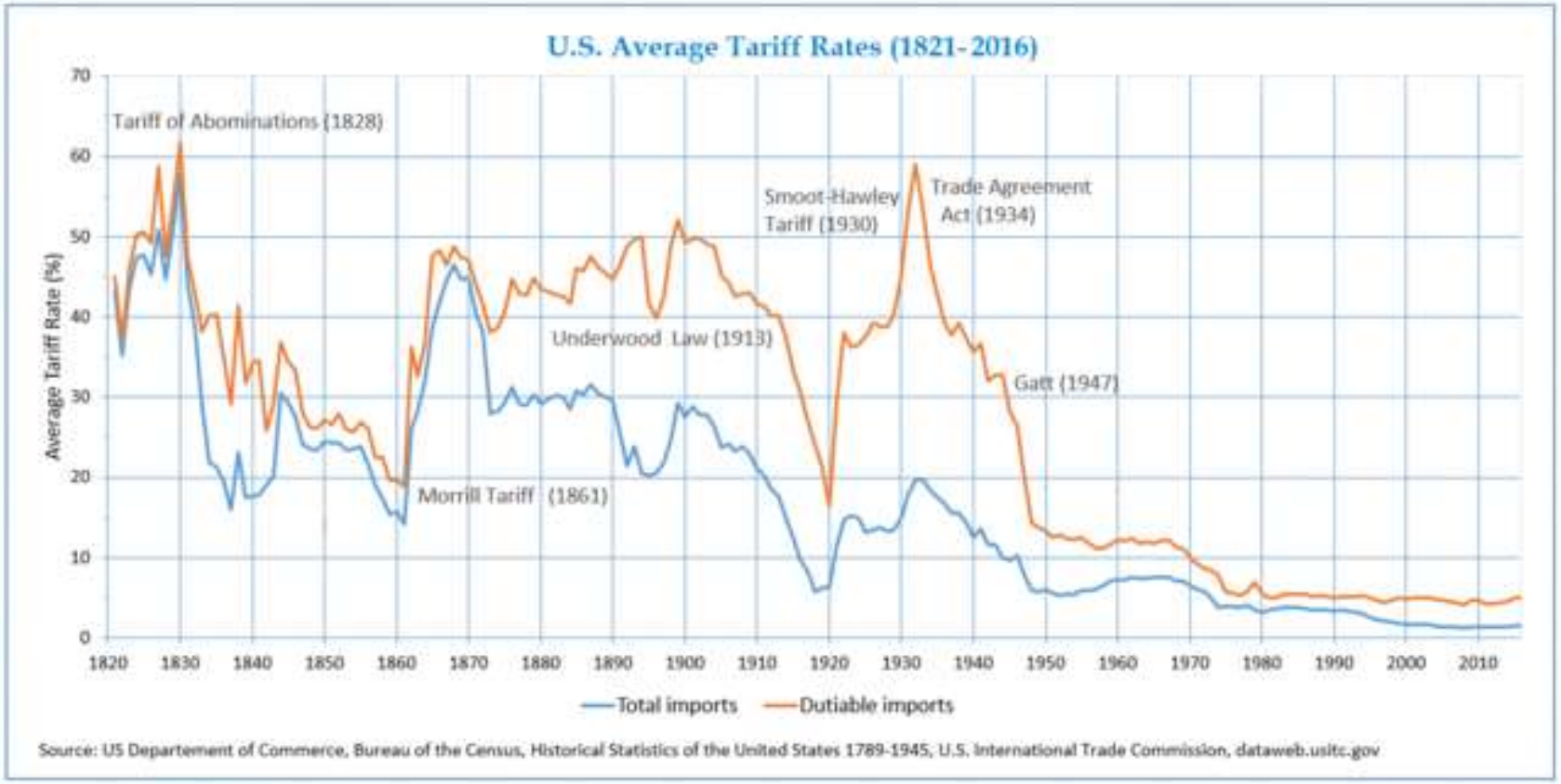
- Using a combination of US Census and a collection of labor force surveys we compare the wages of *observational equivalent* workers (male, 30-35, urban resident, wage earning, born in same country, educated in same country) one working in the US versus their country of birth
- Adjusting that for potential selection effects on observed variables econometrically
- This is the *price (ad valorem tariff) equivalent* of the complex scheme of border based barriers to low skill labor mobility ($p=p^*(1+\tau)$)

Country	Annual income of low skill worker in the US, $/hour in 2000	Upper bound (using Altonji-Oster adjustment for selectivity) estimate of the annual wage in home country (adjusted for PPP) of the same, equal productivity, worker	Gain from labor mobility for a low skill worker	Price equivalent (percent distortion)	Pop'l, 15-49, millions
Yemen	$23,042	$1,408	$21,634	**1537%**	7.60
Nigeria	$18,689	$1,186	$17,503	**1476%**	57.01
Egypt	$20,739	$1,712	$19,028	**1112%**	33.91
Cambodia	$24,026	$2,626	$21,401	**815%**	5.91
Vietnam	$19,820	$2,624	$17,196	**655%**	43.73
Cameroon	$21,348	$3,395	$17,952	**529%**	7.11
Sierra Leone	$18,459	$2,944	$15,514	**527%**	1.86
Ghana	$20,179	$3,238	$16,941	**523%**	9.08
Indonesia	$21,194	$3,423	$17,771	**519%**	117.26
India	$23,846	$4,021	$19,825	**493%**	544.70
Unweighted average (total for population) of 10 countries with largest distortion	$21,134	$2,658	$18,476		828.16

Same result for other rich countries, using occupational wages

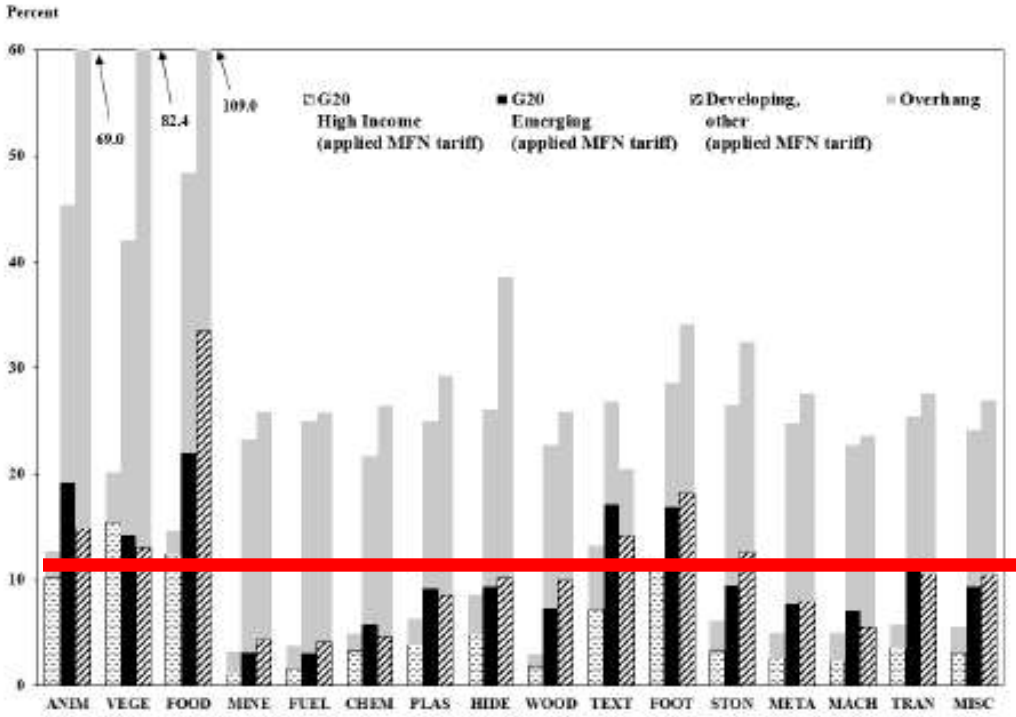


The *highest* average tariffs on dutiable imports ever was in US history was 60 (versus 500 to 1000 percent)



Two orders of magnitude higher then tariffs on any sector (10 percent vs 1000 percent)

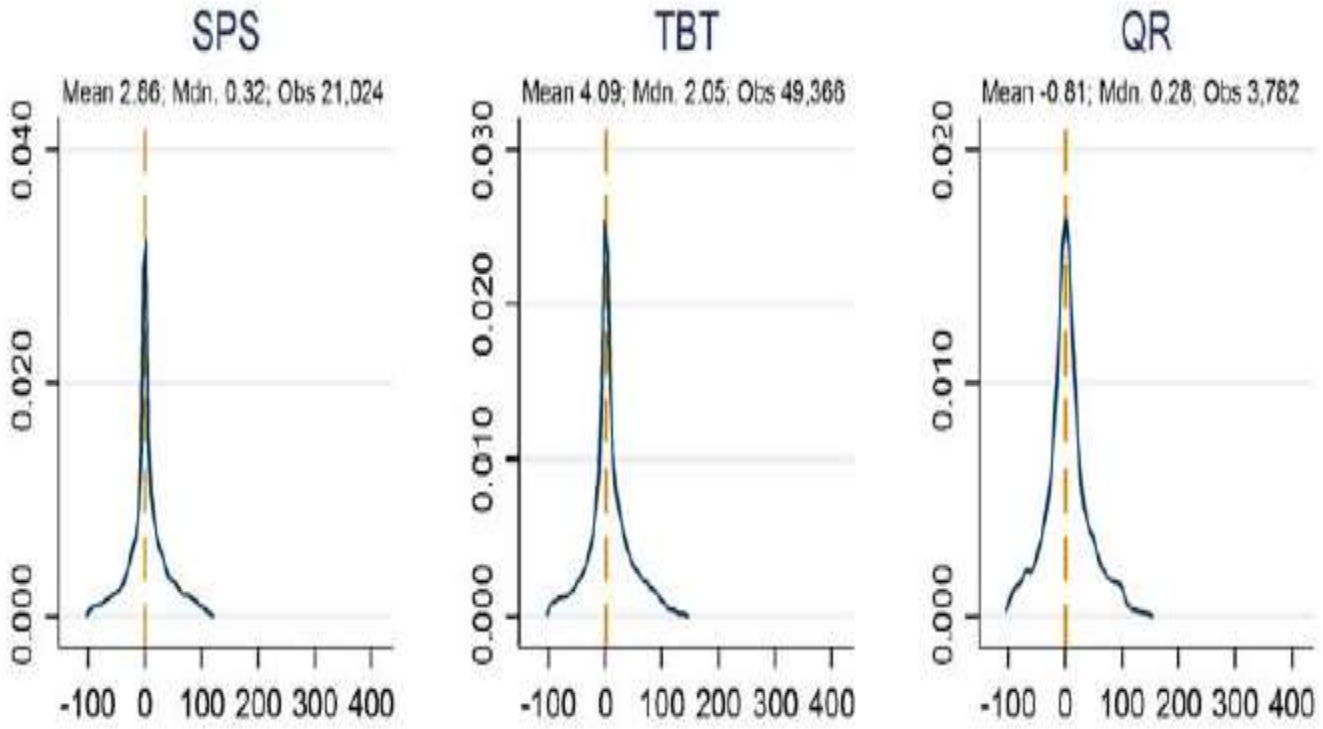
Figure 2: Average Applied MFN Tariffs in 2013 and Tariff Bindings, by Industry and Country Group



Source: Constructed by the authors from tariff data at the HS-06 level from the WTO and UNCTAD/TRAINS. Tariff 'overhang' (or water) defined as the difference between the country's tariff binding legal commitment and its applied MFN rate. Country groupings based on Table 1.

G20 tariffs are almost never higher than 10 percent on average in any sector

Estimates of the impacts of non-tariff barriers across countries and goods almost never are above 100 percent (and average under 10)—the *lowest* of the top 10 countries the is around 500 percent



Source: Ghodsi, Gruebler, and Stehrer, 2016

Widely accepted that the "price equivalents" of border based restrictions on low skill labor mobility into OECD countries are massive

- Consistent with all the data on low skill wages, adjusted for observed and observed characteristics (place premium), by occupation, even by exact same job.
- Consistent with the large spending/effort on enforcement
- Consistent with large risks movers are willing to take in order to evade restrictions
- Consistent with large scale unrealized but expressed desire for mobility

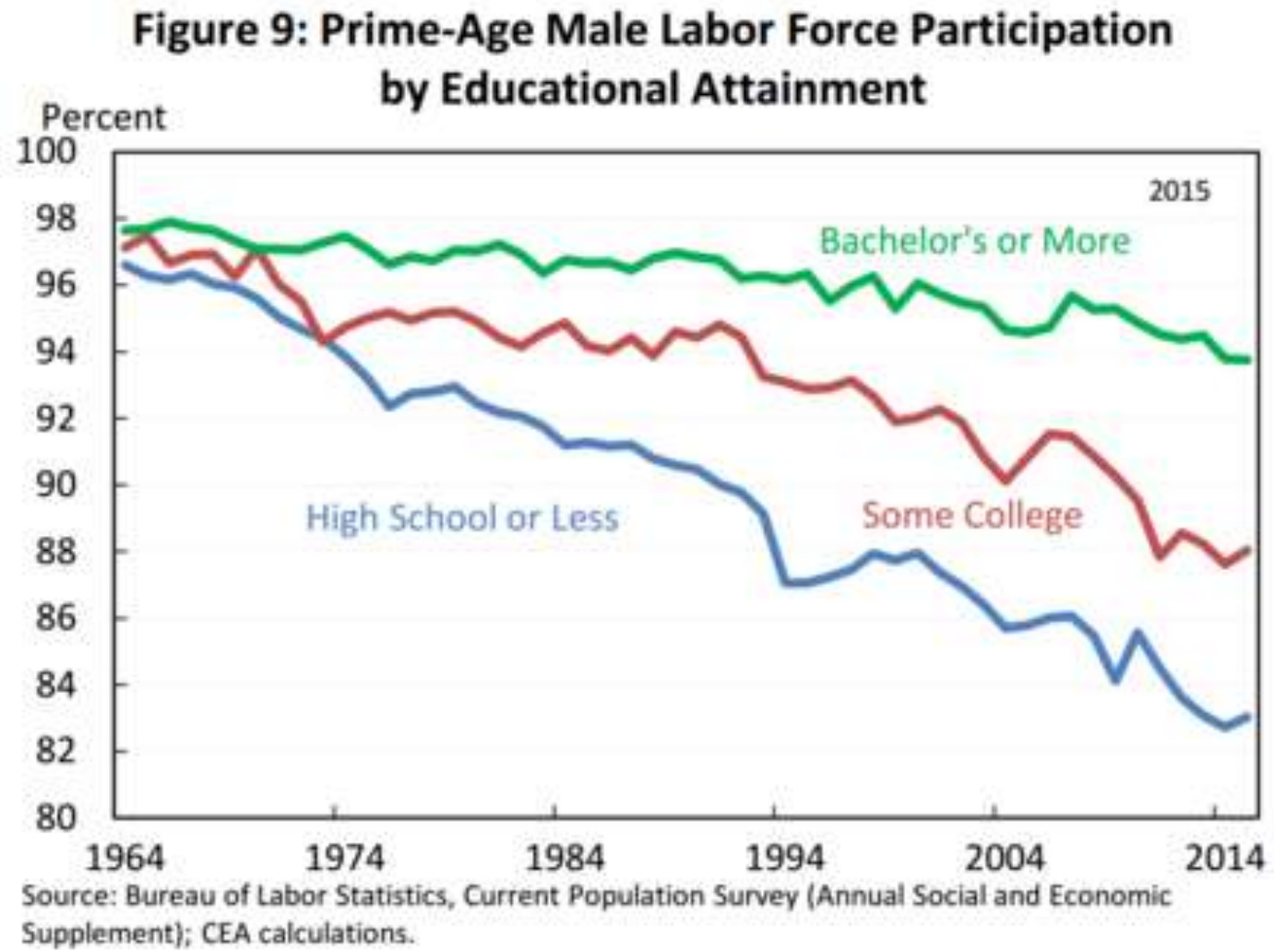
“Technology” and “Innovation” are affected by incentives

- Widely promoted as a Pigouvian tax to offset the negative externality to carbon emissions as carbon tax is favored by economists (including mainstream US Republican economists) as it creates the right incentives for both consumption decisions and incentives for innovations of a wide variety to reduce emissions.
- A commonly proposed level is 50 $/ton C02, which in the USA would lead to a 22 percent increase in gasoline, 62 percent increase in natural gas.
- The incentive for innovation impact of a price differential of between 25 and 60 percent is widely discussed, what about the innovation impacts of a price distortion in low skilled labor of 500-1000 percent?

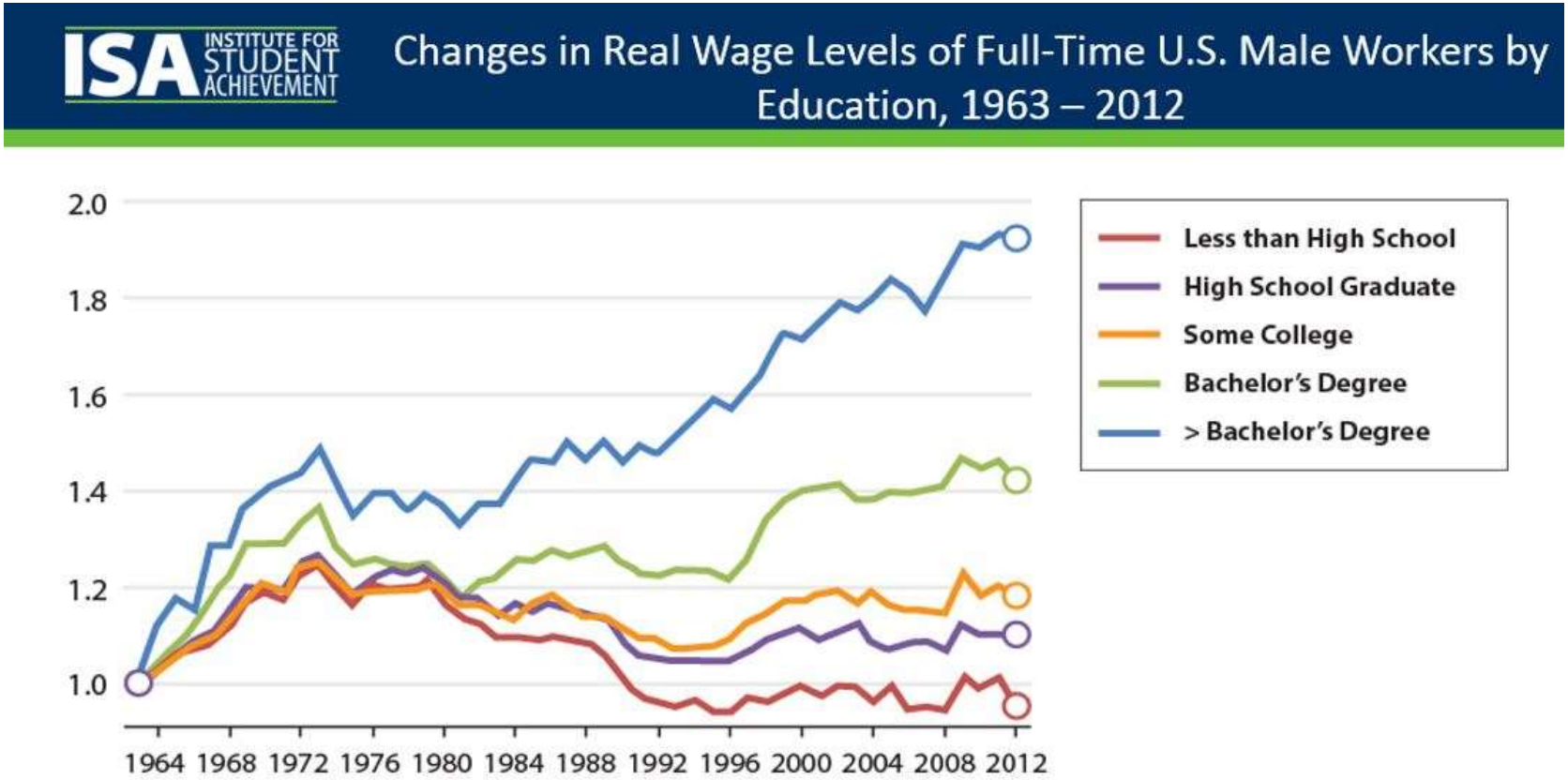
Drug and Pharmaceutical research is structured by incentives

- Drug companies create new products, even for diseases for which there are effective medicines, to keep drugs on patent
- Conditions for which there is a market (because of insurance reimbursement) receive more funding than drugs that may affect more people but which affect poorer populations.

Male labor force participation rates, by education level in the USA: fallen by almost 15 percentage points for HS or less



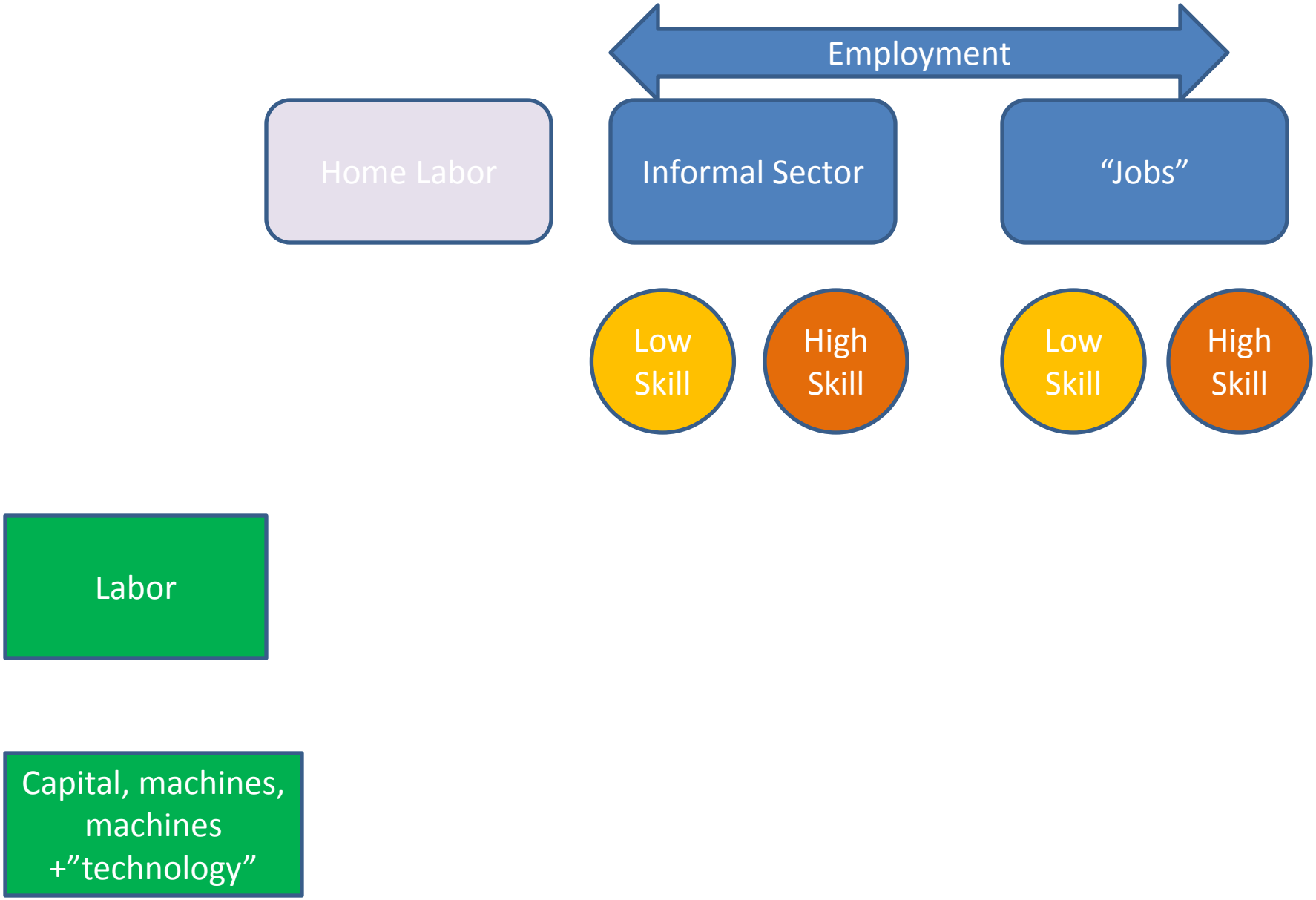
Wages have declined for low skilled males in USA steadily since 1970s

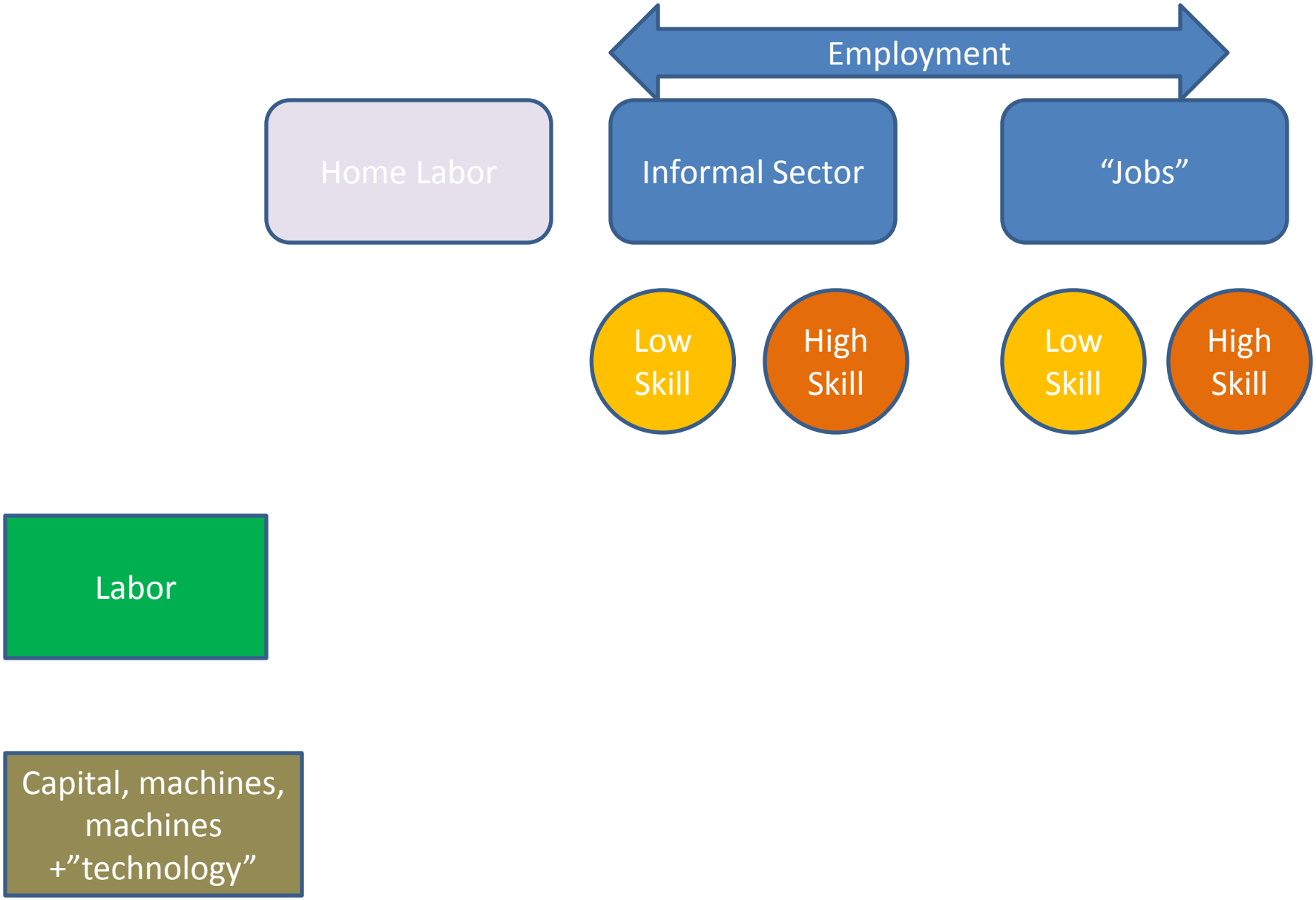


Source: The ETS Opportunity Project: Choosing Our Future, A Story of Opportunity in America.2015 Page 9.

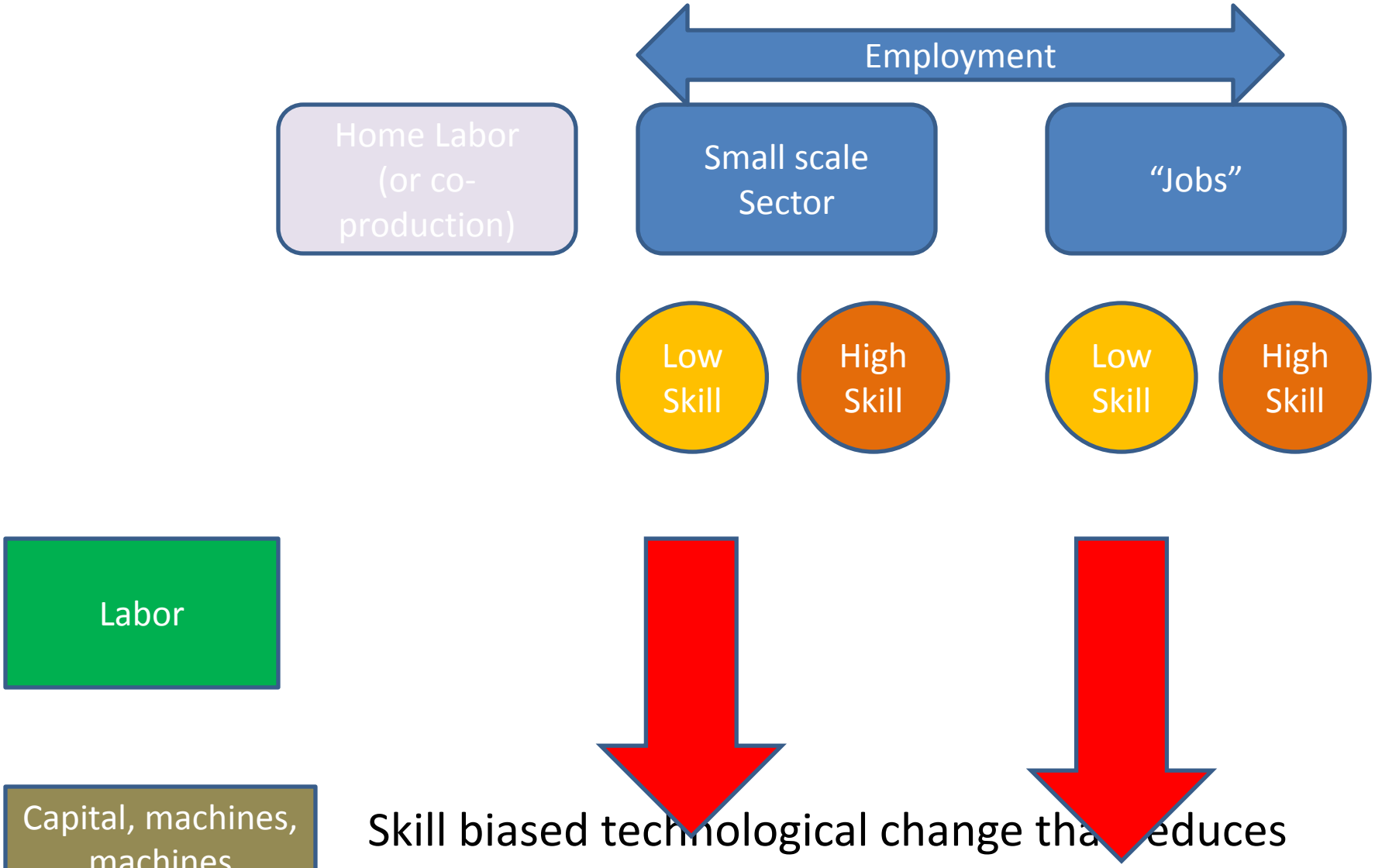
A Division of ETS Measuring The Power of Learning.™

The many ways in which “innovation” displaces “low skill jobs”

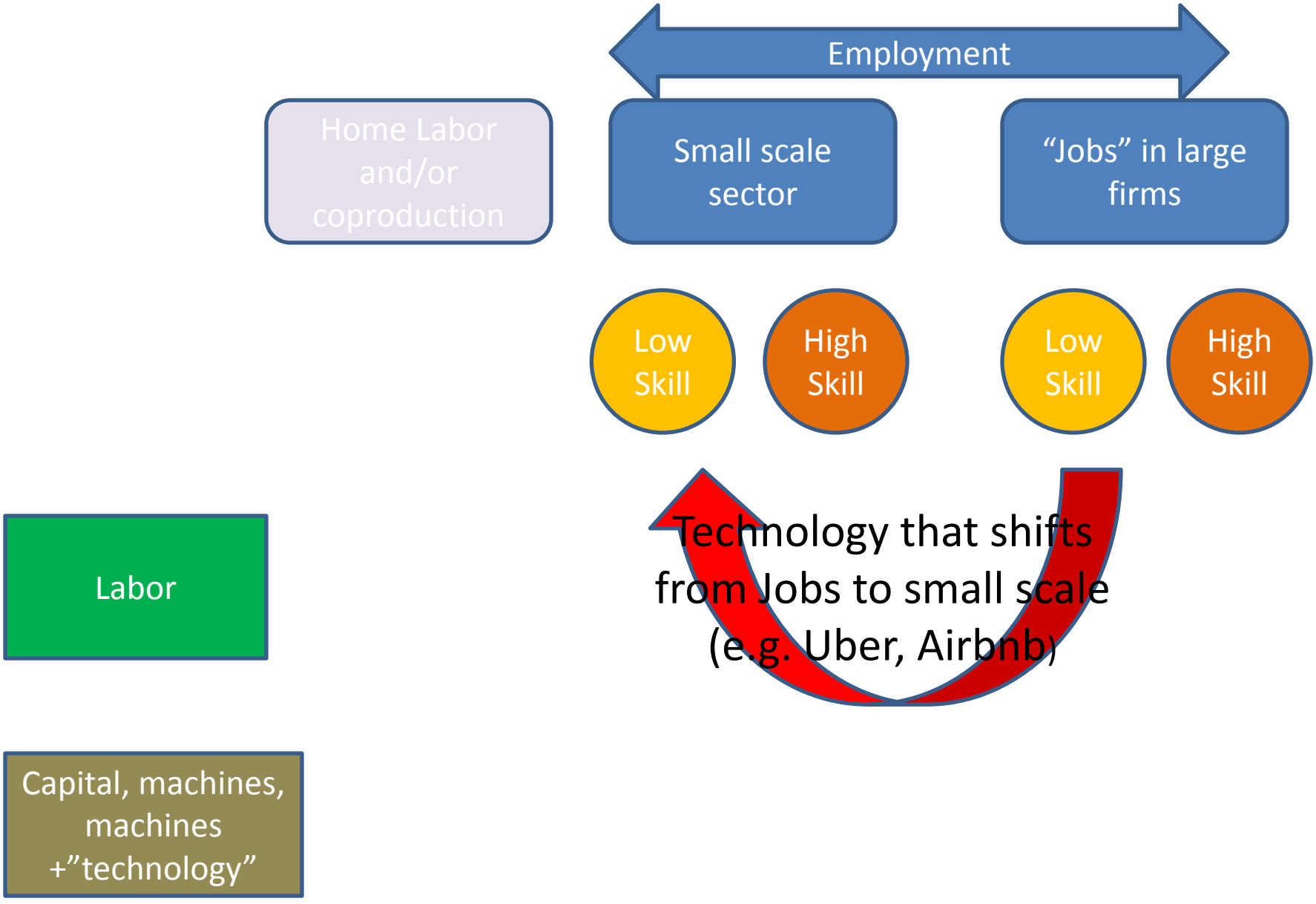

Employment
Home Labor
Informal Sector
"Jobs"
Low Skill
High Skill
Low Skill
High Skill
Labor
Capital, machines, machines +"technology"

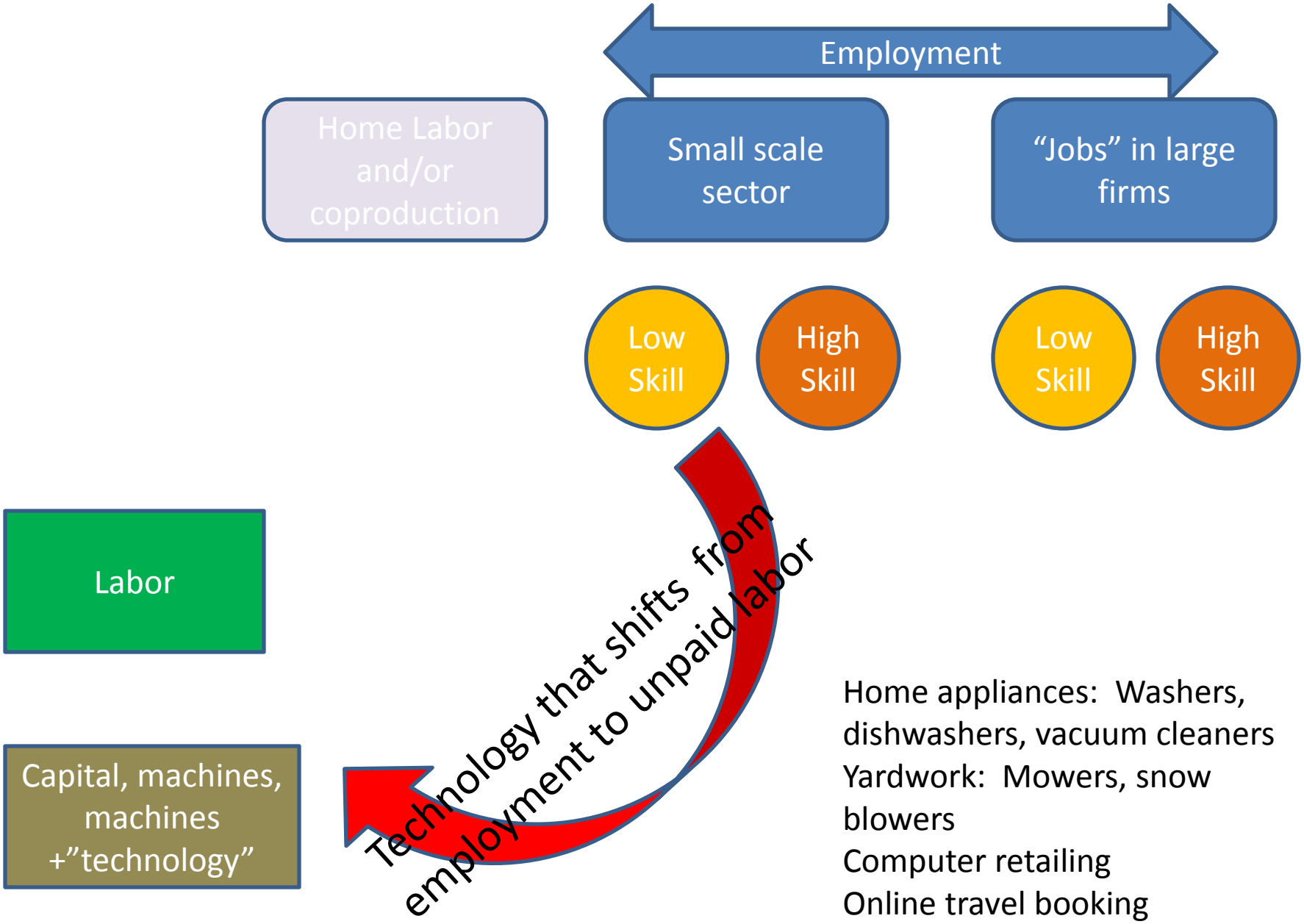


General replacement of all labor by capital



Skill biased technological change that reduces demand for low skill labor: Introduction of office technology that has high skill labor perform their own services (computers, email), machines ("robots") in factories


Employment
Home Labor and/or coproduction
Small scale sector
"Jobs" in large firms
Low Skill
High Skill
Low Skill
High Skill
Technology that shifts from Jobs to small scale (e.g. Uber, Airbnb)
Labor
Capital, machines, machines +"technology"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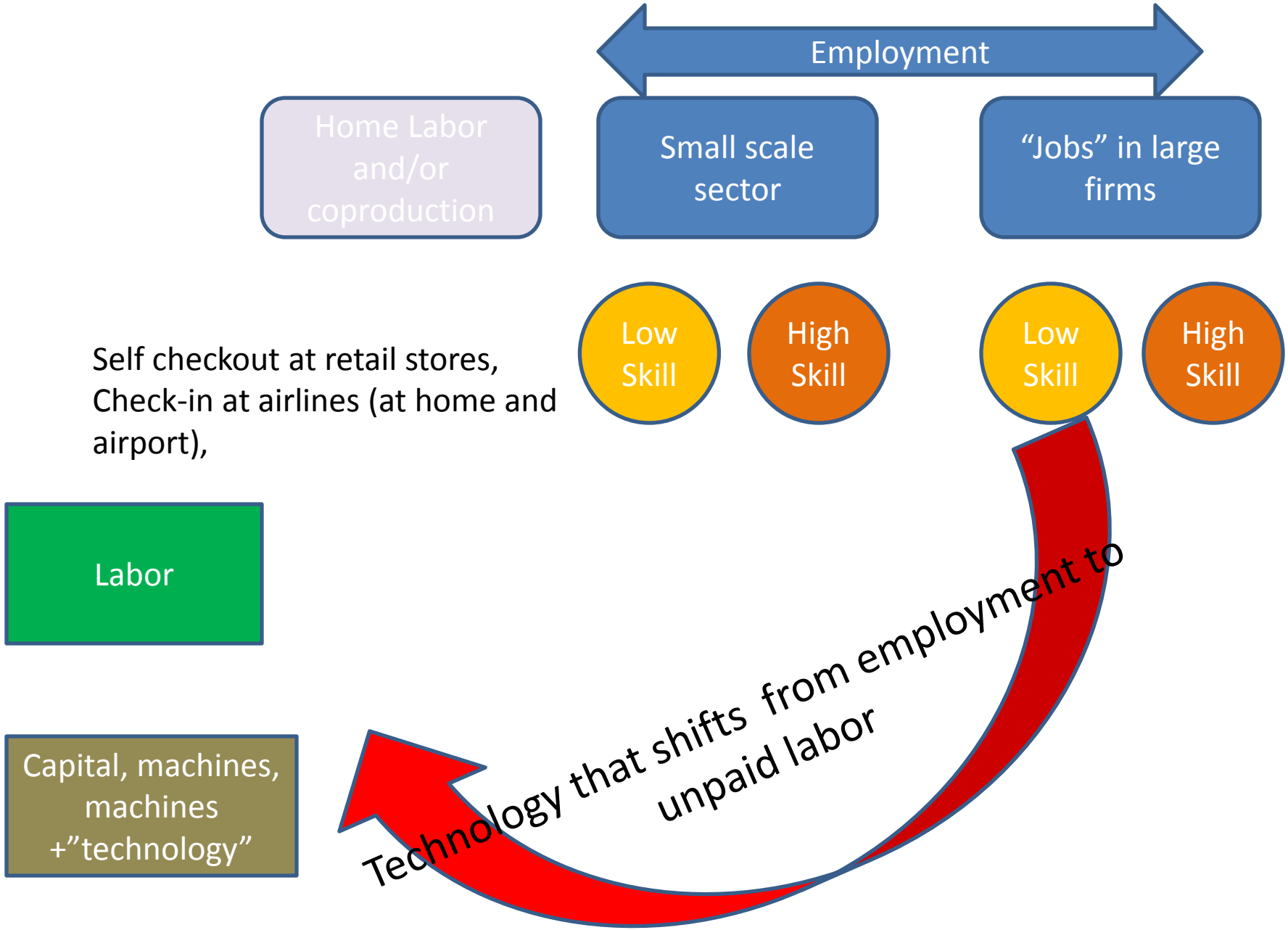
Low Skill
High Skill
Labor
Capital, machines, machines +"technology"
Technology that shifts from employment to unpaid labor
Home appliances: Washers, dishwashers, vacuum cleaners
Yardwork: Mowers, snow blowers
Computer retailing
Online travel booking


Employment
Home Labor and/or coproduction
Small scale sector
"Jobs" in large firms
Low Skill
High Skill
Low Skill
High Skill
Self checkout at retail stores, Check-in at airlines (at home and airport),
Labor
Capital, machines, machines +"technology"
Technology that shifts from employment to unpaid labor

The self-driving vehicle (car, truck): Why do the richest people on the planet want to destroy jobs?

Numbers currently employed

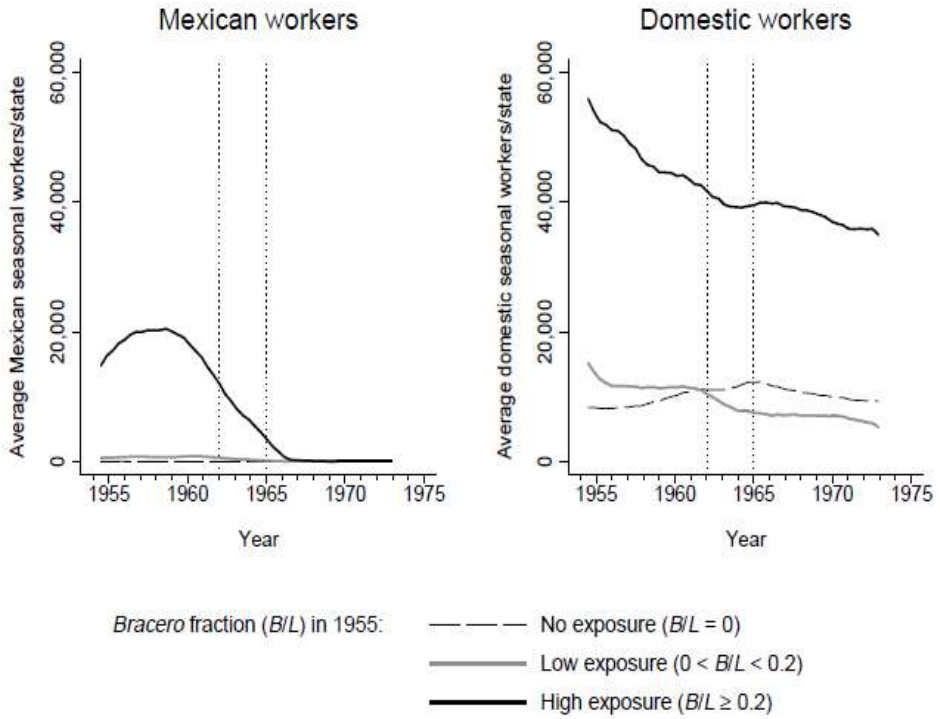
Driver occupations	Number (in '000s)
School bus	497.3
Bus	167.8
Driver/Sales	445.8
Heavy Truck	1797.7
Truck	530.9
Light	884.7
Taxi	233.7
Total	4557.9

Gains to US wages over current local wages (times 50 percent)

Country	Hourly wage	Hourly wage*1.5	Gain to US wage over 1.5*home wage in PPP
MWI	$0.52	$0.78	$39,285
MDG	$0.85	$1.28	$38,244
IDN	$0.90	$1.36	$38,085
BWA	$1.10	$1.64	$37,485
MDA	$1.13	$1.69	$37,387
MEX	$1.27	$1.90	$36,954
ZMB	$1.43	$2.14	$36,446
PHL	$1.62	$2.43	$35,846
JOR	$1.74	$2.62	$35,461
KHM	$1.78	$2.68	$35,338
CIV	$1.89	$2.83	$35,018
ROM	$2.09	$3.14	$34,376
PAK	$2.13	$3.19	$34,267
LVA	$2.28	$3.42	$33,795
PER	$2.58	$3.86	$32,869
THA	$2.60	$3.90	$32,795

New evidence from elimination of *Bracero* in the USA

Figure 3: Number of seasonal farm workers employed, state averages grouped by exposure

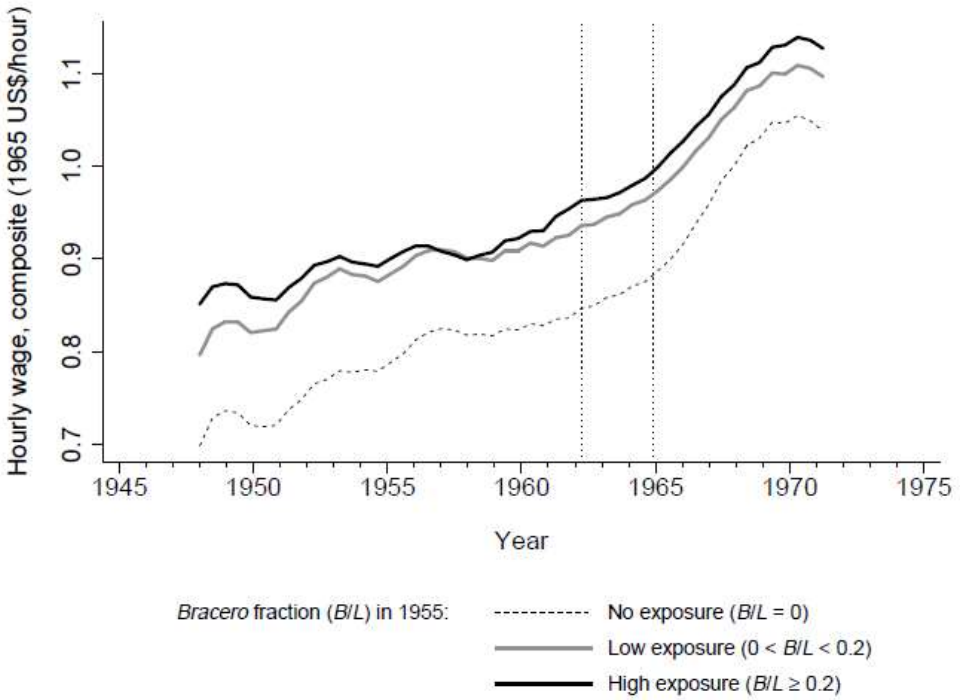


Fan-Gijbels (1992) local linear regressions of monthly state-average number of workers employed on month-by-year, Epanechnikov kernel, bandwidth 9 months. Vertical dotted lines show the beginning of major government efforts toward *bracero* exclusion (March 1962) and near-complete exclusion at the termination of the program (December 1964).

The elimination of 20,000 low skill seasonal farm workers from Mexico had zero positive impact on domestic employment (really zero)—mostly output fell, crops changed, technology adopted

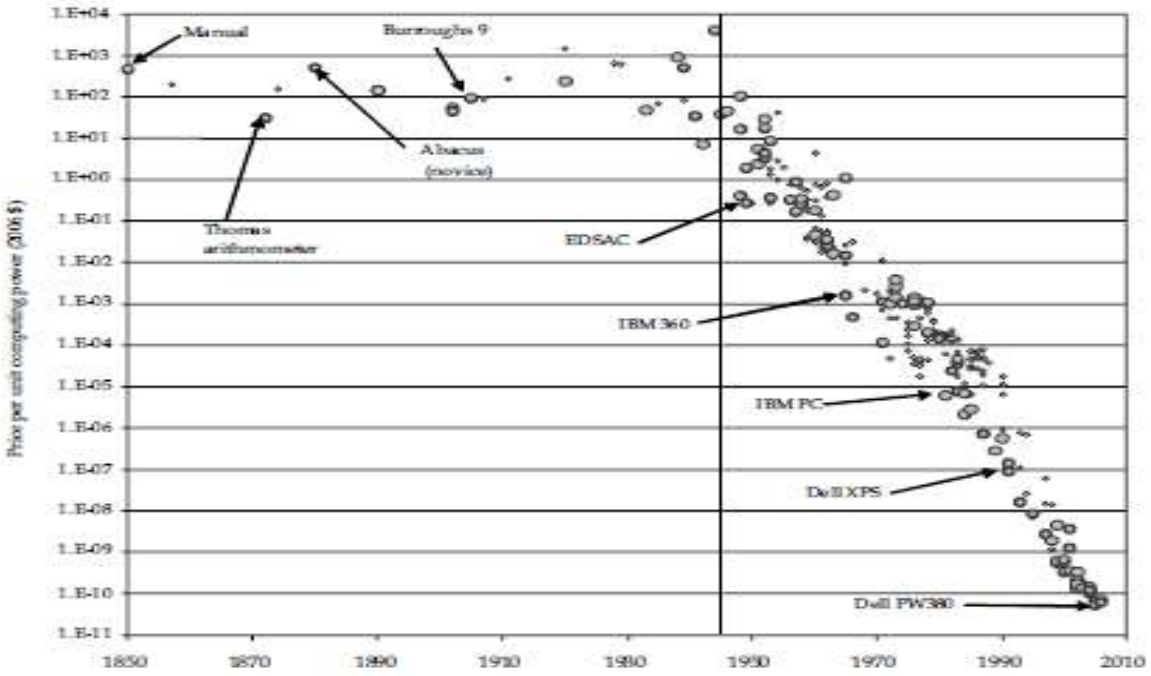
New evidence from elimination of Bracero (Clemens, Lewis, Postel 2018)

Figure 2: Quarterly average real farm wages in states grouped by exposure to *bracero* exclusion



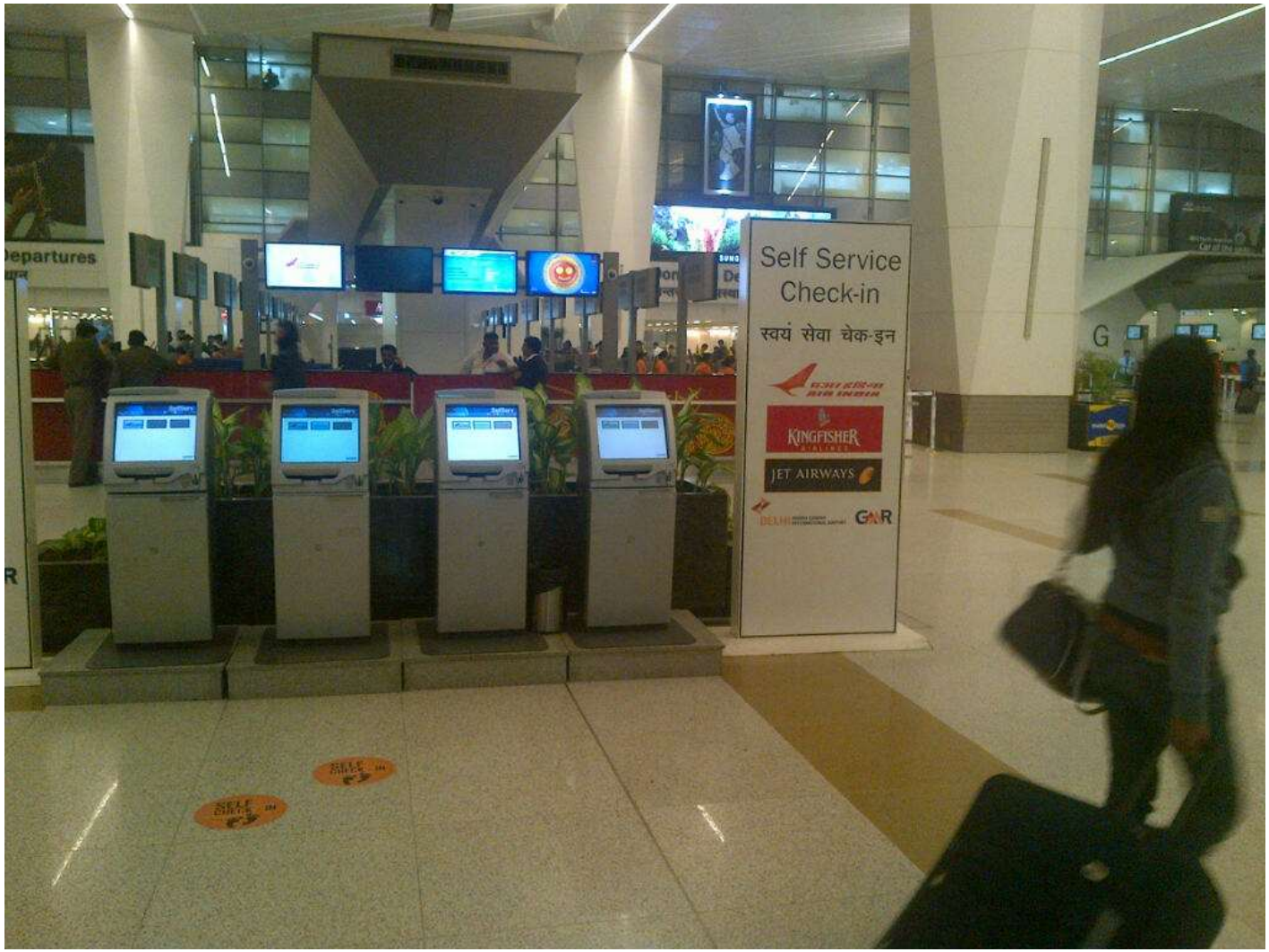
Fan-Gijbels (1992) local linear regressions of quarterly state-average hourly wage on quarter-by-year, Epanechnikov kernel, bandwidth 2 quarters. Real wage adjusted by national Consumer Price Index. Vertical dotted lines show the beginning of government efforts toward *bracero* exclusion (March 1962) and near-complete exclusion at the termination of the program (December 1964). High-exposure group is AZ, CA, NE, NM, SD, TX. Low-exposure group is AR, CO, GA, ID, IL, IN, MI, MN, MO, MT, NV, OR, TN, UT, WA, WI, WY. No-exposure group is AL, CT, DE, FL, IA, KS, KY, LA, MA, MD, ME, MS, NC, ND, NJ, NY, OH, OK, PA, SC, VA, VT, WV.

How does one get to optimism from a 10 to the 10^{th} change in price of computing due to Moore's law since 1960 and US labor market outcomes?



Developing countries are trying to provide jobs for very low skilled labor pushing uphill against a pattern of R&D and innovation and technology that are biased towards “labor saving” and “job destroying” technological change by the largest existing policy induced price distortion (by a factor of two) in the global economy

How crazy is this? Automated check-in in the Delhi airport?



Third Point: Elites are choosing machines over people

- "Jobs" are a way of constructing labor employment that has positive externalities in facilitating taxes:
  - Jensen (2016) shows a large part of the ability of rich countries to have and sustain higher tax/gdp ratios is the ease of taxing "jobs" over "employment" (and home production)
  - Lindert ( ) shows the rise of schemes of social protection against risk (health insurance, employment insurance) accounts for most of the rise in government
  - Most developing country governments are stuck with too few "jobs" relative to employment and hence dual labor markets with benefits provided through jobs, making them expensive….the "persons not jobs" is great rhetoric for countries with jobs but not "advice" for countries that already have people and not jobs"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Are the nurses of the future Robots or Rosalie?

Important questions

- Do the rich Gulf states have it globally right by allowing people to move to do non-tradables rather than invent and adopt machines?
- Is the Digital Revolution a counter-revolution against the social contract implicit in “jobs with benefits”?