Hours Worked Across the World

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Hours Worked Across the World

1. Measurement
2. Facts
3. Implications
4. Driving Forces
5. The Future of Hours Worked

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1. MEASUREMENT

Measurement of Hours Worked per Person

- Hours per person $=$ employment rate $*$ hours per worker
- Employment rates easier to measure than hours per worker

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  - Problem: Subject to regular major revisions
- Poor countries: Time-series data from TED / Penn World Tables
  - Problem: Many data points are inter-/extrapolated or taken from other countries

Low-Income Countries: Few Independent Observations

- Historical Maddison Data (25 countries)
  - 1870 & 1913
    * Use weekly hours worked per worker for UK
    * Multiply with weeks worked in each country

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    - Peru: average of 6 other Latin American countries
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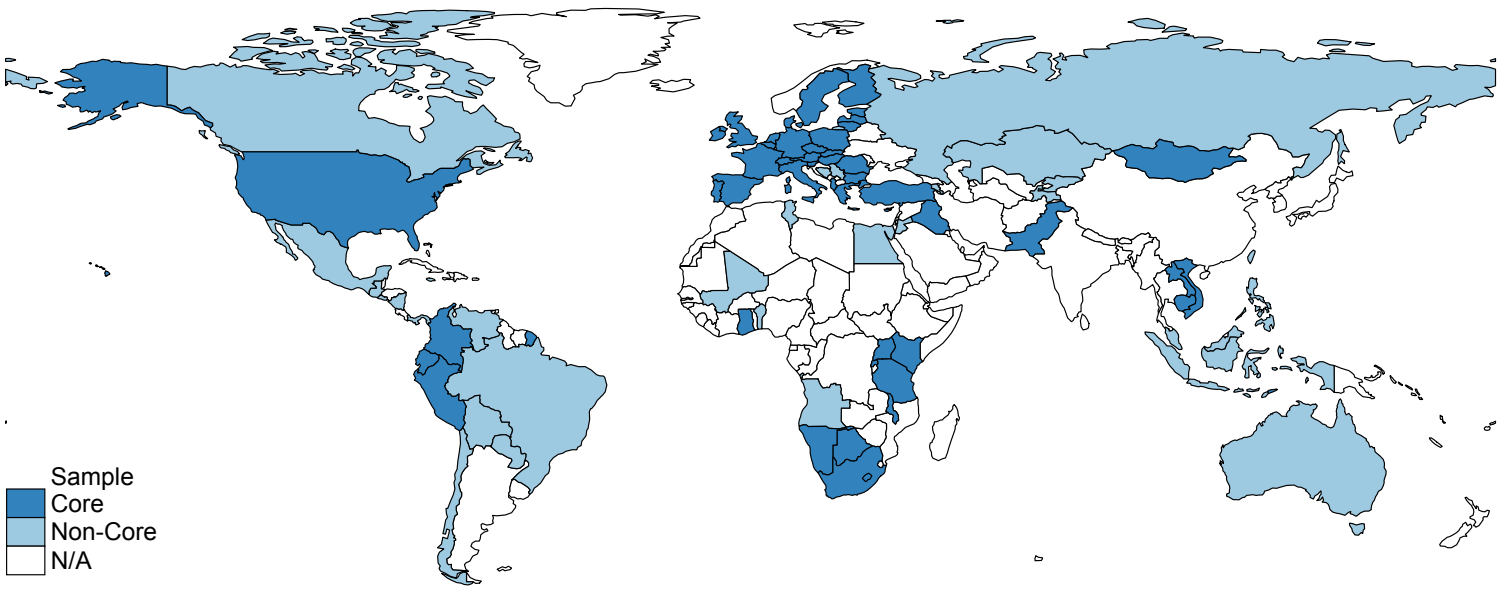
    - ...
- TED / PWT: annual data for 67 countries starting 1950
  - 304 "low-income" observations from 17 countries
  - Omitting data from Maddison, inter- or extrapolated observations, and observations with unknown data source:
    42 observations from 4 countries left

Alternative: Use of Labor Force Surveys

- Household surveys from 80 countries from 2005 or closest avail. year: Nationally representative and have 5,000+ individuals aged 15+
- Focus on 49 "core countries" with most comparable data:
  1. Hours Information
     a. Producing output counted in NIPA:
        includes informal work, self-employment, and unpaid family work
     b. Actual (not usual) hours worked at all jobs (not just primary job)
     c. In the last/recent reference week
  2. Survey covers a full year

Sample Countries



2. FACTS

Three Facts on Hours Worked Across the World

Over the development spectrum:

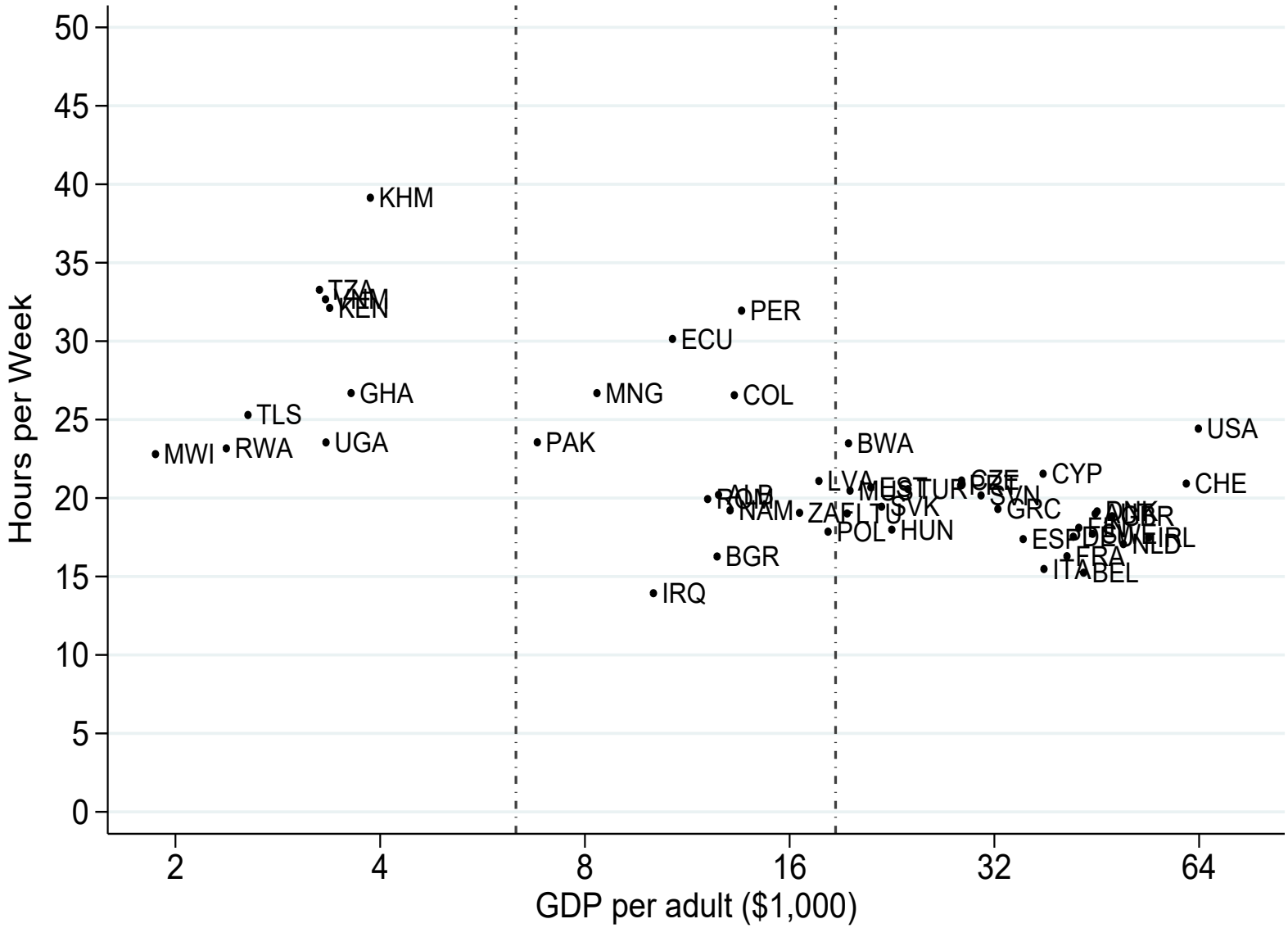
1. Hours per adult decrease

2. Employment rates are convex, hours per worker concave

3. Share of workers in subsistence self-employment declines

Fact 1: Decreasing Hours per Adult

Decreasing Average Weekly Hours per Adult (15+)



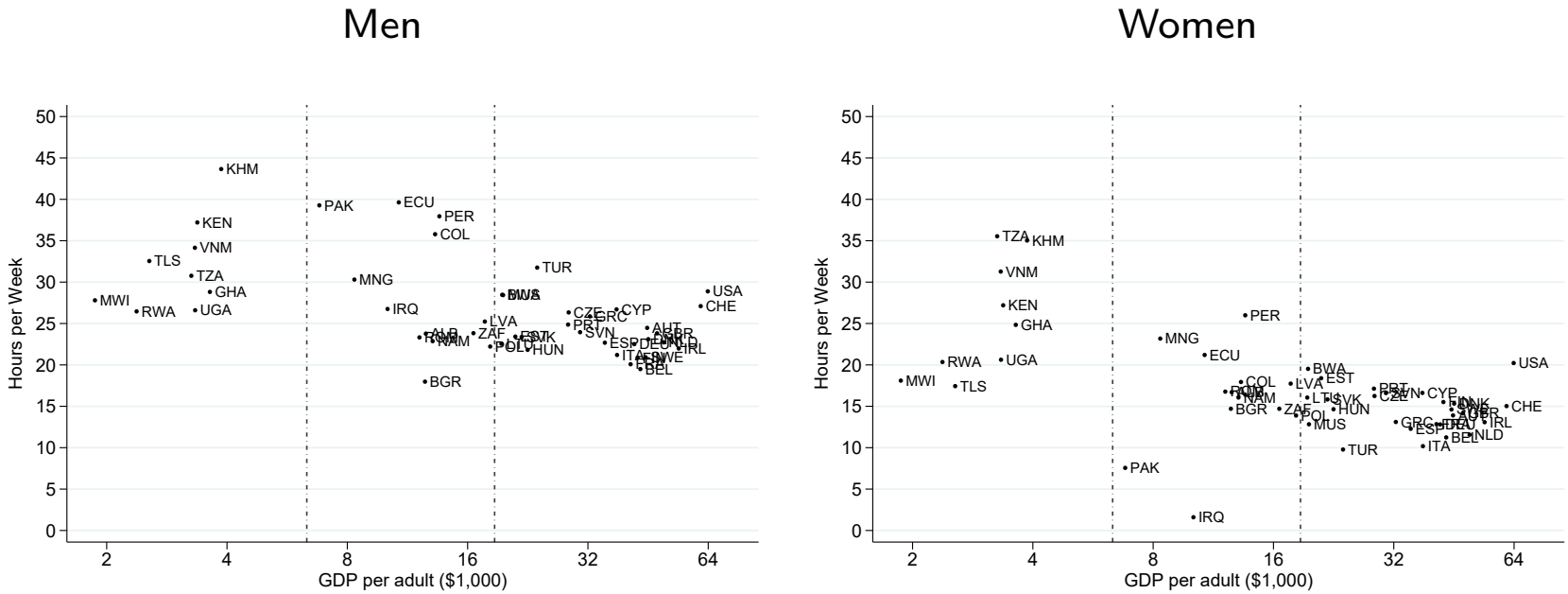
- Adults in poor countries work 9 hours (50%) more than in rich ones

Heterogeneity: Key Fact is Broad-Based

- Hours per adult are higher in low-income countries
  - by gender
  - by education
  - by age group
- Decline in hours by GDP not driven by compositional effects

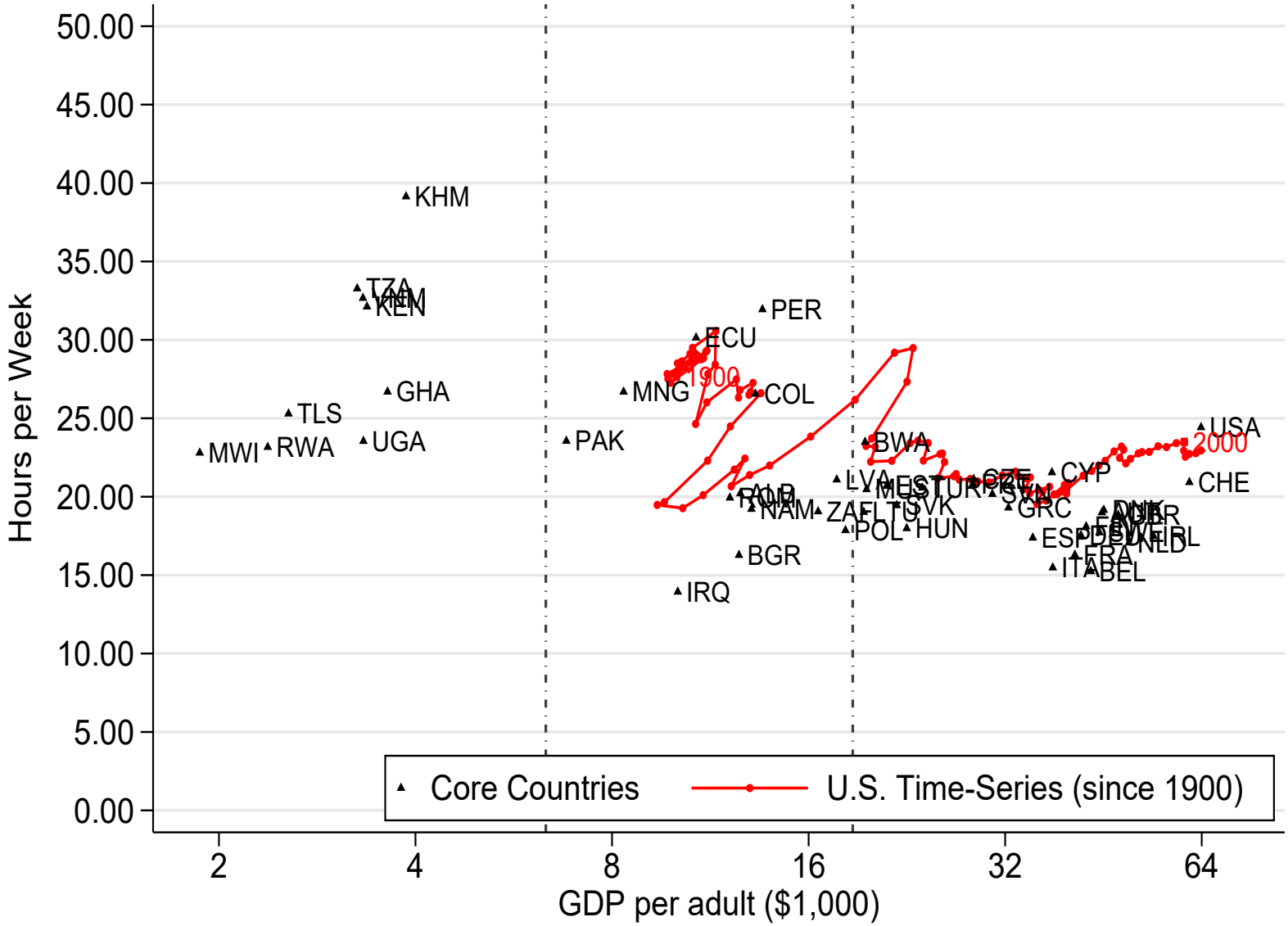
education, age, compositional effects, welfare implications, labor productivity

Decreasing Hours per Adult for Both Genders



- Decrease of 9 hours for both men and women

Cross-Country Evidence in Line with U.S. Time-Series

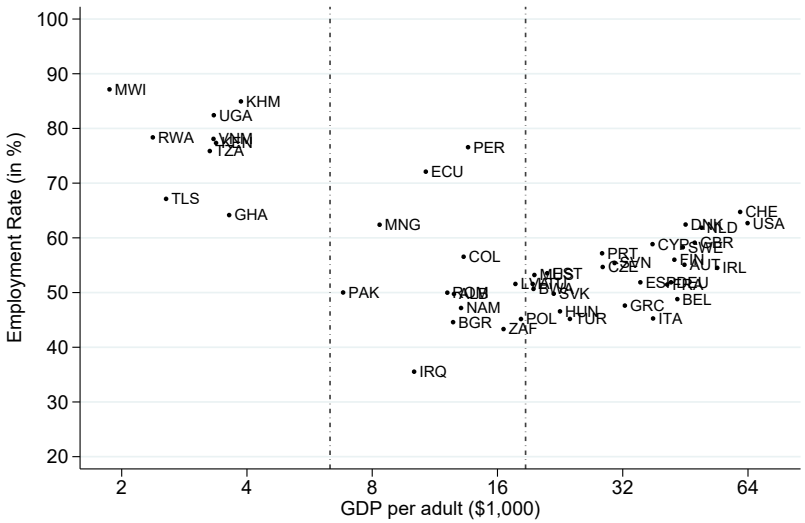


Source U.S. time-series: Ramey and Francis (2009)

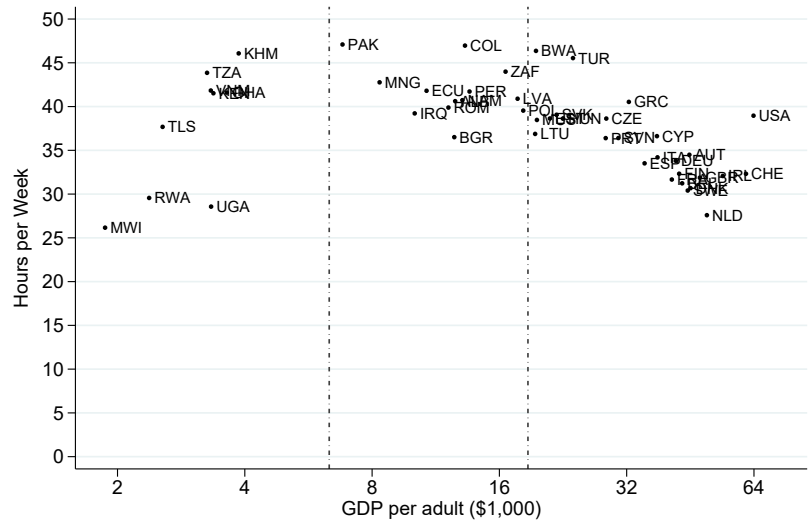
Fact 2: Convex Employment Rates, Concave Hours per Worker

Convex Employment Rates, Concave Hours per Worker

Employment rates



Hours per worker

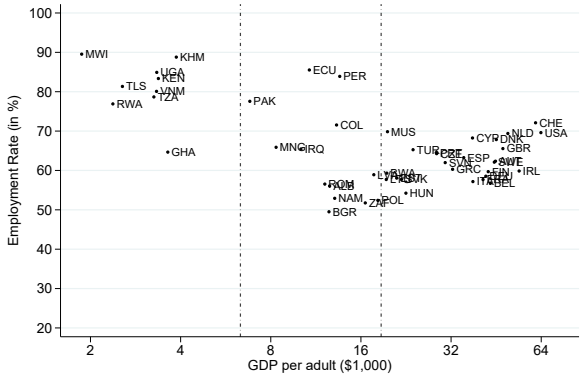


- Employment rates convex, hours per worker concave over development spectrum
- Between poor and rich
  - Employment rates decrease by 20 percentage points
  - Hours per worker fall by 3.3 hours

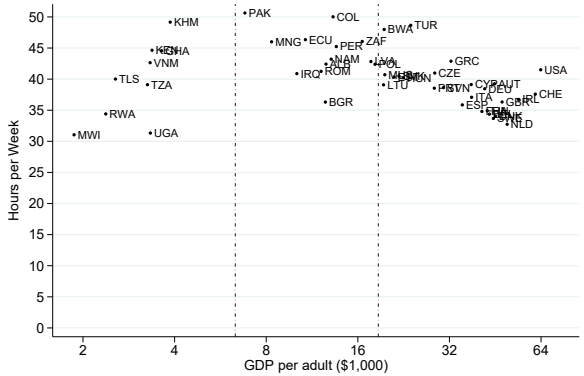
Prime-Aged Men

Shapes of Two Margins the Same for Both Genders

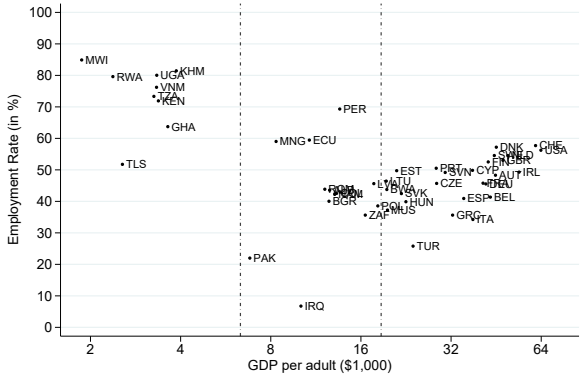
(a) Employment Rates
Men



(b) Hours per Worker
Men



(c) Employment Rates
Women



(d) Hours per Worker
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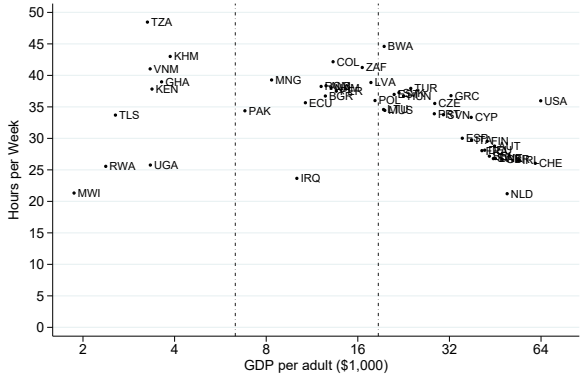
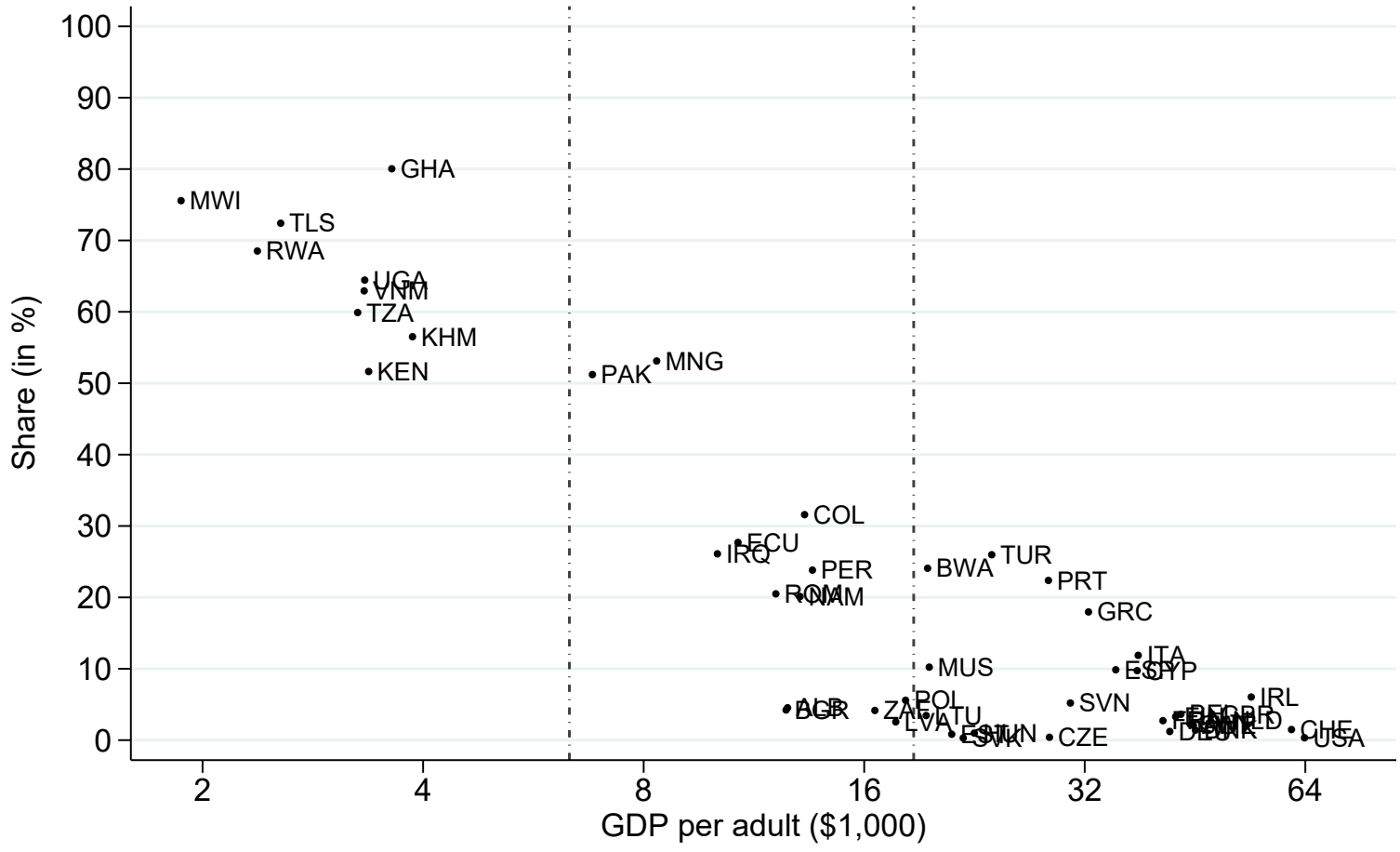


Fact 3: Decreasing Share of Workers in Subsistence Self-Employment

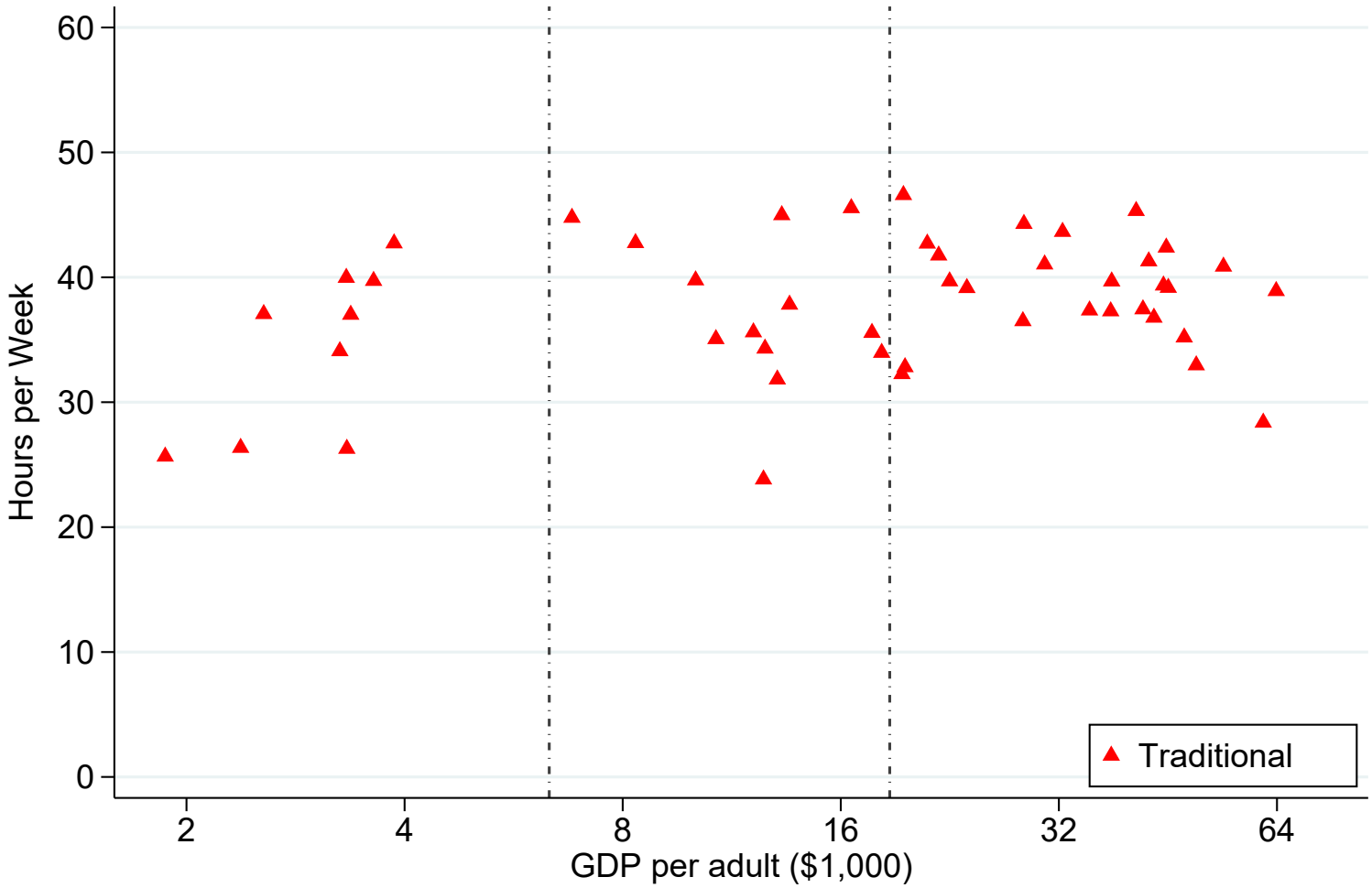
Decreasing Share of Subsistence Self-Employment



Empirical proxy for subsistence self-employment (traditional sector): Self-employed individuals with low education

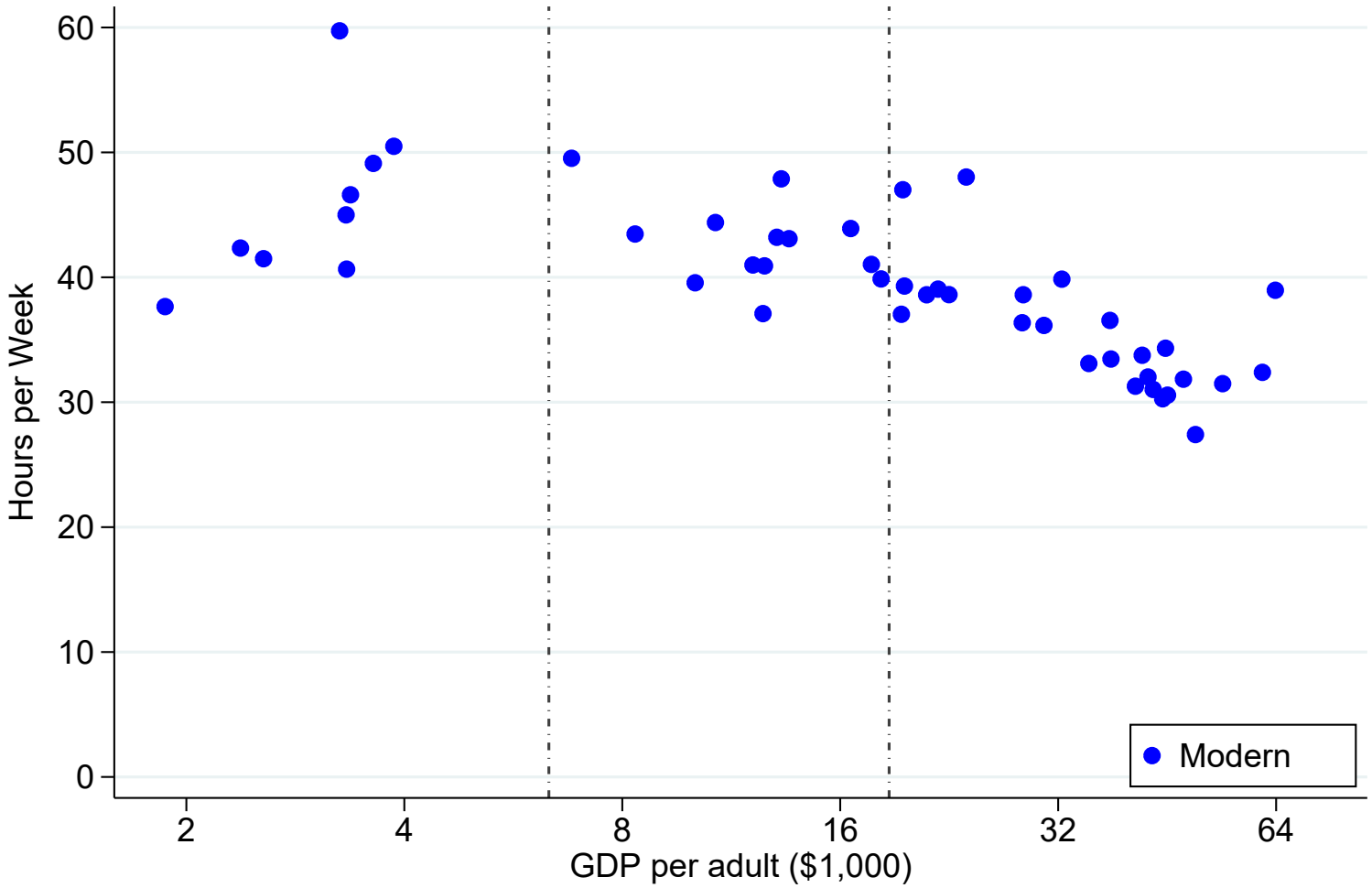
Agricultural share

Low Hours per Worker in Subsistence Self-Employment



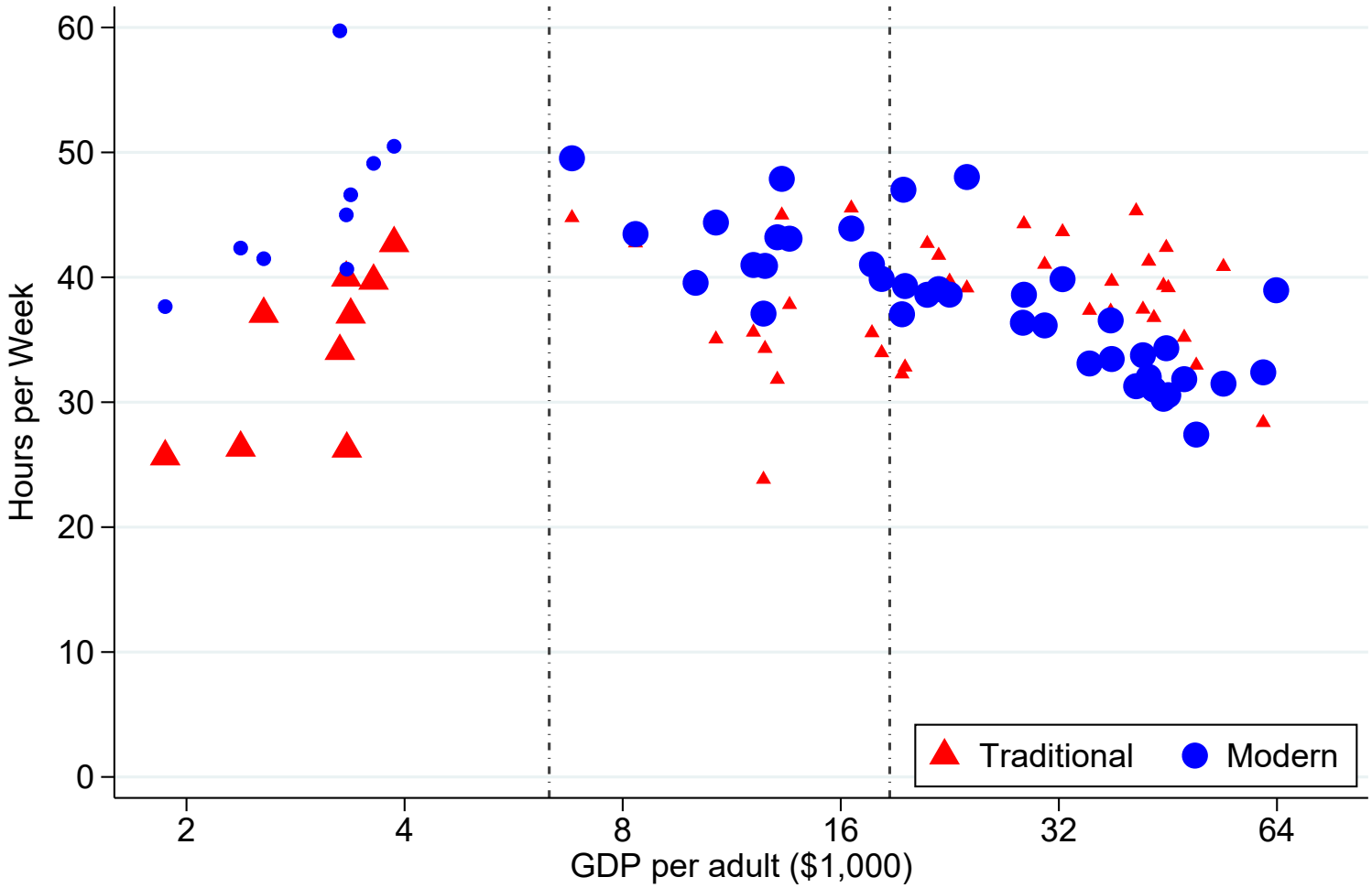
Hours per worker in subsistence self-employment slightly increasing from 35.4 to 39.2 hours between poor and rich

Strongly Decreasing Hours in Wage Work



Hours per worker in wage work (modern sector) 11 hours higher in poor countries and strongly decreasing from 46.3 to 35 hours

Concave Hours per Worker Caused by Compositional Effect



Concave shape in hours per worker due to sectoral reallocation from subsistence self-employment into wage work

3. IMPLICATIONS

Larger Welfare Differences Across Countries

- Measurement of welfare differences:
  - Based on **only** consumption:
    Rich countries have 12 times higher welfare than poor countries
  - Based on consumption **and** hours worked:
    19 times higher welfare

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    19 times higher welfare
  - Jones and Klenow (2016): differences in life expectancy and inequality further increase welfare differences between rich and poor countries

Larger Labor Productivity Differences Across Countries

- Measurement of labor productivity differences:
  - GDP **per worker** 14 times higher in rich countries
  - GDP **per hour worked** 17 times higher in rich countries

$\Rightarrow$ Further challenge for development accounting (Caselli, 2005)

4. DRIVING FORCES

Potential Driving Forces of Hours Decrease by Development

- Income effects (Keynes, 1930; Boppart/Krusell, 2020)
- Taxation (Prescott, 2004; Rogerson, 2006)

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- New driving force: Structural change in labor supply
  1. Sectoral reallocation
  2. Varying fixed costs of working

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- New driving force: Structural change in labor supply
  1. Sectoral reallocation
  2. Varying fixed costs of working
- Driving forces matter for predictions about future hours

A Static Model of Structural Change in Labor Supply

- MaCurdy (1981) preferences (special case of Boppart/Krusell, 2020)
- Non-linear labor taxes, consumption taxes, transfers
- Traditional (subsistence self-empl.) vs. modern (wage) sectors
- Fixed costs of work in modern sector (Rogerson/Wallenius, 2013)

Households

- Measure one of heterogenous households
- Households differ in modern sector prod. z with $log(z) \sim N(0, \sigma_z^2)$
- Within each household, measure one of heterogeneous individuals
- Individuals differ in fixed disutility of work η
- MaCurdy (1981) preferences for individuals:

$$u(c, h; S, \eta) = \frac{c^{1-\gamma}}{1-\gamma} - \alpha \frac{h^{1+\frac{1}{\phi}}}{1+\frac{1}{\phi}} - \bar{u}_S \eta \, \mathbf{1}_{h>0}$$

Budget Constraint and Household Problem

- Budget constraint:

$$(1+\tau_c)C = Y_S - T_S(Y_S) + \Upsilon$$

τ_c is linear cons. tax rate, $T_S(y_S)$ are non-linear labor income taxes, Υ are lump-sum transfers

first and second stage

Budget Constraint and Household Problem

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  τ_c is linear cons. tax rate, $T_S(y_S)$ are non-linear labor income taxes, Υ are lump-sum transfers

- Two-stage problem of household head, maximizing joint utility:

  1. First stage: given z, choose sector S, household hours H, cons. C
  2. Second stage: given η, choose individual hours h, consumption c

first and second stage

Two Sectors

- Two sectors defined by **production technology**, not nature of goods
- Modern sector:
  - Competitive sector with constant returns to scale production
  - Pre-tax household income in modern sector: $Y_M = wzH = A_M zH$
  - Fixed cost of working $\bar{u}_M$

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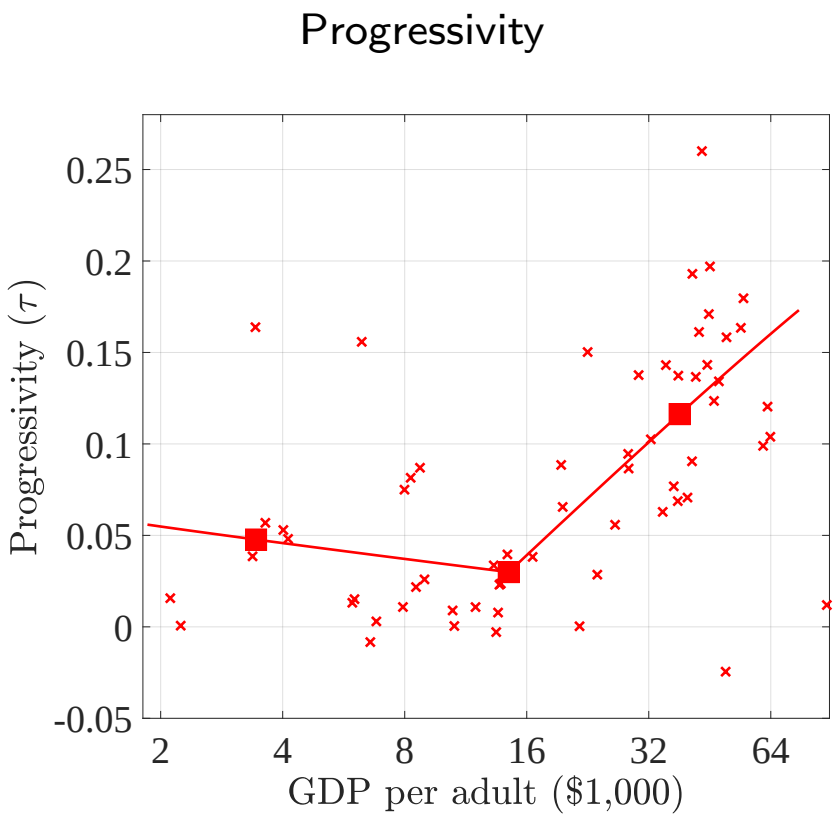
  - Pre-tax household income in modern sector: $Y_M = wzH = A_M zH$
  - Fixed cost of working $\bar{u}_M$
- Traditional (subsistence self-employment) sector:
  - Decreasing returns production function: $Y_T = A_T H^{\rho}$ (Bandiera et al. 2017)
  - No fixed cost of working
  - No taxation of labor income (Jensen, 2019)

Taxation by country income, intensive margin regulation

Cross-Country Differences

- Exogenous model input:
  - Tax-and-transfer system $\{\tau_c, T(\cdot), \Upsilon\}$
- Endogenously estimated:
  - Aggregate labor productivities $\{A_M, A_T\}$
  - Fixed cost of working in modern sector $\{\bar{u}_M\}$

Novel Cross-Country Facts on Non-Linear Labor Income Taxes

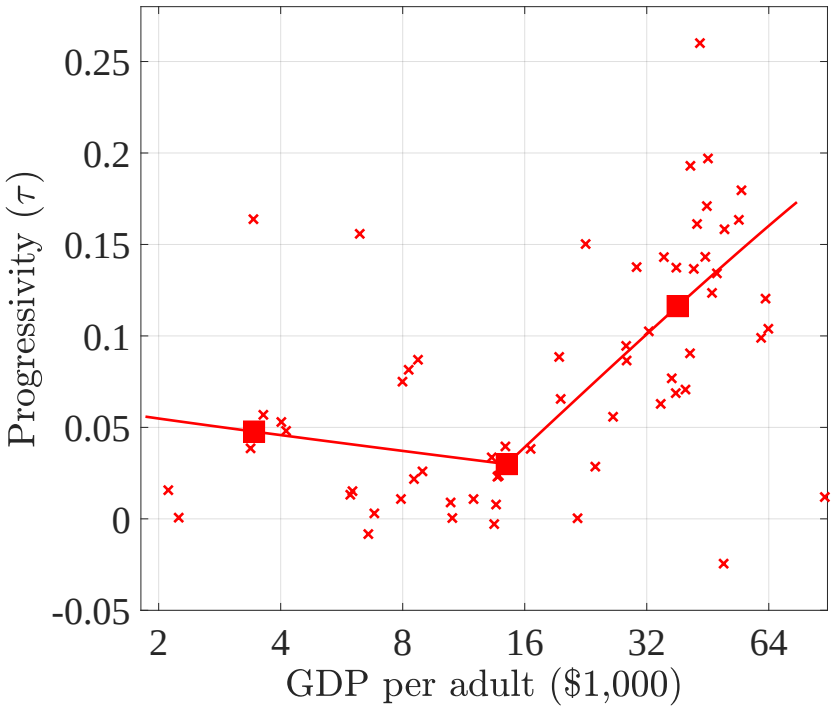


- Tax function: $Y^{net} = Y - T(Y) = \lambda Y^{1-\tau}$ (Heathcote et al. 2017)
- Cross-country data from Egger et al. (2018)
- Estimate τ for each country

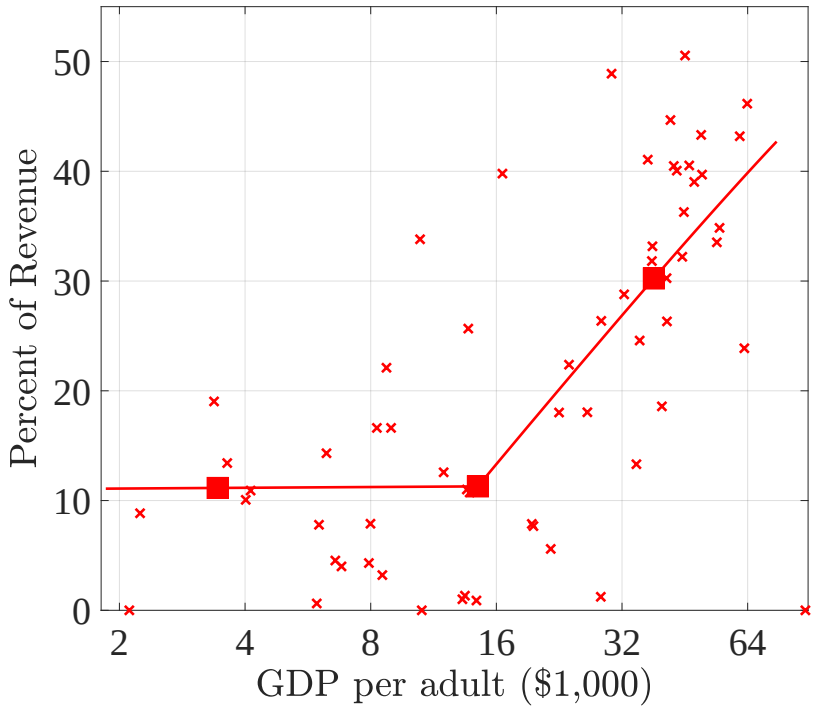
$\Rightarrow$ **Progressivity increasing** between **middle and rich** countries

Novel Cross-Country Facts on Non-Linear Labor Income Taxes

Progressivity



Labor Income Tax Share

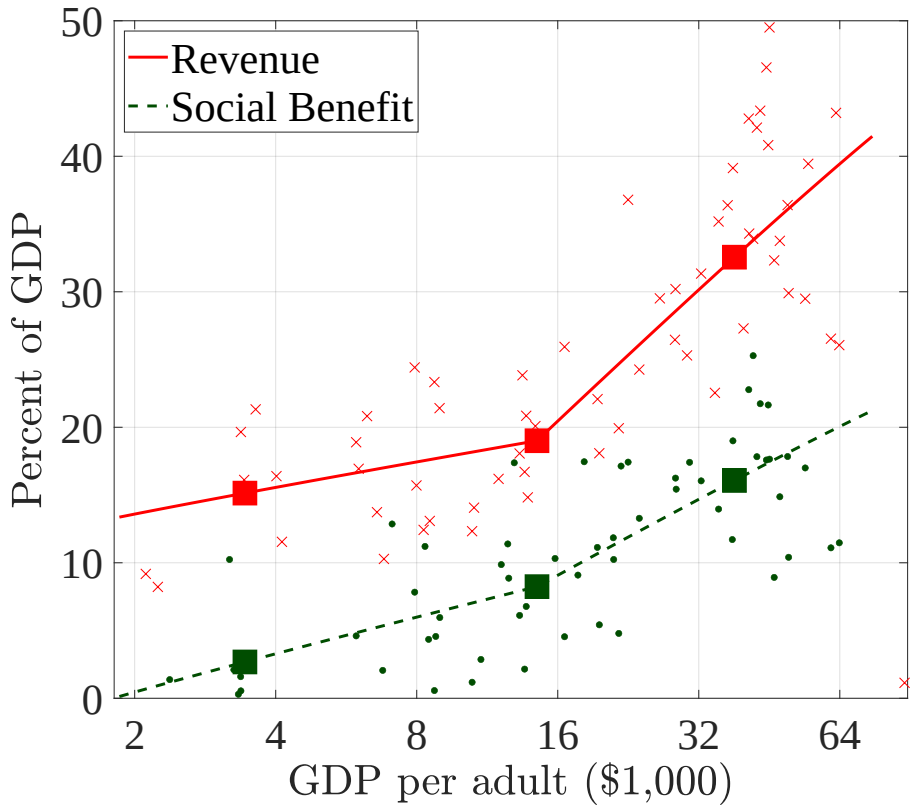


- Tax function: $Y^{net} = Y - T(Y) = \lambda Y^{1-\tau}$ (Heathcote et al. 2017)
- Cross-country data from Egger et al. (2018)
- Set λ to match share of govt. revenues from labor income taxes

$\Rightarrow$ **Labor taxation increasing** between **middle and rich** countries

implied average income tax rate

Consumption Taxes and Redistribution



- "Consumption" taxes set to match govt. revenues over GDP
- Υ set to match social benefits over GDP

$\Rightarrow$ Consumption taxes and transfers increasing with GDP

implied consumption tax rate

Estimation

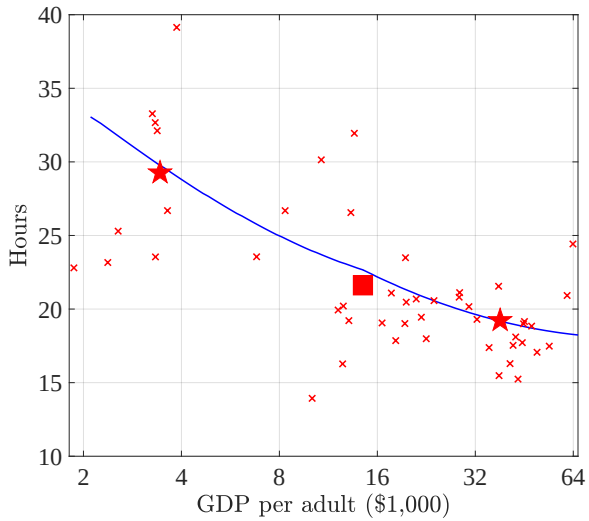
- Estimate model to key facts of average **poor** and **rich** country:
  - Employment rates
  - Fraction of workers in traditional sector
  - Average hours per worker in each sector
  - Output per adult
- Non-targeted moments:
  - **Middle-income** countries

Estimated Parameters

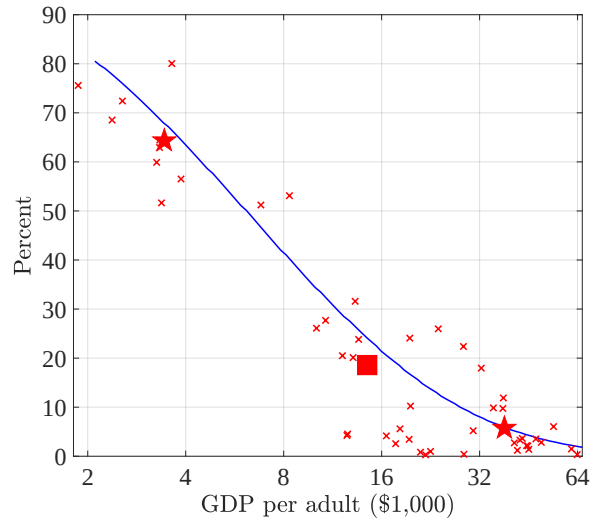
Parameter	Description	Value
γ	Curvature of consumption in preferences	1.21 (1.13, 1.29)
α	Weight of labor supply in preferences ($\times 10^{-6}$)	3.6 (2.1, 5.6)
ϕ	Curvature of labor supply in preferences	0.51 (0.45, 0.58)
$\bar{u}_M^P$	Fixed cost of working, poor countries	0.39 (0.20, 0.79)
$\bar{u}_M^R$	Fixed cost of working, rich countries	0.18 (0.12, 0.23)
ρ	Returns to scale in traditional sector	0.85 (0.65, 0.99)
A_T^P	Traditional sector productivity, poor countries	118 (73, 195)
A_T^R	Traditional sector productivity, rich countries	624 (445, 1044)
A_M^P	Modern sector productivity, poor countries	210 (144, 270)
A_M^R	Modern sector productivity, rich countries	2575 (1918, 3385)

Estimated Model Fit

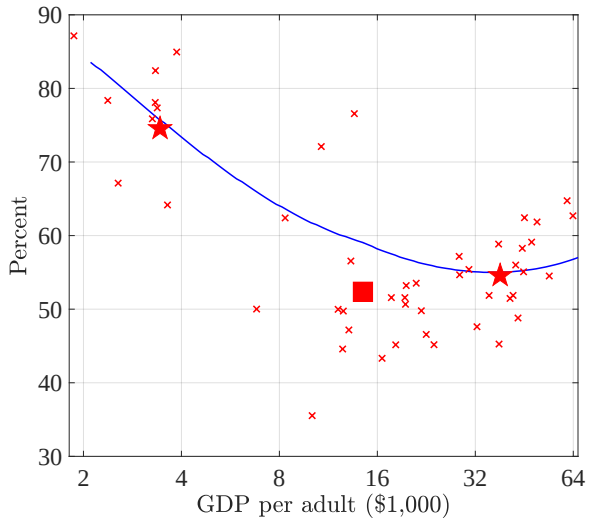
(a) Hours Worked per Adult



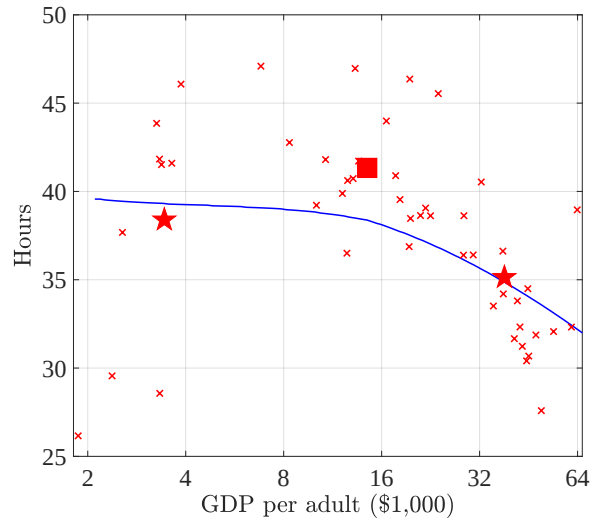
(b) Traditional Sector Share



(c) Employment Rate



(d) Hours per Worker



Decomposition: Quantitative Importance of Driving Factors

Start from average low-income country, impose no sectoral reallocation, and vary by development:

1. Aggregate labor productivities:
   - A_M and A_T increase
2. Additionally taxes and transfers:
   - Fiscal inputs as in the data
3. Additionally fixed cost of working in modern sector:
   - $\bar{u}_M$ decreases
4. Finally, allow for sectoral reallocation

$\hookrightarrow$ Which percentage of hours decline is explained?

Decomposition of Hours per Adult: Poor-Rich

	Hours	% Explained
Model	9.9	100.0
Higher Productivity	5.7	**57.6**
Higher Taxes & Transfers	2.3	23.2
Structural Change in Labor Supply		
Lower Fixed Costs	-2.4	-24.2
Sectoral Reallocation	4.3	**43.4**

- Income effects and sectoral reallocation most important drivers of decrease of hours over development spectrum

alternative decomposition

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- Income effects and sectoral reallocation most important drivers of decrease of hours over development spectrum
- Decreasing fixed costs as counteracting force

alternative decomposition

Decomposition of Hours per Adult: Poor-Middle-Rich

	% Explained	
	Poor-Middle	Middle-Rich
Model	100.0	100.0
Higher Productivity	52.4	69.4
Higher Taxes & Transfers	**11.1**	**44.4**
Structural Change in Labor Supply		
Lower Fixed Costs	-19.0	-33.3
Sectoral Reallocation	**55.6**	**22.2**

- Sectoral reallocation loses importance and taxes gain importance over development spectrum

alternative decompositions

Decomposition of Hours per Adult: Poor-Middle-Rich

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- Sectoral reallocation loses importance and taxes gain importance over development spectrum
- Decreasing fixed costs become stronger countervailing force

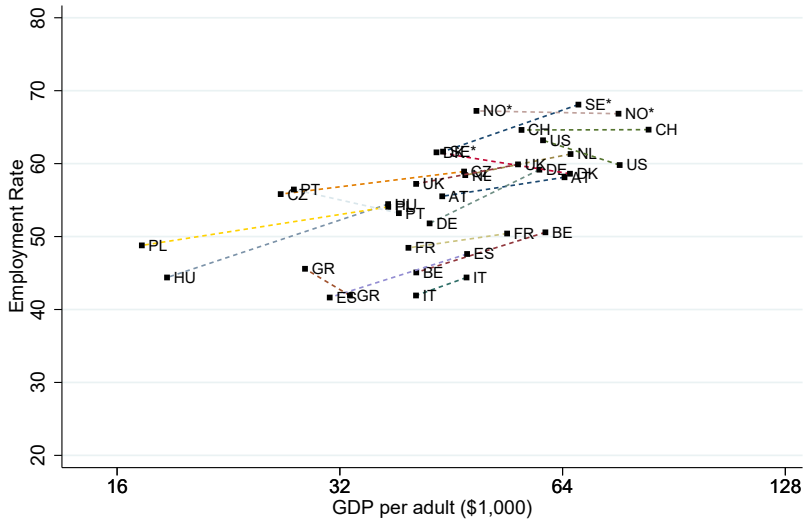
$\Rightarrow$ How will hours worked evolve in future?

alternative decompositions

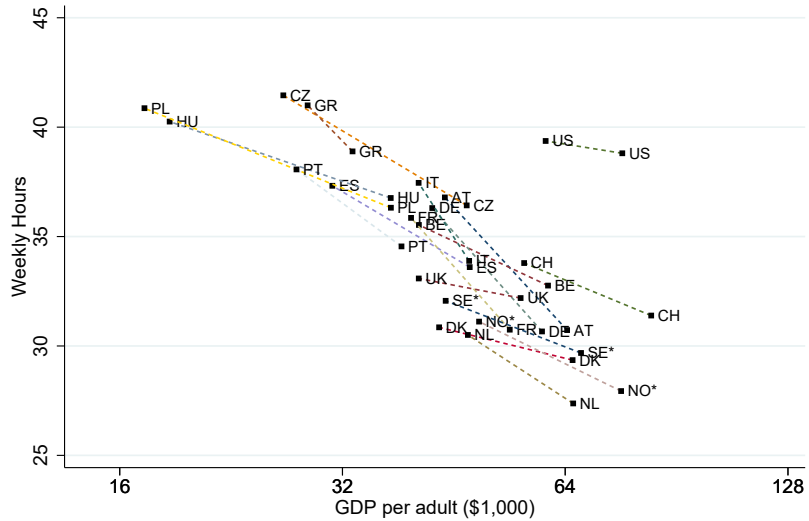
5. THE FUTURE OF HOURS WORKED

Rich Countries' Time-Series in Line with Cross-Section

Employment rates



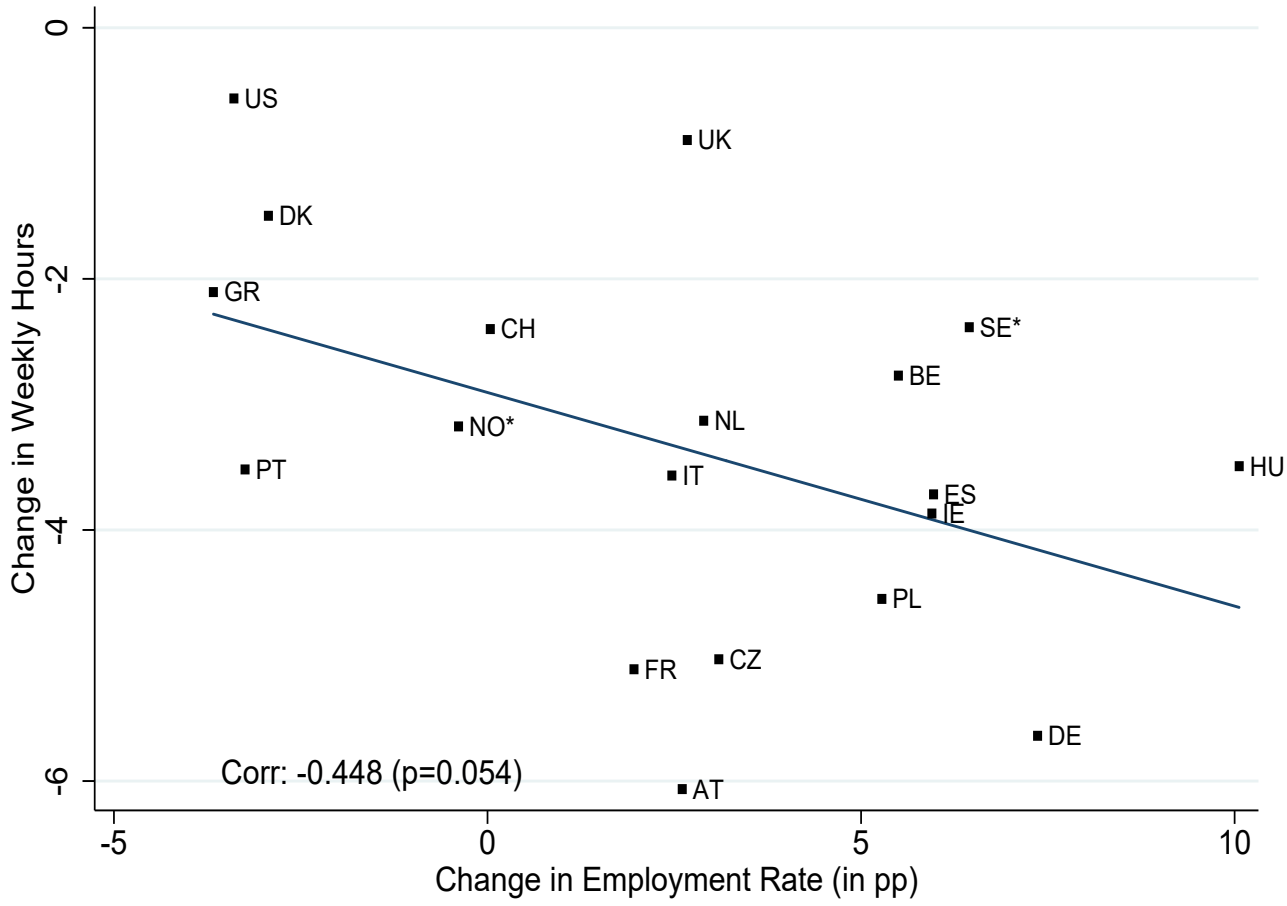
Hours per worker



Data on European countries and US from 1997/99 to 2017/19:

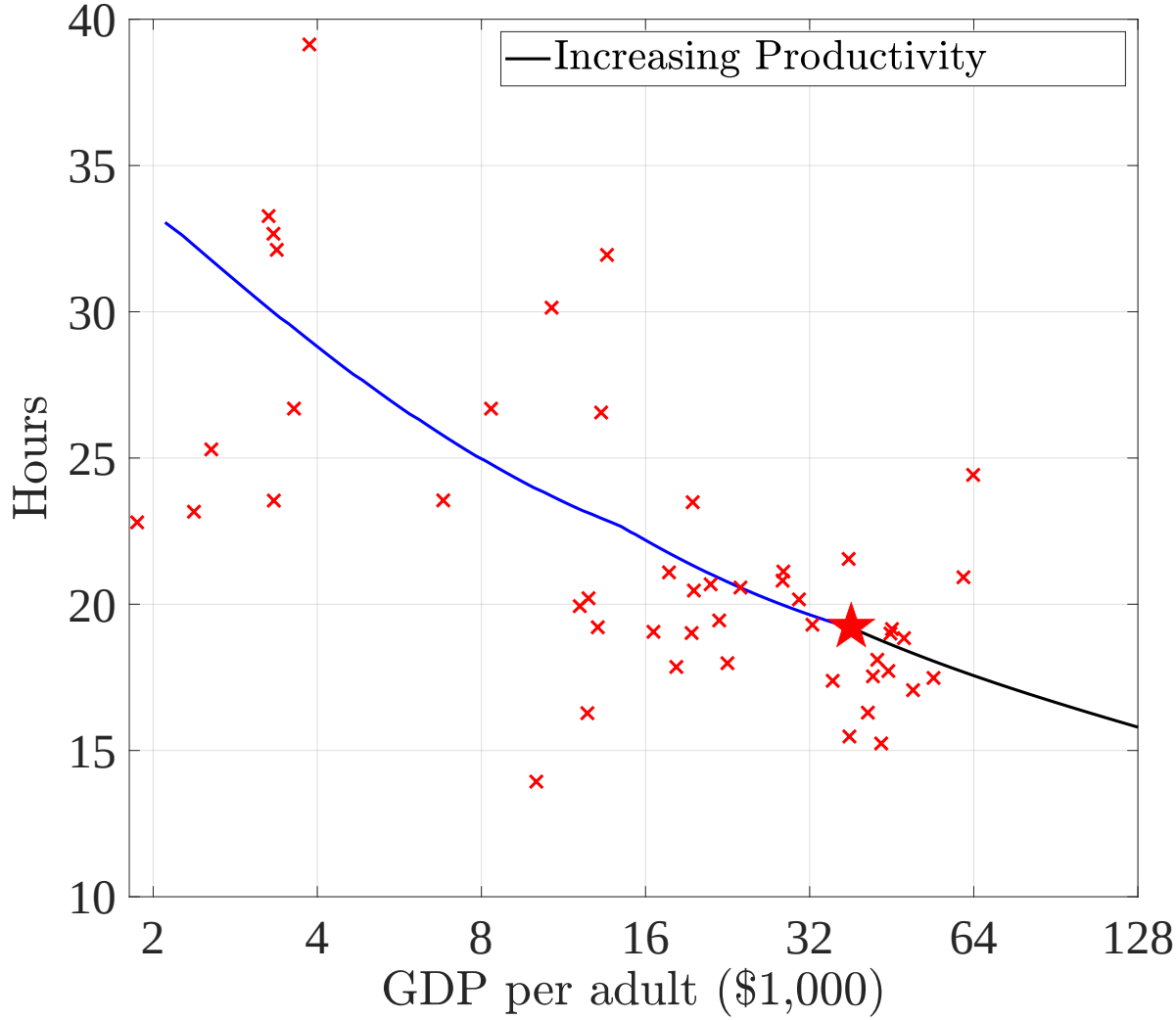
- Employment rates mostly increasing (despite population ageing)
- Hours per worker decreasing

Negative Correlation between Changes in Two Margins



- Countries w/ large *increases* in employment have large *decreases* in hours per worker

Model Predictions for Future Hours Worked



- Only income effects: Hours continue to decrease

employment rate, hours per worker

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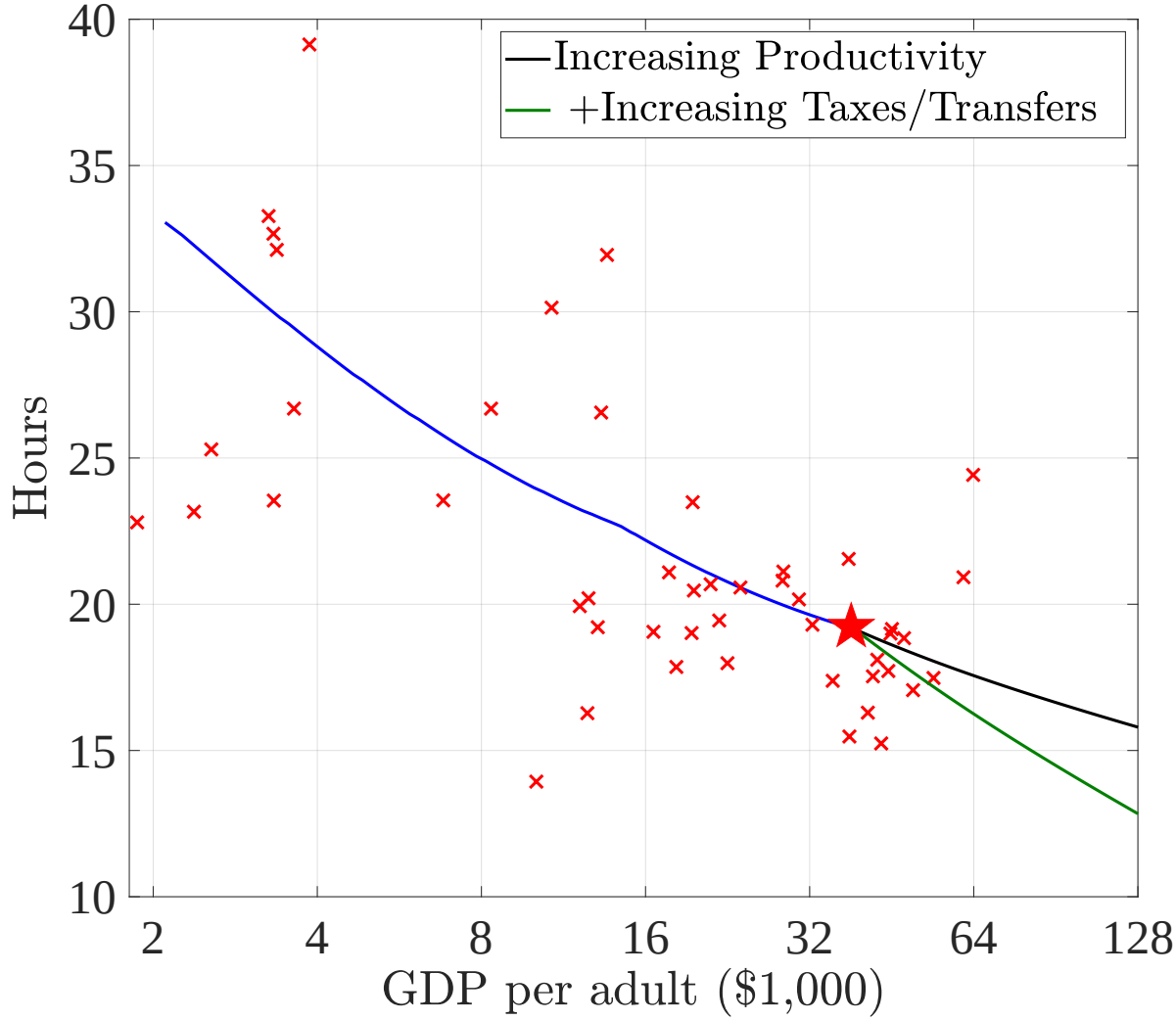

- Adding increasing taxes and transfers:
  Predicted decrease becomes even stronger

employment rate, hours per worker

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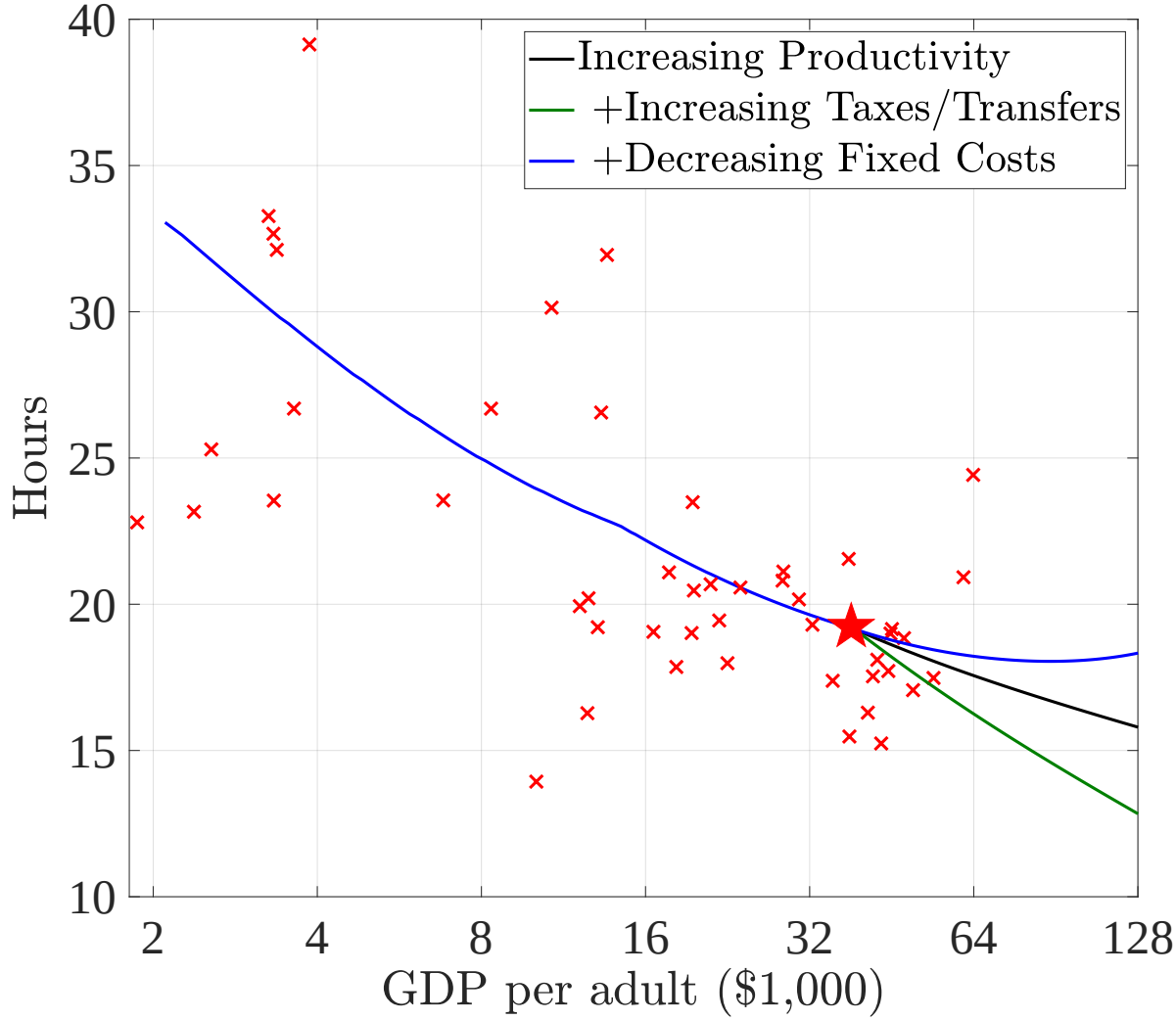
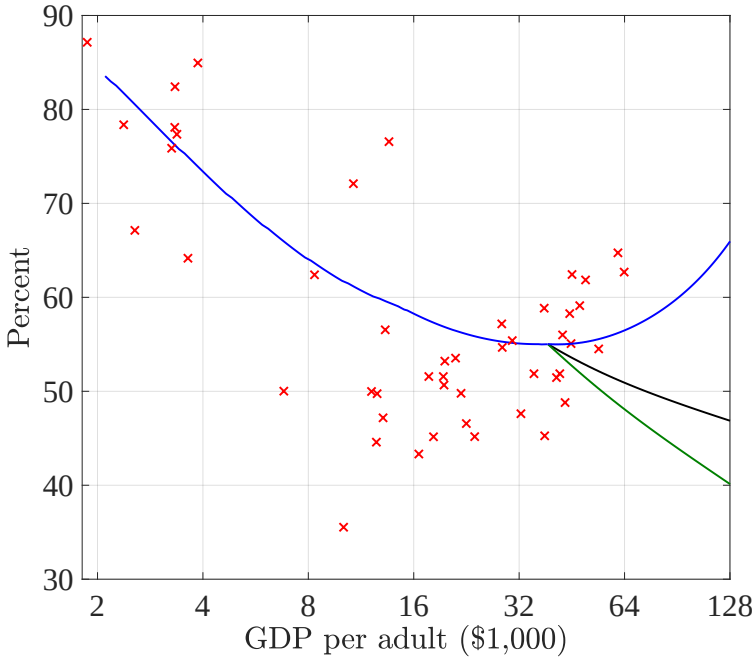


- Adding decreasing fixed cost of working:
  Decrease overturned into slight increase

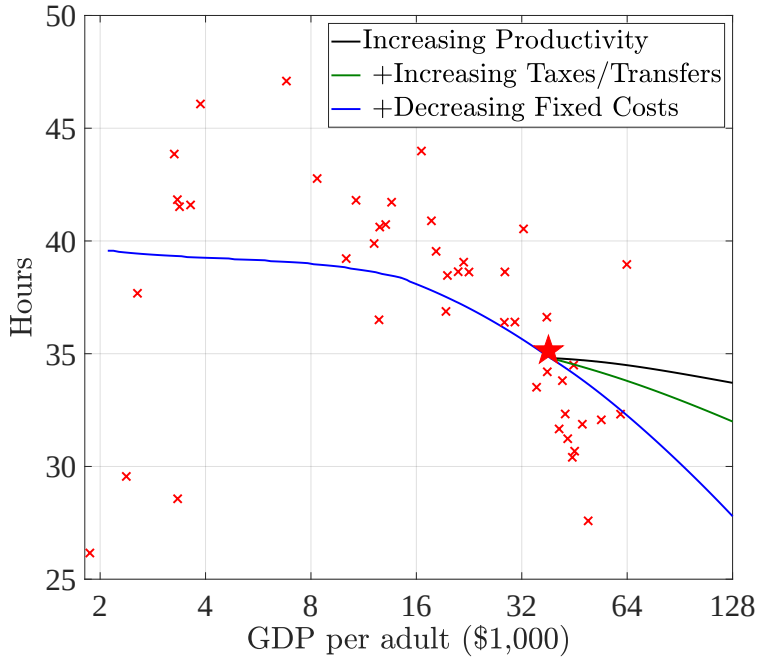
employment rate, hours per worker

Increasing Employment Rates, Decreasing Hours per Worker

Employment Rate



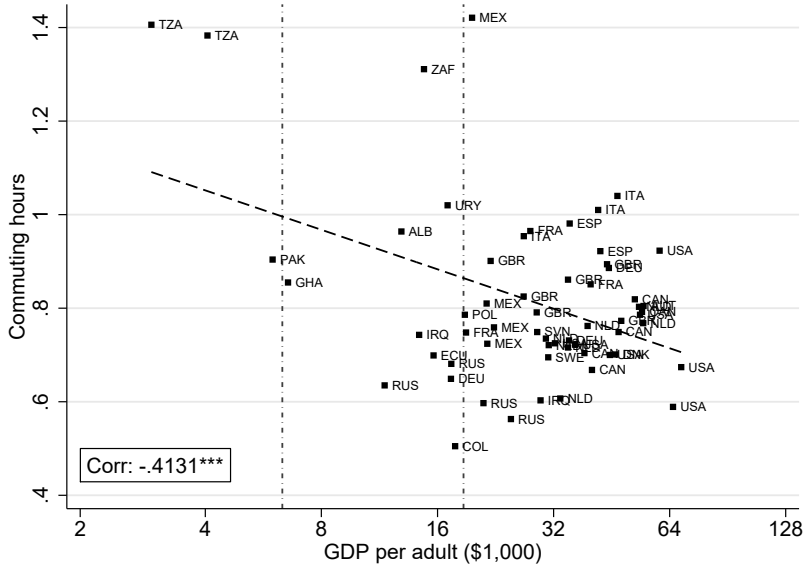
Hours per Worker



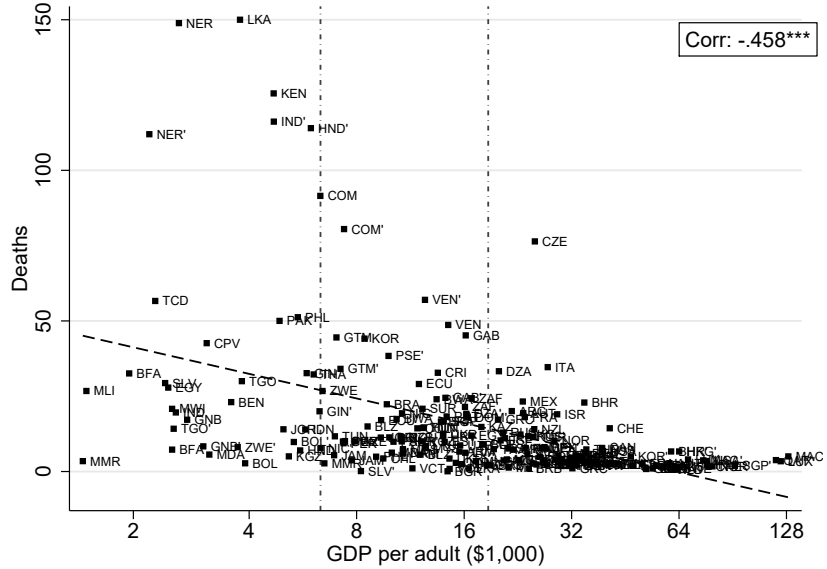
- Decreasing fixed costs lead to increasing employment rates
- For hours per worker, all three driving forces go in same direction

Evidence on Decreasing Fixed Costs of Work

Daily Commuting Time



Fatal Occupational Injuries



Looking ahead:

- Work from home
- Hours flexibility

Conclusion

Hours Worked Across the World

1. New data set of internationally comparable hours worked measures

2. Hours per adult are decreasing in GDP per capita

    - Convex employment rates, concave hours per worker

3. Structural change in labor supply as a new driver of hours worked

    - Matters for prediction of future hours

THANK YOU!

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Extra Slides

Larger Welfare Differences Across Countries

- Measurement of welfare differences:
  - Based on **only** consumption:
    Rich countries have 12 times higher welfare than poor countries
  - Based on consumption **and** hours worked:
    19 times higher welfare

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Larger Welfare Differences Across Countries

- Measurement of welfare differences:
  - Based on **only** consumption:
    Rich countries have 12 times higher welfare than poor countries
  - Based on consumption **and** hours worked:
    19 times higher welfare
  - Jones and Klenow (2016): differences in life expectancy and inequality further increase welfare differences between rich and poor countries

Back

Larger Labor Productivity Differences Across Countries

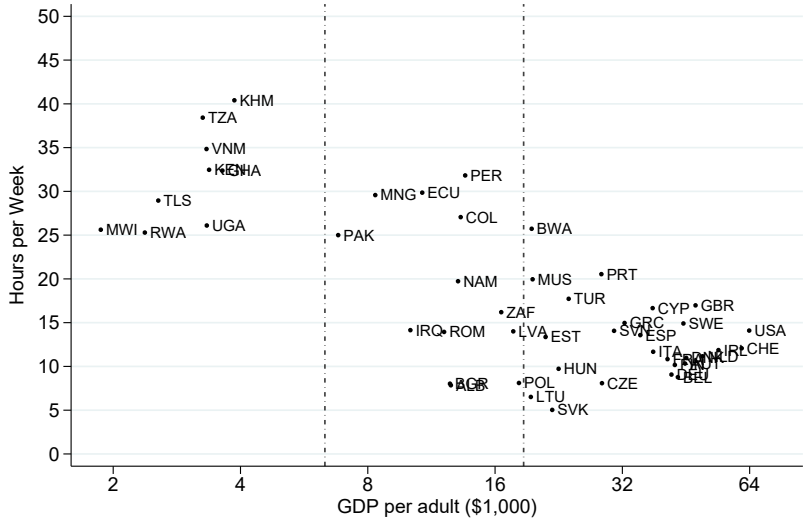
- Measurement of labor productivity differences:
  - GDP **per worker** 14 times higher in rich countries
  - GDP **per hour worked** 17 times higher in rich countries

$\Rightarrow$ Further challenge for development accounting (Caselli, 2005)

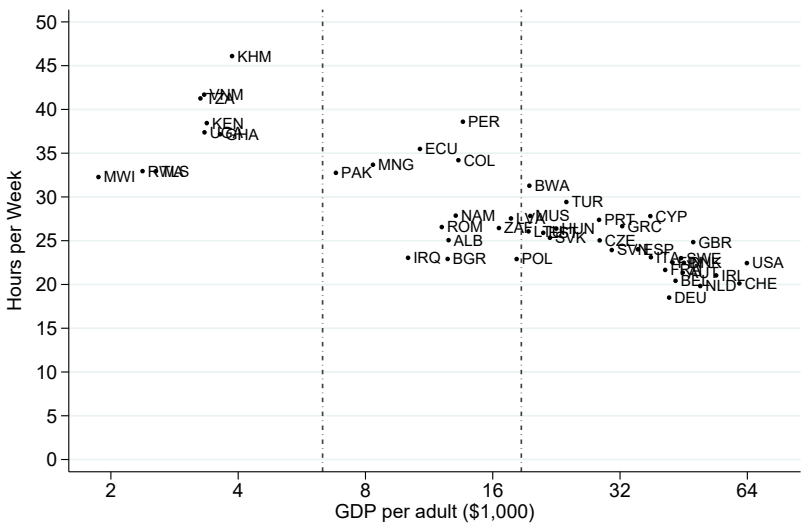
Back

Average Weekly Hours per Adult (Ages 25+) by Education

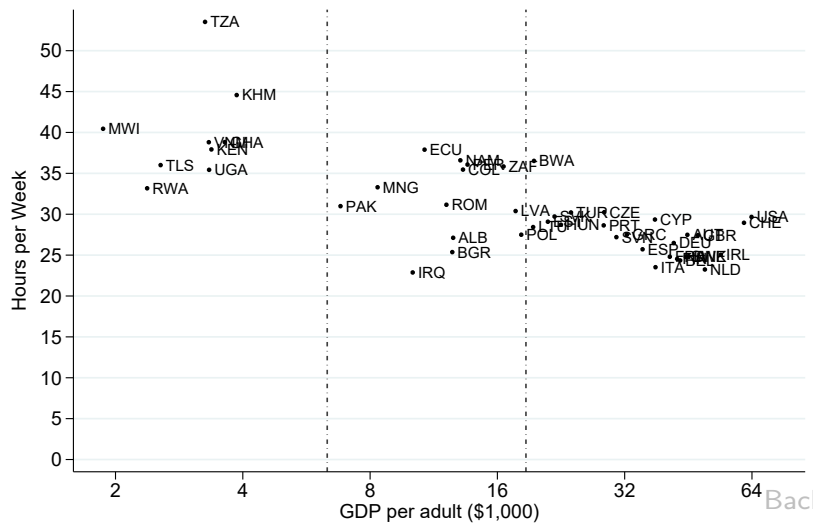
Less than Secondary



Secondary



More than Secondary



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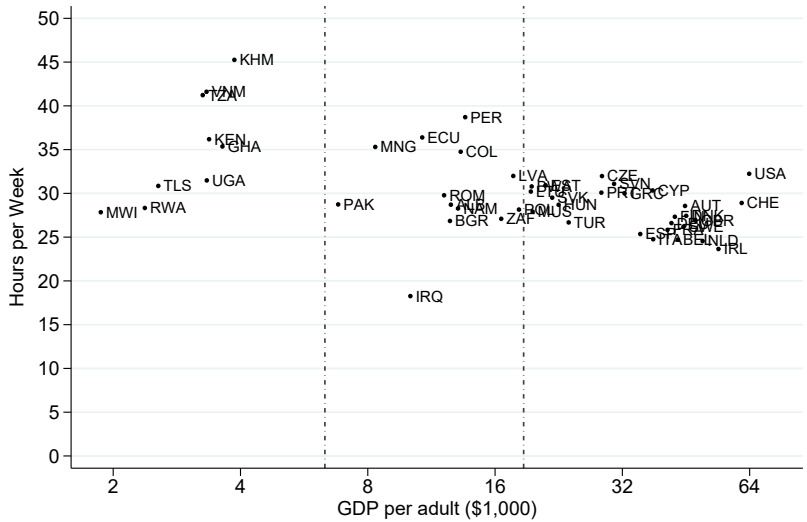
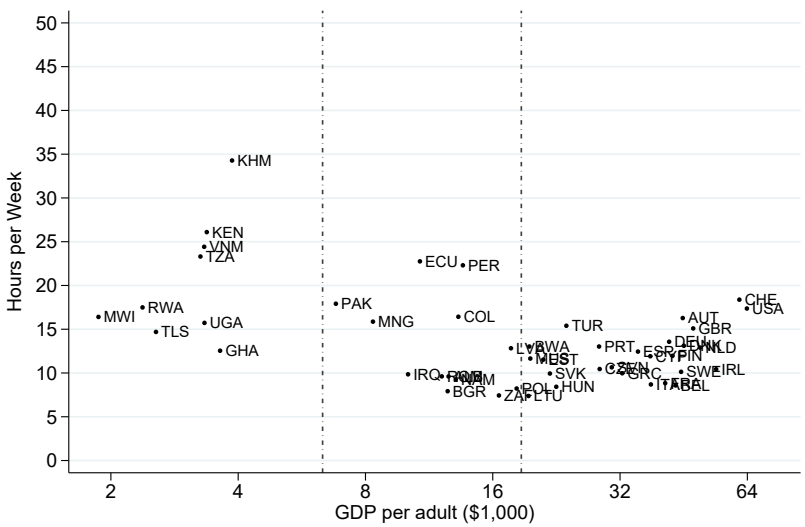
Average Weekly Hours per Adult by Age

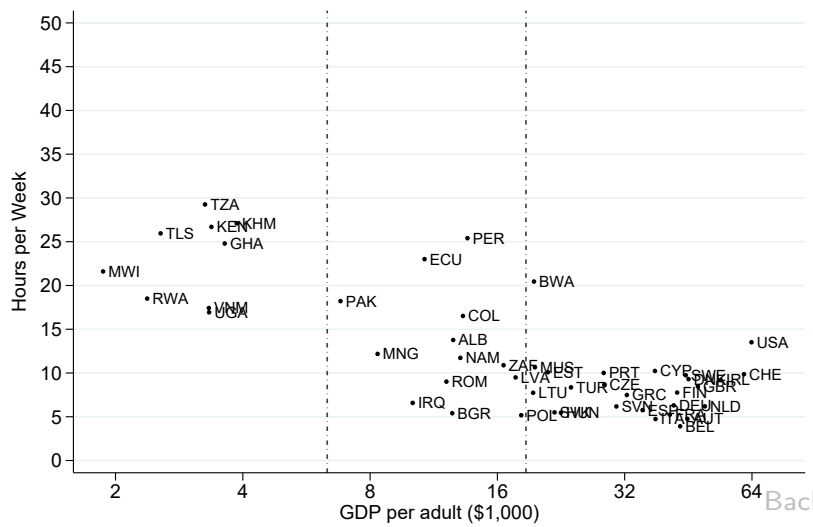
Prime



Young



Old



Back

Average Hours per Adult with U.S. Demographics

	Country Income Group		
	Low	Middle	High
Actual Hours per Adult	28.5	21.7	19.0
Hypothetical Hours: U.S. Age Composition	29.5	22.0	19.5
Actual Hours per Adult (*Ages 25+, Non-miss. Educ.*)	33.0	25.2	20.7
Hypothetical Hours: U.S. Educ. Comp.	38.3	27.6	24.7
Hypothetical Hours: U.S. Age & Educ. Comp.	34.9	24.8	22.8

- Cross-country differences in hours per adult not driven by demographic compositions

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Average Hours per Adult with Ghanaian Demographics

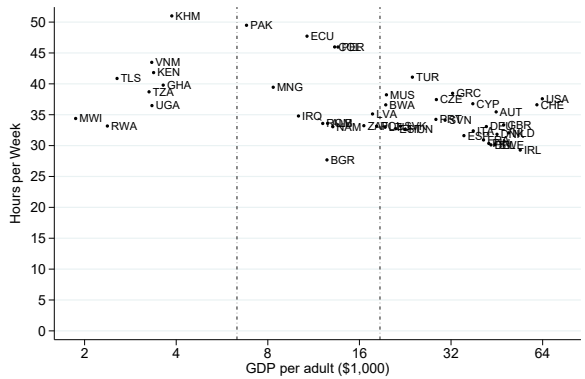
	Country Income Group		
	Low	Middle	High
Actual Hours per Adult (*Ages 25+, Non-miss. Educ.*)	33.0	25.2	20.7
Hypothetical Hours: U.S. Age & Educ. Comp.	34.9	24.8	22.8
Hypothetical Hours: Ghanaian Age & Educ. Comp.	29.6	19.5	15.8

- Cross-country differences in **hours per adult** not driven by demographic compositions
- Similar difference when imposing U.S. or Ghanaian demographics

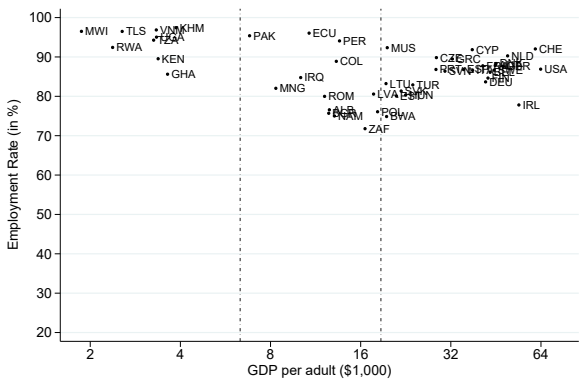
Back

Facts for Men Aged 25-54

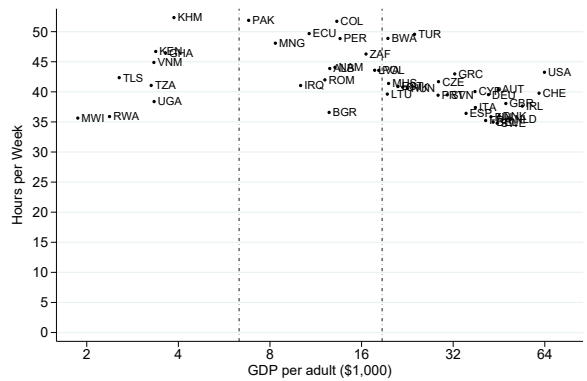
(a) Hours Worked per Adult



(b) Employment Rate



(c) Average Hours Worked per Worker



- Between poor and rich
  - hours per adult decrease by 7.2 hours
  - employment rates decrease by 8.4 percentage points
  - hours per worker fall by 4.1 hours

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Average Weekly Hours per Adult by Gender

	Low-High
All	9.5***
Women	10.0***
Men	8.9***

***/**/* denotes significance at the 1%/5%/10% level.

$\Rightarrow$ Hours per adult decrease for both gender

back

Average Weekly Hours per Adult by Education

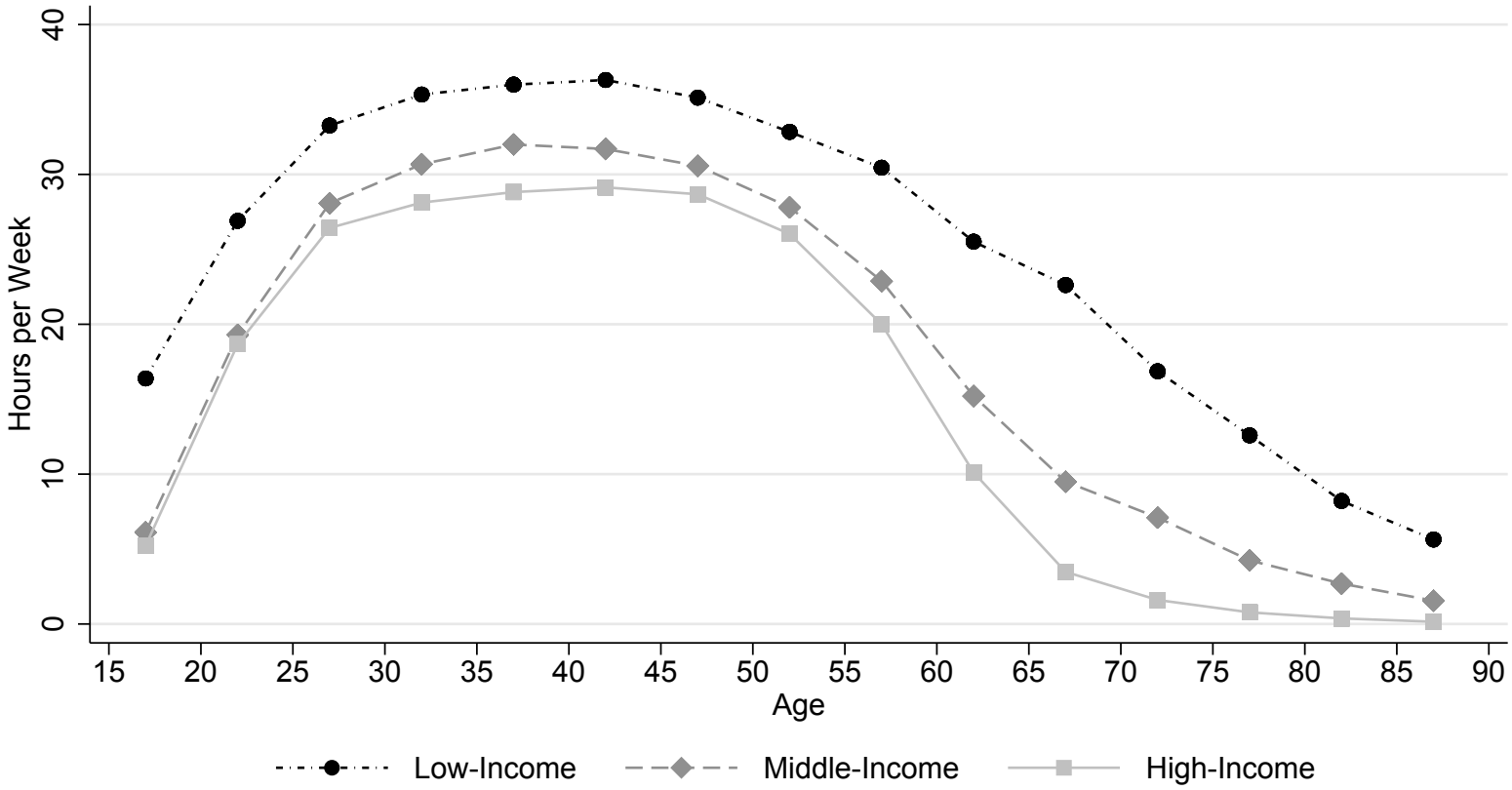
	Low-High
All	9.5^{***}
Ages 25+ (*Non-missing Educ.*)	12.3^{***}
Ages 25+	
Less than Secondary	19.3^{***}
Secondary Completed	13.7^{***}
More than Secondary	12.5^{***}

$^{***}/^{**}/^{*}$ denotes significance at the 1%/5%/10% level.

$\Rightarrow$ Hours per adult decrease for all education groups

back

Life-Cycle Profiles of Average Weekly Hours per Adult



$\Rightarrow$ Hours per adult decrease for each age

- Caveat: cannot distinguish between age- and cohort-effects!

back

Shape of Extensive Margin Decrease is Broad Based

	Country Income Group		
	Low	Middle	High
All	74.5	52.4	54.6
Men	80.6	63.2	62.0
Women	68.5	42.1	47.7
Young (15-24)	57.4	32.4	37.9
Prime (25-54)	86.2	70.6	78.9
Old (55+)	69.8	30.5	24.0

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Shape of Intensive Margin Decrease is Broad Based

	Country Income Group		
	Low	Middle	High
All	38.4	41.3	35.1
Men	40.8	43.7	38.2
Women	35.0	37.0	31.5
Young (15-24)	36.1	39.8	32.6
Prime (25-54)	40.6	42.3	35.9
Old (55+)	32.6	37.5	33.6

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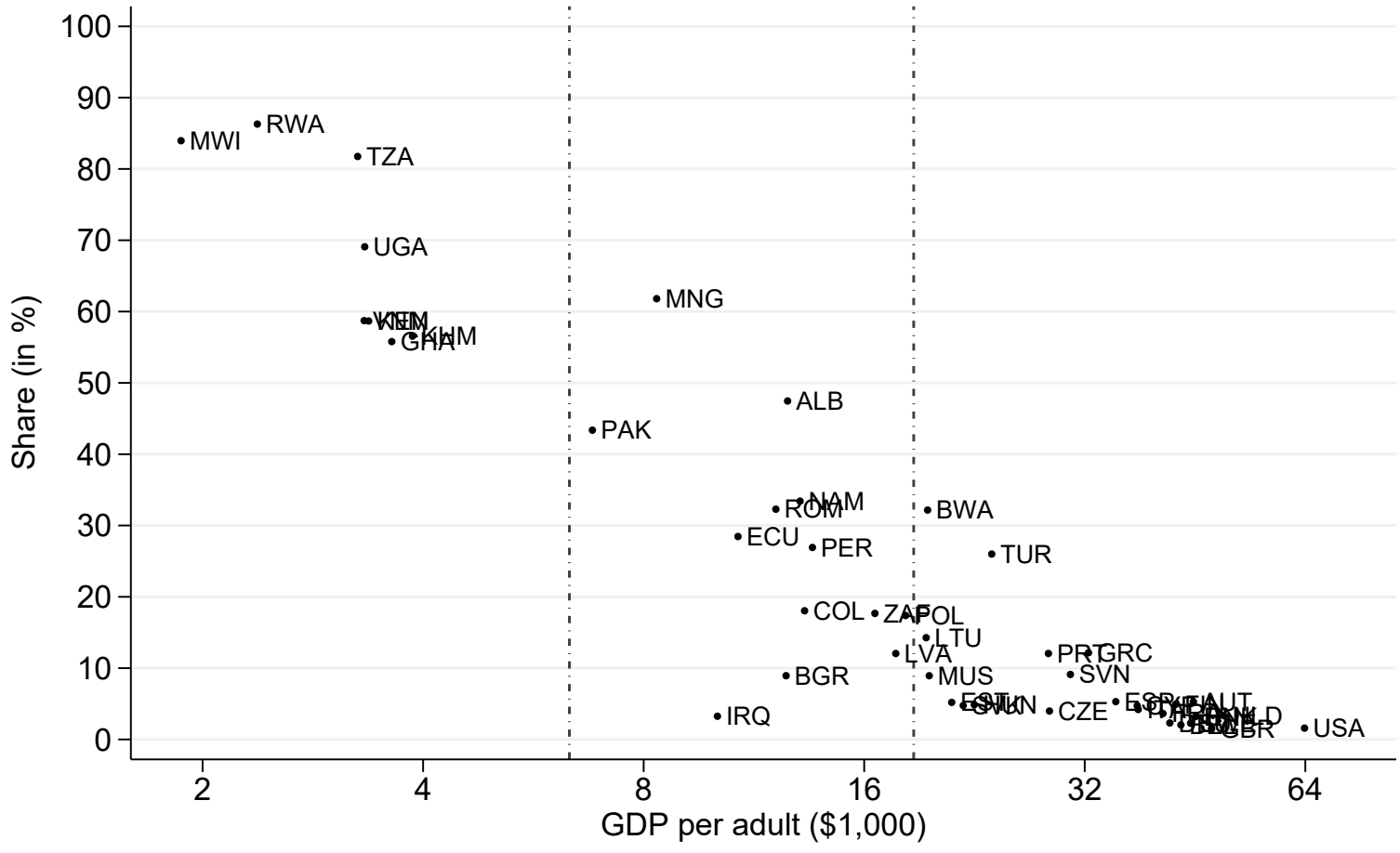
Agricultural Sector Share



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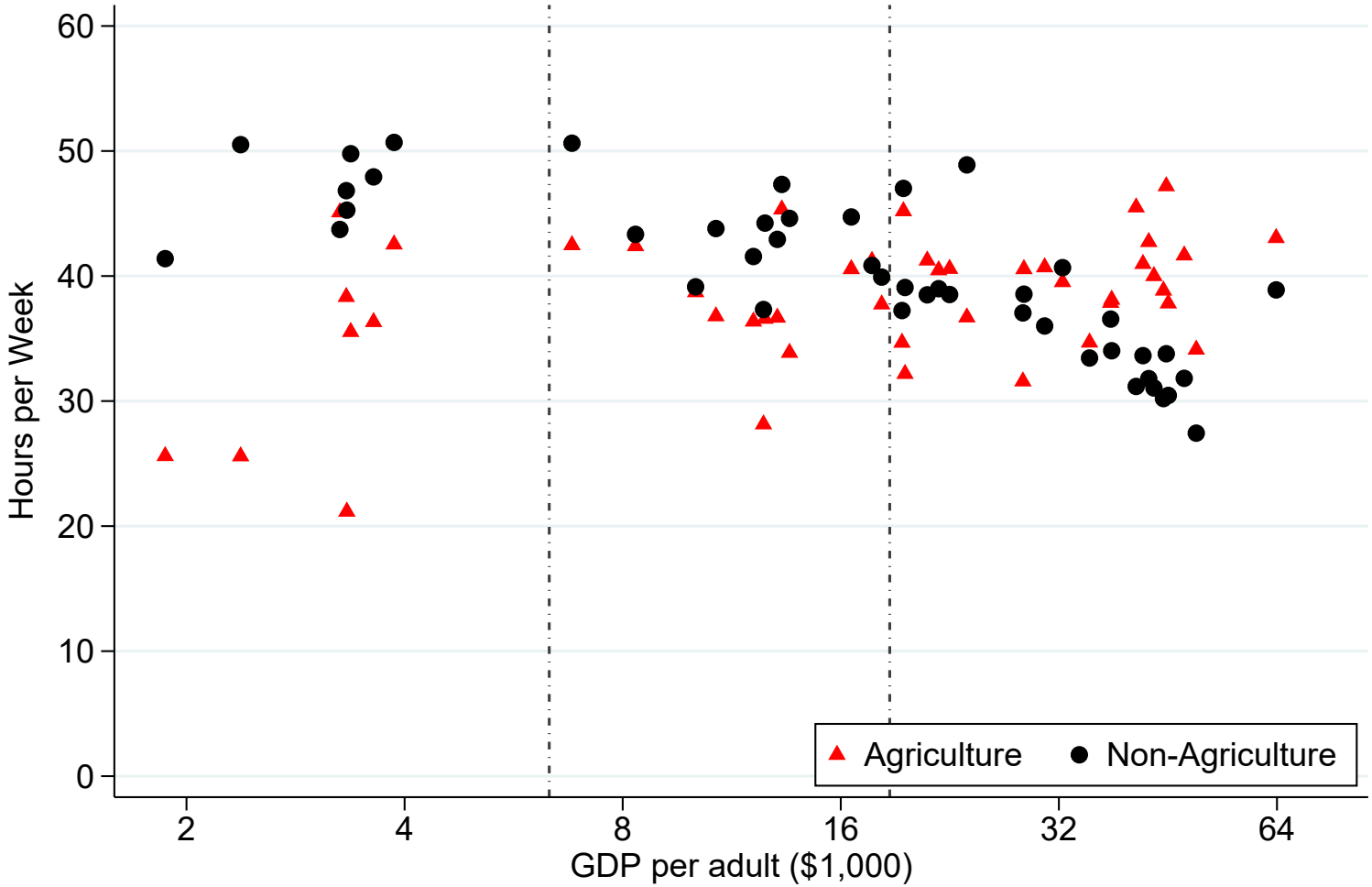
Hours per Worker in Agriculture vs. Rest



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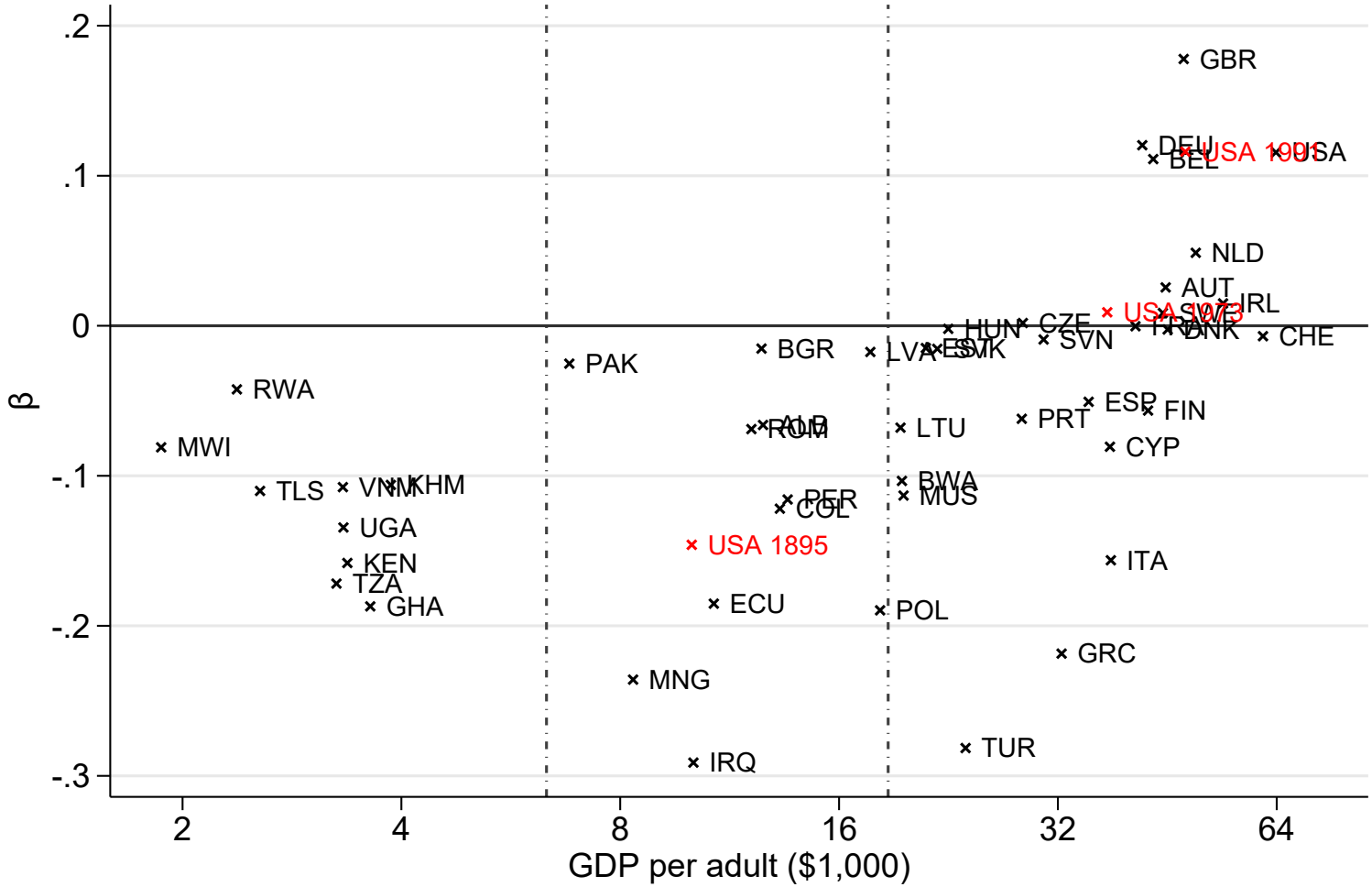
Some Evidence on Division Bias

	Dep. Var.: Hours	β_w	Obs.
Baseline - USA	Usual Main J.	0.125^{***}	162,281
Robustness	Usual Main J.	0.124^{***}	
	Actual All J.	0.125^{***}	156,348
Baseline - Turkey	Actual All J.	-0.303^{***}	88,138
Robustness	Actual All J.	-0.303^{***}	
	Usual Main J.	-0.211^{***}	88,138
Baseline - Peru	Actual All J.	-0.108^{***}	15,356
Robustness	Actual All J.	-0.150^{***}	
	Usual All J.	0.056^{***}	3,262
Baseline - Mongolia	Actual All J.	-0.213^{***}	1,222
Robustness	Actual All J.	-0.213^{***}	
	Usual Main J.	-0.189^{***}	1,222
Baseline - Uganda	Actual All J.	-0.176^{***}	671
Robustness	Actual All J.	-0.155^{***}	
	Usual All J.	-0.055^{*}	360
	Usual Main J.	-0.070^{**}	

- Robust evidence on bias, but except for Peru rather small

back

Country-Specific Elasticities of Hours to Wages: Women



- U.S. estimates from Costa (2000) for 1890s, 1973, and 1991

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Family Head's Problem: Second Stage

- Given (C, H) and sectoral choice, solve

$$\max_{\{c(\cdot),h(\cdot)\}} \int \left[\frac{c(\eta)^{1-\gamma}}{1-\gamma} - \alpha \frac{h^{1+\frac{1}{\phi}}}{1+\frac{1}{\phi}} - \bar{u}_S \eta I_{h>0} \right] dF$$

$$\text{s.t.} \quad \int c(\eta) dF = C$$

$$\int h(\eta) dF = H$$

- F.o.c. for consumption gives perfect risk sharing: $c(\eta) = C \ \forall \eta$
- No intensive labor supply variation within family
- Optimal hours function given by:

$$h(\eta) = \begin{cases} h^* > 0 & \text{for } \eta \leq \eta^* \\ 0 & \text{otherwise} \end{cases}$$

Family Head's Problem: Second Stage (cont.)

- Head chooses threshold level η^*, implying h^*
- f.o.c.

$$\underbrace{\alpha \frac{h^*(\eta^*)^{1+\frac{1}{\phi}}}{1+\frac{1}{\phi}} f(\eta^*)}_{\text{disut. of new workers}} + \underbrace{\bar{u}_S \eta^* f(\eta^*)}_{\text{fixed cost of new workers}} = \underbrace{\alpha h^*(\eta^*)^{\frac{1}{\phi}} h^{*\prime}(\eta^*) F(\eta^*)}_{\triangle \text{ marg. ut. of already working}}$$

- Solution expresses η^* as a function of family hours H, i.e. $\eta^* = \eta^*(H)$
- If $\eta \sim U(0,1)$, get closed form solution for $\eta^*(H)$ and $u(C,H)$

back

Family Head's Problem: First Stage

Substituting optimal decisions into objective function gives family utility:

$$U(C,H) \equiv \frac{C^{1-\gamma}}{1-\gamma} - \alpha \frac{H^{1+\frac{1}{\phi}}}{1+\frac{1}{\phi}} \left(F(\eta^*)\right)^{-\frac{1}{\phi}} - \bar{u}_S \int_0^{\eta^*} \eta dF \tag{1}$$

see (Constantinides 1982)

First stage maximization problem:

$$\begin{array}{cc} \max\limits_{C,H,S \in \{T,M\}} & U(C,H) \\ \text{s.t.} & (1+\tau_{C,S})C = Y_S - T_S(Y_S) + \Upsilon, \\ \text{where} & Y_M = wzH \text{ and } Y_T = A_T H^{\rho} \end{array} \tag{2}$$

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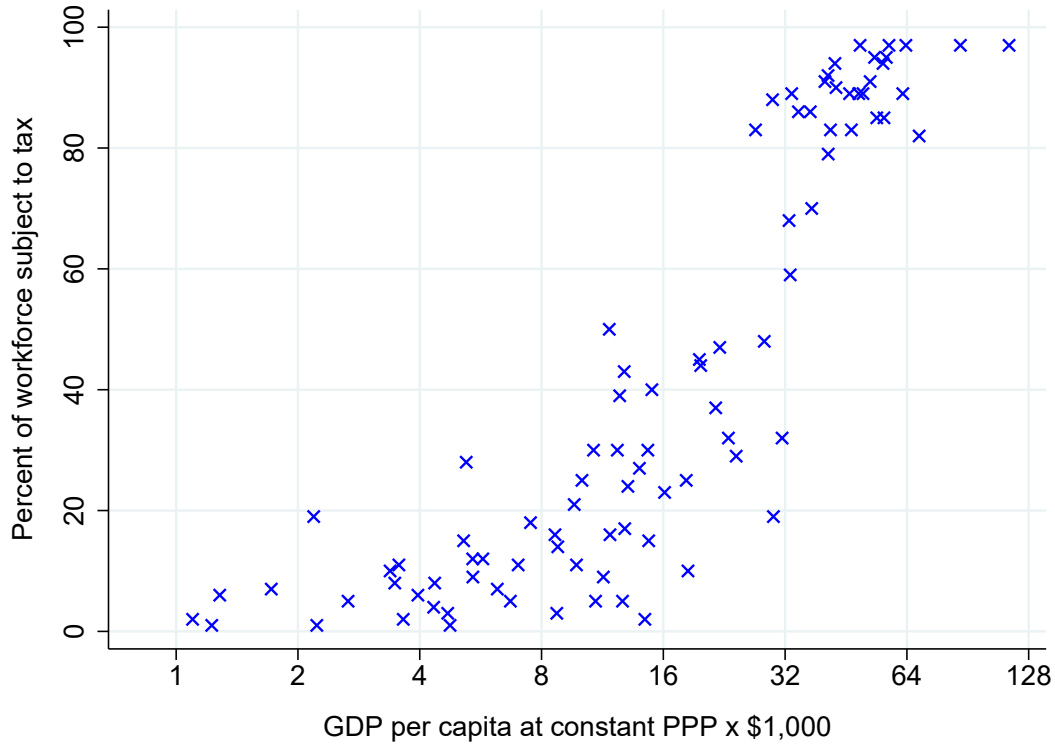
Taxation by Country Income



Notes: Data on share of workforce subject to tax from Jensen (2019)

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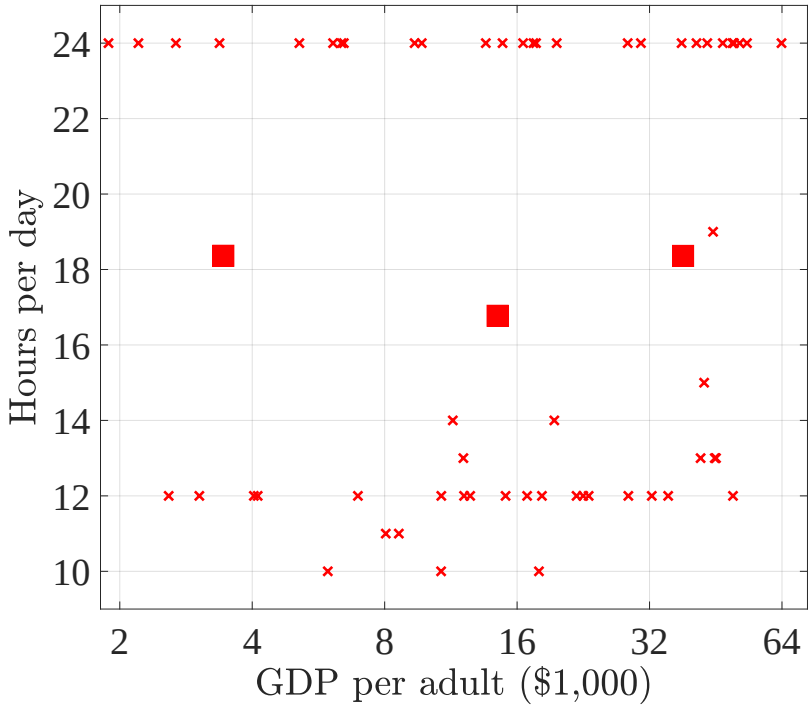
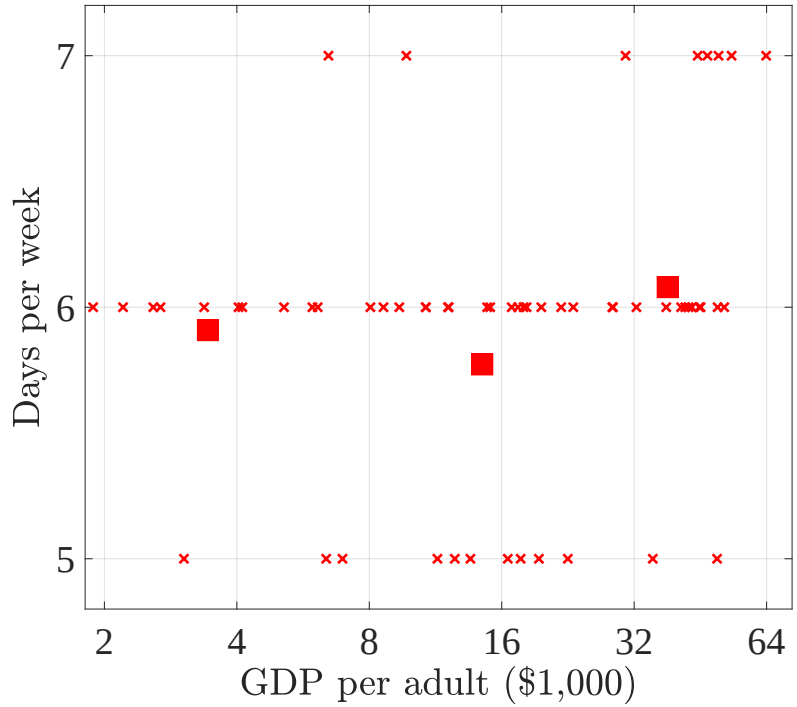
Restrictions on Intensive Margin of Hours Worked

(a) Legal Limits on Hours per Day



(b) Legal Limits on Days per Week



Source: Doing Business 2005, World Bank

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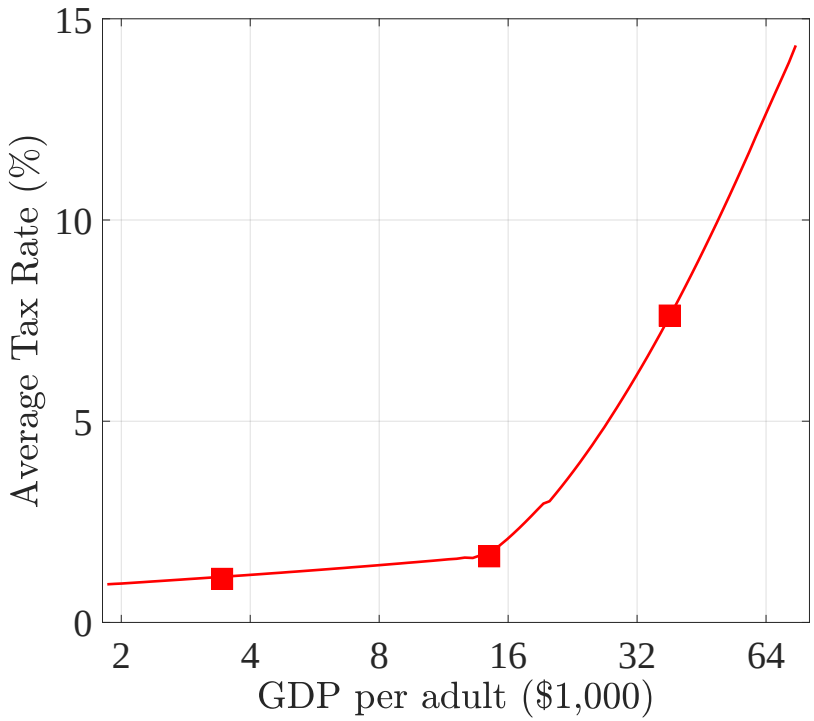
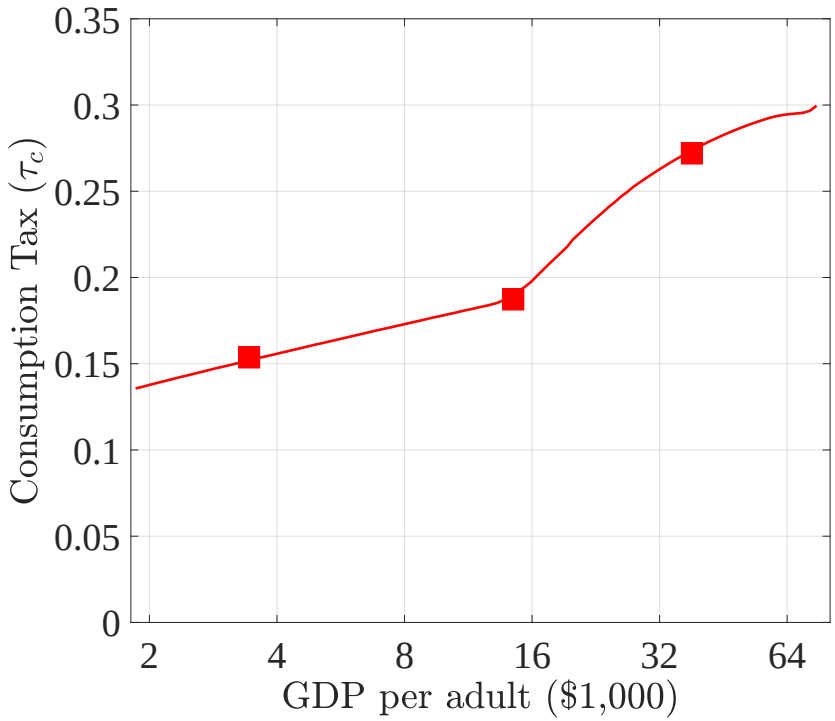
Implied Tax Rates

Average Labor Income Tax Rate



Consumption Tax Rate



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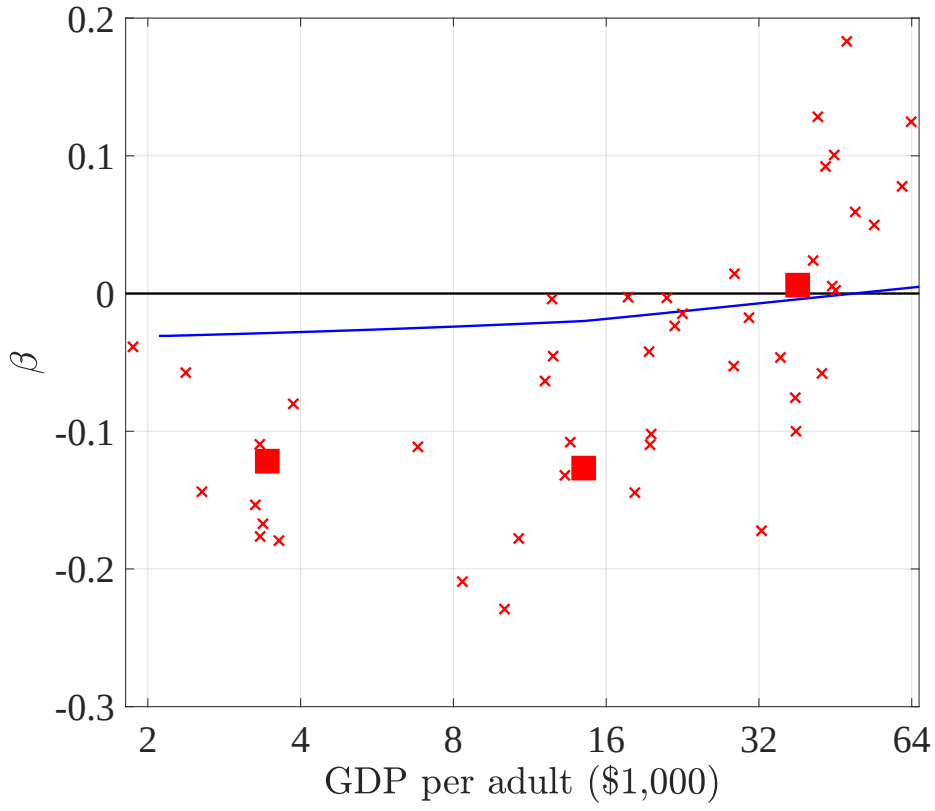
Estimated Model Fit: Hours-Wage Elasticities



Model qualitatively matches shape, but not quantitatively

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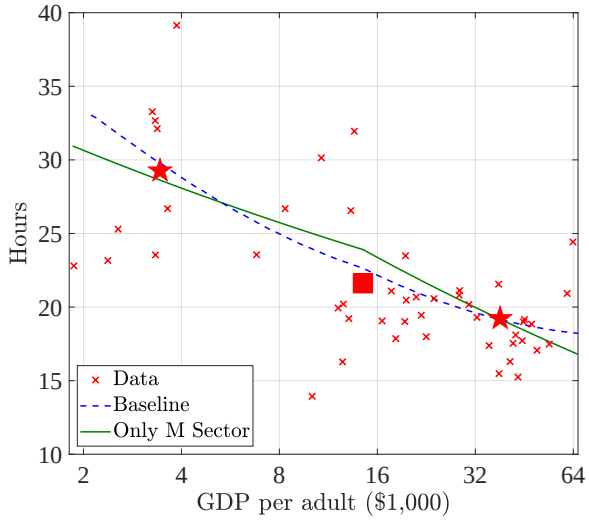
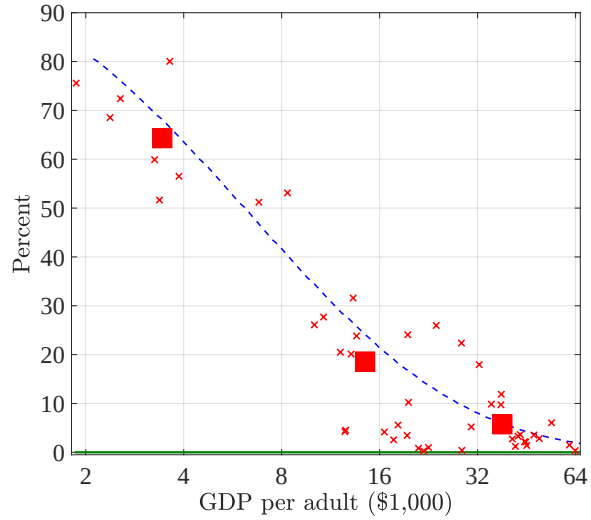
Importance of Structural Change: Omit Traditional Sector

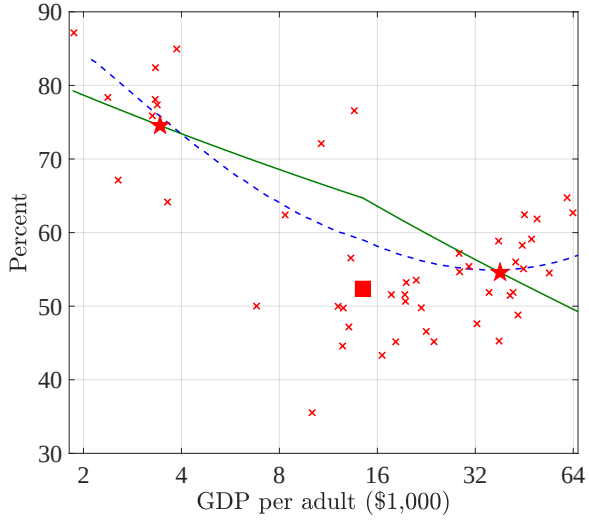
(a) Hours Worked per Adult



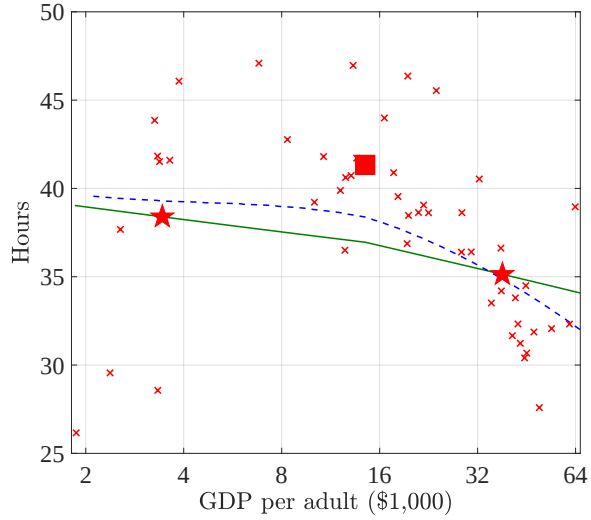
(b) Traditional sector share



(c) Employment Rate



(d) Hours per Worker



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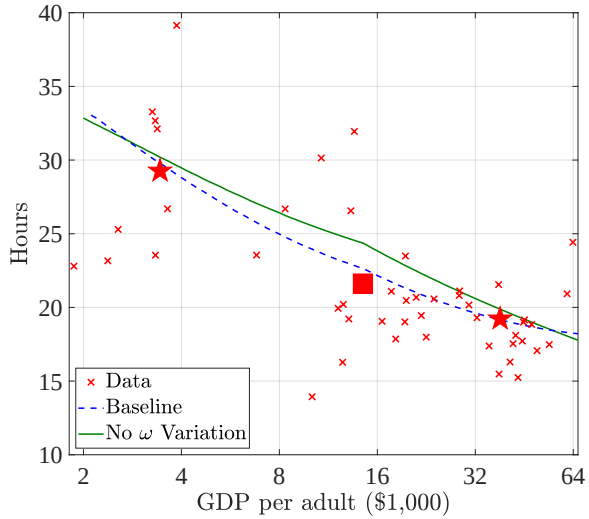
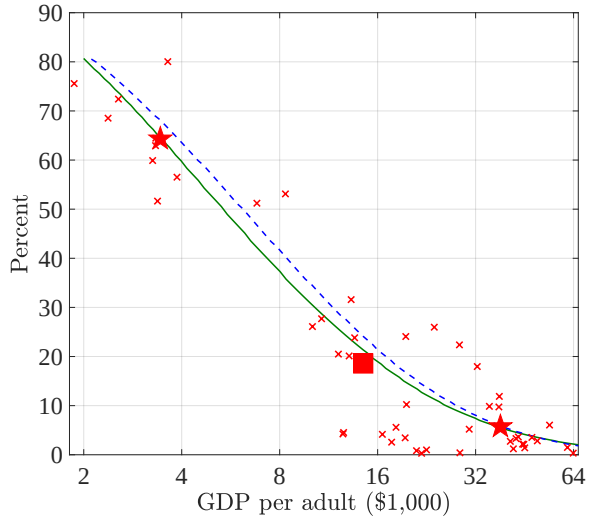
Importance of Structural Change: Omit Variation in Fixed Costs

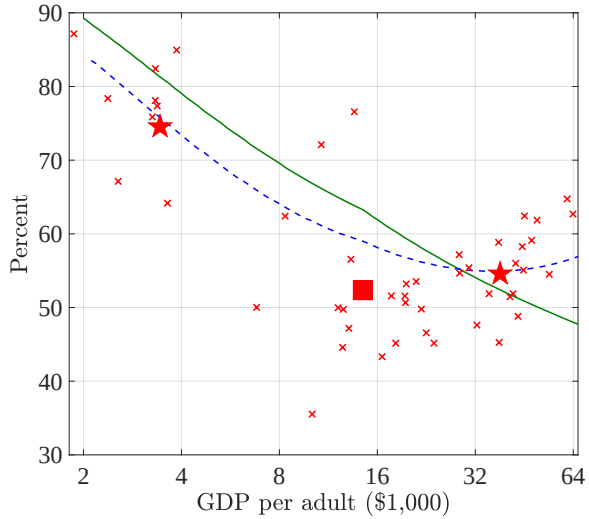
(a) Hours Worked per Adult



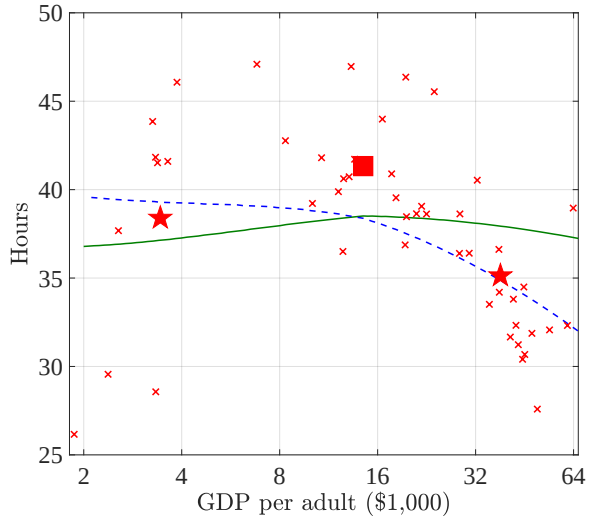
(b) Traditional sector share



(c) Employment Rate



(d) Hours per Worker



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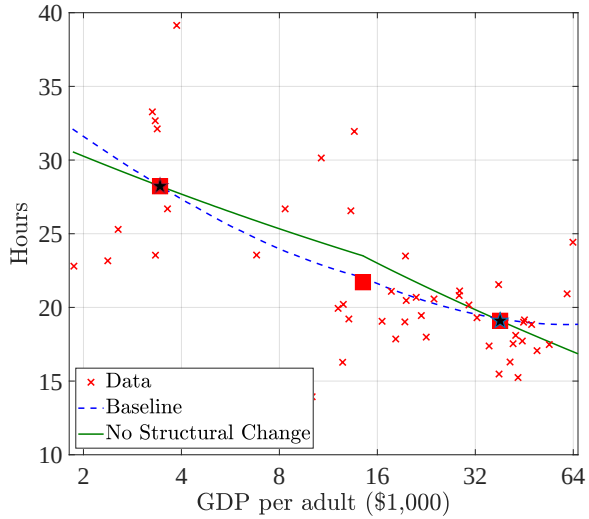
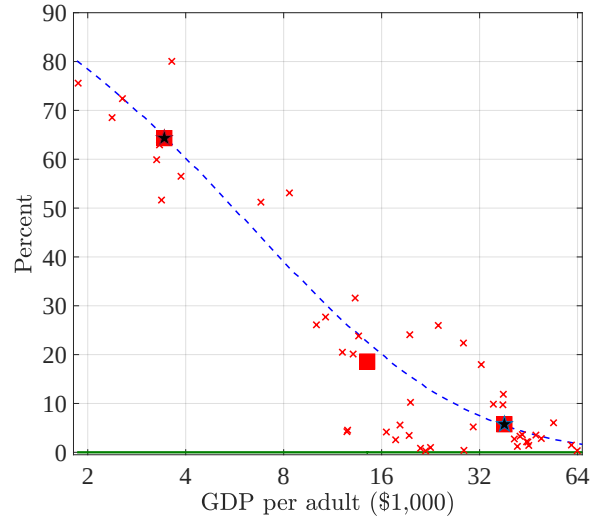
Omit T Sector and Variation in Fixed Costs

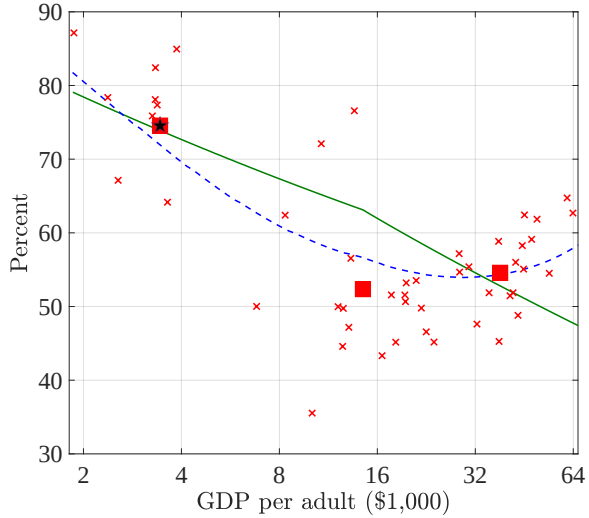
(a) Hours Worked per Adult



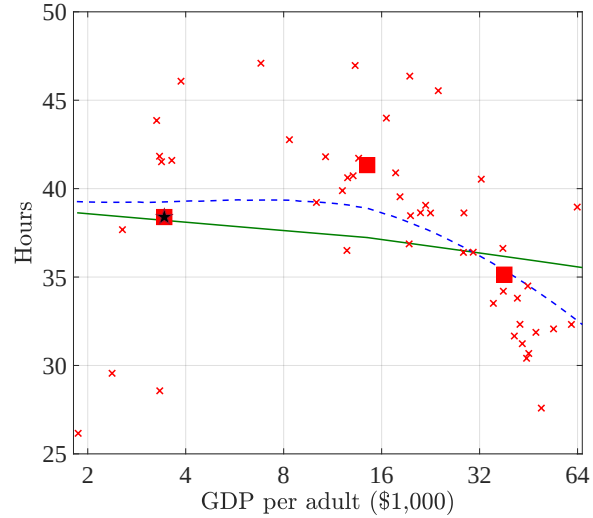
(b) Traditional sector share



(c) Employment Rate



(d) Hours per Worker



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Decomposition Poor-Rich: All Permutations

	Hours			% Explained		
	Mean	Min	Max	Mean	Min	Max
Model	9.9			100.0		
Higher Productivity	5.7	5.3	6.2	57.6	53.5	62.7
Higher Taxes & Transfers	2.3	2.1	2.5	23.2	21.2	25.3
Lower Fixed Costs	-2.4	-3.1	-1.8	-24.2	-31.3	-18.1
Sectoral Reallocation	4.3	4.3	4.3	43.4	43.4	43.4

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Decomposition Poor-Middle: All Permutations

	Hours			% Explained		
	Mean	Min	Max	Mean	Min	Max
Model	6.3			100.0		
Higher Productivity	3.3	3.1	3.5	52.4	49.2	55.5
Higher Taxes & Transfers	0.7	0.6	0.8	11.1	9.5	12.7
Lower Fixed Costs	-1.2	-1.4	-1.0	-19.0	-22.2	-15.9
Sectoral Reallocation	3.5	3.5	3.5	55.6	55.6	55.6

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Decomposition Middle-Rich: All Permutations

	Hours			% Explained		
	Mean	Min	Max	Mean	Min	Max
Model	3.6			100.0		
Higher Productivity	2.5	2.1	2.8	69.4	58.3	77.8
Higher Taxes & Transfers	1.6	1.4	1.8	44.4	38.9	50.0
Lower Fixed Costs	-1.2	-1.7	-0.8	-33.3	-47.2	-22.2
Sectoral Reallocation	0.8	0.8	0.8	22.2	22.2	22.2

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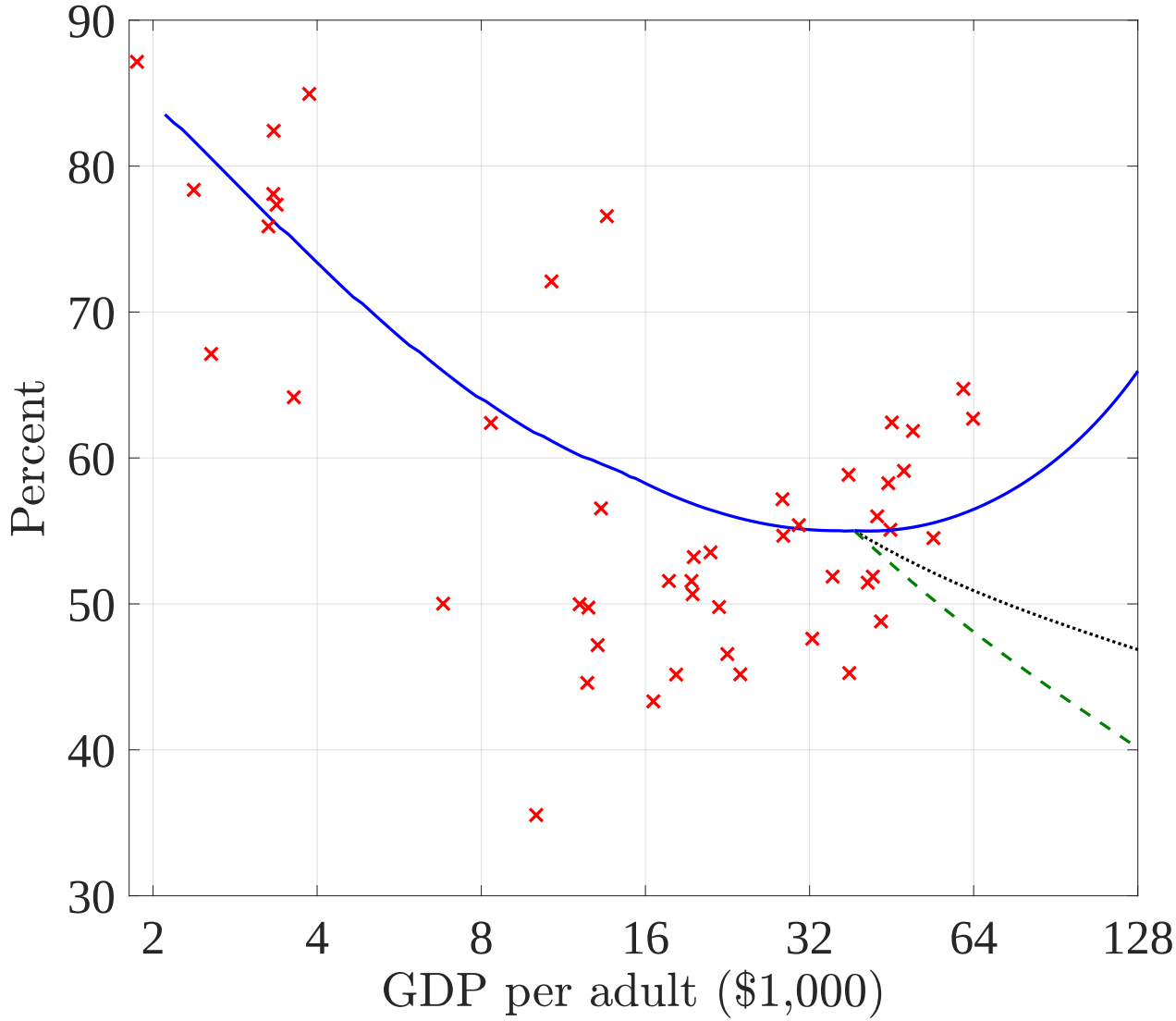
Model Predictions for Future Employment Rates



- Decreasing fixed costs lead to increasing employment rates

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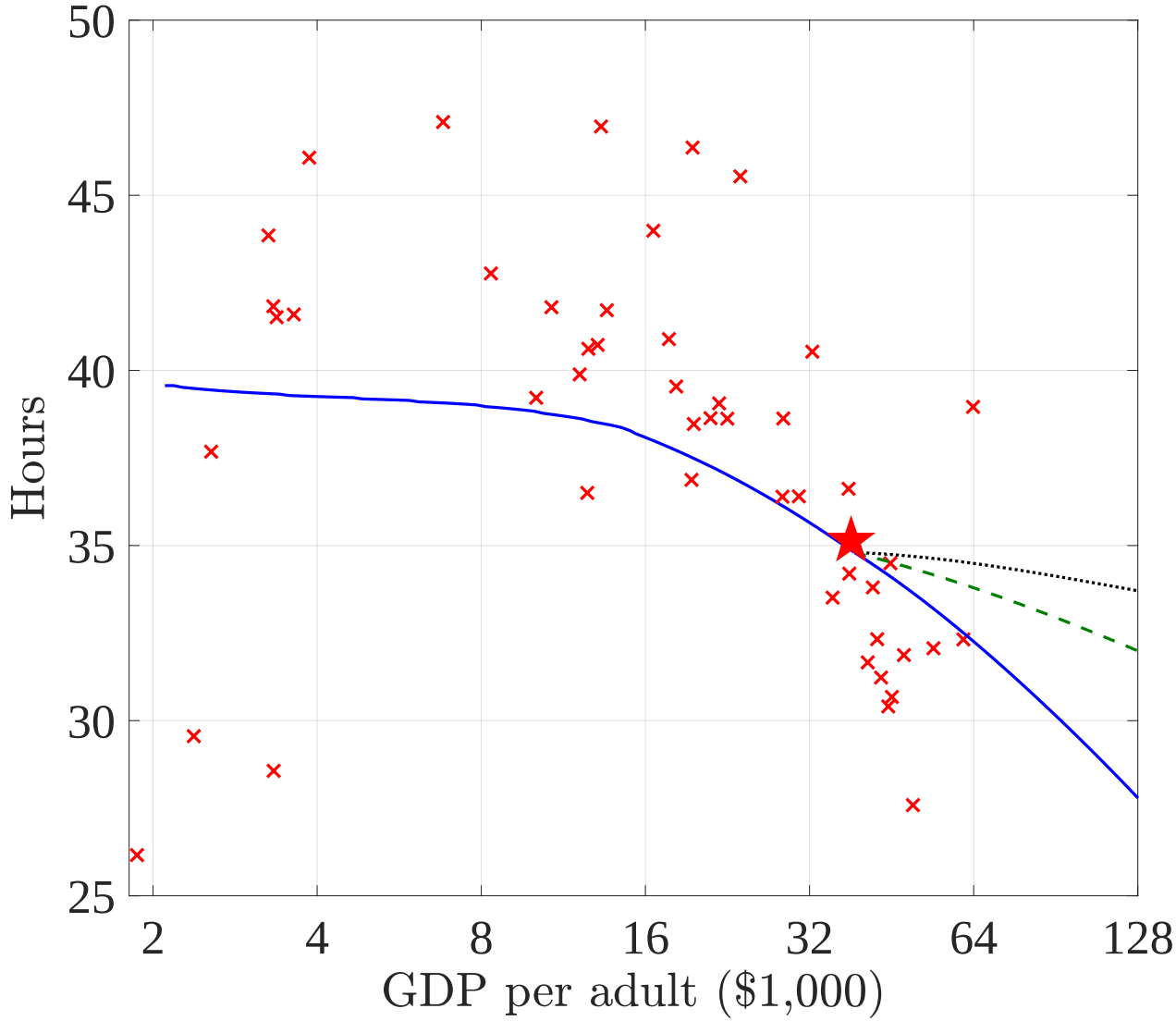
Model Predictions for Future Hours per Worker



- For hours per worker, all three driving forces go in same direction

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Fact 4: Within-Country Hours-Wage Elasticities Turn from Negative to Positive

Individual Hours-Wage Elasticities by Country

- Do low-wage workers work longer hours than high-wage workers?

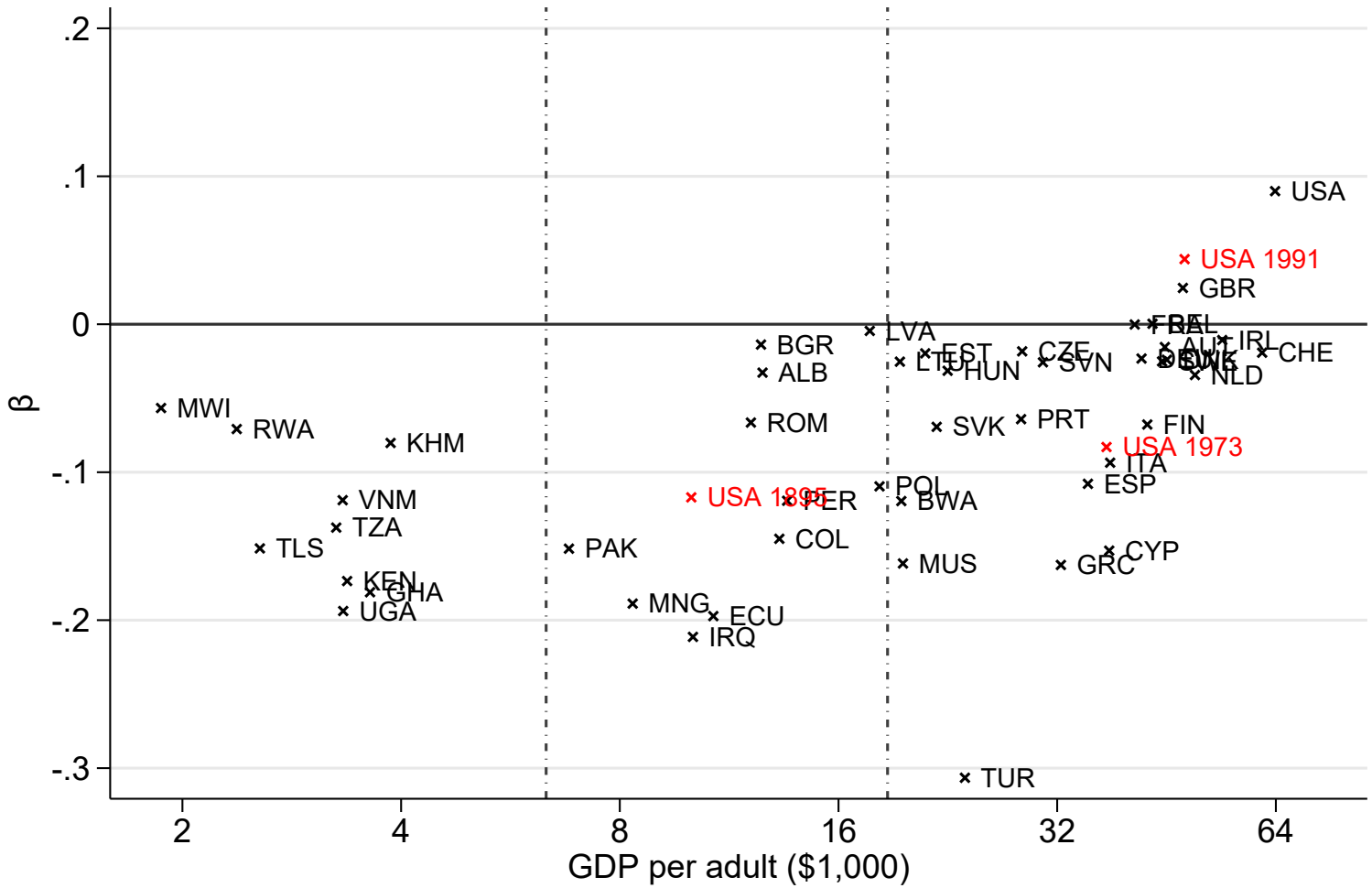
- Run regression country by country:

$$log\left(h_i\right) = \alpha + \beta log\left(w_i\right) + \delta_1 age_i + \delta_2 age_i^2 + \epsilon_i$$

- Costa (2000) runs same regression on historical US data

division bias

Country-Specific Elasticities of Hours to Wages



- Elasticity negative for most countries, positive for richest
- Cross-country evidence in line with US time-series evidence