

Gendered Labor Transitions within Agri-food Value Chains

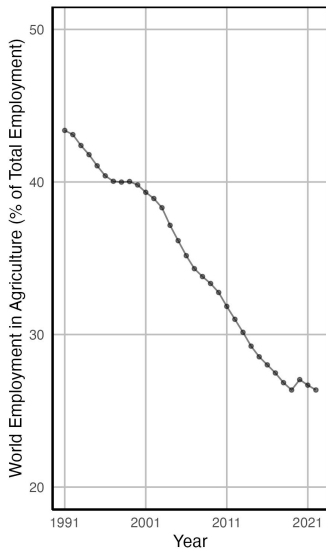
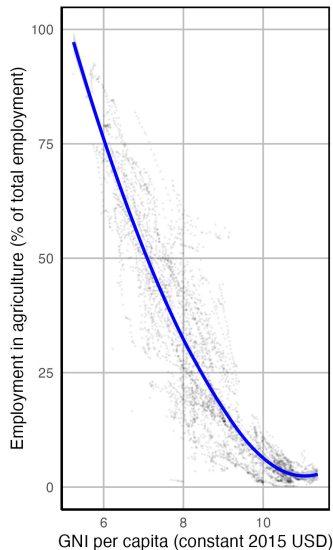
Shiyun Jiang, Jing Yi, Patrick Canning and Christopher B. Barrett

32nd International Conference of Agricultural Economists

New Delhi, India | August 5, 2024

This research was funded in part through Cooperative Agreement number 58-4000-1-0080 between Cornell University and the U.S. Department of Agriculture Economic Research Service. The findings and conclusions in this presentation are those of the authors and should not be construed to represent any official USDA or U.S. Government determination or policy.

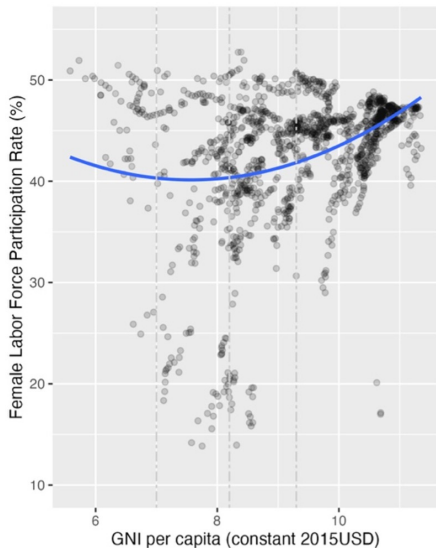
Structural Transformation



Structural Transformation = a shrinking agricultural share of workforce

- As ag TFP \uparrow & income \uparrow labor exits ag
- Post-farmgate share of consumer food expenditures also rises (Yi et al. 2021)
- Thus post-farmgate employment w/n AVCs may be stable/growing even as primary production employment falls (Yi et al. 2024)

Female Labor Force Participation



Female labor force participation (LFP) follows U-shape as income \uparrow (Goldin 1995, Ngai et al. 2024)

But women and men transition differently

- Female: agriculture \downarrow , services \uparrow
- Male: agriculture \downarrow , manufacturing \uparrow

▸ (Ngai, Olivetti and Petrongolo, 2024)

Note: LIC < 7 LMIC [7, 8.2]
UMIC [8.2, 9.3] HIC > 9.3

This Paper

- Combining these patterns implies gendered labor transitions within AVCs. Little presently known on this empirically.
- We document stylized facts for 108 countries, 1993-2021, on gender composition of employment across AVC sectors and how evolves w/ ag TFP \uparrow & income \uparrow .
- Has important implications for economywide gender earnings gap

Central findings:

- Women move more from primary production to consumer-facing retail and food service jobs, while men move more to midstream manufacturing, transport, and wholesaling.
- Midstream jobs pay better than primary prod'n or downstream (Yi et al. 2024)
- Abstracting from gender wage discrimination for same jobs, gendered inter-industry labor transitions within AVC imply that **female/male earnings ratio falls**.

Data

- Labor Data

Source: ILOSTAT: Employment by sex and economic activity – ISIC level 2 – Annual

▶ Definitions

- Industry-specific Average Compensation (real USD/worker) within AVCs

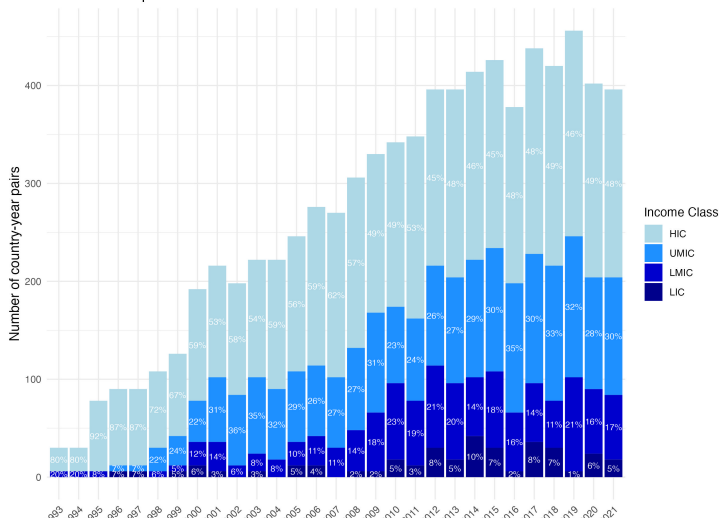
Source: decomposed by the expanded Global Food Dollar method (Yi et al. 2024), based on the Eora MRIO tables (Lenzen et al., 2012 & 2013) ▶ MRIOs

- Other explanatory variables (real GNIpc), mainly from World Bank, plus Ag TFP from USDA ERS

Data Coverage

Unbalanced panel data set

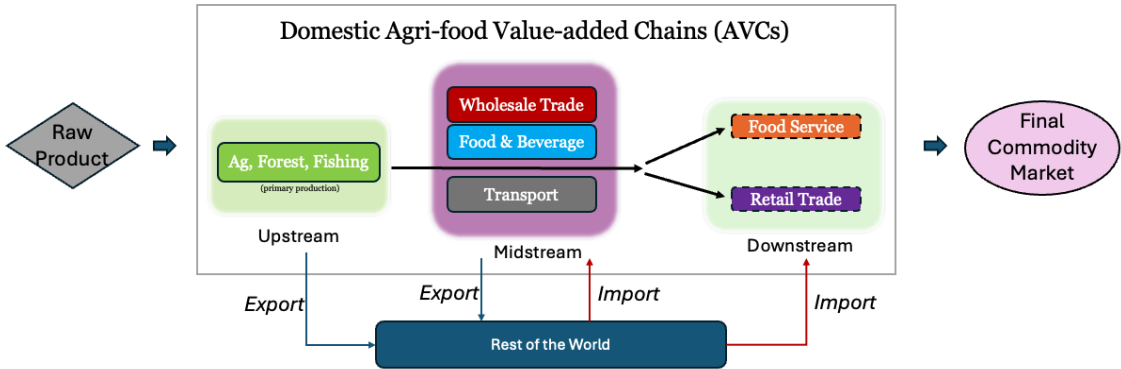
Distribution of pairs across income classes over time



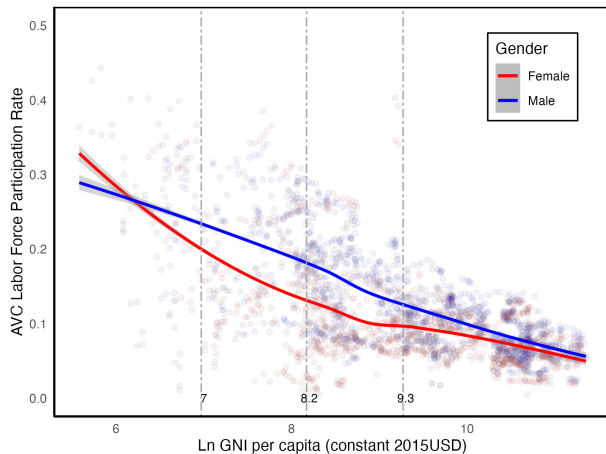
- Data cover **108 countries** over **29 years** (1993-2021) with GNI pc (2015\$), from \$265 to \$85,161.
- Together, all countries in this study represented **68%** of world's GNI and **66%** of world's population in 2020.
- Of observations in data set, **4.4%** LIC, **14.8%** LMIC, **28.0%** UMIC and **52.8%** HIC.

Agri-food Value Chains

AVC comprised of six distinct industries. We include international trade flows.



Results - Overall AVC LFP Rate by Gender ▶ Industry Share

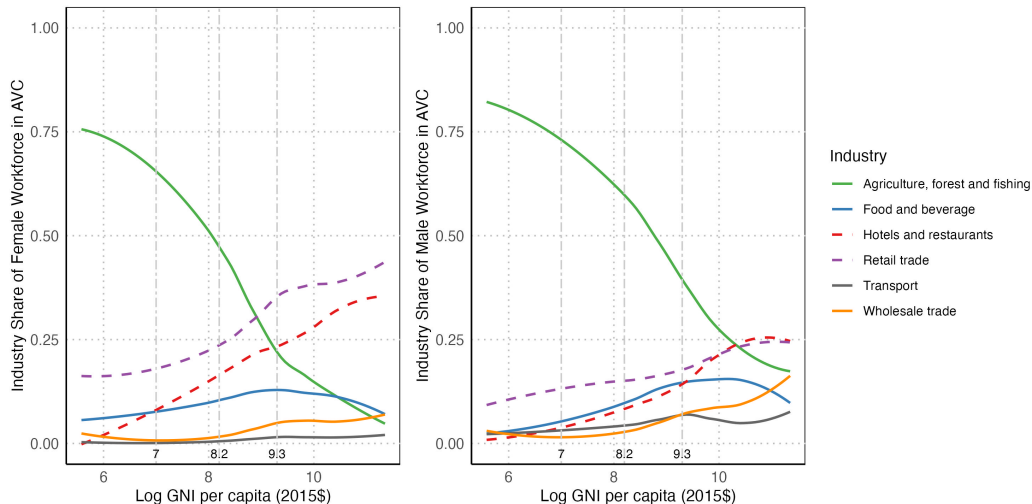


- At lowest income, women's AVC LFP > men's, each \approx 30-35% on average.
- As incomes rise, female AVC LFP falls faster than male.
- Decreases driven mainly by primary production exits.

Note: LIC < 7 LMIC [7, 8.2]
UMIC [8.2, 9.3] HIC > 9.3

Results - Industry Share of Employment

Inter-industry transition patterns similar, but levels/rates of Δ differ b/n men and women.



Results - Regression

Income growth, not ag TFP growth, drives gendered differences in AVC employment patterns. Main shift is from primary prod'n to consumer-facing jobs, esp. for women.

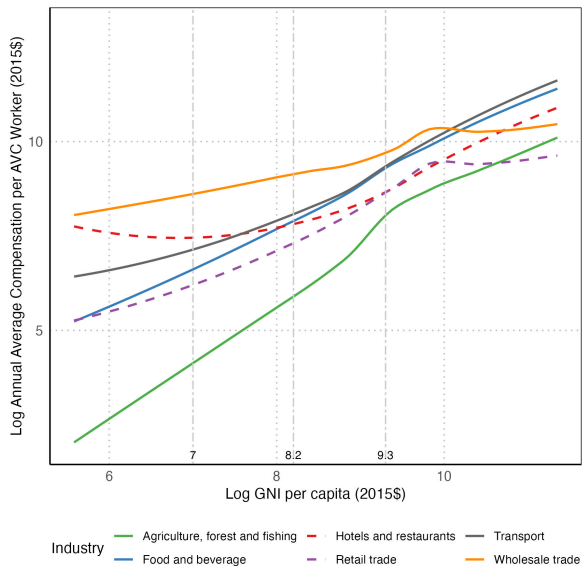
Table: Estimated Marginal Effects of GNI/AgTFP growth on Industry Emp Share within AVC

	GNI			TFP		
	Female	Male	Between	Female	Male	Between
Ag, forest and fishing	-0.151***	-0.148***		0.067	-0.150***	
Food and Beverage	0.005	0.022***	***	-0.025	0.002	
Hotels and restaurants	0.070***	0.062***		0.022	0.116***	
Retail trade	0.059***	0.031***	*	-0.045	0.066*	
Transport	0.004***	0.005**		-0.003	-0.009	
Wholesale trade	0.014***	0.028***	***	-0.016	-0.024	

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Symbol in Between = stat sig difference between genders (Male - Female).

Results - Annual Average Compensation

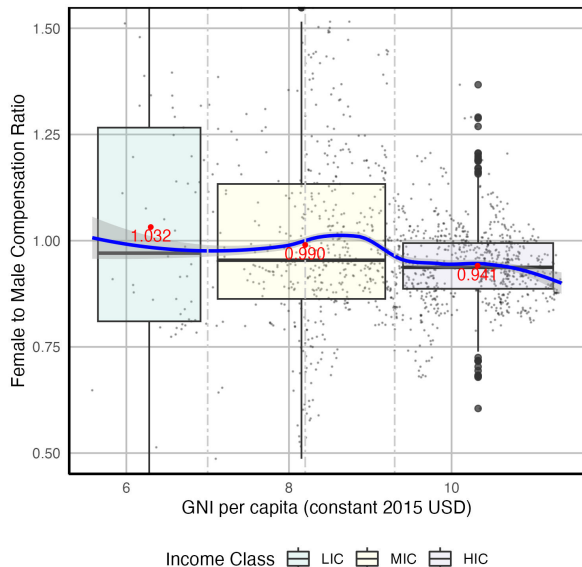


This matters!

- Female dominated AVC industries are relatively poorly compensated. Best compensated AVC jobs male dominated and the male bias reinforced by intersectoral labor migration.
- As avg. income grows, women move from poorly compensated primary production to slightly better compensated downstream, consumer-facing industries, while men move into best compensated midstream manufacturing and distribution jobs.

Figure from Yi et al. (2024)

Results - Female to Male Compensation Ratio



Gendered labor transitions within AVCs + differential avg. compensation b/n industries has big implication: **differential inter-industry labor migration widens the gender earnings gap with structural transformation!**

Abstract from gender pay differences w/n AVC industries (impose "same pay for same job"). Falling female/male compensation ratio results **purely** from gendered labor transitions.

Conclusions

As structural transformation advances, workers leave ag, while women exit then enter workforce, and workers' avg. earnings partly converge across industries.

Gendered transitions in AVC workforce composition are a stylized fact, driven more by D-side (income growth) than S-side (ag TFP growth). So are avg. compensation differences among AVC industries.

End result: women move to mildly better jobs, men to much better jobs and gender earnings gap w/n AVCs rises with structural transformation.

Thank you for listening!

Comments welcome: cbb2@cornell.edu

Results - Regression

▶ Back

Table: Summary Table of Relevant Coefficients for AVC LFP Rate

	GNI			TFP		
	Female	Male	Between	Female	Male	Between
Ag, forest and fishing	-0.036***	-0.045***	-0.010***	-0.023*	-0.049***	-0.026
Food and Beverage	-0.006**	-0.003	0.003***	0.004	0.0003	-0.004
Hotels and restaurants	-0.003	0.0001	0.003***	0.005	0.013***	0.008
Retail trade	-0.006*	-0.005*	0.001	-0.012	0.004	0.016
Transport	-0.004	-0.003	0.001	0.011**	0.004	-0.007
Wholesale trade	-0.004	-0.001	0.003***	0.009*	0.003	-0.006

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Estimates in Between columns are differences between gender (Male - Female), statistical significance levels are included.

Definitions - Employment

▶ Back

	Description	Source
Employment	a) paid employment (whether at work or with a job but not at work); b) self-employment (whether at work or with an enterprise but not at work)	ICLS (2013)
Labor force	$Employment + Unemployment = Age15+$ population	ICLS (2013)
Compensation of employees	wages and salaries + social insurance contributions payable by employers	SNA (2008)
Total EMP in AVC	$\sum_{i=1}^6 (Females_i + Males_i - Other_i)$	in this paper

Table: Definitions of Key Variables

Definitions - Sectors

▶ Back

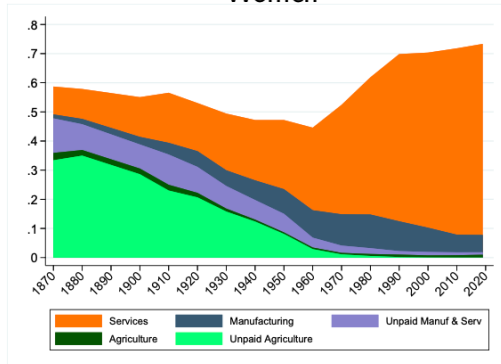
Sector	Description
A01T02	Agriculture, forest and fishing
A04	Manufacture of food products and beverages
A16	Wholesale trade
A17	Retail trade
A18	Accommodation, food and beverage service activities
A19	Transport

Table: Definitions of AVC Sectors

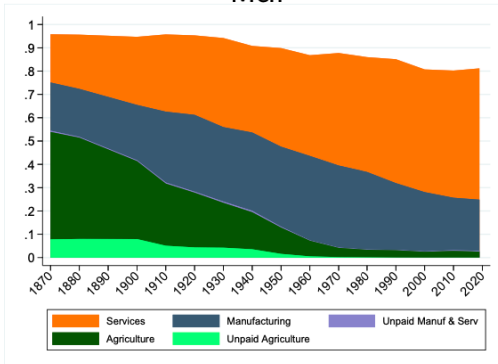
Historical Employment Transition by Gender in US

▶ Back

Women



Men

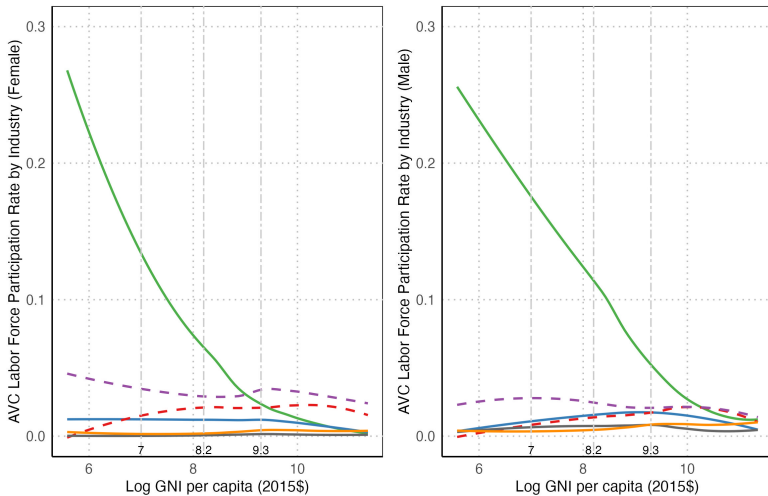


(Ngai, Olivetti and Petrongolo, 2024)

Results - AVC LFP Rate

▶ Relevant Coefficients

▶ Back



Industry

- Agriculture, forest and fishing
- Hotels and restaurants
- Transport
- Food and beverage
- Retail trade
- Wholesale trade