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Trade Effects on Agricultural Labor: Implications of CETA for U.S. Agricultural Exports

Caitlyn Carrico and Marinos Tsigas

Selected Paper prepared for presentation at the EAAE XV Congress, "Toward Sustainable Agri-Food Systems: Balancing between Markets and Society", August 29 – September 1, 2017 in Parma, Italy.

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IATRC Symposium: CETA, Food Safety Standards, and Environmental Standards
XV EAAE Congress

1 September 2017

Disclaimer: This research presents hypothetical scenarios and represents the authors' personal analysis. The research presented and the authors' analysis should not be taken as the viewpoints of prior or present employers.

Key Questions

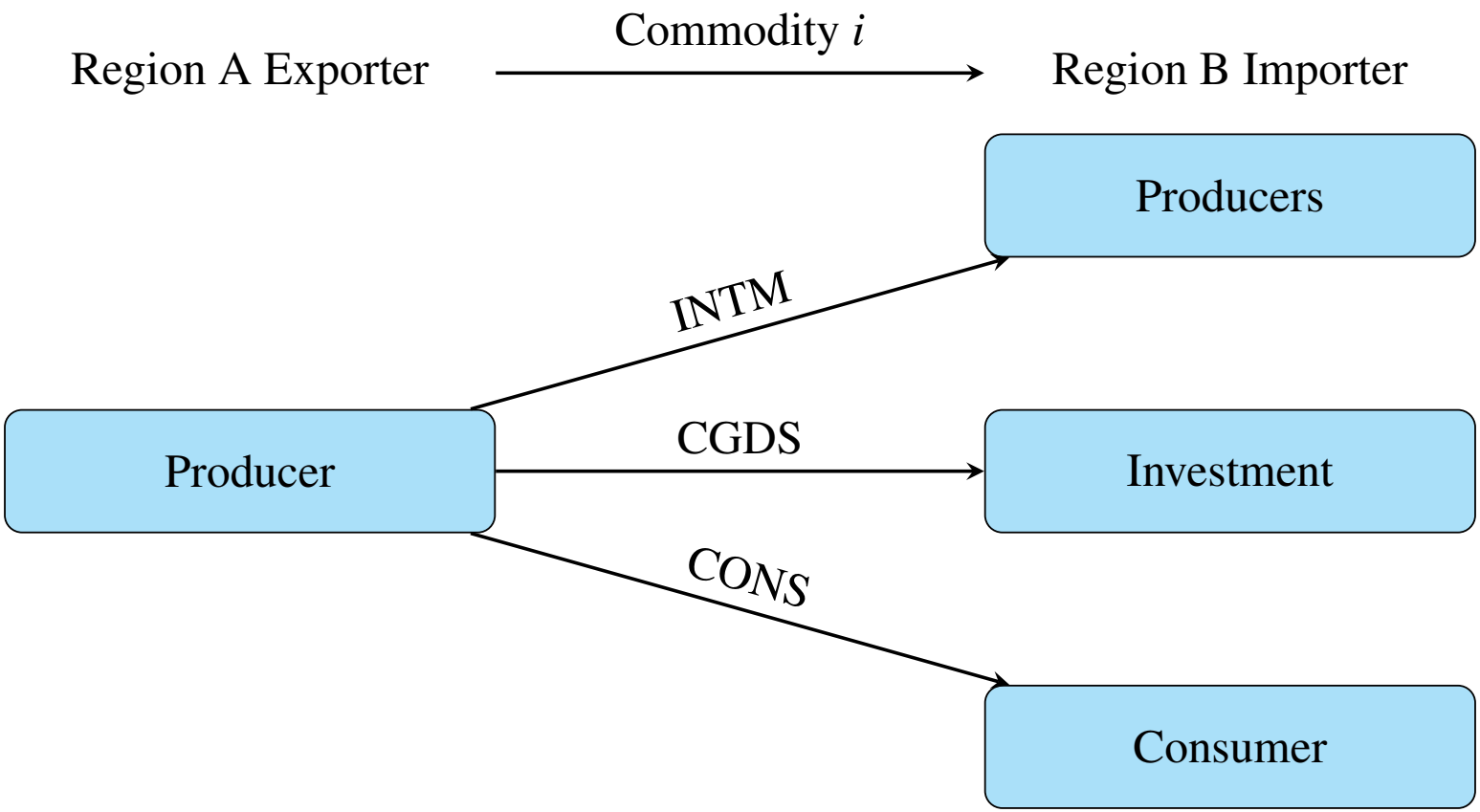
1. How does international trade affect workers ?
   - employment and wage effects
2. What framework to analyze these questions ?
   - multi-regional input-output (MRIO) framework
3. What insights can be gained from occupational distinction ?
   - distribution effects of trade across workers
4. How do trade shocks affect agricultural workers ?
   - CETA: effects of ag exports from US to Canada

Contributions

- Popular media has highlighted a backlash against trade
- Economic literature has shown nuanced implications of trade for labor
  - wage/emp effects Chinese import competition (Autor, Dorn, and Hanson 2013)
  - stronger effects at low end of wage distribution (Autor, Dorn, Hanson, and Song 2014)
  - sectoral, regional effects (Caliendo, Dvorking, and Parro 2015)
- Depart from typical dialogue on implications of import competition for manufacturing
- Examine distributional effects of trade across occupations in supply chain analysis with a focus on trade shocks in agricultural markets and on agricultural workers

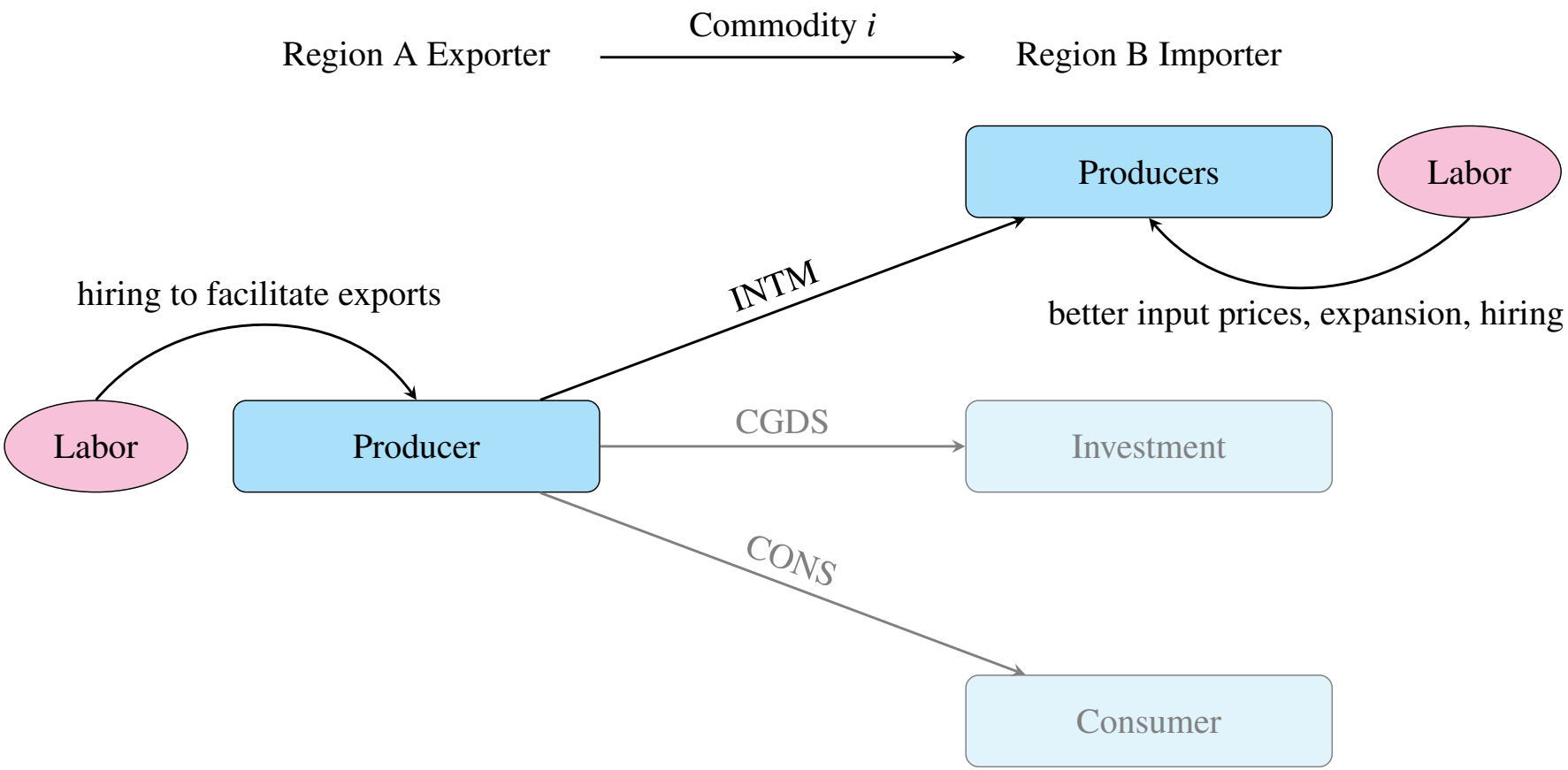
Trade in MRIO Framework

direct cross-border linkages between suppliers and purchasing agents
distinction between trade flows for each purchaser



Labor in MRIO Framework

labor affected through supplying and purchasing producers



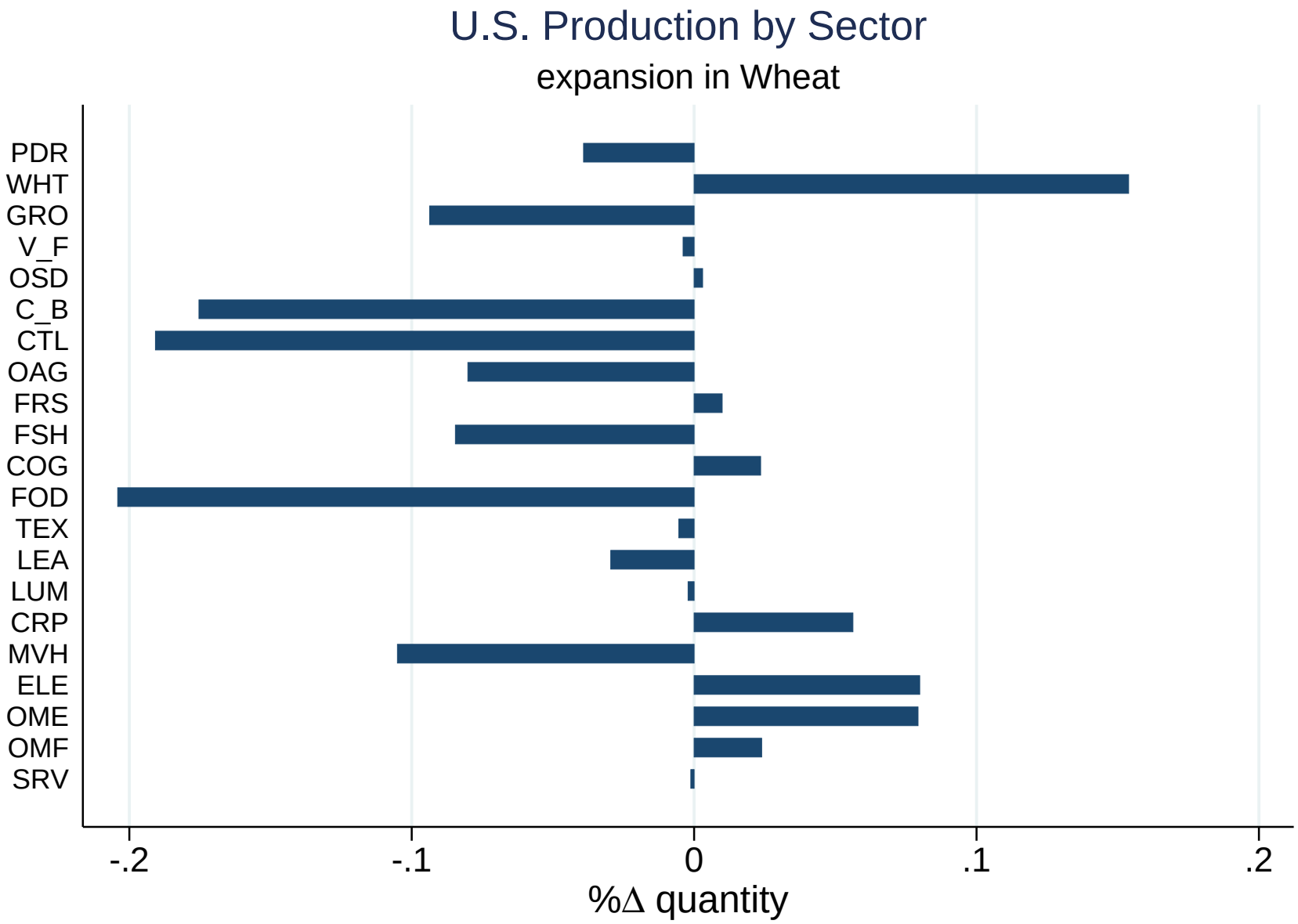
Detailed U.S. Labor Statistics by Industry and Occupation

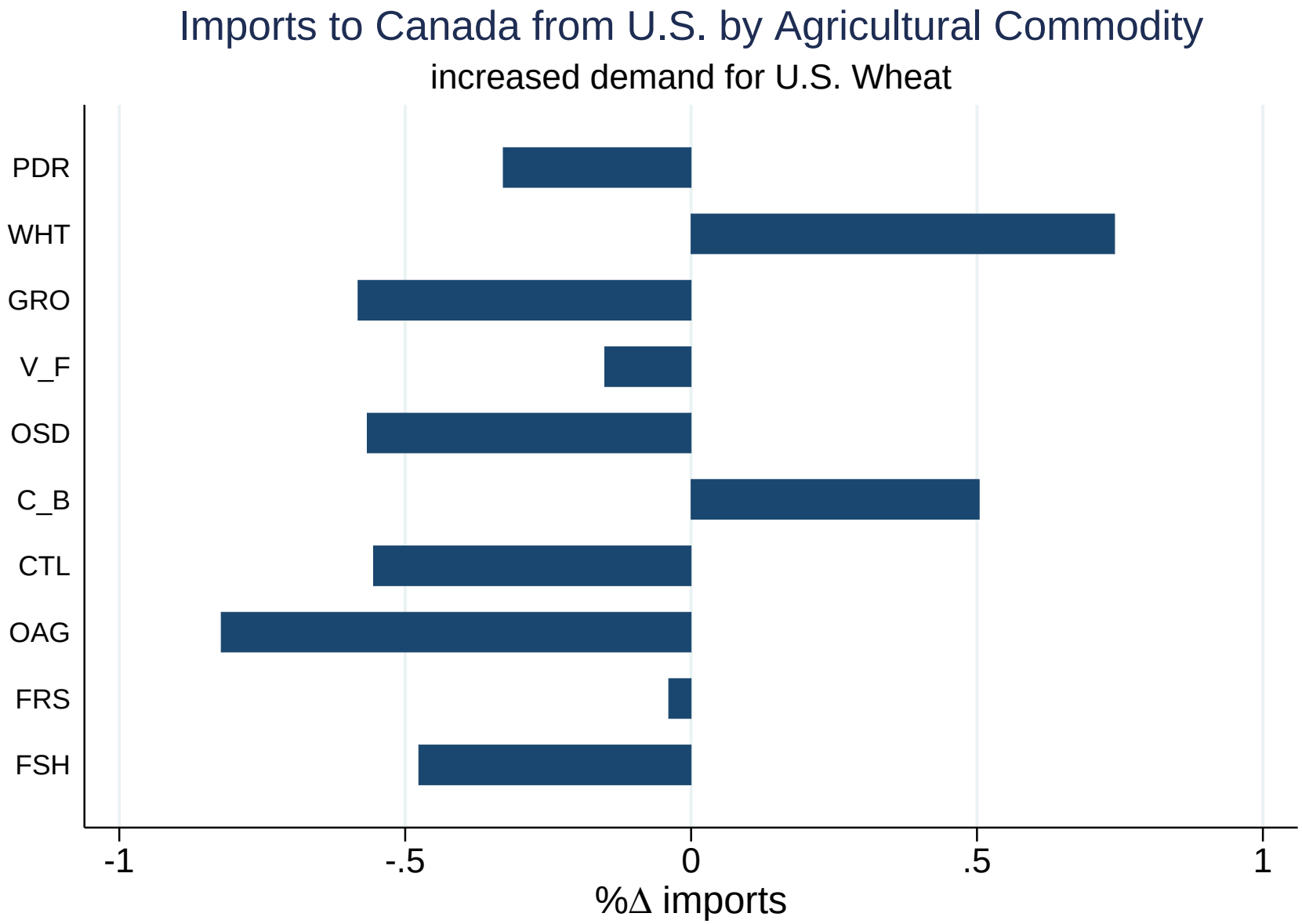
Carrico and Tsigas (*Economic Modelling* 2014)

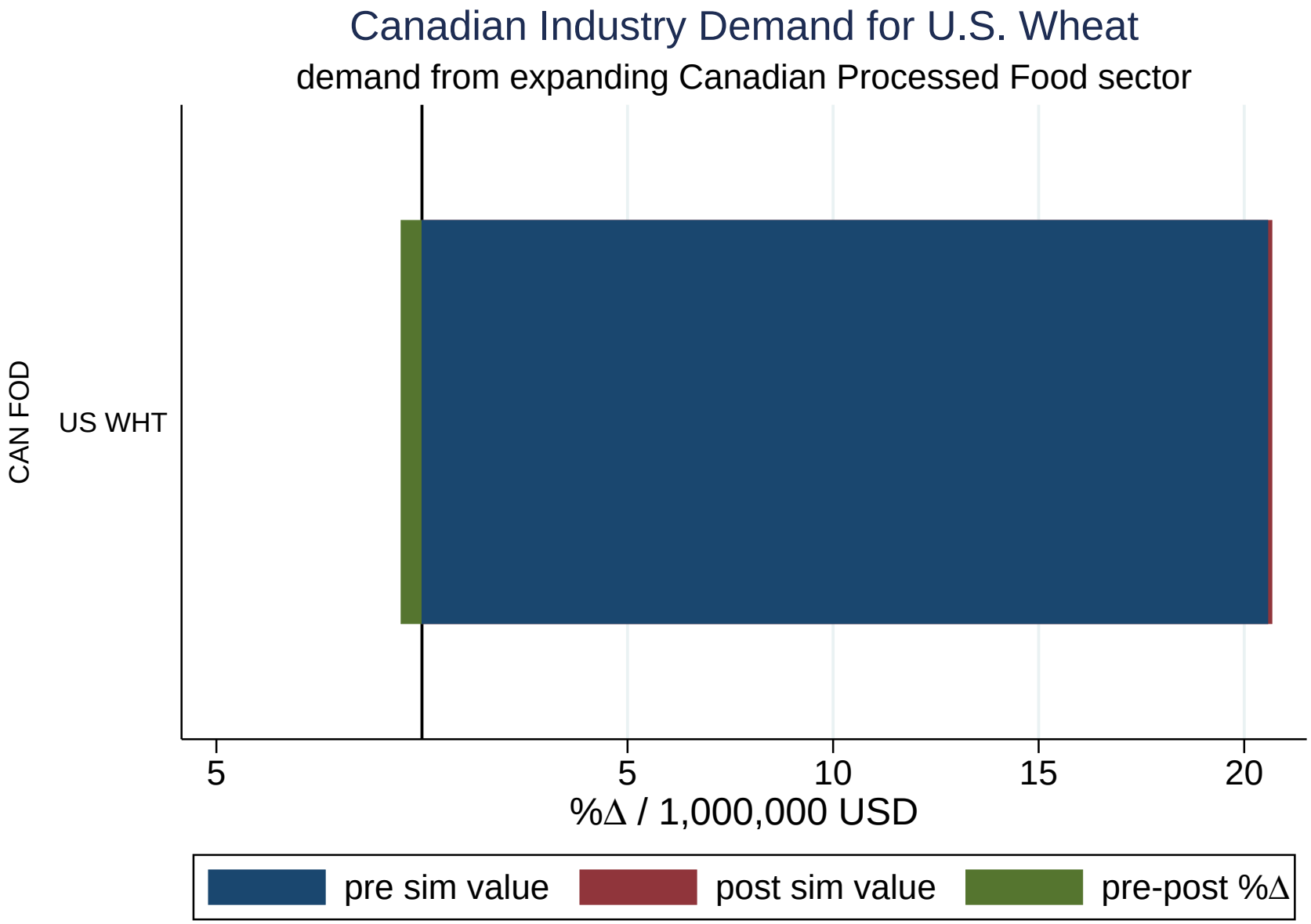
- US BLS Occupational Employment Statistics (OES) Survey
  - manufacturing and service sectors (NAICS)
  - non-farm establishments
  - number of employees, annual wages
- USDA 2007 Census of Agriculture
  - number of farm operators and hired workers
  - hired labor wages from farm production expenditure
  - operator wages from OES
- Compute wagebill from OES and USDA data
- Apply occupational shares by industry to U.S. wagebill in GTAP Data Base v9 (global trade, IO and national account statistics)

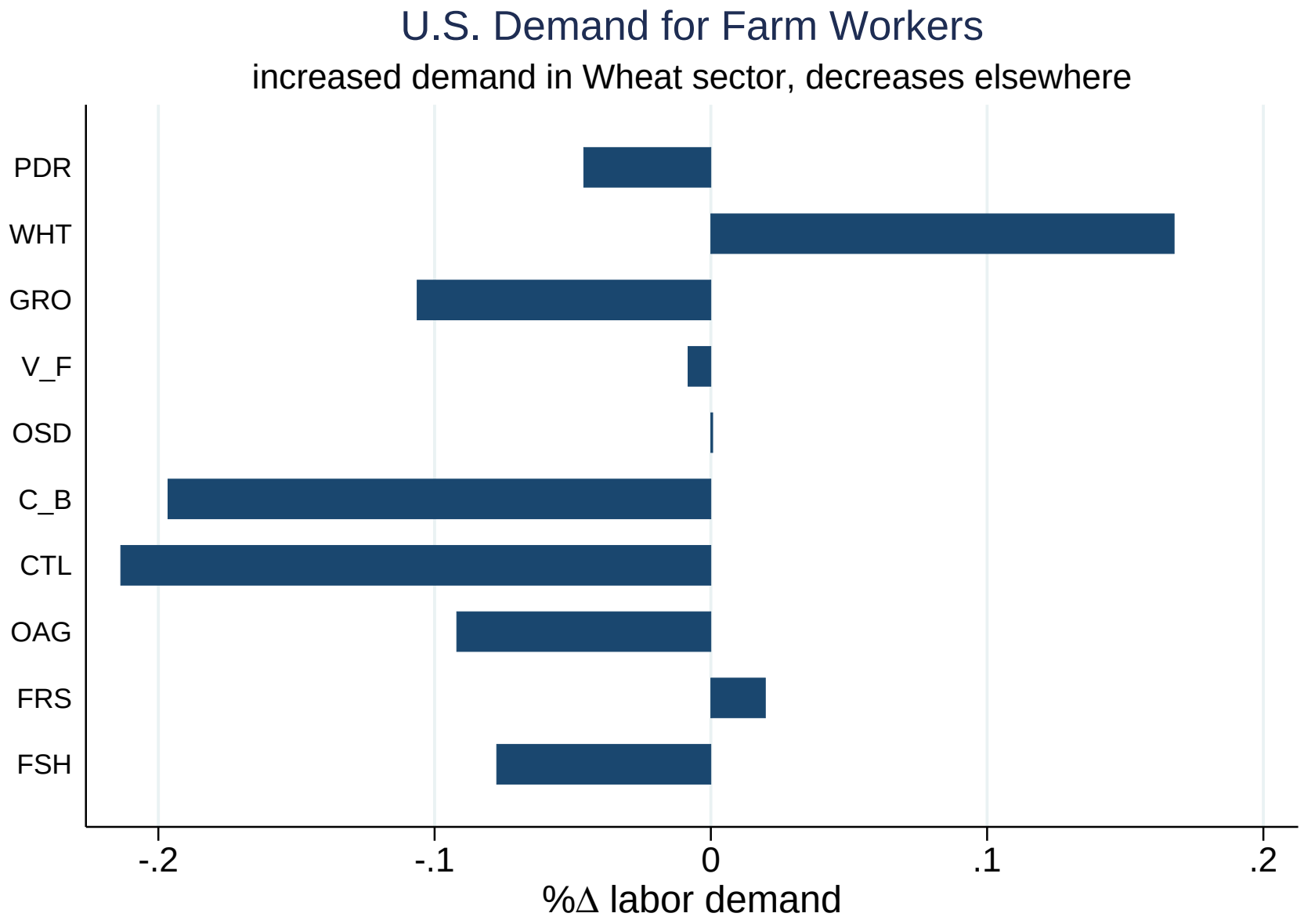
Illustrative Scenario: Comprehensive Economic and Trade Agreement

- CETA
  - Canada-EU trade agreement
  - Canada signed Oct. 2016, EU ratified Feb. 2017, awaiting national approvals
- Tariff removal on merchandise trade between Canada and the EU
  - GTAP Supply Chain Model: direct supplier-purchaser linkages following MRIO structure
  - Simplified scenario to illustrate MRIO linkages: excludes reductions in non-tariff barriers
- Closure - modelling assumption
  - Fixed labor supply (no unemployment)
  - Labor reallocation between sectors
  - Economy-wide wage effects


U.S. Production by Sector
expansion in Wheat
PDR
WHT
GRO
V_F
OSD
C_B
CTL
OAG
FRS
FSH
COG
FOD
TEX
LEA
LUM
CRP
MVH
ELE
OME
OMF
SRV
-.2
-.1
0
.1
.2
%Δ quantity

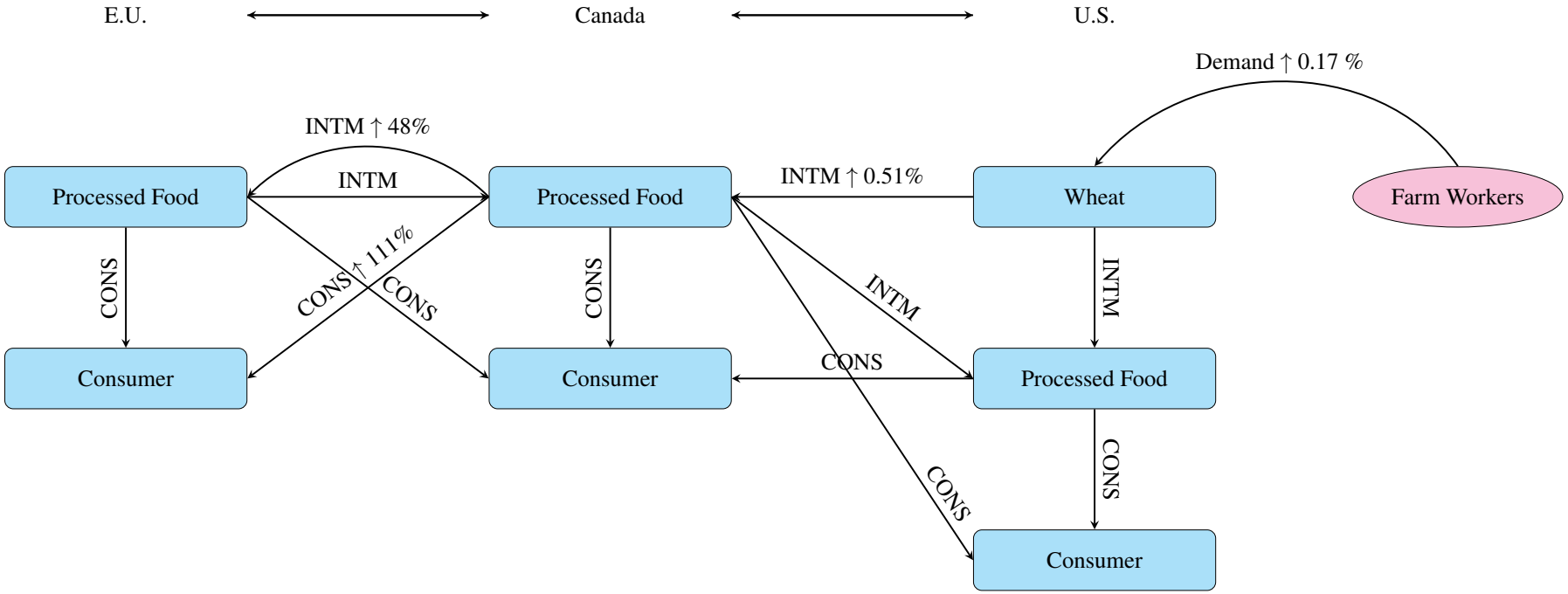

Imports to Canada from U.S. by Agricultural Commodity
increased demand for U.S. Wheat
PDR
WHT
GRO
V_F
OSD
C_B
CTL
OAG
FRS
FSH
-1
-.5
0
.5
1
%Δ imports

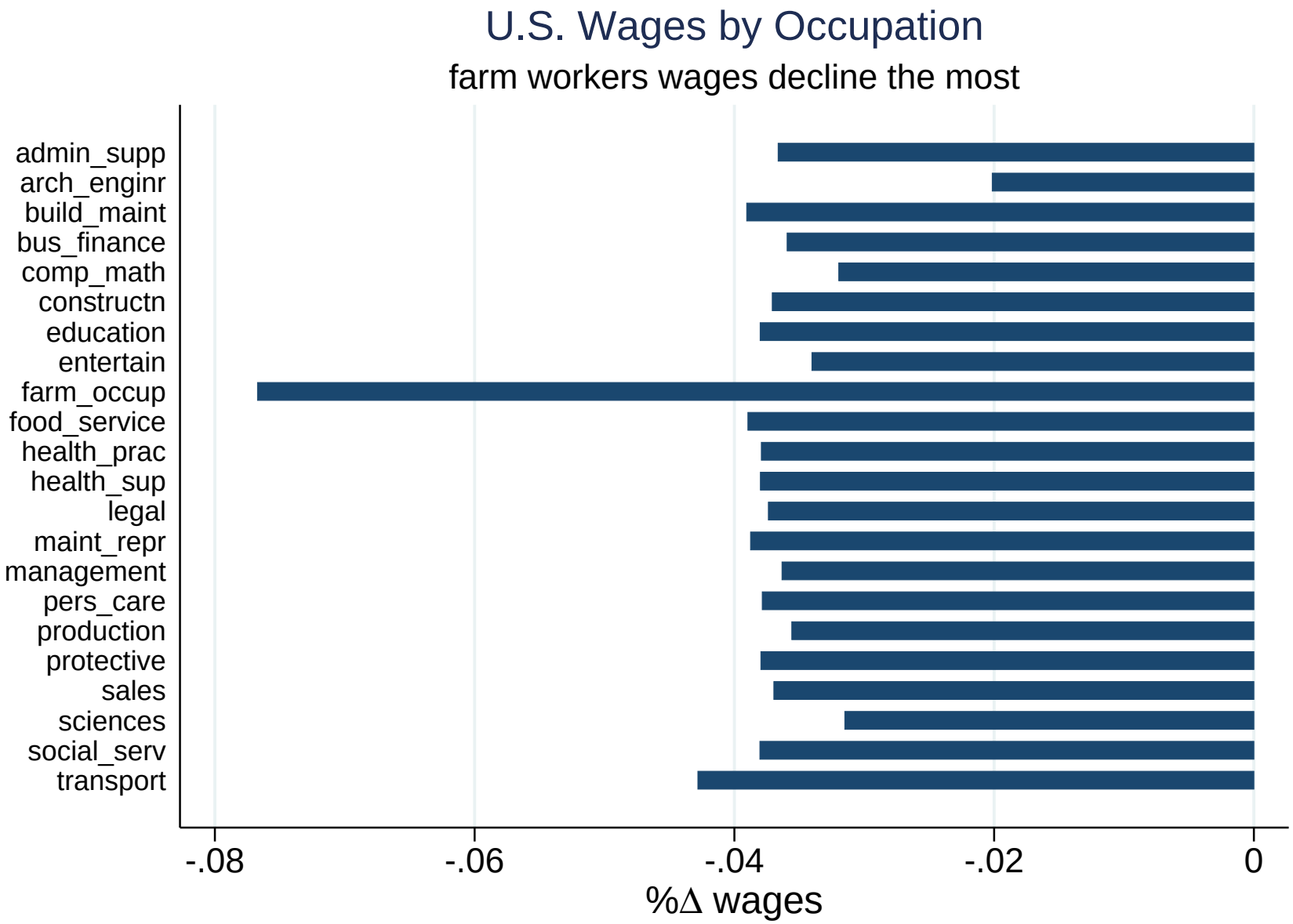

Canadian Industry Demand for U.S. Wheat
demand from expanding Canadian Processed Food sector
CAN FOD
US WHT
5
5
10
15
20
%Δ / 1,000,000 USD
pre sim value
post sim value
pre-post %Δ


U.S. Demand for Farm Workers
increased demand in Wheat sector, decreases elsewhere
PDR
WHT
GRO
V_F
OSD
C_B
CTL
OAG
FRS
FSH
-.2
-.1
0
.1
.2
%Δ labor demand

Supply Chain Effects

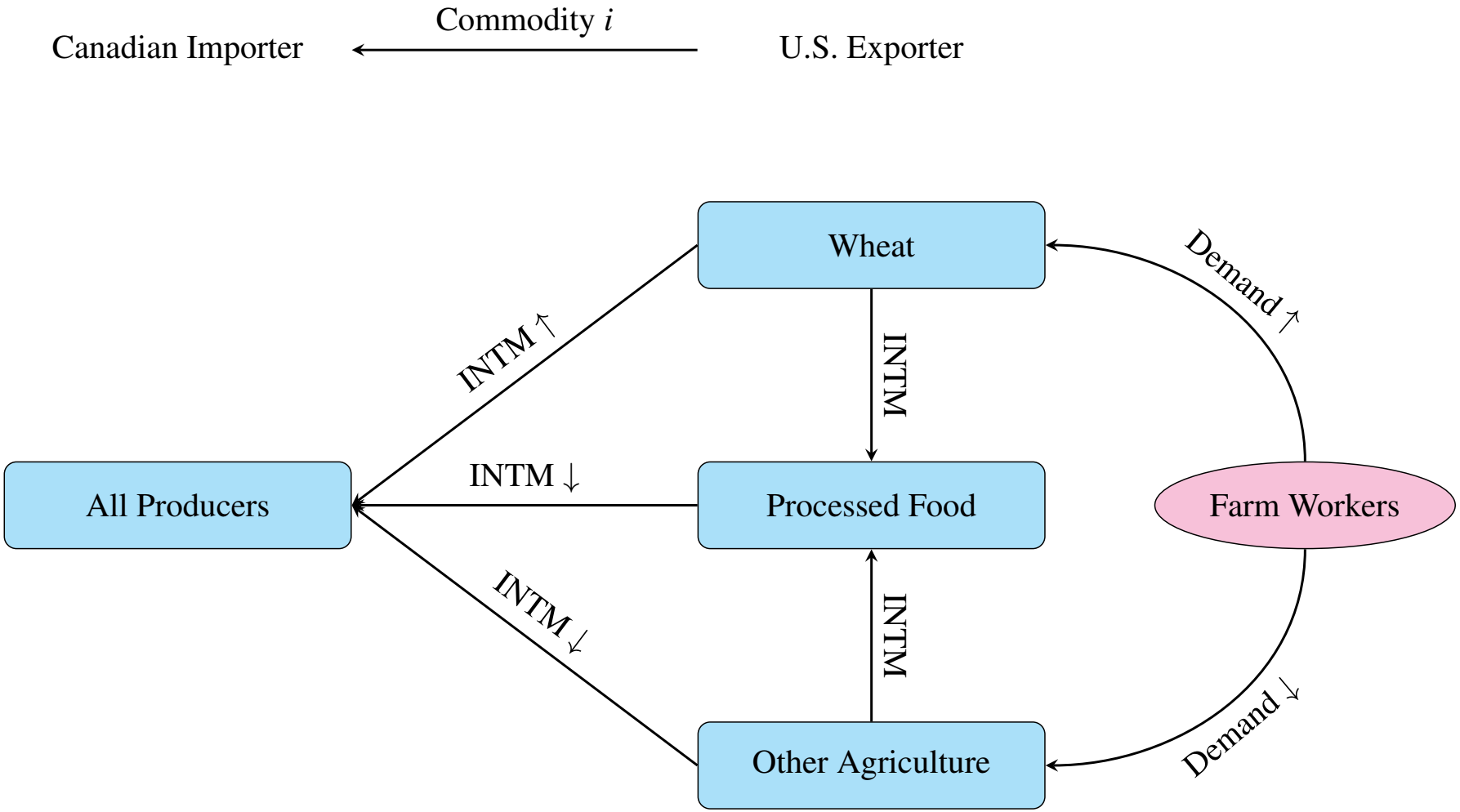
increasing demand for farm workers as wheat exports rise




U.S. Wages by Occupation
farm workers wages decline the most
admin_supp
arch_enginr
build_maint
bus_finance
comp_math
constructn
education
entertain
farm_occup
food_service
health_prac
health_sup
legal
maint_repr
management
pers_care
production
protective
sales
sciences
social_serv
transport
-.08
-.06
-.04
-.02
0
%Δ wages

Wage Effects

main employers (other ag sectors) contract
fixed labor supply - flooded market - wages decline



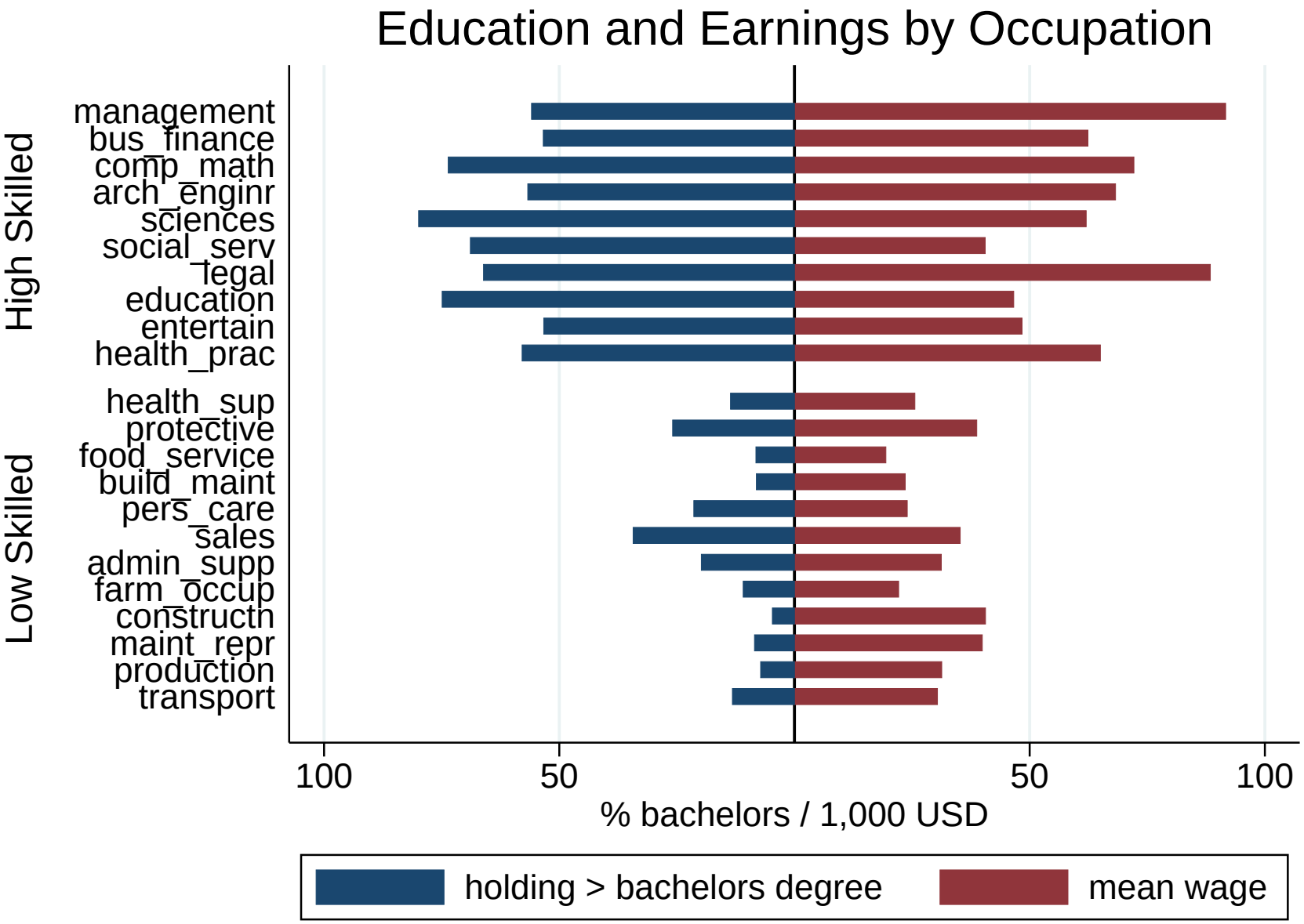
Labor Review

- Labor in the supply chain: changes in labor demand
  - U.S. Wheat production expands with increasing exports to Canada
  - U.S. Wheat sector increases demand for Farm Workers
- U.S.-wide labor market effects: national wages
  - general wage decreases as economy-wide demand decreases with widespread sectoral contraction
  - wages for Farm Workers decrease the most as predominantly hired by contracting sectors

Conclusion

- Globalization (trade) backlash in popular media
- Economic literature finds nuanced effects of trade across workers/regions and over time, with focus on manufacturing
- This paper explores effects of CETA on U.S. agricultural labor
  - MRIO framework
  - 22 U.S. labor occupations - Farm Workers broken out
- Supply chain effects: increased hiring of Farm Workers by expanding U.S. Wheat sector
- Economy-wide effects: overall, U.S. Farm Workers wages decline relatively more

OCCU	Occupational Description
Management	Management occupations
Bus_finance	Business and financial operations occupations
Comp_math	Computer and mathematical occupations
Arch_enginr	Architecture and engineering occupations
Sciences	Life, physical, and social science occupations
social_serv	Community and social services occupations
Legal	Legal occupations
Education	Education, training, and library occupations
Entertain	Arts, design, entertainment, sports, and media occupations
Health_prac	Healthcare practitioners and technical occupations
Health_sup	Healthcare support occupations
Protective	Protective service occupations
Food_service	Food preparation and serving related occupations
Build_maint	Building and grounds cleaning and maintenance occupations
Pers_care	Personal care and service occupations
Sales	Sales and related occupations
Admin_supp	Office and administrative support occupations
Farm_occup	Farming, fishing, and forestry occupations
Constructn	Construction and extraction occupations
Maint_repr	Installation, maintenance, and repair occupations
Production	Production occupations
Transport	Transportation and material moving occupations


Education and Earnings by Occupation
High Skilled
Low Skilled
management
bus_finance
comp_math
arch_enginr
sciences
social_serv
legal
education
entertain
health_prac
health_sup
protective
food_service
build_maint
pers_care
sales
admin_supp
farm_occup
constructn
maint_repr
production
transport
100
50
50
100
% bachelors / 1,000 USD
holding > bachelors degree
mean wage