

Immigration Policy and Its Possible Effects on U.S. Agriculture and the Market for Hired Farm Labor: A Simulation Analysis

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The Question

- How much effect would immigration reforms that raise or lower supply of foreign-born labor have on...
 - Farm wages
 - Employment of authorized versus unauthorized?
 - Agricultural output
 - Agricultural exports
 - Wages and employment of other low-skill workers
 - GNP of authorized residents

What Share of Costs = Unauthorized Labor?

- ❑ Conflicting estimates of total number of farmworkers, and of share of labor that is family, legal hired, and unauthorized hired.
- ❑ Est. 2/3rds of **TOTAL** farm employment = **family members**. [NASS]
- ❑ Est. 2/3rds of **hired** crop workers are unauthorized. [NAWS]
- ❑ Many are seasonal, so in terms of FTEs it is not as high as 2/3rds.
- ❑ Apply 2/3rds to all farm commodities means that $2/3 * 1/3 = 22\%$ of TOTAL employment is unauthorized. Probably an upper bound.
- ❑ Labor costs = about 17% of total variable costs for all farms, but as high as 40% in fruits, vegetables, horticulture. [ARMS]
- ❑ Our modeling assumes that 14% of total FTEs = unauthorized, and that this accounts for about $0.14 * 0.17 = 2.4\%$ of total costs.

Using CGE modeling to address this question

- ❑ Need to model microeconomic substitution between different types of labor, and capital, taking account of differing amounts of reliance on unauthorized labor in different sectors.
- ❑ Reforms that affect only the agricultural sector (such as H-2A liberalization) should have small macroeconomic effects...
- ❑ But larger economy-wide reforms would have macroeconomic effects on demand for agricultural commodities.
- ❑ We use the USAGE Model, a Computable General Equilibrium model of the U.S. economy to capture both the micro- and macroeconomic effects of labor supply changes.

What is the USAGE Model?

- ❑ USAGE Model = USA General Equilibrium Model. Developed by Peter Dixon and Maureen Rimmer, Center for Policy Studies, Monash University, Australia.
- ❑ Initial collaboration in 2001 with the U.S. International Trade Commission (USITC). Refined through consultancies with USITC, Homeland Security, Commerce, USDA/ERS, and others
- ❑ <http://www.monash.edu.au/policy/mon-usa.htm>
- ❑ Full model has 500-sectors, 700 occupations. Our version has 70 sectors and 50 occupations, with full detail preserved for agriculture and “low-skill” occupations.

Factors of Production

- ❑ Three categories of labor:
 1. US Born (hence authorized)
 2. Foreign Born, Authorized
 3. Foreign Born, Not Authorized

- ❑ Capital: mobile, based on sector-specific rates of return.
 - ✓ Note: Capital stock is assumed to be fully utilized, which means this model cannot recreate current recessionary conditions. Applies to a “normal full-employment” context.

- ❑ Land: Assumed mobile between agricultural sectors, but not between agricultural and non-agricultural uses.

Labor Supply Dynamics

- ❑ At start of year, labor force participants can be:
 1. Employed in one of 5 high-skill or 45 low-skill US occupations.
 2. Unemployed in the US
 3. Employed in another country (generically “Mexico”)
- ❑ Supply of labor to each U.S. occupation is determined by occupation’s wage rate and preference matrix B:
B: Status last year → Offers to different occupations this year
- ❑ Changes in labor supply are implemented by manipulating parameters of the B-matrix.

Labor Demand Dynamics

1. Demand for labor by a given industry depends on:
 - Weighted average real before tax wage across the occupations needed by that industry
 - Capital stock, technology, commodity prices
2. Demand by occupation is allocated across workers of different immigration statuses:
 - Authorized & Unauthorized = close substitutes ($e=5.0$)
 - For Authorized: US & Foreign-Born = close substitutes ($e=7.5$)
 - Different occupations = poor substitutes ($e=0.35$)
3. Labor market does not always clear, because wages adjust slowly (about 5 years). But these short-run dynamics are not the focus of the analysis.

Two Policy Simulations, Compared to Baseline

- ❑ Simulation results are compared to a Baseline (“Business as Usual”) scenario, which assumes steady growth of US economy, and steady growth of the number of unauthorized workers, in line with past trends.

1. Expansion of H-2A visa program:

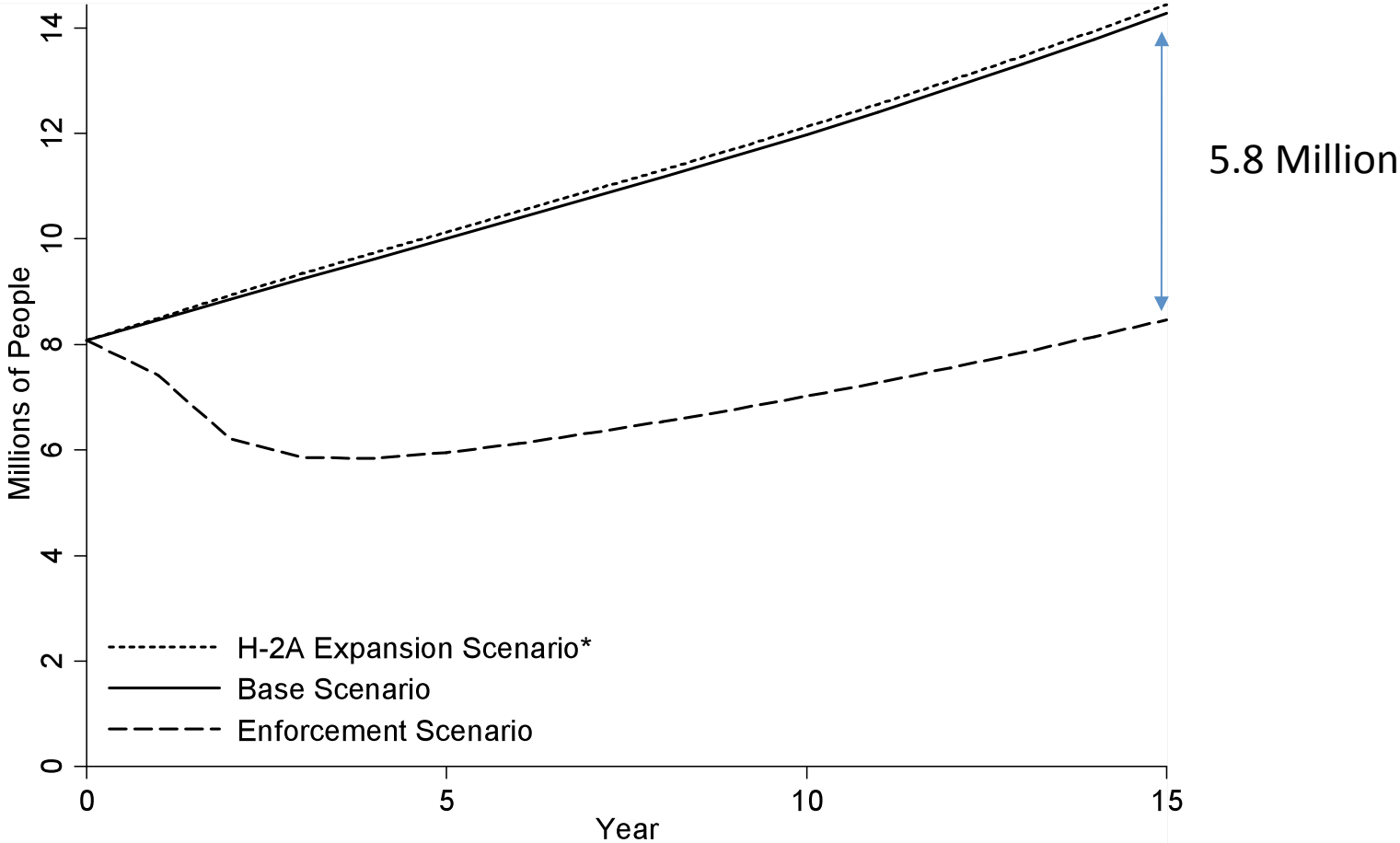
- Number of H-2A admissions (temporary, one-year stay) assumed to increase by 30,000 in Year 1; by 83,000 in Year 2; reaches about 156,000 extra H-2A workers by Year 15.
- Note: These new workers are still considered Foreign-Born/Unauthorized by employers, for labor demand purposes.

2. Increased enforcement:

- Absolute reduction in unauthorized workforce in all industries of 2.1 million over 5 years. Compared to baseline this is a relative reduction of 5.8 million after 15 years.

Size of Unauthorized Workforce

***Includes New H-2A Workers**



Results: Employment and Wages in Agriculture

Difference in outcomes:		
Policy simulation versus base line	Expand H-2A	Enforcement
Stock of unauthorized and newly authorized H-2A workers (millions)	0.16	-5.8
Net annual inflow of unauthorized and newly authorized H-2A workers (thousands)	156	-175
Employment in agriculture (%)	1.7	-3.5
U.S.-born (%)	-5.7	4.0
Foreign-born, previously authorized (%)	-5.6	3.7
Foreign-born, unauthorized and newly authorized H-2A workers (%)	32.4	-34.5
Wages in agriculture (%)	-4.4	3.4
U.S.-born (%)	-3.4	2.8
Foreign-born, previously authorized (%)	-3.4	2.8
Foreign-born, unauthorized and newly authorized H-2A workers (%)	-10.0	13.3

Results: Effect on Agricultural Output

Percent Difference in outcomes:		
Policy simulation versus base line	Expand H-2A	Enforcement
Fruit	1.2	-2.1
Vegetables	1.2	-3.2
Greenhouse and nursery	1.1	-3.9
Tree nuts	2.0	-3.0
Feed grains	0.4	-2.9
Food grains	0.3	-3.0
Oilseeds	0.1	-2.1
Sugar crops	0.3	-2.4
Cotton	1.3	-3.7
Grass seeds	0.4	-3.5
Tobacco	0.3	-2.3
Miscellaneous crops	0.6	-3.4
Meat	0.3	-2.4
Poultry	0.2	-2.1
Dairy	0.3	-2.4
Miscellaneous livestock	1.5	-3.6

Results: Effect on Agricultural Exports

Percent Difference in outcomes:

Policy simulation versus base line

	Expand H-2A	Enforcement
Fruit	1.7	-3.0
Vegetables	2.7	-6.5
Greenhouse and nursery	3.1	-7.6
Tree nuts	3.2	-3.7
Feed grains	0.8	-5.6
Food grains	0.5	-4.0
Oilseeds	0.2	-1.5
Sugar crops	1.7	-7.8
Cotton	1.7	-3.9
Grass seeds	0.6	-4.7
Tobacco	0.7	-2.2
Miscellaneous crops	1.5	-5.7
Meat	1.9	-5.8
Poultry	0.7	-4.6
Dairy	2.3	-6.5
Miscellaneous livestock	2.6	-5.2

Outcomes for US Born & Foreign Authorized Workers (All Industries)

Percent Difference in outcomes:		
Policy simulation versus base line	Expand H-2A	Enforcement
Gross National Product	0.06	-1.04
Employment	0.02	-0.10
Hired farm labor	-5.68	3.96
Other low paying occupations	0.10	3.34
Higher paying occupations	0.09	-0.58
Wages	0.03	-0.87
Hired farm labor	-3.36	2.80
Other low paying occupations	0.00	1.32
Higher paying occupations	-0.01	-0.62

Conclusions

- ❑ Effects on farm wages and employment are large for unauthorized workers in both scenarios:
 - ✓ Employment changes by +32% (H-2A) or -35% (enforcement)
 - ✓ Wages change by -10% (H-2A) or +13% (enforcement)

- ❑ Effects for US Born and Foreign Authorized much smaller:
 - ✓ Employment changes by -6% (H-2A) or +4% (enforcement)
 - ✓ Wages change by -3% (H-2A) or +3% (enforcement)

- ❑ Effects on output vary with unauthorized-labor-intensity, but also depend on demand effects in enforcement scenario:
 - ✓ Output rises by 0.2% to 2% in H-2A scenario
 - ✓ Output falls by 2.1% to 3.7% in enforcement scenario
 - ✓ Exports fall by more than output, due to exchange rate appreciation in enforcement scenario

Conclusions, Continued

- Economy-wide effects of H-2A scenario are negligible
- For enforcement scenario:
 - ✓ GNP (income to only the authorized) falls with enforcement.
 - ✓ However, wages and employment both rise for US workers in low-skilled occupations: this model is consistent with the “Borjas school” that emphasizes competition between immigrants and low-skilled US born workers.
- The degree of this competition depends on choice of elasticities of substitution: would a 3% increase in farm wages really suffice to draw 4% more U.S.-born and foreign legal workers into farming?
- Sensitivity to these elasticities is next topic for our research.
- Also looking at effects of a mechanization-promotion program.

Thanks!
Comments welcomed:

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