Regional Equilibrium Wage Rate for Hired Farm Workers in the Tree Fruit Industry

Michael P. Brady,[3] R. Karina Gallardo,[4]
Syed Badruddozza[5] and Xiaojiao Jiang[4]

Introduction

Farm labor supplied by migrant workers from outside of the United States, particularly from Mexico, has been critical to agricultural production for decades. From the demand-side perspective, U.S. economic growth in the twentieth century pulled considerable domestic labor off the farm and increased consumers' purchasing power, allowing them to buy more labor-intensive products. From the supply side, determinants such as large water-storage projects in the West coupled with optimal biotic (e.g., living organisms in an ecosystem, such as pests, fungi, bacteria) and abiotic (e.g., non-living physical and chemical elements in an ecosystem, such as weather, light exposure, soil fertility) production conditions have fostered the existence of large-scale specialty-crop operations. High population growth rates and slow economic growth in Mexico have made work options in the U.S.—especially the West—more attractive. This abundant availability of foreign labor has kept wages relatively low in labor-intensive agriculture in the United States and reduced incentives for developing labor-saving technologies.

Since 2009, migration—particularly from Mexico—has decreased (Pew Research Center, 2016), resulting in a decline in migrant agricultural labor. The U.S. specialty-crop industry—including the tree fruit industry, which is largely dependent on labor, especially for hand harvesting—is increasingly concerned by these trends. Decreases in the availability of farm labor for specialty crop industries are not driven by cross-sector labor switching (Richardson and Patterson, 1998) but from declining numbers of migrant workers in aggregate. This has been attributed to various factors, including higher rates of economic growth in Latin America, including Mexico; falling fertility rates after 1980 (Taylor et al., 2012); and stricter border enforcement.

Farm owners facing workers demanding higher wages could switch to less labor-intensive crops or invest in labor-saving technologies. The first option reduces profitability by definition, while the latter option requires long-term research into technologies that are still exploratory. The potential for mechanization varies considerably across crops (Martin and Calvin, 2010; Gallardo and Brady, 2015). Moreover, substituting a variable cost (labor) for a fixed cost (machine harvesting) may be problematic for a large number of small growers that cannot take advantage of economies of scale.

A public policy that augments the supply of migrant workers, such as the H-2A temporary agricultural workers visa program, could help resolve the issue. Liberalization of public policy

[3] Assistant Professor, School of Economic Sciences, Washington State University.
[4] Associate Professor, School of Economic Sciences, Puyallup Research and Extension Center, Washington State University.
[5] Doctoral student, School of Economic Sciences, Washington State University.
[4] Associate, Risk Analytics – Core Modeling at JPMorgan Chase & Co.

related to immigrant workers is associated with reduced wages and enhanced agricultural output (Wise, 1974; Morgan and Gardener, 1982; Robinson et al., 1993; Taylor et al., 1999; Boucher et al., 2007; Zahniser et al., 2012). An expansion of the existing H-2A program for seasonal laborers would relax the supply constraint of labor and enhance social welfare.

Currently, the H-2A program enables farm owners to apply to the Department of Labor (DOL) to bring in seasonal "low-skilled laborers" for agricultural work. However, despite the growing risk of hiring undocumented workers, farmers' use of the H-2A program was only 10% of total hires in 2013 (O'Brien et al., 2014). Farms are reluctant to use the program because of its burdensome procedure and high compensation requirements (Bronars, 2015).

Using econometric analysis and an equilibrium displacement model, this study explores the existence and magnitude of the likely impact of an expanded H-2A program on regional equilibrium outcomes in the Washington tree fruit industry by forecasting labor costs to estimate the impact of reduced labor supply on production and profitability. These results are then used to consider whether a proposed H-2A expansion is adequate to meaningfully affect equilibrium outcomes.

H-2A Workers in Washington State

In 1986, the Immigration Reform and Control Act (IRCA) divided the H-2 program, a nonimmigrant visa given on a temporary basis for "low-skilled labor" in the United States, into H-2A and H-2B. The H-2A program enables farm owners to apply to the DOL to bring in seasonal "low-skilled laborers" for agricultural work. The H-2A program connects farm owners and guest farm workers directly and is considered an important migration policy for alleviating regional or seasonal labor shortages. The number of workers admitted through the H-2A program increased from 831 in 2006 to 7,086 in 2012 (accounting for approximately 5% of farm workers in the United States). However, as the availability of domestic labor has decreased, more growers have turned to the H-2A program, and the number of new H-2A workers swelled by 50% between 2010 and 2014 (Bronars, 2015). The use of the program has varied across regions. The majority of H-2A workers are young men from Mexico, but South Africa, Peru, Guatemala, Romania, Nicaragua, New Zealand, Costa Rica, El Salvador, and Uruguay are also represented. Given the current labor situation faced by growers, expanding the number of documented workers (via H-2A expansion) may contribute to the reduction of regional equilibrium wage rates (Bronars, 2015).

H-2A employment increased about eight-fold between 2006 and 2012, but requirements for worker pay and amenities have deterred the expansion of the H-2A program (O'Brien et al., 2014). In general, large farms are able to spread the fixed costs of the program across more workers and tend to hire more H-2A workers. Large farms are also more likely to be concerned with hiring workers in advance rather than relying on the spot market for labor at harvest. In some cases, small farms collaborate to hire seasonal workers via third party institutions like the WA Farm Labor Association (Fazio, 2014). Typically, farms hire more than 15 workers. Farms that hire fewer than 10 workers tend to employ them as skilled or specialized labor, such as machine operators or in horticulture. In the state of Washington, three entities hire up to 80% of H-2A workers: the WA Farm Labor Association, Zirkle Fruit Company, and Stemilt Ag. Services. These workers are generally stationed in tree fruit industries in Yakima, Okanogan, and Chelan Counties. In 2014, 97% of these workers were paid over $12 per hour (Fazio, 2014).

The Washington State tree fruit industry—including apples, cherries, pears, and grapes—provides a good case study scenario because it is labor intensive, especially during harvest. In 2015, Washington produced 60% of all apple production in the United States, 47% of all pear production, 66% of all sweet cherry production, and 5% of all grape production (U.S. Department of Agriculture, 2016). In 2015, the farm gate value of apple production was $2.3 billion, pear production was $240 million, sweet cherry was $437 million, and grape was $297 million (U.S. Department of Agriculture, 2016). In 2014, the apple industry alone accounted for 72% of all H-2A workers in the state (Fazio, 2014).

Forecasting Labor Demand

To model the equilibrium effects of an exogenous labor demand shock (e.g., an expansion of the H2A program) on the tree fruit industry in Washington State, we develop an equilibrium displacement model based on Muth (1964), who derived a system of reduced-form equations that facilitates analysis of the effects of input supply shifts on industry output and input prices and quantities. Gunter, Jarrett, and Duffield (1992) adopted Muth's model to analyze the effects of labor supply reduction on selected U.S. crops. We follow their approach to analyze the effects of labor supply shocks on wage changes for labor-intensive crops.

To overcome the limitation of Muth's (1964) static approach, we include an hour per acre linkage equation to forecast labor demand for the next two decades. This provides a detailed time series of future labor demand as driven by changes in cropping patterns and per acre labor inputs. We use a reduced-form equation of change in bearing acreage to estimate the supply response for Washington apple production:

$$\Delta B_t = \beta_0 + \beta_1 D\bar{B}_{t-1} + \beta_2 p_{t-2} + \beta_3 p_{t-3} + \beta_4 \bar{B}_{t-1} + \beta_4 \bar{y}_{t-1} + \beta_5 y_{t-3} + u_t ,$$

where $\Delta B_t = B_t - B_{t-1}$, the change bearing acreage from year $t-1$ to year t ; $D\bar{B}_{t-1} = B_{t-1} - B_{t-2}$ is lagged one period of change in bearing acreage; $\bar{B}_{t-1} = \frac{\sum_{i=0}^{5} B_{t-1-i}}{5}$ is average bearing acreage during the previous five years at year $t-1$; $\bar{y}_{t-1} = \frac{\sum_{i=0}^{5} y_{t-1-i}}{5}$ is average yield per acre during the previous five years at year $t-1$; p_{t-3} is lagged three period price; and u_t is the error term.

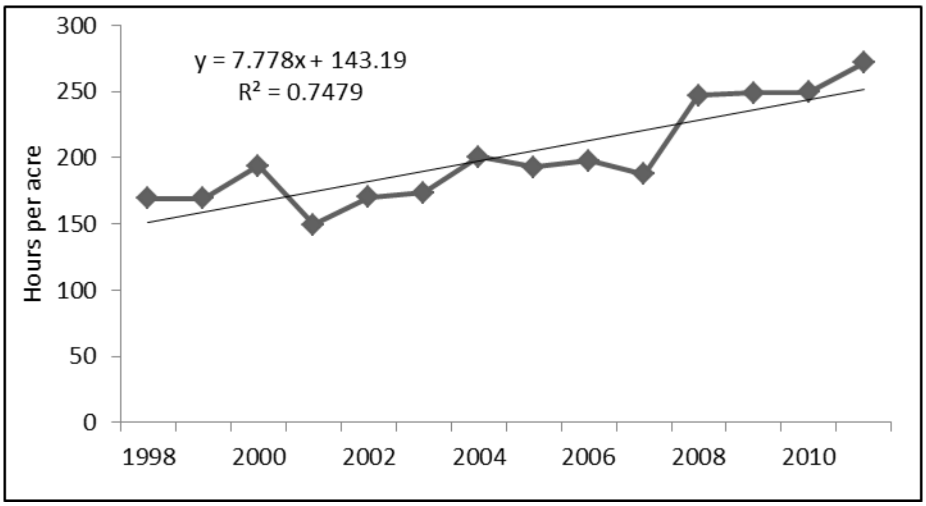
Table 1. Estimated Change in Bearing Acreage Model for Washington Apples.

Variable	Parameter Estimate	Standard Error	t Value	Pr > |t|
Intercept	2,100.68	7,110.82	0.30	0.7697
$D\bar{B}_{t-1}$	0.47	0.14	3.39	0.0020
p_{t-2}	-14.79	8.67	-1.71	0.0984
p_{t-3}	14.04	10.48	1.34	0.1904
$\bar{B}_{t-1}$	-0.05	0.02	-2.12	0.0423
y_{t-1}	-675.58	286.86	-2.36	0.0253
y_{t-3}	1,008.68	358.75	2.81	0.0086

The adjusted R-squared indicates that the model explains 50.46% of total variation. The Durbin-Watson statistic of 1.931 implies no autocorrelation in the residuals.

We predict a future crop price using both univariate time series and the USDA-ERS baseline projections of non-citrus fruit price index. The USDA baseline projections consider possible future structural changes in a complex model of the global economy. We found that results using both methods differed only slightly in terms of predicted bearing acreage. The same econometric method was used to estimate change in bearing acreages for other labor-intensive crops.

Figure 1. Estimated Labor Input Coefficient for WA Apples, 1998–2010.



We further estimate total farm labor hours demanded by multiplying the predicted labor input coefficient and bearing acreages. We use the average monthly employment of covered seasonal workers at year t, SL_t, as a base to calculate annual seasonal labor hours, LS_t, for growing apples in Washington State (average monthly seasonal workers multiplied by hours worked per month, which we assume to be 160 hours). The hour per acre linkage equation, $L_t = \hat{a}_{L,t} \cdot BA_t$, enables us to predict hours per acre of seasonal work by using historical trends to estimate bearing acreage. We replicate similar models for pears, sweet cherries, and grapes produced in Washington State.

Forecasting Labor Supply

To forecast labor supply, we employed a dynamic labor supply model from Mexico to the United States to characterize the exogenous labor supply shock. Migration is the end product of new entrants, return migration, and repeat migration. Data from the National Agricultural Workers Survey (NAWS) showed that 35% of agricultural workers migrated back and forth from a foreign country (primarily Mexico) between 2001 and 2002. Fully 38% of these were newcomers to the United States who had been in the country less than a year when they were interviewed. These foreign-born newcomers comprised 16% of all hired crop workers in 2001–2002. Nearly all (99%) of the foreign-born newcomers were unauthorized. Based on migration patterns, it is reasonable to focus on the change in migration in specifying a labor supply shock. The change in labor supply between two years is considered as the migration in that year, $\Delta M_t = M_t - M_{t-1}$.

The empirical specification of the migration model is

$$\Delta M_t = \beta_0 + \beta_1 \Delta M_{t-1} + \beta_2 M_{t-2} + \beta_3 GDPPC_t^{US} + \beta_4 Wag_{t-1}^{MEX} + \beta_5 Fertility_t^{MEX} + \beta_6 GDPPC_t^{MEX} + \beta_7 dummy_t + \mu_t$$

where ΔM_t is the change in farm labor at year *t*, Wag_{t-1}^{MEX} is agricultural sector wage rate at year t-1, $Fertility_t^{MEX}$ is fertility rate in Mexico at year *t*, $GDPPC_t^{MEX}$ is GDP per capita in Mexico at year *t*, $dummy_t$ is a dummy variable that captures the migration policy change at year *t*, and $dummy_t = 1$ for years after 2007, 0 otherwise,(2007 is used as the cutoff point because farm labor peaked in that year).

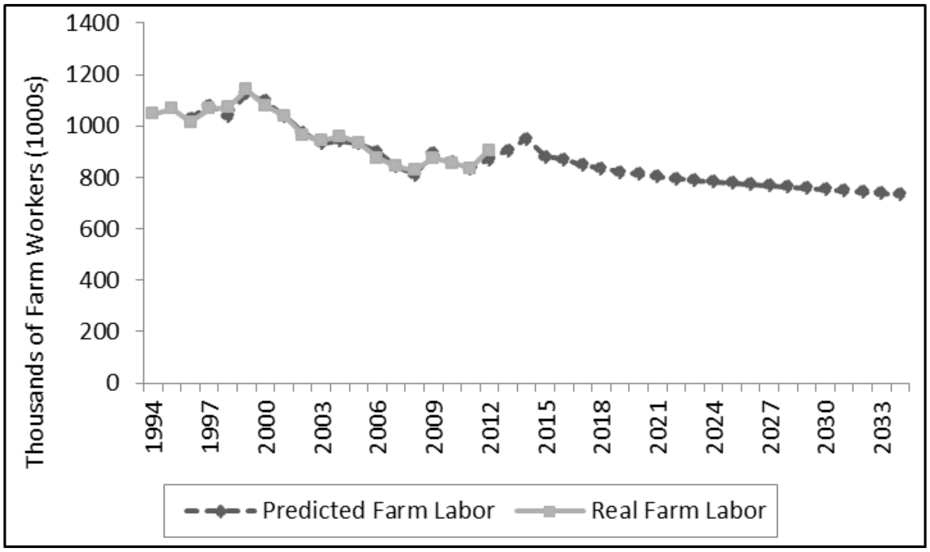
Only U.S. economic growth is positively associated with migration. Mexican demographics such as increasing economic growth and decreasing fertility are negatively associated with migration. In other words, we expect changes in Mexican demographics to mean that less labor is available in the United States. We use this model to forecast the change in migration, which gives future farm labor supply when combined with the number of existing farm workers.

Table 2. Migration Model Results.

Variable	Parameter Estimate	Standard Error	t Value	Pr > |t|
Intercept	1,206,774	416,691	2.90	0.0200
ΔM_{t-1}	-0.753	0.179	-4.21	0.0029
M_{t-2}	-0.378	0.106	-3.57	0.0073
$GDPPC_t^{US}$	37.605	11.437	3.29	0.0111
Wag_{t-1}^{MEX}	-73,376	12,521	-5.86	0.0004
$Fertility_t^{MEX}$	-414,192	125,726	-3.29	0.0110
$GDPPC_t^{MEX}$	-93.600	51.612	-1.81	0.1073
$dummy_t$	-67,862	27,888	-2.43	0.0410

The independent variables used in the migration model to predict the change in migration are either estimated by the authors using unit variable prediction or from other sources. We forecast a drop of 1% in the number of migrant workers per year as the most likely scenario. This varies over the forecast horizon. In the first six years we forecast an annual reduction of 1.4% in the number of migrant workers, after which we expect an annual drop of 0.7%.

Figure 2. Predicted Farm Labor.



Agricultural Labor Market Model

In the equilibrium displacement model we assume homogeneous degree-one production, competitive markets, no technological change, and constant demand elasticity and substitution elasticity. Interactions between agricultural regions in the United States are assumed to occur via the market for hired farm labor. Industry equilibrium is described by

(1) $Q = f(p)$

(2) $Q = Q(K, L)$

(3) $p_K = pQ_K$

(4) $p_L = pQ_L$

(5) $K = g(p_K)$

(6) $L = g(p_L)$

where Q is the output of the composite commodity; K and L are non-labor and labor inputs; and p, p_A, p_B are output and input prices. Equation (1) is the demand for industry output, (2) is the industry production function, (3) and (4) describe the fact that both factors are paid by the value of their marginal products, and (5) and (6) are factor supply schedules facing the industry. A shift in one or more of equations (1)–(6) results in displacements from the initial equilibrium. The shift parameters represent a shift in the output demand schedule (α), the supply schedule for factor *K* (β), the supply schedule for factor *L* (γ), and a factor-neutral shift in technology (δ) and a labor-saving shift in technology (ε). Total logarithm differentiation of equations (1)–(6) and the shift parameters give us the reduced form of the equilibrium system, which enables the use of elasticities to measure the impact of reduced labor supply on hired farm-labor wages.

(1') $-\frac{1}{\eta}\mathrm{dlnQ} + \mathrm{dlnp} = \alpha$

(2') $\mathrm{dlnQ} - \mathrm{k_K dlnK} - \mathrm{k_L dlnL} = \delta$

(3') $-\mathrm{dlnp} + \frac{\mathrm{k_L}}{\sigma}\mathrm{dlnK} - \frac{\mathrm{k_L}}{\sigma}\mathrm{dlnL} + \mathrm{dlnp_K} = \delta + \varepsilon$

(4') $-\mathrm{dlnp} + \frac{\mathrm{k_K}}{\sigma}\mathrm{dlnK} - \frac{\mathrm{k_K}}{\sigma}\mathrm{dlnL} + \mathrm{dlnp_L} = \delta - \frac{\mathrm{k_K}}{\mathrm{k_L}}\varepsilon$

(5') $\frac{1}{e_K}\text{dlnK} + \text{dlnp}_K = \beta$

(6') $\frac{1}{e_L}\text{dlnL} + \text{dlnp}_L = \gamma$

We use equations (1')–(6') to solve for the six endogenous variables—*dlnQ*, *dlnp*, *dlnK*, *dlnL*, $dlnp_K$, and $dlnp_L$—which indicate the percentage changes in composite commodity output quantity, composite commodity price, nonlabor input, nonlabor input price, labor, and wage. Six parameters are included: *n* is output demand elasticity, e_K is supply elasticity for capital output, e_L is supply elasticity for labor input, k_K is total receipt share for capital input, k_L is total receipt share for labor input, and σ is elasticity of substitution between input capital and labor. Parameter values are listed in Table 3.

Following Gunter et al. (1992) and their two-stage implementation of the Muth model (Muth, 1964), we considered the projected change in wages to be fixed to estimate the impacts of labor supply reductions on output quantities, prices, and labor demand for each labor-intensive fruit grown in Washington State (apple, sweet cherry, pear, and grape).

Table 3. Parameters Used in the Production System of Equations.

Parameter	Description	Value	Source
σ	Elasticity of substitution between input capital and labor	0.75/2.11	Duffield (1990)
e_K	Supply elasticity for capital input	9,999	Duffield (1990)
e_L	Supply elasticity for labor input	0.71/1.55	Duffield (1990)
k_K	Marginal value of capital	0.65	Duffield (1990)
k_L	Marginal value of labor	0.35	Duffield (1990)
n	Composite labor intensive commodity demand elasticity	-2.44	Gunter et al. (1992)

The demand shift for five years is 0.054, estimated by an annual population growth rate of 0.009 together with estimated per capita availability of total fruit and vegetable growth rate of 0.0018. The impact of the 5.4% output demand increase relative to today is evident in the fact that output is projected to increase even though labor supply declines. Increasing the substitution elasticity increases projected output growth and reduces growth in labor use and wages. Higher labor supply elasticity generally increases output and labor use growth but reduces the wage rate increase.

Variation in other parameters has a relatively small impact on wage level when either labor supply elasticity or elasticity of substitution between labor and non-labor is above 0.5 (Gunter et al., 1992). We used labor supply elasticities of both 0.71 and 1.55. Therefore, errors in specifying the substitution elasticity should not produce large errors in estimated aggregate wage changes. In the simulations, non-labor inputs were assumed to be perfectly elastic in supply, which is consistent with the assumption that the price of non-labor inputs will not be affected by a labor supply shock induced change in non-labor input demand. No technology change was assumed in the simulations and reduced-form equations were solved for a five-year time horizon to allow markets to adjust to the labor shift.

From the migration labor supply model we forecast a drop of 7% in the number of migrant workers in five years. We report upper and lower bounds on labor costs using 95% confidence intervals on the migration forecast, which extends between 11% and 2% for the model that had a point estimate of 7%. We report the results of the aggregate model assuming a capital/labor elasticity of substitution of 0.75 and a labor supply elasticity of 1.55. A 7% decrease in labor supply was estimated to increase wages by 8.3%, and the 95% confidence interval of the wage increase was 5.6% and 10.5%. Output price for the final good increases by 3% if a 7% drop in labor supply occurs. The 95% confidence interval extends between 2% and 3.7%.

We take the projected wage change for labor-intensive crops in the first stage as given (or fixed) and then consider the change in production decisions in response to the change in the wage level of each individual crop in the second stage. We account for consumer substitution, which introduces interactions between the final demand for crops through the cross-price elasticity.

Table 4. Estimates of Output Change, Output Price Change, Labor Change and Wage Change Given Different Levels of Labor Reduction at Different Elasticities of Substitution (Labor/Capital) and at Different Labor Supply Elasticities.

Labor Shift	Elasticity of Substitution	Labor Supply Elasticity	Output Change	Output Price Change	Labor Change	Wage Change
0	0.10	0.71	0.063	0.028	0.057	0.081
		1.55	0.086	0.019	0.083	0.053
	0.75	0.71	0.077	0.022	0.046	0.064
		1.55	0.093	0.016	0.071	0.046
	2.11	0.71	0.093	0.016	0.032	0.045
		1.55	0.102	0.012	0.054	0.035
2%	0.10	0.71	0.055	0.031	0.049	0.090
		1.55	0.075	0.023	0.071	0.066
	0.75	0.71	0.071	0.025	0.036	0.071
		1.55	0.084	0.020	0.056	0.056
	2.11	0.71	0.089	0.017	0.021	0.050
		1.55	0.095	0.015	0.036	0.043
7%	0.10	0.71	0.037	0.039	0.029	0.111
		1.55	0.049	0.034	0.042	0.097
	0.75	0.71	0.056	0.031	0.013	0.088
		1.55	0.061	0.029	0.020	0.083
	2.11	0.71	0.079	0.022	-0.006	0.062
		1.55	0.077	0.022	-0.010	0.064
11%	0.10	0.71	0.022	0.045	0.013	0.129
		1.55	0.027	0.043	0.019	0.122
	0.75	0.71	0.044	0.036	-0.005	0.102
		1.55	0.042	0.037	-0.008	0.105
	2.11	0.71	0.071	0.025	-0.027	0.071
		1.55	0.063	0.028	-0.046	0.080

Table 5. Assumed Own- and Cross-Price Demand Elasticities.

	Apple	Cherry	Pear	Grape
Apple	-1.09	-0.61	0.3	0.277
Cherry	-0.285	-1.792	-0.551	-0.0064
Pear	0.227	-0.193	-1.5	-0.0932
Grape	0.05	-0.0527	-0.037	-1.4189

Source: Commodity and food elasticities, ERS, USDA.

An example model for the case of two individual crops that are either substitutes or complements for consumers is shown explicitly below. The partial equilibrium for crop *i* with crop *j* as a substitute (cross-price elasticity is positive) or as a complement (cross-price elasticity is negative) is

(6) $Q^i = f(p^i, p^j)$

(7) $Q^i = Q^i(K^i, L^i)$

(8) $p_K^i = p^i Q_K^i$

(9) $p_L^i = p^i Q_L^i$

(10) $K^i = g^i(p_K^i)$

Given the same notation for the exogenous parameters as in the aggregate market-level analysis, we use (') to denote a commodity-specific model.

(6') $-\frac{1}{n^i}\mathrm{dlnQ^i} + \mathrm{dlnp^i} + \frac{n^{ij}}{n^i}\mathrm{dlnp^j} = \alpha$

(7') $\mathrm{dlnQ^i} - k_K^i \mathrm{dlnK^i} - k_L^i \mathrm{dlnL^i} = \delta^i$

(8') $-\mathrm{dlnp^i} + \frac{k_L^i}{\sigma^i}\mathrm{dlnK^i} - \frac{k_L^i}{\sigma^i}\mathrm{dlnL^i} + \mathrm{dlnp_K^i} = \delta^i + \varepsilon^i$

(9') $-\mathrm{dlnp^i} + \frac{k_K^i}{\sigma^i}\mathrm{dlnK^i} - \frac{k_K^i}{\sigma^i}\mathrm{dlnL^i} = \delta^i - \frac{k_K^i}{k_L^i}\varepsilon^i - \mathrm{dlnp_L}$

(10') $\frac{1}{e_K^i}\mathrm{dlnK^i} + \mathrm{dlnp_K^i} = \beta^i$

where n^{ij} is the cross-price elasticity for crop *i* in response to a change in price of crop *j*. Commodity *j* has the same partial equilibrium form, and we solve the two-commodity model simultaneously. We use the baseline wage increase of 4.6% and then test the impact on the production of the individual crops.

Table 6. Commodity Model Results for Washington State Fruit[a]

Labor Shift	Commodity	Demand Elasticity	Demand Shift [b]	Labor Share	Substitution Elasticity	Output Change	Output Price Change	Labor Wage Change
Baseline	Apples	-1.09	0.089	0.35	0.75	0.0849	0.0161	0.0625
2%						0.0821	0.0197	0.0547
7%						0.0749	0.0291	0.0344
11%						0.0691	0.0366	0.0182
Baseline	Grapes	-1.38	0.131	0.43	0.75	0.1521	0.0198	0.1324
2%						0.1455	0.0242	0.1215
7%						0.1285	0.0357	0.0929
11%						0.1148	0.0450	0.0701
Baseline	Pears	-1.5	-0.01	0.44	0.75	-0.0530	0.0200	-0.0721
2%						-0.0610	0.0245	-0.0845
7%						-0.0821	0.0362	-0.1166
11%						-0.0989	0.0455	-0.1424
Baseline	Cherries	-1.792	0.138	0.4	0.75	0.1989	0.0184	0.1783
2%						0.1883	0.0225	0.1630
7%						0.1605	0.0332	0.1231
11%						0.1383	0.0418	0.0912

[a] Wage shift is 4.6%, 5.6%, 8.3% and 10.5% for baseline, 2%, 7%, and 11% decline in labor supply, respectively.

[b] Demand shift was estimated by authors.

We model a labor supply drop of 7% with a 95% confidence interval of 2% and 11%. Compared to the baseline, a 7% labor supply decrease results in output decreases of 3.84%, 2.91%, 2.36%, and 1% for cherries, pears, grapes, and apples, respectively. The associated projected prices for cherries, pears, grapes, and apples increases by 1.5%, 1.62%, 1.60%, and 1.30%, respectively.

Implications

An appropriate expansion of the H-2A program should significantly reduce labor costs to the tree fruit industry in Washington State. Hired labor accounts for 17% of all variable costs in U.S. agriculture but accounts for 40% of costs for labor intensive crops. Gunter et al. (1992) considered a scenario in which the IRCA (Immigration Reform and Control Act of 1986) caused agricultural labor to fall by 10%, which raised wages by 5.1%, reduced agricultural employment by 6.2%, and reduced output by 3.4%.

We model the effect of an expanded H-2A program on labor costs by keeping other factors constant and then reducing the magnitude of the labor supply. Multiple sources report labor shortages ranging between 15% and 30% in U.S. agriculture (Koba, 2014; Brat, 2015). We use the Muth (1964) model to quantify the impact of a scenario in which the H-2A program generates 1% of total farm workers and with a pessimistic 7% drop in labor supply. With an additional 1% of H-2A guest workers, the wage rate is 0.54% lower. Consumers benefit from more fruit available at a lower price. Farms not using H-2A may also benefit from the “free ride” in the case of a wage decrease.

Political Challenges of H-2A Expansion

Both farm employers and worker advocates have voiced opposition to the current H-2A program (O’Brien et al., 2014). While working with an H-2A labor contractor to obtain foreign migrant workers can be helpful for farms, problems of moral hazard may still arise in terms of rules and regulations outlined by the U.S. Department of Labor. Farmers often complain that workers arrive weeks after the beginning of harvest due to visa uncertainty and that they must commit to pay workers for a longer period than they actually need them (Bronars, 2015). If H-2A guest workers are paid by the hour, they must earn at least the adverse effect wage rate (the highest of the prevailing wage, collectively bargained wage rate, or the federal or state minimum). This is attractive for guest workers but imposes higher costs on farm owners, limiting the use of the H-2A program. Larger farms are better equipped financially to use it, as H-2A employers are required to provide free housing to H-2A workers and to any U.S. workers performing the same tasks who cannot commute back and forth in a day. Farms need to house workers through direct public investment. The majority of the least-cost investment would be in permanent, seasonally occupied housing (Qenani-Petrela et al., 2008). Recently, California farms sued federal agencies for failing to process H-2A applications on time (Wheat, 2016). Worker advocates cite insufficient health protection for workers, poor housing conditions, and employer failure to live up to worker payment provisions by making wages due. Many farms are accused of exploiting the vulnerability of foreign citizens in a way that leads to debt-peonage, human trafficking, and forced labor (Farmworker Justice, 2011; U.S. EEOC, 2011).

In addition to the direct beneficiaries of the H-2A program, there are a number of agricultural operations that do not incur the costs of the program but benefit from the associated changes in the equilibrium wage rate. However, quantifying these specific benefits is difficult with observed data, which is where the analysis in this report can be useful. By quantifying the equilibrium effects—such as changes in output, output prices and labor wages—of a potential expansion of the H-2A program in the region, we provide a more complete picture than what is likely achievable empirically. A strict economic perspective would focus on efficiency, but distributional goals are embedded in farm policy in the United States. In other words, the total of the increase in producer and consumer surplus from an expanded H-2A program could be used to inform benefits from an expansion. However, it may be just as relevant politically to quantify the benefits accrued to the smaller farms that would be threatened by higher labor costs under a smaller H-2A program. Another application of this study is to combine it with assumptions related to induced innovation that predict technological change as a function of labor costs. Without making a normative statement related to mechanization, it would be valuable to predict the degree to which an expanded H-2A would slow the rate of innovation given that funding for R&D and expanded H-2A are often proposed in tandem.

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