Implications of Immigration Policies for the U.S. Farm Sector and Workforce

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Implications of Immigration Policies for the U.S. Farm Sector and Workforce
Stephen Devadoss (University of Idaho) and Jeff Luckstead (Washington State University)
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Background
- Congress passed the 1986 Immigration Reform and Control Act (IRCA) to:
  1. Curb the influx of illegal immigrants by increasing the border enforcement.
  2. Eliminate undocumented workers through domestic enforcement.
- In spite of the IRCA, the illegal immigrant population continued to rise to about 12 million in the United States by 2007.
- The Congressional debate on immigration resumed and after much heated debate, no new legislation was passed into law.
- Due to the failed legislations and the 9/11 attack, the U.S. government focused on border control and domestic enforcement to curb illegal immigration.
- For example, by 2005 border expenditure experienced a six-fold increase over the last 25 years and by 2008 the number of arrests by domestic enforcement increased 14 times over the domestic level.

Objectives
1. Analyze theoretically through immigration and trade theory the effects of domestic and border enforcement on the illegal farm wage rate, unauthorized entry, and commodity trade between the United States and Mexico.
2. Empirically implement the theoretical model through econometric estimation and simulation analysis.
3. Provide policy recommendations for solving labor shortages in U.S. agriculture and immigration problems.

Theoretical Analysis
![Diagram showing the effects of Domestic Enforcement and Border Enforcement on Labor Flow and Trade](Diagram)

Theoretical Model (Contd.)

**Variable Definitions**
- Supply (S), Demand (D), Labor (L), Excess supply (ES), Excess demand (ED), Agricultural goods (A), Wage rate (W), Subsidy to U.S. agricultural producers (SU), and Import tariff by Mexico on U.S. agricultural products (T).

**Simulation Results**

<table>
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<tbody>
<tr>
<td>US Legal Wage Rate ($)</td>
<td>6.53</td>
<td>7.64</td>
<td>7.43</td>
<td>7.75</td>
<td>8.05</td>
<td>8.27</td>
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<td>Domestic Enforcement Impact (%)</td>
<td>0.13</td>
<td>0.21</td>
<td>0.25</td>
<td>0.25</td>
<td>0.34</td>
<td>0.38</td>
<td>0.42</td>
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<td>Border Enforcement Impact (%)</td>
<td>3.16</td>
<td>0.98</td>
<td>0.51</td>
<td>0.34</td>
<td>0.22</td>
<td>0.03</td>
<td>0.15</td>
<td>0.60</td>
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<td>US Illegal Wage Rate ($)</td>
<td>6.56</td>
<td>9.93</td>
<td>7.06</td>
<td>7.25</td>
<td>7.39</td>
<td>7.75</td>
<td>7.58</td>
<td>7.56</td>
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<tr>
<td>Domestic Enforcement Impact (%)</td>
<td>1.19</td>
<td>0.86</td>
<td>0.48</td>
<td>0.28</td>
<td>0.15</td>
<td>0.08</td>
<td>0.09</td>
<td>0.08</td>
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<tr>
<td>Mexican Wage Rate (NP)</td>
<td>36.06</td>
<td>35.95</td>
<td>40.17</td>
<td>42.07</td>
<td>43.70</td>
<td>45.33</td>
<td>47.31</td>
<td>49.85</td>
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<td>Domestic Enforcement Impact (%)</td>
<td>-0.16</td>
<td>-0.53</td>
<td>-0.75</td>
<td>-1.17</td>
<td>-1.81</td>
<td>-3.72</td>
<td>-3.99</td>
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<td>-1.51</td>
<td>-0.80</td>
<td>-0.49</td>
<td>-0.37</td>
<td>-0.19</td>
<td>0.00</td>
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<td>US Ag. Demand (bil. $)</td>
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<td>521.34</td>
<td>501.07</td>
<td>500.21</td>
<td>471.57</td>
<td>476.51</td>
<td>484.71</td>
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<td>-1.71</td>
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<td>Mexican Ag. D. (bil. NP)</td>
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<td>202.92</td>
<td>222.42</td>
<td>235.96</td>
<td>245.02</td>
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<td>US Ag. Supply (bil. $)</td>
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<td>195.94</td>
<td>203.20</td>
<td>219.40</td>
<td>235.96</td>
<td>242.05</td>
<td>242.38</td>
<td>287.35</td>
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<td>Border Enforcement Impact (%)</td>
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<tr>
<td>Mexican Ag. Supply (bil. NP)</td>
<td>226.67</td>
<td>249.66</td>
<td>255.31</td>
<td>255.39</td>
<td>245.92</td>
<td>276.57</td>
<td>264.58</td>
<td>271.91</td>
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<tr>
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<td>0.09</td>
<td>0.24</td>
<td>0.43</td>
<td>0.77</td>
<td>1.12</td>
<td>1.86</td>
<td>2.80</td>
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<tr>
<td>Border Enforcement Impact (%)</td>
<td>0.28</td>
<td>0.40</td>
<td>0.26</td>
<td>0.23</td>
<td>0.23</td>
<td>0.15</td>
<td>0.09</td>
<td>0.00</td>
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<tr>
<td>Net Exports to Mex. (bil. $)</td>
<td>4.11</td>
<td>1.21</td>
<td>2.67</td>
<td>3.13</td>
<td>4.21</td>
<td>3.07</td>
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<tr>
<td>Border Enforcement Impact (%)</td>
<td>-0.01</td>
<td>-0.01</td>
<td>-0.01</td>
<td>-0.01</td>
<td>-0.01</td>
<td>-0.01</td>
<td>-0.01</td>
<td>-0.01</td>
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</tbody>
</table>

**Empirical Analysis**

- **System of Equations Estimated:**
- **Data Source:** Labor Statistics of the U.S. Department of Labor, Banco de Mexico, and Comision Nacional de los Salarios Minimos, International Monetary Fund, Food and Agricultural Organization.

- **Simulation Results:**
  - Year 1998-2007
  - US Legal Wage Rate: $6.53 to $8.79
  - Domestic Enforcement Impact: 0.13 to 0.48
  - Border Enforcement Impact: 3.16 to 0.03
  - US Illegal Wage Rate: $6.56 to $7.58
  - Domestic Enforcement Impact: 1.19 to 0.08
  - Mexican Wage Rate: $36.06 to $49.85
  - Domestic Enforcement Impact: -0.16 to -0.19
  - US Ag. Demand: $496.03 to $242.35
  - Domestic Enforcement Impact: 0.00 to -0.01
  - US Ag. Supply: $201.44 to $287.35
  - Domestic Enforcement Impact: 0.00 to -0.01
  - Mexican Ag. Supply: $226.67 to $271.91
  - Domestic Enforcement Impact: 0.05 to 0.09
  - Net Exports to Mex.: $4.11 to 3.94
  - Domestic Enforcement Impact: 0.00 to 0.01
  - Border Enforcement Impact: -0.01 to 0.00

Simulation Analysis
- The estimated system of equations is used to run a benchmark simulation by utilizing the historical values of the explanatory variables.
- Two alternate scenarios are run to analyze the impacts of changes in domestic and border enforcement policies.
- **Alternate Scenario 1:** 10 percent increase in the domestic enforcement budget over the baseline.
- **Alternate Scenario 2:** The baseline is run using border apprehension probability increasing from 0.30 in 1994 to 0.40 in 2001, from 0.50 in 2002 to 0.60 in 2007. The alternate scenario is run by setting the apprehension probability at 0.60 over the entire simulation period.

Conclusions
- In response to the heightened border surveillance, new workplace enforcements, and economic downturns, fewer immigrants are attempting to enter the United States, which reduce the farm labor supply.
- As a result, the U.S. agricultural sector is facing labor shortages in labor-intensive production.
- Producers in several states — beset with labor scarcity — are experiencing devastating effects on farm production and profitability.
- Consequently, consumers have incurred higher costs for labor-intensive products.
- Any reduction of the immigrant workforce, by deporting undocumented workers and scuttling the guest-worker program, has several adverse implications for U.S. agriculture.
- Therefore, U.S. government policies aimed at deporting unauthorized workers — without taking adequate measures to supply farm laborers through guest-worker programs — will adversely affect the supply of farm laborers to crop production.
- Immigration reform allows a well-functioning guest-worker program, it can increase the availability of the farm workforce and will have a positive impact on the agricultural sector.

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