

The End of Farm Labor Abundance

Labor, Water, and California Agriculture

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The Two Flows

- Water
 - Source: Nature
 - Delivery: Pumps & Aqueducts

- Labor
 - Source: Rural Mexico
 - Delivery: Immigration



The Bottom Line

- No one dreams of growing up to be a hired farm worker
- *Everywhere* as incomes go up the share of the workforce in agriculture plummets
- Mexico saved us, now Mexico is changing
- Immigration policy doesn't solve the farm labor problem unless people are willing to do farm work
- The biggest change: Kids

The Bottom Line: New Data Show That...

- Mexico's farm labor supply is declining
- The demand for labor on Mexican farms is rising
- The reservation wage (minimum wage needed to induce new workers to migrate) is increasing
- Immigration policy will not be the solution
- U.S. growers must look for labor substitutes
 - Shift to *less* labor-intensive FVH production
 - Seek migrant workers from other countries?
 - Invest in labor-saving agricultural technologies
 - ...and management practices

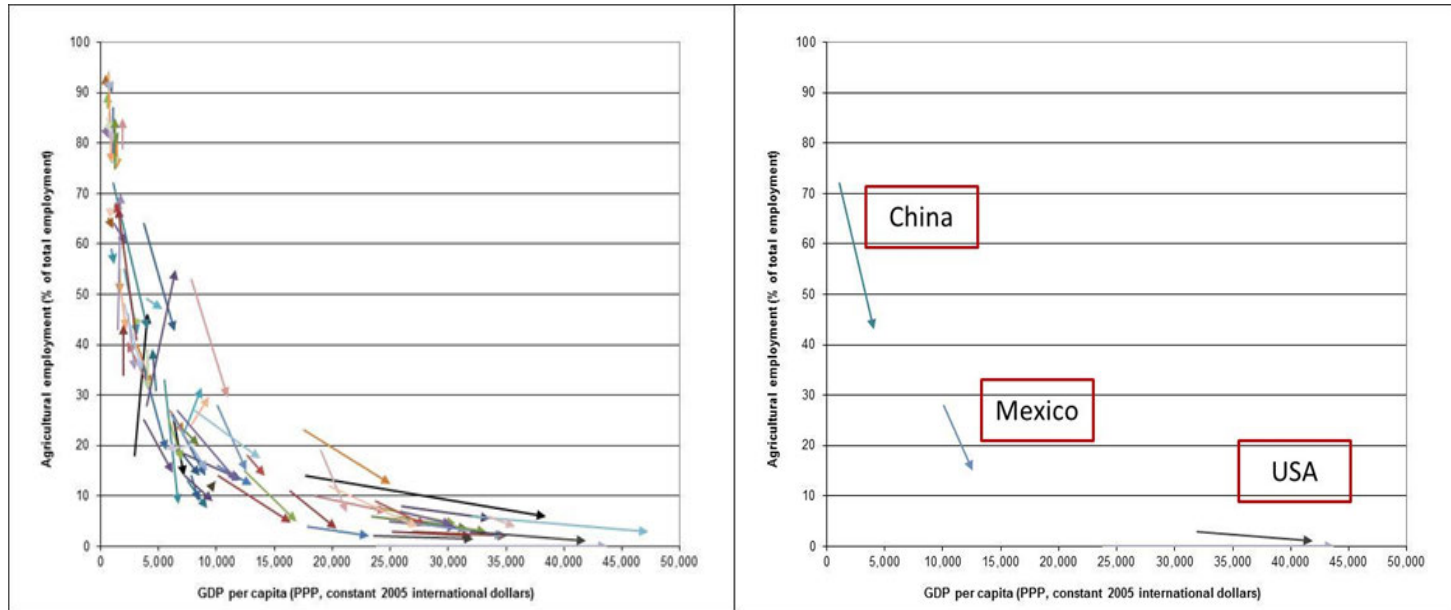
Mexico in Transition

- Mexico is the major supplier of hired labor to U.S. farms
 - Only 2% of California's hired farm workers are U.S.-born
- Guatemala has become a supplier of farm labor to Mexico
- Mexico is in the transitional phase of being both a farm labor exporter and importer

Fleeing the Farm

The % of workforce in agriculture falls as per-capita incomes rise

Workforce in Agriculture



Income

Source: Taylor and Lybbert, *RebelText: Essentials of Development Economics*, 2012 (forthcoming, UC Press, 2014).

Is Something Happening Out There?

Farmers across California are experiencing the same problem: Seasonal workers who have been coming for decades to help with the harvest, planting and pruning have dropped off in recent years.

SF Chronicle, May 27, 2012

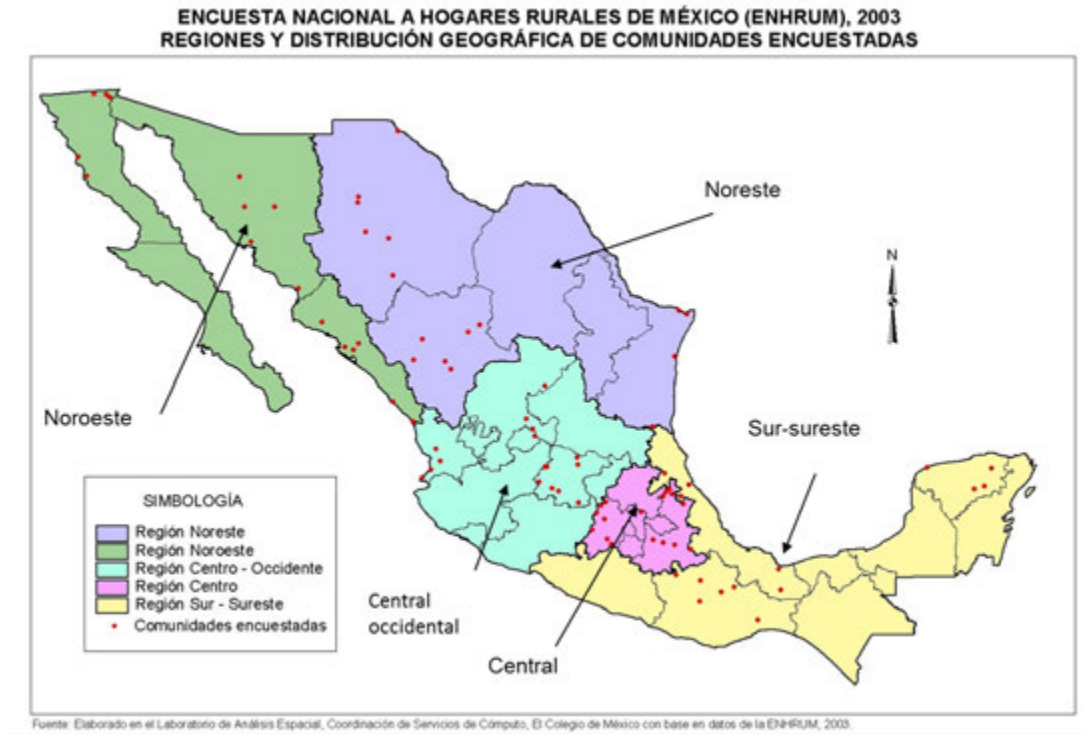
The workforce has been decreasing in the last two to three years, but last year it was drastic.

Kristi Boswell, Farm Bureau

The supply of Mexican labor available to work in the United States has fallen due to a sharp decrease in Mexico's total fertility rate and employment growth in Mexico.

Passel, et al. (2012)

The UCD-COLMEX Mexico National Rural Household Survey (ENHRUM)



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- Nationally representative sample of rural households
- Tracks workers from 1980 through 2010, inside and outside Mexico
- 201,779 person-years of data

Mexico's Decreasing Agricultural Labor Supply, 1980-2010

Estimated Percentage Impacts on the Probability of
Individuals Working in Farm Jobs

VARIABLES	(1)	(2)
	No controls	Control for age
year	-0.062 (0.007)***	-0.070 (0.007)***
age in year t		0.045 (0.004)***
L.agriculture	0.809 (0.009)***	0.808 (0.009)***
L2.agriculture	0.109 (0.009)***	0.108 (0.009)***
Constant	126.138 (14.396)***	141.037 (14.544)***
Observations	128,072	128,072
R-squared	0.833	0.833
R-squared	0.833	0.833

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Source: Charlton and Taylor (2014)

Conditional Probability of Working in Ag (anywhere, in Mexico or the US)



Source: Charlton and Taylor (2014)

How large is that decline?

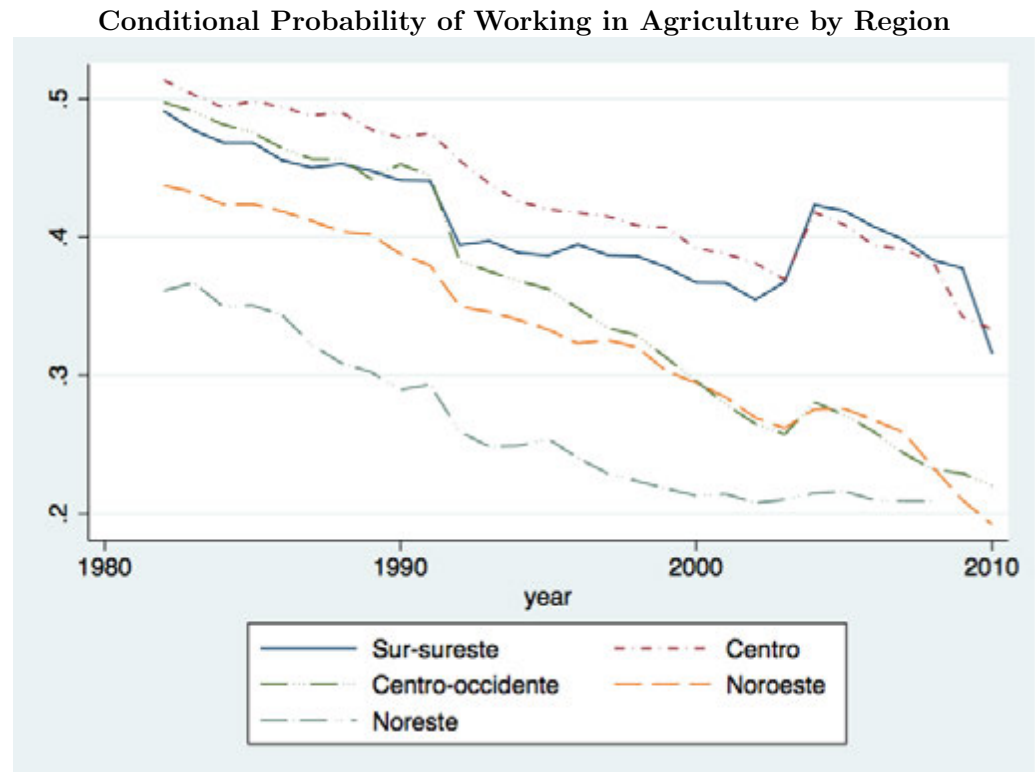
- The working age rural population of Mexico is 16 million people
- That means the farm labor supply from rural Mexico is decreasing by **11,200** people each year
- That is a **0.13%** decrease in the Mexican farm labor supply each year (working in Mexico or the U.S.)
- U.S. and Mexican farmers compete for this dwindling supply of farm workers

Downward Sloping Trends in all Regions of Mexico

Percentage Impacts on Probability of working in Agriculture by Region	
(1)	
VARIABLES	Percentage Probability Agriculture
L.agriculture	0.797 (0.009)***
L2.agriculture	0.105 (0.009)***
age in year t	0.052 (0.005)***
Centro	72.237 (46.282)
Centro-Occidente	149.936 (43.639)***
Noroeste	163.267 (46.618)***
Noreste	31.029 (50.806)
Sur-Sureste*year	-0.041 (0.016)**
Centro*year	-0.077 (0.017)***
Centro-Occidente*year	-0.116 (0.015)***
Noroeste*year	-0.123 (0.017)***
Noreste*year	-0.057 (0.020)***
Observations	128,072
Number of id	8,133
R-squared within	0.502
R-squared between	0.955
R-squared overall	0.833

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

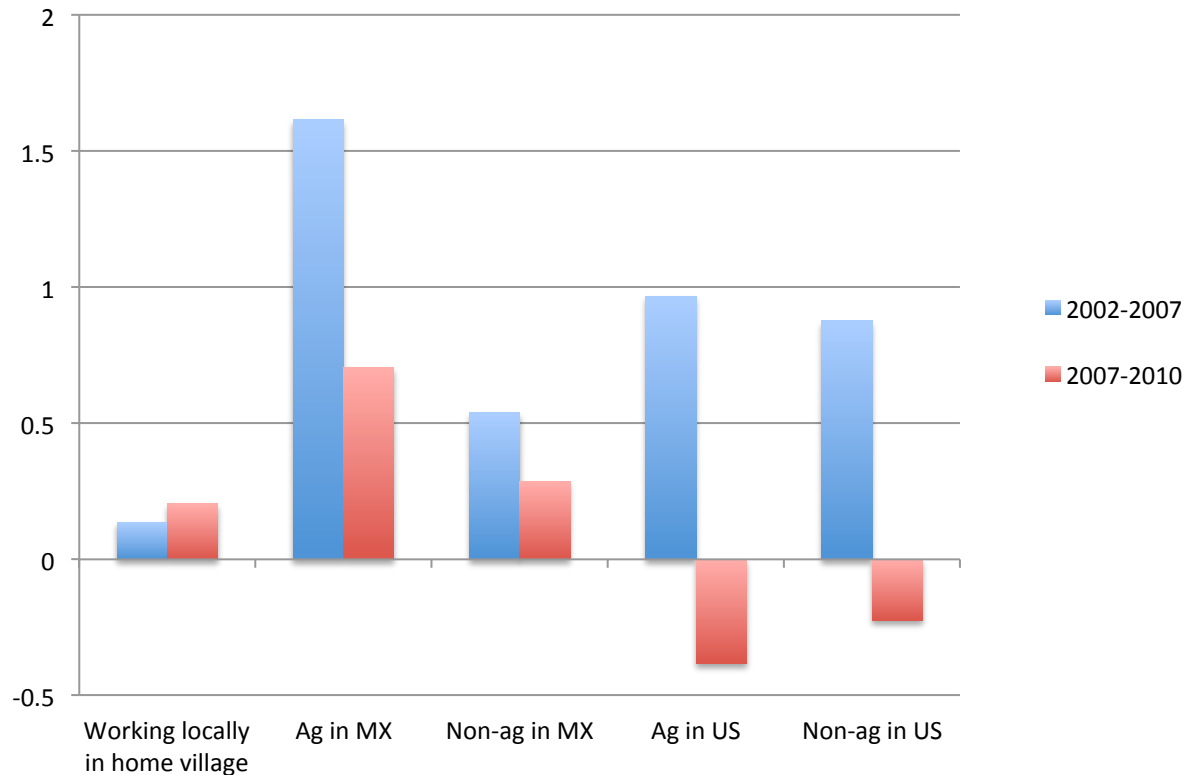


The Recession “Quasi Experiment”

Why Did Migration to US Ag Jobs Decrease?

Percentage change in the rural Mexican labor force by sector.

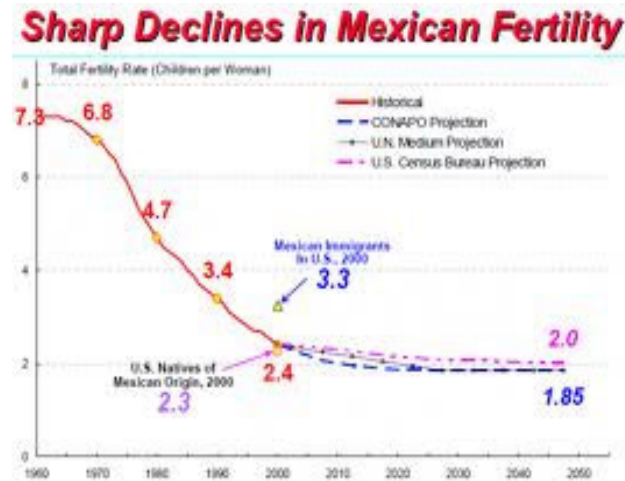
Mexican industry is growing.



Source: Taylor and Charlton (2012)

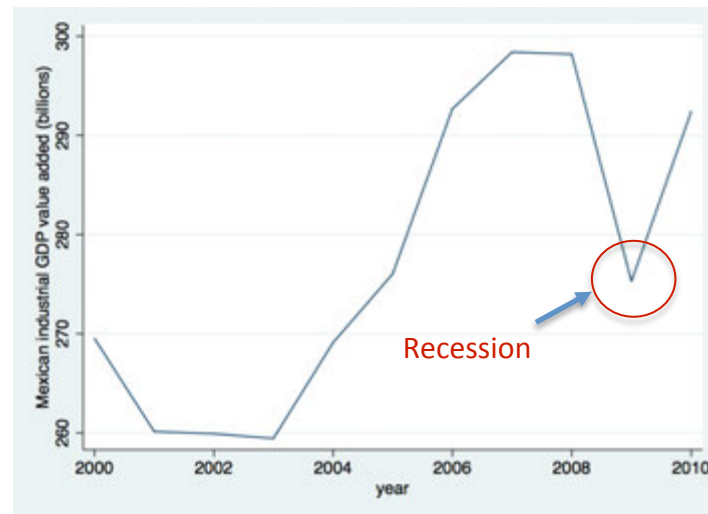
WHY the Negative Trend?

- A falling birthrate:



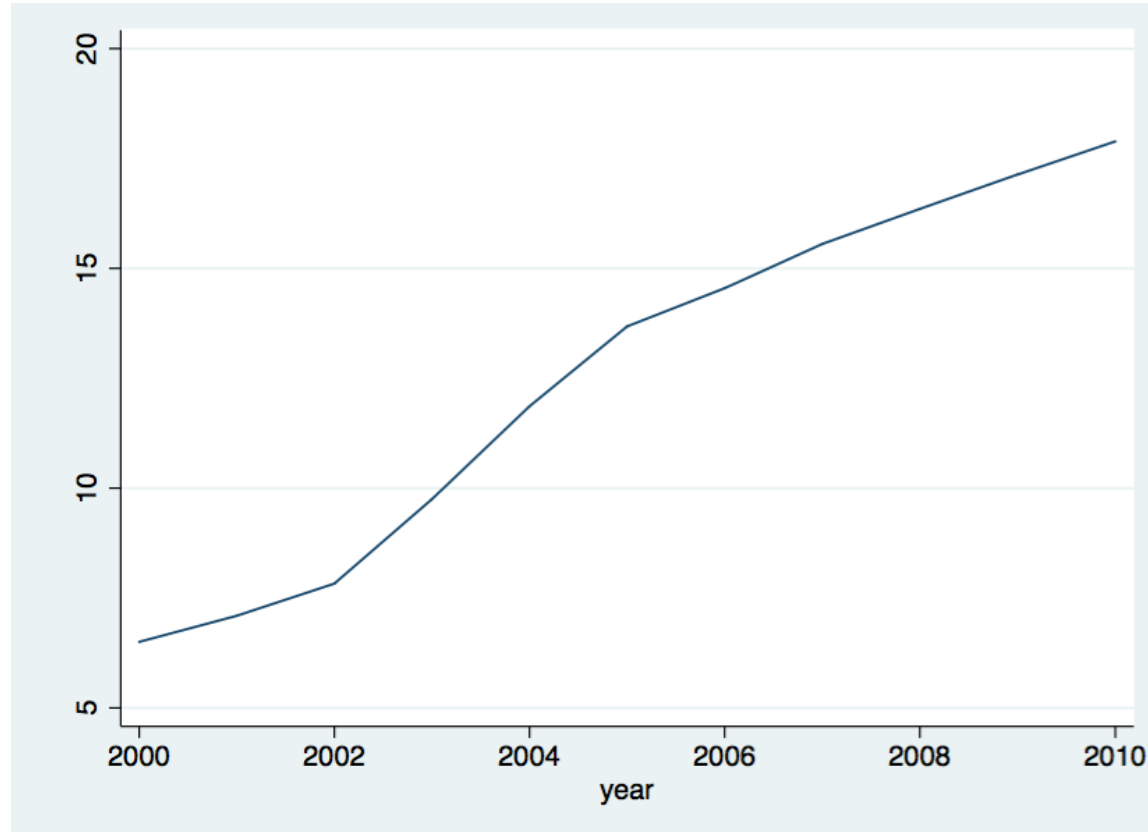
Source: Jeffrey Passel, PEW Research Center

- A growing non-farm economy:

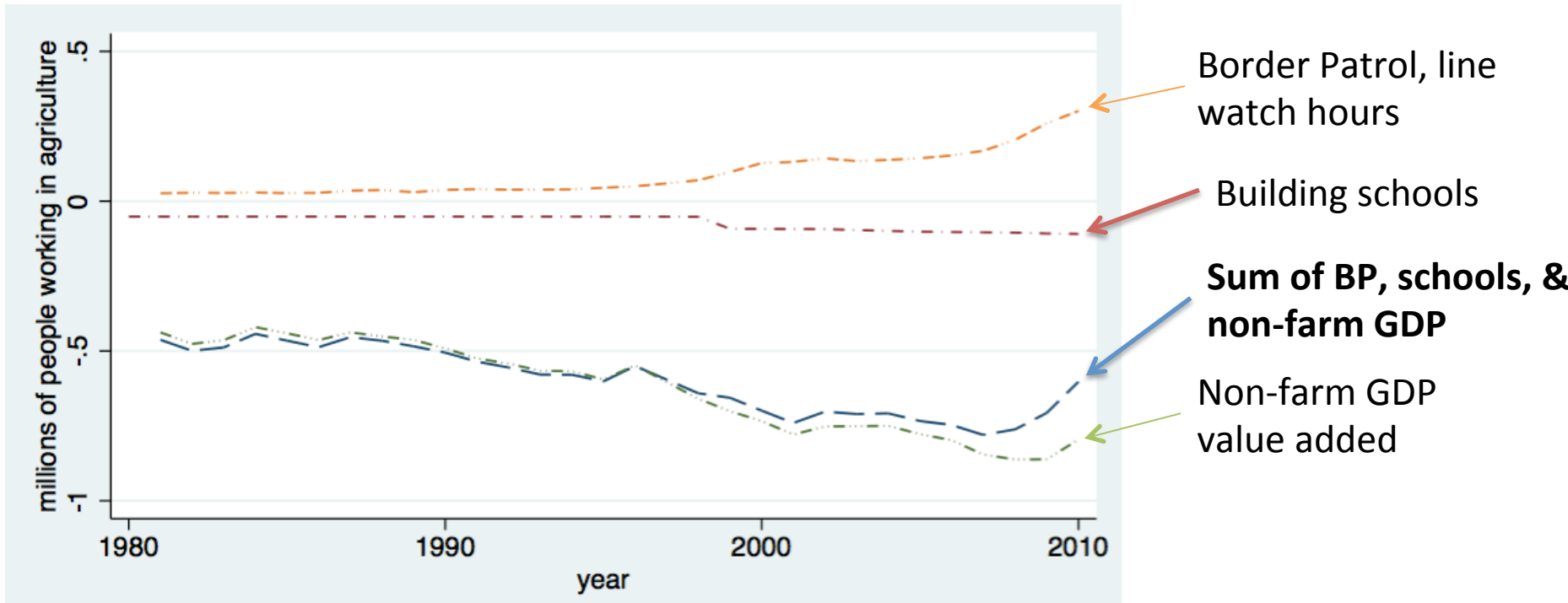


...And Schools!

% of working-age population with a secondary school in their village when 12

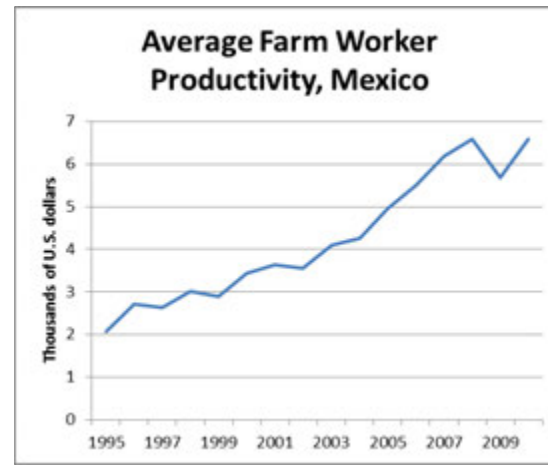
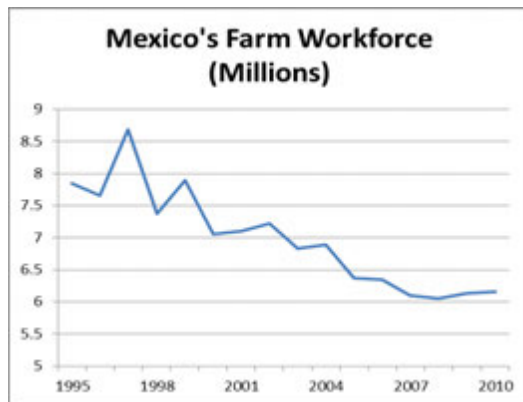
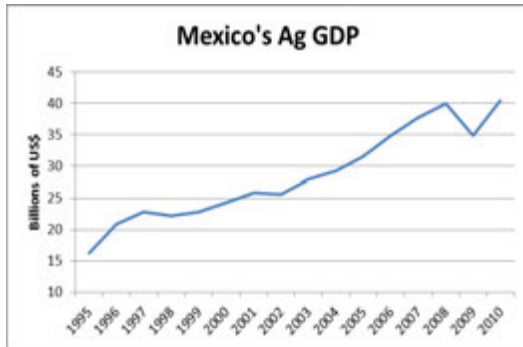


How It All Stacks Up (Preliminary)



Source: Estimates by Diane Charlton, UCD ARE

What It Means to Mexico: Producing More with Less



- Rising productivity in Mexico means higher farm wages in CA
- Nonfarm wages are now the major source of household income in rural Mexico

What It Means to California

- Farms will have to produce more with fewer workers
 - Technological change: mechanization
 - Changing crop mixes
 - More efficient labor management practices
 - Demand for more skilled workers
 - Rising farm worker productivity and wages
 - Could be good for rural communities

What Happens to Labor When Farms Tech Up?

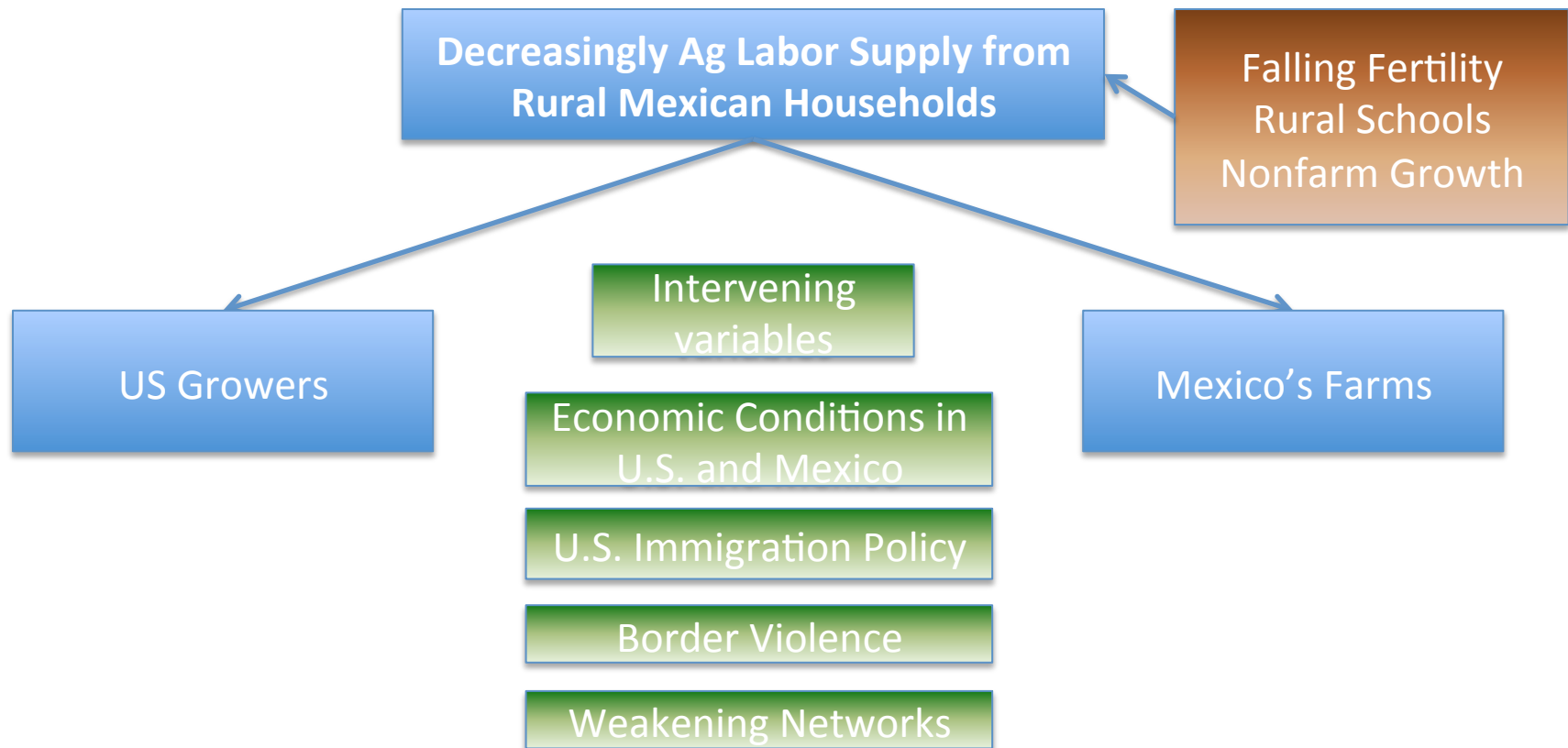
Lessons from “Shake and Catch”

- “Shake-and-catch” machines surround a tree and shake fruit and nuts into a catching frame
- They usually replace many low-skilled foreign-born workers with a few US workers with high-school diplomas and sometimes some college
 - Most machine operators speak English and have mechanical skills
 - Some are ex-pickers, but many did not move up from picking to machine operation

Skilled Farm Labor Migration?

- Mexico graduates 113,000 engineers a year, twice the rate per 100,000 residents as the US
- Mexican agricultural education “practical” compared with the increasing “theoretical” orientation of shrinking agricultural programs at US universities
- Some of the foreign workers hired via the H-2A program are skilled, but most are not
- Will there be an expansion of skilled farm labor migration in the future?

Immigration Policy in an Era of Diminishing Ag Labor Supply



- Immigration policy plays a role, but it is only an intervening variable against the backdrop of a diminishing farm labor supply in Mexico

Some Policy Lessons

- Don't assume immigration will solve the farm labor problem
 - The labor has to be there
- Adjust to a future with fewer workers
 - Get over the tomato harvester
 - UCD: Robots in the fields
- Educate the future farm workforce
 - ...or import it from Mexico
- Good news for ag workers, communities
 - Less labor, higher productivity → higher wages

*The Rains Are Likely to Come Back,
But the Hired Farm Labor from
Mexico Is Not*

References

- J. E. Taylor, D.E. Charlton, and A. Yunez-Naude (2012). “The End of Farm Labor Abundance.” *Applied Economic Perspectives and Policy*, [34\(4\):587-598](http://aepp.oxfordjournals.org/content/34/4/587.full.pdf+html),
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