Scale, Technique and Composition Effects in the Mexican Agricultural Sector: The Influence of NAFTA and the Institutional Environment.

November 2005

About me & the research

- **Research Associate at the University of Oxford's Environmental Change Institute (ECI).**
- **Research project derived from my MSc.**
- **Support from CEC and Prof. Diana Liverman at the ECI.**

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Research Aims

Explore changes in agricultural input use in Mexico during the post NAFTA period – both among Industrialized and Communal (ejido) farmers – as well as the influence of the national and multilateral institutional framework on these outcomes.

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Research Objective

- Decompose the post NAFTA period into **Scale, Technique** and **Composition** (STC) effects to estimate the impact that the trade liberalization process has had on the use of **fertilizer** and **land**.

- Further understand how the multilateral and national **institutional framework** has had a determinant influence on the resulting SCT effects.

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Paper's Principal contributions

- **Demonstrate the usefulness of applying the SCT theory to better understand the factors influencing input use trends in the agricultural sector.**

- **Highlight factors that have either not been large enough or not been directionally adequate to counteract overall Scale increases.**

- **Better understand how the institutional framework has contributed to these outcomes, particularly the Composition and Technique effects.**

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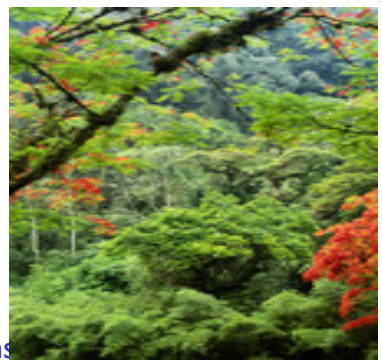
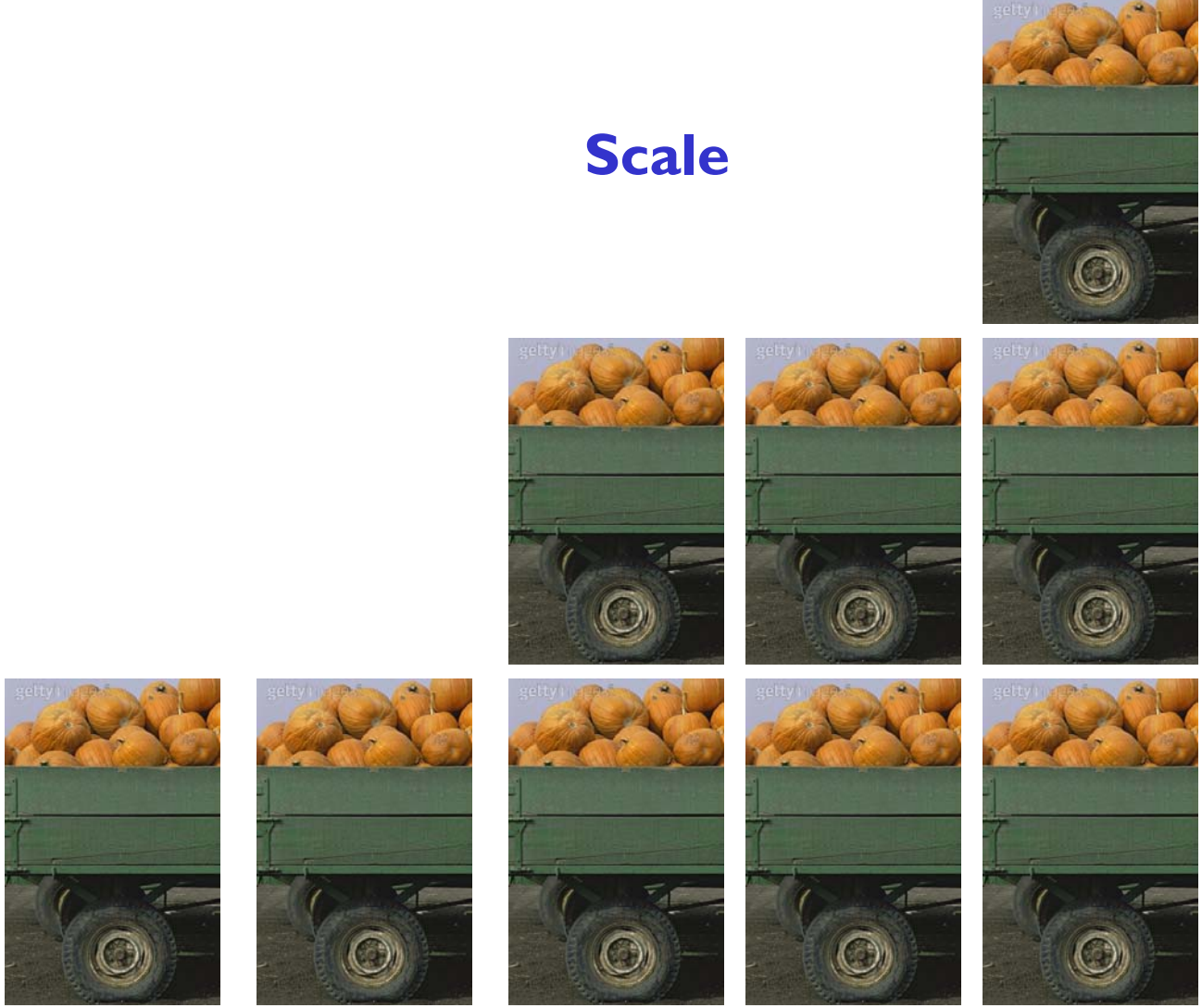
Agricultural Producers



Scale



The scale effect measures the increase in environmental degradation (input use) due to increased production.

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Composition

The Composition effect measures the change in environmental degradation (input use) due to changes in the range of goods produced.

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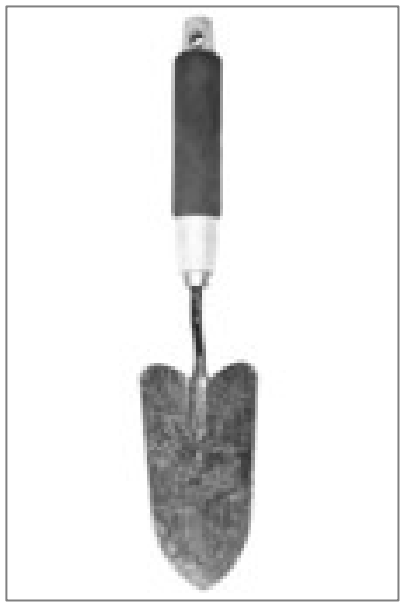
Technique





The Technique effect measures changes in aggregate pollution (input use) arising from trade induced technological changes.

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Data Used and Limitations

Data

- Agricultural Production Data (SIACON)
- Fertilizer use (FAO)

Limitations

- Input use levels, not pollution
- Exploratory rather than conclusive

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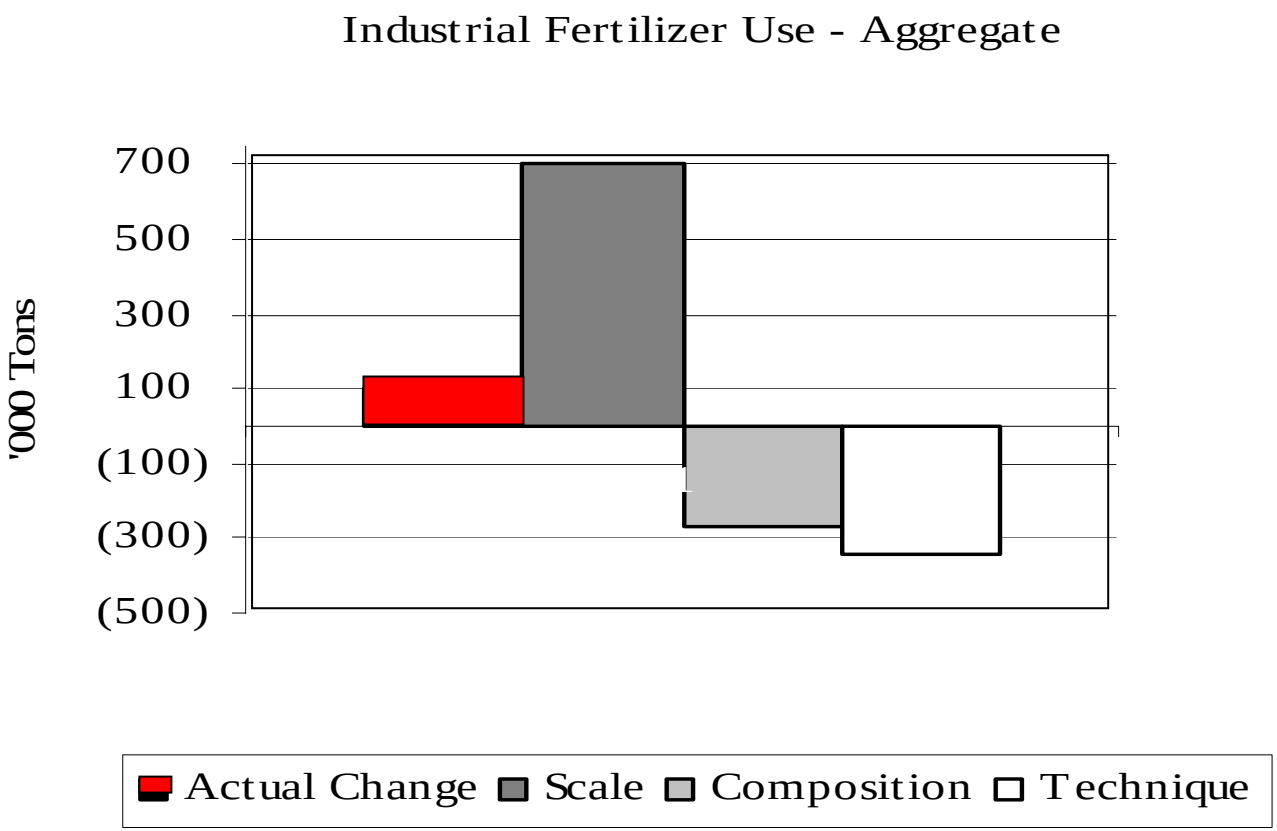
Fertilizer use increased among Industrial farmers



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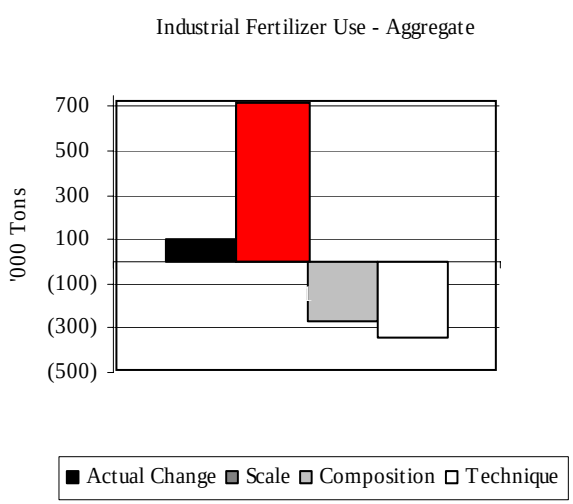
Scale drove fertilizer use up

↑56%



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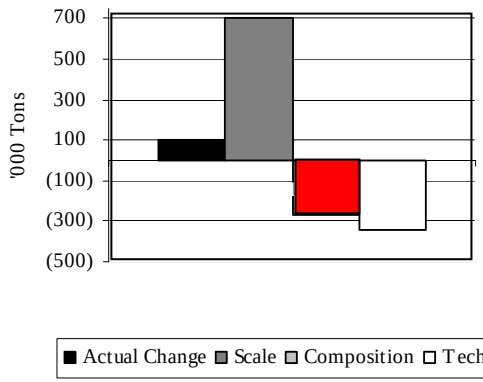
Composition is driving it down

21%

+48%



+8%

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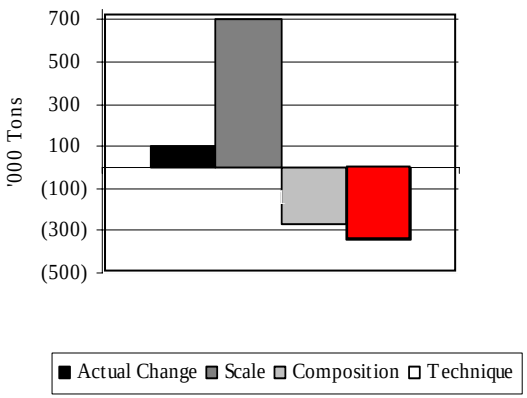
As well as technique…but not enough

27%



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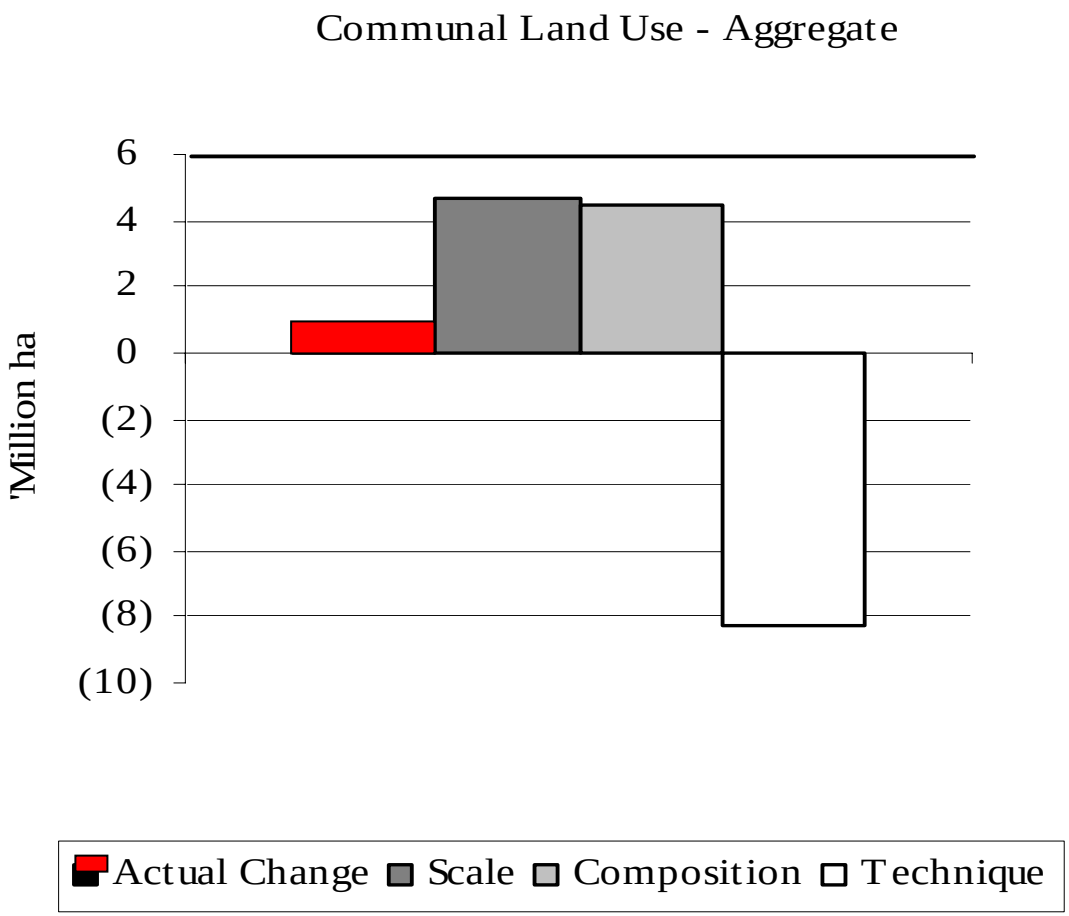
Land use increased among communal farmers



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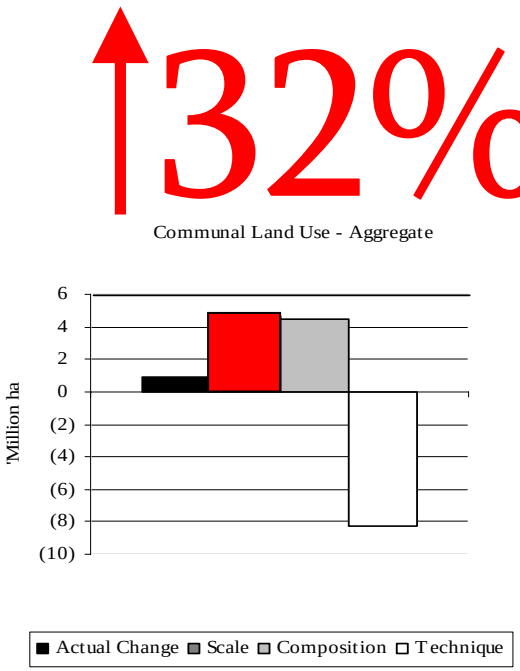
Scale is driving land use up

↑32%



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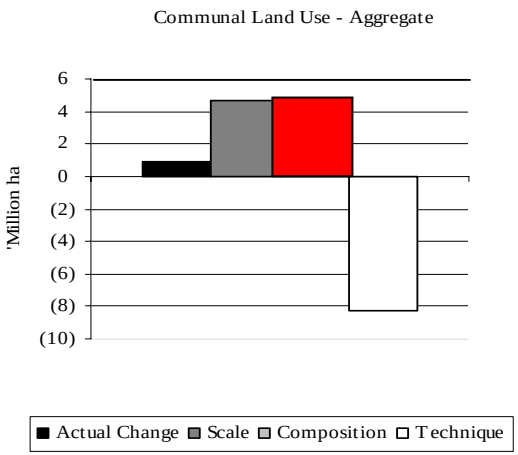
Composition is also driving land use up

↑31%



+77%

+12%

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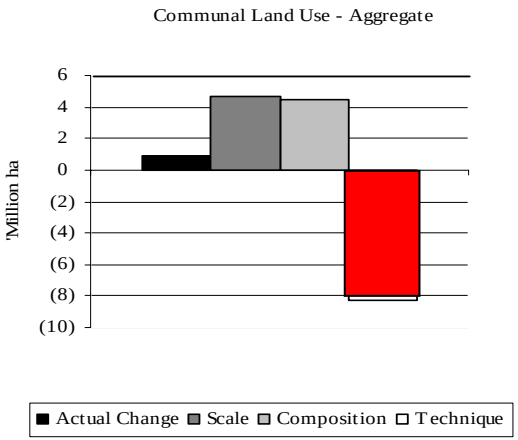
Technique is driving it down, but not enough

↓59%



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Institutional framework has a role to play

FERTILIZER USE

- Develop institutional framework capacity to coordinate, integrate and enforce dispersed pesticide and fertilizer regulatory framework.
- Adequate funding

LAND USE

- Rural Development plans adequate funding and allocation for communal farmers to:
    - Transition to higher value crops
    - Adopt higher yielding technologies

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