

Impact of NAFTA on Productivity A Firm-Level Analysis

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Outline

- 1 Motivation
- 2 Main Results
- 3 Theoretical Background
- 4 Econometric Strategy
 - Objectives
 - Difference in Difference Approach
- 5 Data
 - Productivity Trends
 - Productivity Decomposition
- 6 Results
 - Main Results
 - Other Results
- 7 Conclusions and Further Research
 - Conclusions

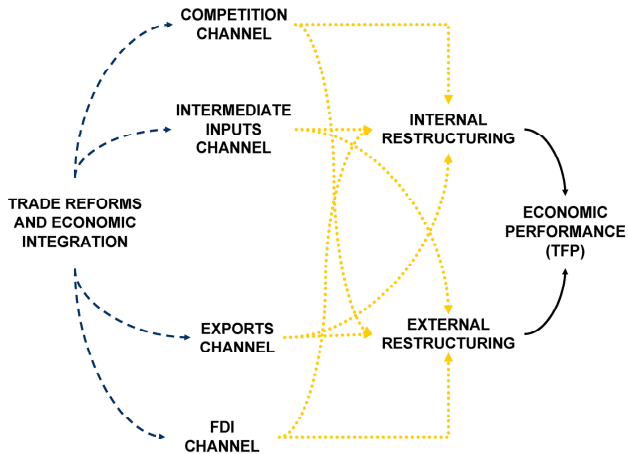
- Trade and growth debate: lack of definitive answer (Winters, 2004)
 - ① Econometric shortcomings of cross-countries regressions
 - ② Assume trade reforms captured by unidimensional index
 - ③ Assume relationship between trade reforms and growth
 - Constant across time
 - Identical across different countries
- Therefore
 - ① Microdata \Rightarrow More structure for identification
 - ② Capture overall effect of reforms (not just tariffs)
 - ③ Country specific study (Mexico) and time varying impact

- NAFTA impact evaluated through different channels

- 1 Import competition
- 2 Access to foreign intermediate inputs
- 3 Exports
- 4 Full integration: Joint import and export channel

- Results

- 1 Import competition: \downarrow 10% Tariffs \rightarrow \uparrow 0.5% Productivity
- 2 Access to foreign intermediate inputs: Being integrated \rightarrow \uparrow 8% Extra productivity growth
- 3 Export channel (just exports): Weak NAFTA-Productivity linkages
- 4 *Full integration* (exports and imports): Strongest NAFTA-productivity linkages
 - Being fully integrated \rightarrow \uparrow 14% Extra productivity growth



- 1 Identify and isolate the impact of NAFTA from other contemporaneous macro shocks
 - Difficult to isolate NAFTA impact from the Peso devaluation
- 2 Capture the overall effect of NAFTA
 - Tariffs
 - Other regulatory changes

1 Naive approach → Integrated vs Non-integrated

- $E[\varphi_t^{\text{int}}|X] - E[\varphi_t^{\text{nonint}}|X]$
- Problem: We attribute all difference to the treatment (NAFTA)
- Solution: Control for time invariant firm-specific characteristics

2 Difference-in-difference

- $(E[\varphi_t^{\text{int}}|X] - E[\varphi_t^{\text{nonint}}|X])^{\text{after}} - (E[\varphi_t^{\text{int}}|X] - E[\varphi_t^{\text{nonint}}|X])^{\text{before}}$

3 Estimated equation

$$\varphi_{it} = \beta_0 + \beta_1 \text{Time}_t + \beta_2 \text{DIntegration}_{it} + \delta \cdot \text{DIntegration}_{it} \times \text{Time}_{it} + \beta_3 \mathbf{X}_{ijs} + \varepsilon_{it}$$

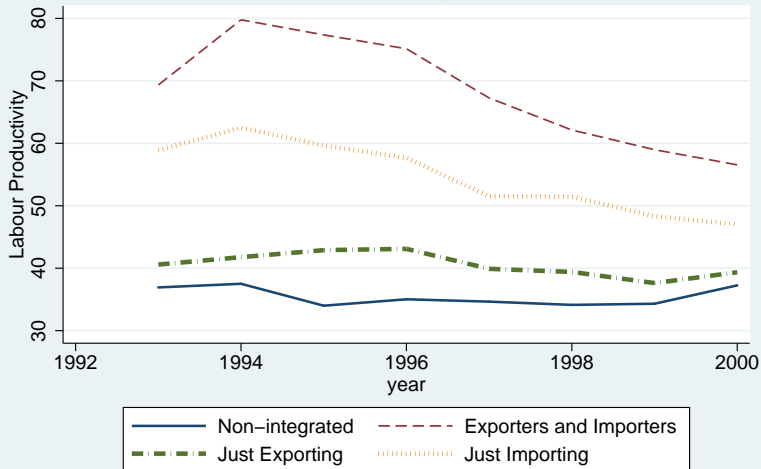
1 Data sources

- EIA 1993-2000
 - Unbalanced panel (5,000-7,000 firms)
 - Covers 85% of Mexican industrial output
 - No maquila
 - 6-digits class disaggregation (CMAP)
 - Plant level data
 - Information on input, output, ownership, investment, capital stock, exports, imports, etc.
- Price data from Banco de Mexico
- Tariff data (Lopez-Cordoba)

2 NAFTA implemented January 1st 1994

3 Peso devaluation in December 1994

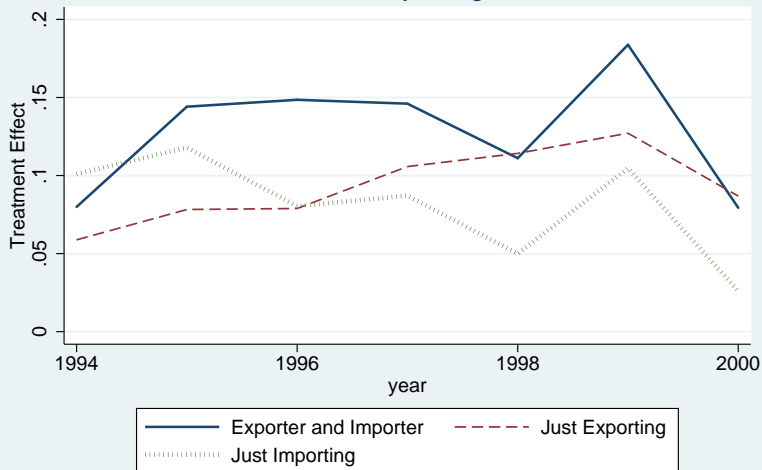
Productivity by Integration Status



Data sources: FIA

Treatment Impact by Integration Status			
Year	Just Importer	Just Exporter	Importer Exporter
<i>1994</i>	0.101*** (0.027)	0.059 (0.043)	0.080** (0.031)
<i>1995</i>	0.118*** (0.031)	0.078 (0.043)	0.144*** (0.031)
<i>1996</i>	0.080* (0.035)	0.079 (0.046)	0.149*** (0.032)
<i>1997</i>	0.087* (0.039)	0.106* (0.046)	0.146*** (0.037)
<i>1998</i>	0.050 (0.040)	0.114* (0.050)	0.111** (0.037)
<i>1999</i>	0.105* (0.048)	0.127* (0.056)	0.184*** (0.044)
<i>2000</i>	0.026 (0.047)	0.087 (0.060)	0.079 (0.043)

Treatment Effect by Integration Status



Data sources: Author's estimations with data from FIA

Competition effect and Firm Controls

Variable	Coefficient (SE)
<i>Tariffs</i>	-0.48***
<i>NAFTA</i>	(0.007)
<i>FDI</i>	0.253***
<i>Participation</i>	(0.018)
<i>FDI</i>	0.274***
<i>Ownership</i>	(0.014)
<i>Real</i>	0.722***
<i>Sales</i>	(0.008)
<i>Employment</i>	-0.629***
	(0.009)
<i>R&D</i>	0.060***
	(0.012)
<i>Capital</i>	0.004*
<i>Stock</i>	(0.002)

- 1 We analysed the impact of NAFTA upon firm level productivity
- 2 It is important to separate the different channels →
Trade-productivity relationship differs across firms types and time
- 3 Through all the different channels positive impact of trade reforms on productivity BUT
 - Stronger impact for *fully integrated firms*
 - Weaker impact for *just exporters*
 - Positive competition effect

- 1 Replicate the analysis with TFP
- 2 Dynamic models and matching to assess causal relationships between:
 - Importing \Rightarrow Productivity
 - Exporting \Rightarrow Productivity
- 3 Analyse productivity effects due to transition between integration status (fixed effect estimation)