How Important is the New Goods Margin in International Trade?

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How Does Trade Grow?

- Intensive Margin: growth in goods already traded

- Extensive Margin: trade in goods not traded before

What Happens to the Extensive Margin?

- During trade liberalization?

  ▶ Large changes in the extensive margin

- During growth episodes?

  ▶ Large changes in the extensive margin

- Over the business cycle?

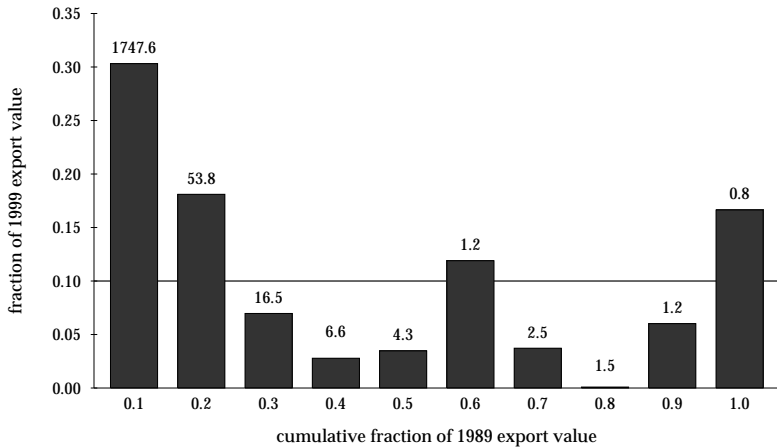 ▶ Little change in the extensive margin

Data & Countries

- 5-digit SITC bilateral trade flows
  - ▸ Also 6-digit HS data

- Trade liberalization
  - ▸ CAUSFTA & NAFTA (also EU accessions)

- Structural change
  - ▸ Chile, China, South Korea

- Business cycles and no structural change
  - ▸ Top U.S. trading partners: Germany, U.K., Japan

Measure 1

1. Rank codes from lowest value of exports to highest value of exports based on average of first 3 years

2. Form sets of codes by cumulating exports: the first 1747.6 codes make up 10 percent of exports; the next 53.8 codes make up 10 percent of exports; and so on.

3. Calculate each set's share of export value at the end of the sample period.

Composition of Exports: Mexico to Canada

fraction of 1999 export value

cumulative fraction of 1989 export value

1747.6
53.8
16.5
6.6
4.3
1.2
2.5
1.5
1.2
0.8

Measure Two

1. Order codes as before.

2. Cumulate exports as before.

3. Follow the evolution of the first (least-traded) set's share

Timing of Extensive Margin Growth

fraction of export value

Canadian exports to Mexico

Mexican exports to Canada
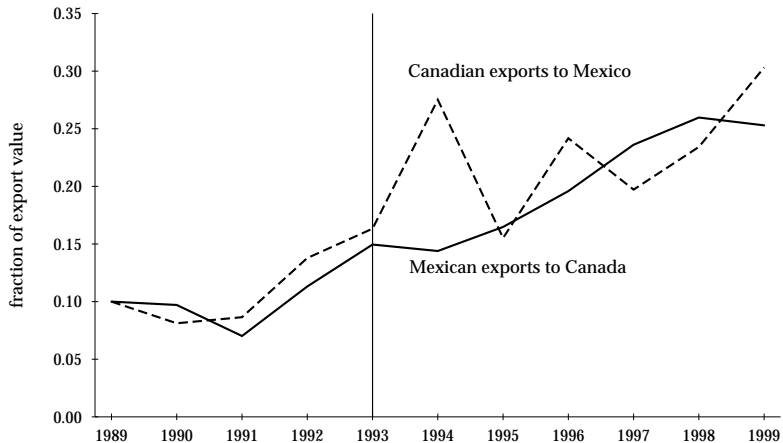
• Before turning to specific events, what happens to the extensive margin when trade grows . . . for any reason?

• Total trade from m to n, x^{mn}

• Least-traded goods from m to n, $\hat{x}^{mn}$

• Regress growth rates over different horizons, k

$$\Delta_{1995,1995+k}(\hat{x}^{mn}) = \alpha_k \Delta_{1995,1995+k} x^{mn} + \epsilon_{mn}$$

• Not meant to be causal!

Least-traded Goods Growth and Total Trade Growth
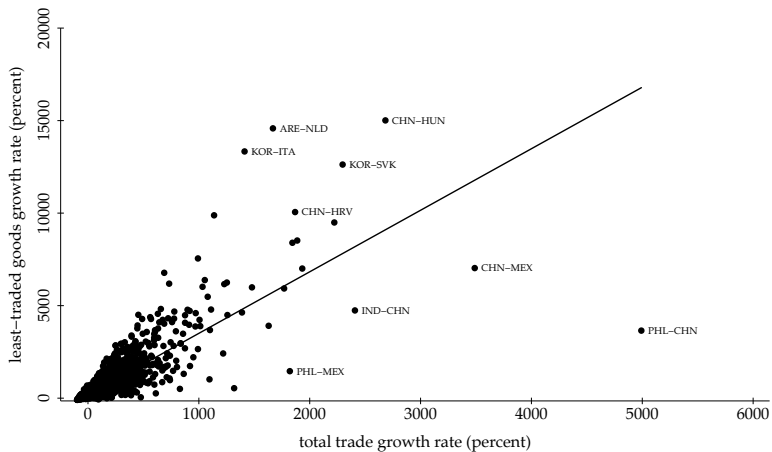
Least-traded Goods Growth and Total Trade Growth

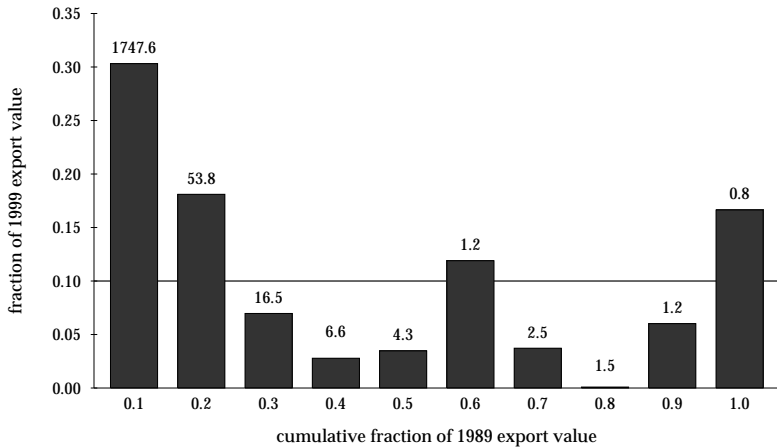| Horizon (years)	SITC2 Coefficient	R-squared	HS 92 Coefficient	R-squared
1	0.299** (0.119)	0.215	0.498*** (0.053)	0.413
2	0.493*** (0.044)	0.403	0.704*** (0.041)	0.595
3	2.016*** (0.192)	0.430	1.885*** (0.151)	0.525
4	2.246*** (0.129)	0.468	2.439*** (0.123)	0.497
5	2.836*** (0.232)	0.503	2.735*** (0.220)	0.566
6	2.425*** (0.381)	0.517	2.829*** (0.245)	0.564
7	3.108*** (0.234)	0.663	3.205*** (0.323)	0.686
8	3.752*** (0.385)	0.682	4.241*** (0.426)	0.791
9	3.599*** (0.330)	0.725	3.647*** (0.387)	0.757
10	3.591*** (0.402)	0.717	4.288*** (0.243)	0.837
Obs	1,913		1,277	

- 10% increase in total trade accompanied by 36% increase in extensive margin

- Extensive margin growth is stronger over longer horizons

  ▶ Picking up long term changes in export profitability?

  ▶ Consistent with sunk cost models (Ruhl 2008)

  ▶ More on this below: business cycles vs. structural change

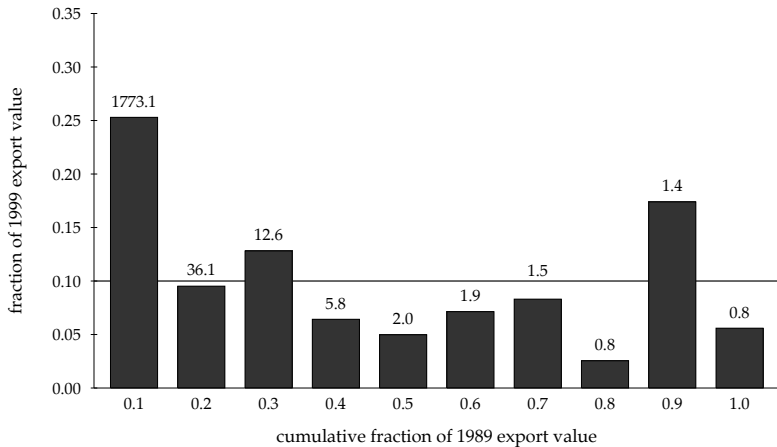• How does the extensive margin change after trade liberalization?

  ▶ NAFTA

• How does the extensive margin change during "structural transformations"?

  ▶ Structural transformation: development episodes

  ▶ Chile, China, South Korea

Composition of Exports: Mexico to Canada

fraction of 1999 export value

cumulative fraction of 1989 export value

1747.6 53.8 16.5 6.6 4.3 1.2 2.5 1.5 1.2 0.8

Composition of Exports: Canada to Mexico

Share of Least-traded Goods: Trade liberalization

Period	Trade flow	Share of total exports
1989-1999	Canada to Mexico	0.303
1989-1999	Mexico to Canada	0.253
1988-1998	Canada to United States	0.166
1988-1998	United States to Canada	0.121
1989-1999	Mexico to United States	0.180
1980-1988	Mexico to United States	0.357
1989-1999	United States to Mexico	0.137
1980-1988	United States to Mexico	0.223

Composition of Exports: China to United States
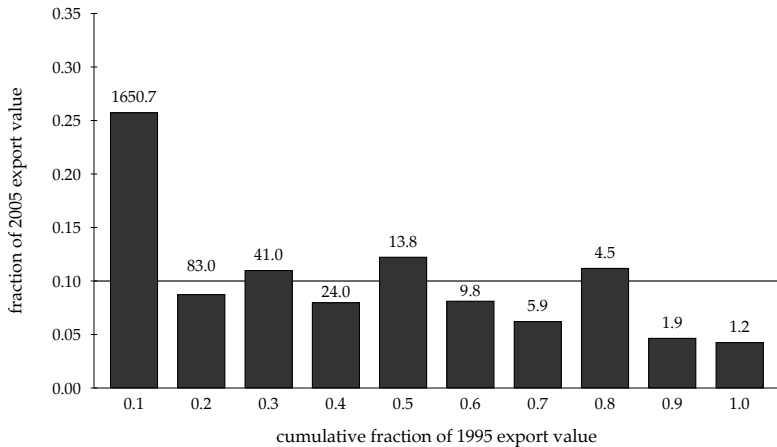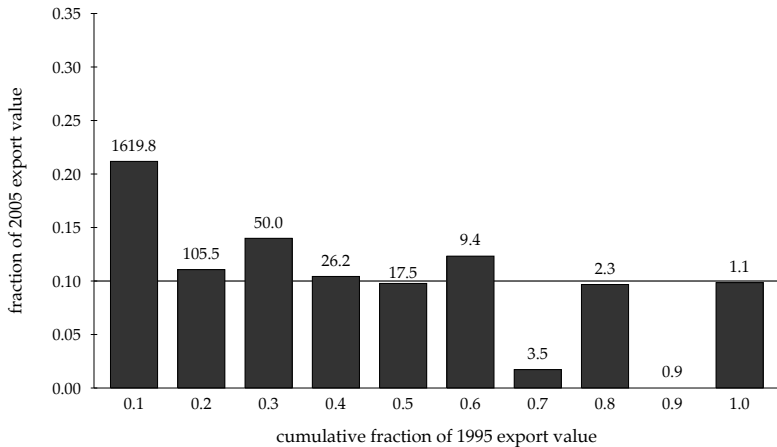
fraction of 2005 export value

cumulative fraction of 1995 export value

Composition of Exports: United States to China

fraction of 2005 export value

1619.8
105.5
50.0
26.2
17.5
9.4
3.5
2.3
0.9
1.1

cumulative fraction of 1995 export value

Share of Least-traded Goods: Structural transformation

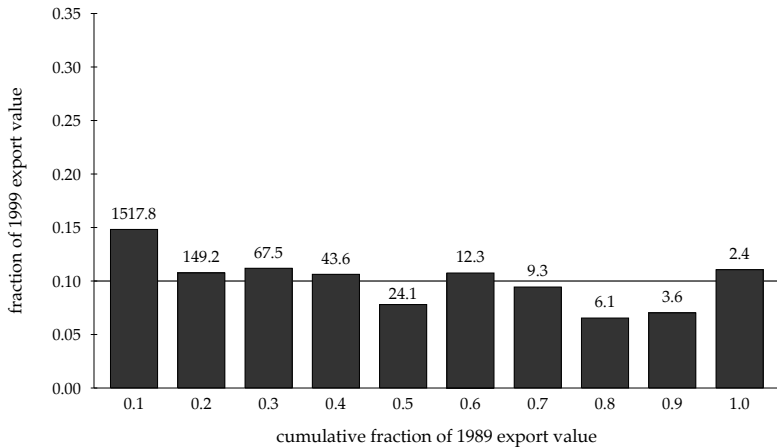| Period	Trade flow	Share of total exports
1975-1985	Chile to United States	0.346
1975-1985	United States to Chile	0.707
1995-2005	China to United States	0.257
1995-2005	United States to China	0.212
1975-1985	Korea to United States	0.658
1975-1985	United States to Korea	0.560

- How does the extensive margin change over the business cycle?

  ▶ U.S. largest trading partners without liberalization or structural transformation

Composition of Exports: United Kingdom to United States
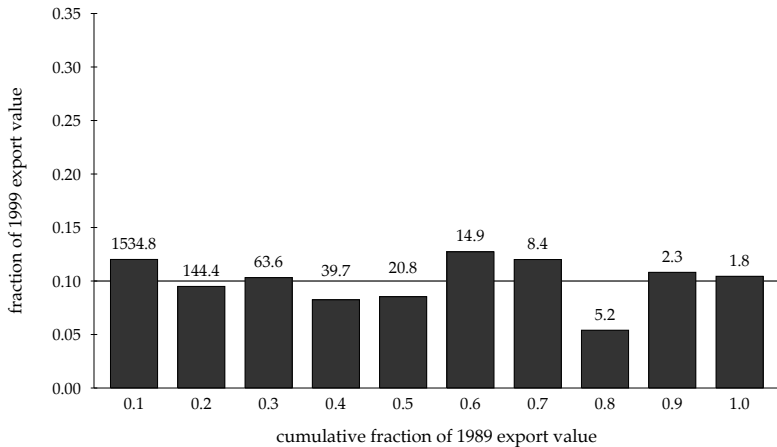
cumulative fraction of 1989 export value

fraction of 1999 export value

Composition of Exports: United States to United Kingdom

Figure data (bar chart):

- y-axis: fraction of 1999 export value
- x-axis: cumulative fraction of 1989 export value

cumulative fraction	label
0.1	1517.8
0.2	149.2
0.3	67.5
0.4	43.6
0.5	24.1
0.6	12.3
0.7	9.3
0.8	6.1
0.9	3.6
1.0	2.4

Share of Least-Traded goods: Structural Transformation

Period	Trade flow	Share of total exports
1989-1999	Germany to United States	0.139
1989-1999	United States to Germany	0.123
1989-1999	Japan to United States	0.118
1989-1999	United States to Japan	0.126
1989-1999	United Kingdom to United States	0.120
1989-1999	United States to United Kingdom	0.148

Decomposing Trade Growth

- Based on Feenstra (1994)
- Exports of good i from m to n at time t: $x_{i,t}^{mn}$
- Set of goods exported at t: I_t, and $I = I_{t_0} \cap I_{t_1}$
- Intensive margin growth rate

$$\frac{\sum_{i \in I} x_{i,t_1}^{mn}}{\sum_{i \in I} x_{i,t_0}^{mn}} = 1 + \gamma_{IM}^{mn}$$

- Extensive margin growth rate

$$\frac{\sum_{i \in I_{t_1}} x_{i,t_1}^{mn}}{\sum_{i \in I_{t_0}} x_{i,t_0}^{mn}} \Big/ \frac{\sum_{i \in I} x_{i,t_1}^{mn}}{\sum_{i \in I} x_{i,t_0}^{mn}} = 1 + \gamma_{EM}^{mn}$$

- In logs, growth in total trade is the sum of the extensive and intensive margin growth

$$\gamma^{mn} = \gamma_{EM}^{mn} + \gamma_{IM}^{mn}$$

Decomposing Total Trade Growth: NAFTA

		log difference [contribution to total]		
		total trade	extensive margin	intensive margin
1989-1999	Canada-Mexico	0.716	0.120 [16.7]	0.597 [83.3]
1989-1999	Mexico-Canada	1.565	0.097 [6.2]	1.468 [93.8]
1988-1998	Canada-U.S.	0.788	0.092 [11.7]	0.696 [88.3]
1988-1998	U.S.-Canada	0.706	0.061 [8.7]	0.645 [91.3]
1989-1999	Mexico-U.S.	1.486	0.136 [9.2]	1.350 [90.8]
1989-1999	U.S.-Mexico	1.310	0.088 [6.7]	1.222 [93.3]

Decomposing Total Trade Growth: Structural Transformation

		total trade	log difference [contribution to total] extensive margin	intensive margin
1975-1985	Chile-U.S.	1.962	0.033 [1.7]	1.929 [98.3]
1975-1985	U.S.-Chile	0.987	0.834 [84.6]	0.152 [15.4]
1995-2005	China-U.S.	1.683	0.258 [15.4]	1.424 [84.6]
1995-2005	U.S.-China	1.308	-0.113 [-8.6]	1.421 [108.6]
1975-1985	Korea-U.S.	3.157	1.015 [32.1]	2.143 [67.9]
1975-1985	U.S.-Korea	1.892	0.580 [30.7]	1.312 [69.3]

Decomposing Total Trade Growth: Business Cycles

		total trade	log difference [contribution to total] extensive margin	intensive margin
1989-1999	Germany-U.S.	0.842	0.086 [10.2]	0.756 [89.8]
1989-1999	U.S.-Germany	0.741	-0.017 [-2.3]	0.759 [102.3]
1989-1999	Japan-U.S.	0.342	0.002 [0.6]	0.340 [99.4]
1989-1999	U.S.-Japan	0.375	0.003 [0.8]	0.373 [99.2]
1989-1999	U.K.-U.S.	0.788	0.022 [2.8]	0.765 [97.2]
1989-1999	U.S.-U.K.	0.659	0.015 [2.2]	0.644 [97.8]

- When is the extensive margin important?

  ▶ NAFTA pairs: extensive margin accounts for 10% of growth

  ▶ Chile, China, Korea: ext. margin accounts for 26% of growth

  ▶ Business cycles: extensive margin accounts for 2.4% of growth