Cost of U.S. New Protectionism for Mexico

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Introduction

- U.S. trading partners were affected by recent wave of protectionism and trade war started in the U.S.
  - China, European Union, Russia, Canada, Mexico, Turkey, ...

- We study short-run impacts of this new wave of protectionism on Mexico's economy
  - Event Study
  - Trade Elasticities, Fajgelbaum, et al. (2019)
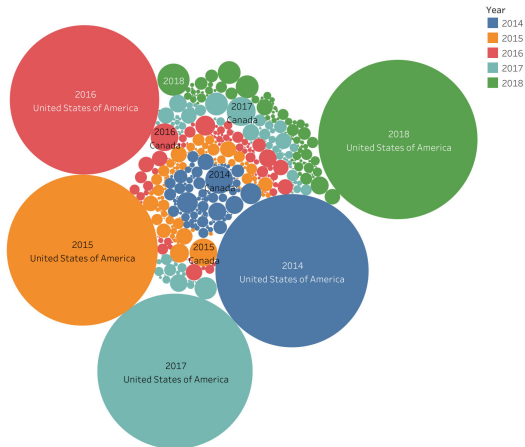 - A Small Open Economy DSGE model, Christiano et al. (2011)

Background
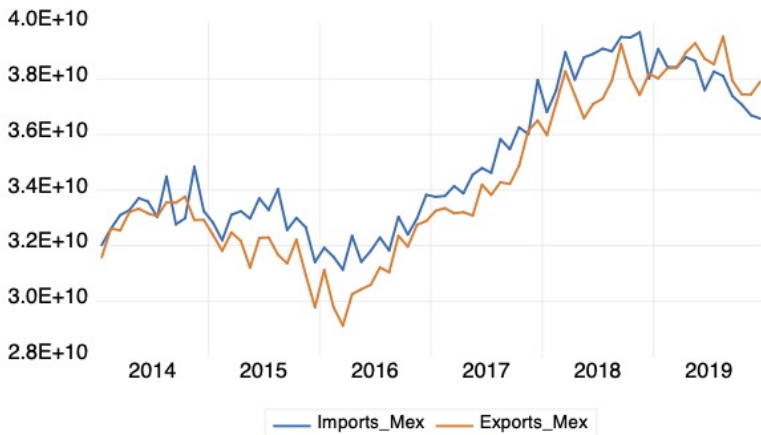
Figure 1: U.S. Trade Deficit with Mexico Since 1985
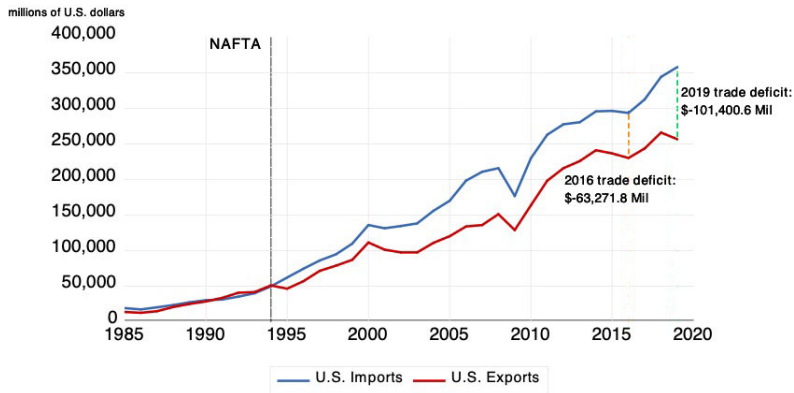
Background

Figure 2: Mexico's Export Partners 2014-2018

Background

Figure 3: Mexico's Exports and Imports (2014-2019)

Data

- We use monthly UN COMTRADE data at the HS6 products levels for the period of 2016-2019.
- For Mexico's tariffs, we use the annual WTO database of Most Favored Nation (MFN) tariff rates and compute the tariff rate for each country-product as the average of the MFN rate.
- For U.S. tariffs we use Fajgelbaum, et al. (2019) database which includes a monthly panel of U.S. statutory import tariffs and is constructed by using public schedules from the U.S. International Trade Commission (USITC).
- For the rest of the variables we use Banco de México and National Institute of Statistics and Geography (INEGI) databases.

Method

- Event Studies
- Trade Elasticities
  - ▶ Mexico Import and Foreign Export Variety Elasticities (σ, ω^*)
  - ▶ Product Elasticity (η)
  - ▶ Import Elasticity (κ)
  - ▶ Foreign Import and Mexico Export Variety Elasticities (σ^*, ω)
- DSGE Model
  - ▶ Exports
  - ▶ Imports

Event Study:

- Following Fajgelbaum, et al. (2019), we compare the trends of targeted varieties to varieties not targeted in the following specification:

$$\ln y_{igt} = \alpha_{ig} + \alpha_{gt} + \alpha_{it} + \sum_{j=-6}^{6} + \beta_{0j} I(event_{igt} = j) + \sum_{j=-6}^{6} + \beta_{1j} I(event_{igt} = j) \times target_{ig} + \epsilon_{igt}$$

- FEs:
  - ▶ country-product (varieties), α_{ig}
  - ▶ country-time, α_{it}
  - ▶ product-time, α_{gt}
- Varieties targeted by tariffs are captured by the $target_{ig}$ dummy
- We plot the β_{1j} dummies that capture the relative trends of targeted varieties

Trade Elasticities:

- Mexico Import and Foreign Export Variety Elasticities (σ, ω^*)

$$\Delta \ln m_{igt} = \eta_{gt}^m + \eta_{it}^m + \eta_{is}^m - \sigma \Delta \ln p_{igt} + \epsilon_{igt}^m$$

$$\Delta \ln p_{igt}^* = \eta_{gt}^{p^*} + \eta_{it}^{p^*} + \eta_{is}^{p^*} - \omega^* \Delta \ln m_{igt} + \epsilon_{igt}^{p^*}$$

- Product Elasticity (η)

$$\Delta \ln s_{M_{gt}} = \psi_{st} + (1 - \eta)\Delta \ln p_{M_{gt}} + \epsilon_{M_{gt}}$$

$s_{M_{gt}} \equiv \dfrac{p_{M_{gt}} m_{gt}}{P_{M_{gt}} M_{gt}}$ is the import share of product g in sector s.

$\psi_{st} \equiv -(1 - \eta)\Delta \ln P_{M_{gt}}$ is a sector-time fixed effect that controls for the overall sector import price index.

- Import Elasticity (κ)

$$\Delta \ln(\frac{p_{M_{st}} m_{st}}{P_{D_{st}} D_{st}}) = \psi_s + \psi_t + (1 - \kappa)\Delta \ln(\frac{P_{M_{gt}}}{P_{D_{gt}}}) + \epsilon_{st}$$

DSGE Model

- We calibrate Christiano et al. (2011) DSGE model by using above estimated elasticities to see the impacts of U.S. protectionism on Mexico's economy. We define bilateral trade shocks between U.S. and Mexico.

- Exports:
$$mc_t^x = \frac{\gamma_t^x R_t^x}{q_t p_t^c p_t^x}[\rho_x (p_t^{m,x})^{1-\theta_x} + (1-\rho_x)]^{\frac{1}{1-\theta_x}}$$

- Imports:
 Foreign firms sell a homogeneous good to domestic importers. There are three types of importing firms:
    - ▶ one which produces goods used to produce an intermediate good for the production of consumption,
    - ▶ one which produces goods used to produce an intermediate good for the production of investment, and
    - ▶ one which produces goods used to produce an intermediate good for the production of exports.
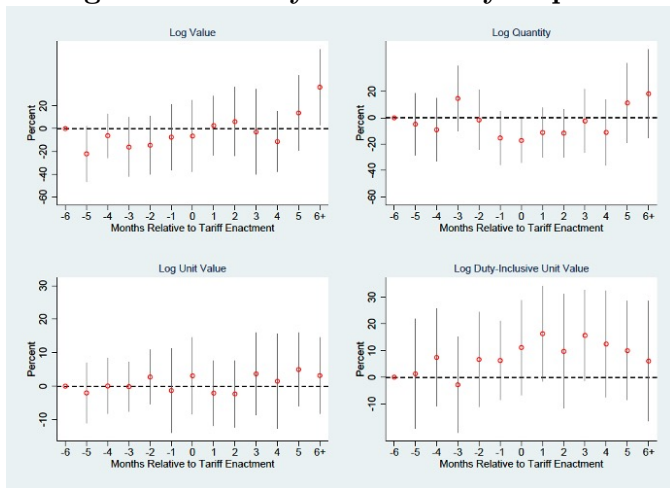$$mc_t^{m,c} = \gamma_t^{m,c} S_t P_t^* R_t^*$$

Event Study

Figure 4: Variety Event Study-Imports
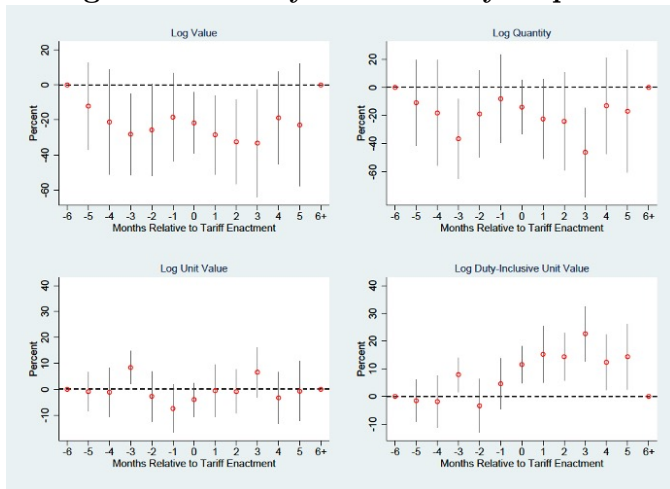
Event Study

Figure 5: Variety Event Study-Exports

Pre-existing Trends

Table 1: Mexico Import and Export Trends

Panel A: Mexico Import Trends

	(1)	(2)	(3)	(4)
	$\Delta \ln p_{ig}^* m_{ig}$	$\Delta \ln m_{ig}$	$\Delta \ln p_{ig}^*$	$\Delta \ln p_{ig}$
$\Delta_{17-18} \ln(1 + \tau_{ig})$	0.54	0.59	-0.20	-0.20
	(0.42)	(0.37)	(0.18)	(0.18)
Country × Sector FE	Yes	Yes	Yes	Yes
Product FE	Yes	Yes	Yes	Yes
R2	0.17	0.18	0.17	0.17
N	59,642	53,999	53,999	53,999

Panel B: Mexico Export Trends

	(1)	(2)	(3)	(4)
	$\Delta \ln p_{ig}^X x_{ig}$	$\Delta \ln x_{ig}$	$\Delta \ln p_{ig}^X$	$\Delta \ln p_{ig}^X (1 + \tau_{ig}^*)$
$\Delta_{17-18} \ln(1 + \tau_{ig}^*)$	-0.22	0.45	0.16	-0.24
	(0.20)	(0.39)	(0.18)	(0.16)
Country × Sector FE	Yes	Yes	Yes	Yes
Product FE	Yes	Yes	Yes	Yes
R2	0.20	0.20	0.20	0.24
N	27,279	31,651	31,651	20,433

Mexico's Imports and Foreign Exports at the Variety Level

Table 2: Variety Import Demand (σ) and Foreign Export Supply (ω^*)

	(1) $\Delta \ln p^*_{igt} m_{igt}$	(2) $\Delta \ln m_{igt}$	(3) $\Delta \ln p^*_{igt}$	(4) $\Delta \ln p_{igt}$	(5) $\Delta \ln p^*_{igt}$	(6) $\Delta \ln m_{igt}$
$\Delta \ln(1 + \tau_{igt})$	-0.10* (0.06)	-0.09* (0.04)	0.00 (0.02)	1.00*** (0.02)		
$\Delta \ln m_{igt}$					0.03 (0.21)	
$\Delta \ln p_{igt}$						-1.08*** (0.07)
Product × Time FE	Yes	Yes	Yes	Yes	Yes	Yes
Country × Time FE	Yes	Yes	Yes	Yes	Yes	Yes
Country × Sector FE	Yes	Yes	Yes	Yes	Yes	Yes
1st-Stage F					1.3	3935
R2	0.14	0.15	0.14	0.14	.	0.03
N	1,634,733	1,147,069	1,147,069	1,147,069	1,147,069	1,147,069

Product Level Imports

Table 3: Product Elasticity (η)

	(1) $\Delta \ln s_{M_{gt}}$	(2) $\Delta \ln p_{M_{gt}}$	(3) $\Delta \ln s_{M_{gt}}$
$\Delta \ln Z_{M_{gt}}$	-0.74*** (0.32)	0.81*** (0.34)	
$\Delta \ln p_{M_{gt}}$			-0.91 (0.83)
Sector - Time FE	Yes	Yes	Yes
1st-Stage F			2.2
$\hat{\eta}(se[\hat{\eta}])$			0.09 (0.83)
R2	0.10	0.03	.
N	85,617	85,617	85,617

Sector Elasticity

Table 4: Sector Elasticity (κ)

	(1) $\Delta \ln \left(\frac{P_{M_{st}} M_{st}}{P_{D_{st}} D_{st}} \right)$	(2) $\Delta \ln \left(\frac{P_{M_{st}}}{p_{st}} \right)$	(3) $\Delta \ln \left(\frac{P_{M_{st}} M_{st}}{P_{D_{st}} D_{st}} \right)$
$\Delta \ln Z_{M_{st}}$	-4.92 (4.96)	13.51 (15.32)	
$\Delta \ln \left(\frac{P_{M_{st}}}{p_{st}} \right)$			-0.36 (0.73)
Sector FE	Yes	Yes	Yes
Time FE	Yes	Yes	Yes
1st-Stage F			0.8
$\hat{\kappa}(se[\hat{\kappa}])$			0.64 (0.73)
R2	0.9	0.1	.
N	2,018	2,018	2,018

Mexico Export Variety Elasticities

Table 5: Foreign Import and Mexico Export Variety Elasticities

	(1) $\Delta \ln p_{igt}^X x_{igt}$	(2) $\Delta \ln x_{igt}$	(3) $\Delta \ln p_{igt}^X$	(4) $\Delta \ln p_{igt}^X (1 + \tau_{igt}^*)$	(5) $\Delta \ln p_{igt}^X$	(6) $\Delta \ln x_{igt}$
$\Delta \ln(1 + \tau_{igt}^*)$	0.59***	1.1***	0.26	1.07***		
	(0.18)	(0.43)	(0.33)	(0.34)		
$\Delta \ln x_{igt}$					0.44***	
					(0.15)	
$\Delta \ln p_{igt}^X (1 + \tau_{igt}^*)$						-0.91***
						(0.29)
Product × Time FE	Yes	Yes	Yes	Yes	Yes	Yes
Country × Time FE	Yes	Yes	Yes	Yes	Yes	Yes
Country × Sector FE	Yes	Yes	Yes	Yes	Yes	Yes
1$^{\text{st}}$-Stage F					0.7	1.7
R2	0.11	0.13	0.12	0.12	0.39	.
N	329,488	233,433	233,433	301,980	233,433	221,355

IRFs

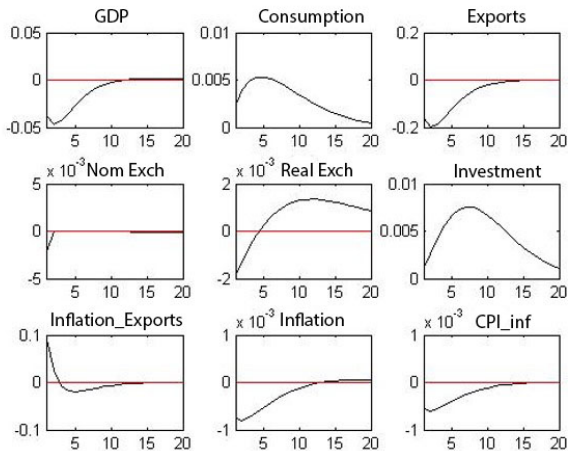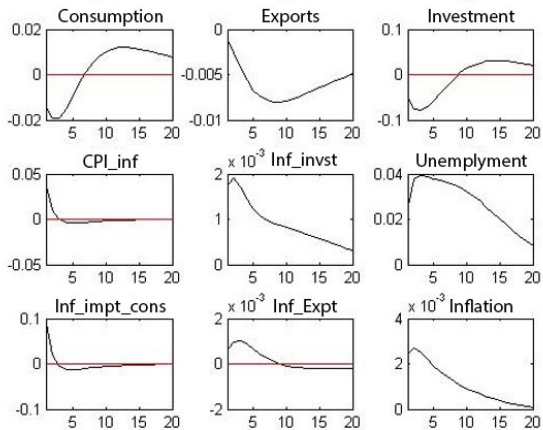**Figure 6: IRFs of U.S Tariff shocks on Mexico's Export**

IRFs

Figure 7: IRFs of Mexico's Retaliatory Tariff shocks on Imported consumption goods

Conclusion:

- We apply event studies to see the impact of changes in trade policies on Mexico's imports and exports for the period of 2016-2019. Our results show that the imposition of tariffs could not significantly reduce the trade values and quantities, but we could find a complete pass-through of the tariffs to imports and exports prices at the variety level.

- We also apply Fajgelbaum, et al. (2019) approach to estimate Mexico import and foreign export variety elasticities, product elasticities, import elasticities between domestic and imported products, and foreign import and Mexico export variety elasticities. The estimated elasticities of Mexico's imports demand and exports supply are -1.08 and 0.44 respectively.

- We also modify Christiano et al. (2011) DSGE model by using the estimated elasticities and defining bilateral trade shocks between U.S. and Mexico.

- Our results show that potentially, if there is a 10 percent tariffs on all exported goods from Mexico to U.S. Mexico's GDP reduces by less than 5 percent.

- Potentially, if Mexico decided to impose 10 percent retaliatory tariffs only on consumption goods imported from U.S., the Mexico's consumption decreases by 2 percent.