Leveraging **U**S **C**ommercial **A**djustments: MFN Tariffs and Trade Diversion

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THE LEGACY OF LUCA SALVATICI 2026

Overview

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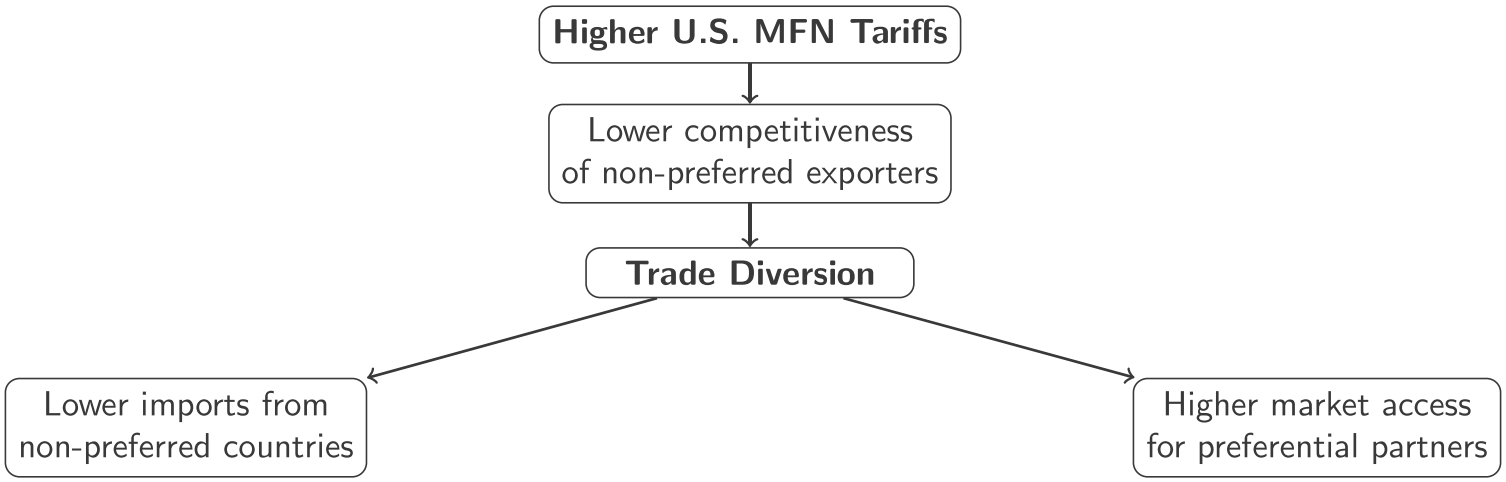
Motivation: Why Study Tariff Increases?

- Recent U.S. protectionist measures, notably the Trump tariffs, led to a substantial increase in MFN tariffs.
- Existing literature has mainly focused on:
  - reductions in import volumes;
  - price and welfare effects;
  - retaliation and trade-war outcomes.
- Less attention has been paid to **how tariff increases affect the composition of imports**.
- Higher MFN tariffs may not only reduce total imports, but also **reallocate trade across exporters**.

Key Intuition

When MFN tariffs increase, exporters benefiting from preferential access become relatively more competitive, even if their own tariff treatment remains unchanged.

Motivation



Research Gap

Most studies focus on import reductions and welfare effects. Less attention has been paid to how changes in MFN tariffs reshape the **composition of imports** through preferential trade agreements.

Research Question and Contribution

Research Question

Do **increases in U.S. MFN tariffs**
divert imports away from non-preferred exporters and toward preferential trading partners?

Contributions

1. Measure the **compositional effects** of U.S. protectionism.
2. Introduce a **multilateral tariff-margin** measure consistent with structural gravity theory.
3. Assess whether preferential trade agreements generate:
   - Trade diversion;
   - Preference amplification;
   - Changes in relative market access.

Literature Review

1. **U.S. Protectionism and Trump Tariffs**
   Javorcik et al. (2025); Cavalcanti, Ogeda & Ornelas (2026)
   - Tariffs reduced imports and increased costs for U.S. firms and consumers.
   - Limited evidence of employment gains in the US
   - Important spillover effects on third countries.

2. **Trade elasticities and Preference margins**
   Bouët et al. (2005); Francois et al. (2006); Cipollina & Salvatici (2017, 2020)
   - Preferential agreements alter relative market access.
   - Changes in preference margins can generate trade diversion.

   Cipollina & Salvatici (2025) and Tamberi (2026) on the UK Global Tariff reform.

3. **Structural Gravity Models**
   Anderson & van Wincoop (2003); Head & Mayer (2014); Yotov et al. (2016); Fontagné et al. (2022)
   - Multilateral resistance terms and trade policy evaluation

Our Contribution

While recent studies focus on the effects of Trump tariffs, we investigate how MFN tariff increases reshape trade preferences and reallocate U.S. imports across trading partners.

Theoretical Framework

Tariff Margins and Relative Market Access

Bilateral tariff margin

$$btm_{ikt} = \frac{1 + T_{kt}}{1 + \tau_{ikt}}$$

- T_{kt}: CES reference tariff factor capturing the multilateral tariff structure for product k.
- τ_{ikt}: tariff applied by the United States to exporter i.
- btm_{ikt} measures exporter i's **relative market access**.

Interpretation

- $btm < 1 \Rightarrow$ exporter faces a relative disadvantage.
- $btm > 1 \Rightarrow$ exporter enjoys preferential relative market access.

Based on Cipollina and Salvatici (2017, 2020, 2025).

Key Mechanism Behind U.S. MFN Tariff Increases

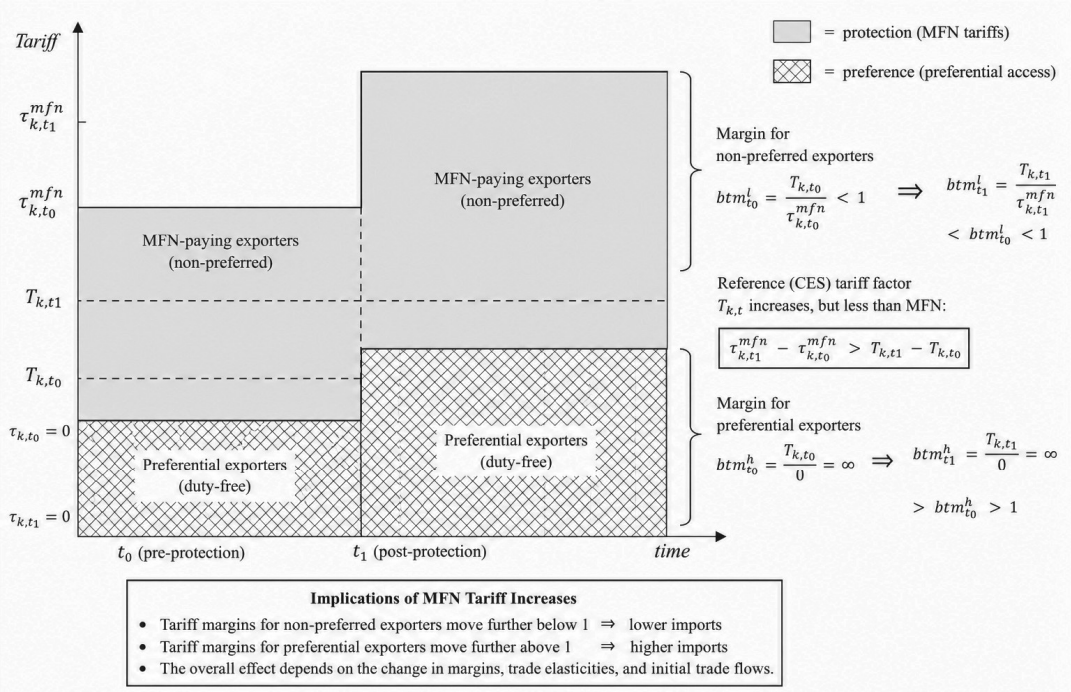
Theoretical Prediction

MFN tariff increases raise the CES reference tariff factor, but by less than the MFN tariff itself. As a result, bilateral tariff margins diverge:

$$\underbrace{btm^{l}}_{\text{Non-preferred}} \downarrow \qquad \underbrace{btm^{h}}_{\text{Preferential}} \uparrow$$

- Non-preferred exporters lose relative market access.
- Preferential exporters gain relative market access.
- Import demand shifts toward preferential trading partners.

MFN Protection and Trade Diversion



MFN tariff ↑ widen bilateral tariff margins between preferential and non-preferential exporters.

Interpreting the Figure

The figure compares two periods:

$$t_0 \text{ (before the MFN tariff increase)} \longrightarrow t_1 \text{ (after the MFN tariff increase)}$$

- At t_0, non-preferred exporters face the MFN tariff, while preferential exporters benefit from lower or zero tariffs.
- At t_1, the United States increases MFN tariffs on non-preferred exporters.
- The CES reference tariff factor also increases, but less than the MFN tariff itself:

$$\Delta\tau^{MFN} > \Delta T.$$

- In the figure, btm^l denotes **low tariff margins** (non-preferred exporters), while btm^h denotes **high tariff margins** (preferential exporters).
- Consequently,

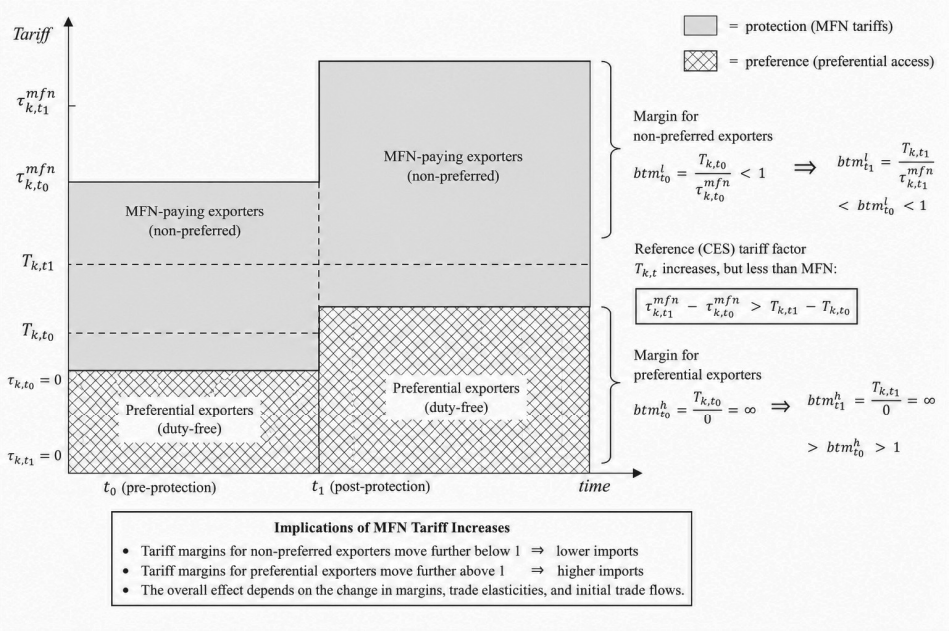
$$btm^l_{t_1} < btm^l_{t_0} < 1, \qquad btm^h_{t_1} > btm^h_{t_0} > 1.$$

  Tariff margins move away from one, increasing the relative advantage of preferential exporters.

Empirical Prediction

MFN tariff increases **reshape the structure of trade preferences**, reducing imports from non-preferred exporters and redirecting trade toward preferential partners.

MFN Protection and Tariff Margins



Pre-protection (t_0)

- Non-preferred exporters pay MFN tariffs.
- Preferential exporters enjoy duty-free access.

Post-protection (t_1)

- MFN tariffs increase.
- Preferential exporters (as domestic producers) still enjoy duty-free access.
- The CES reference tariff also increases:

$$\Delta \tau^{mfn} > \Delta T$$

- Tariff margins move away from one:

$$btm^l \downarrow \qquad btm^h \uparrow$$

Data

Period: 2016–2021

Trade and Tariff Data

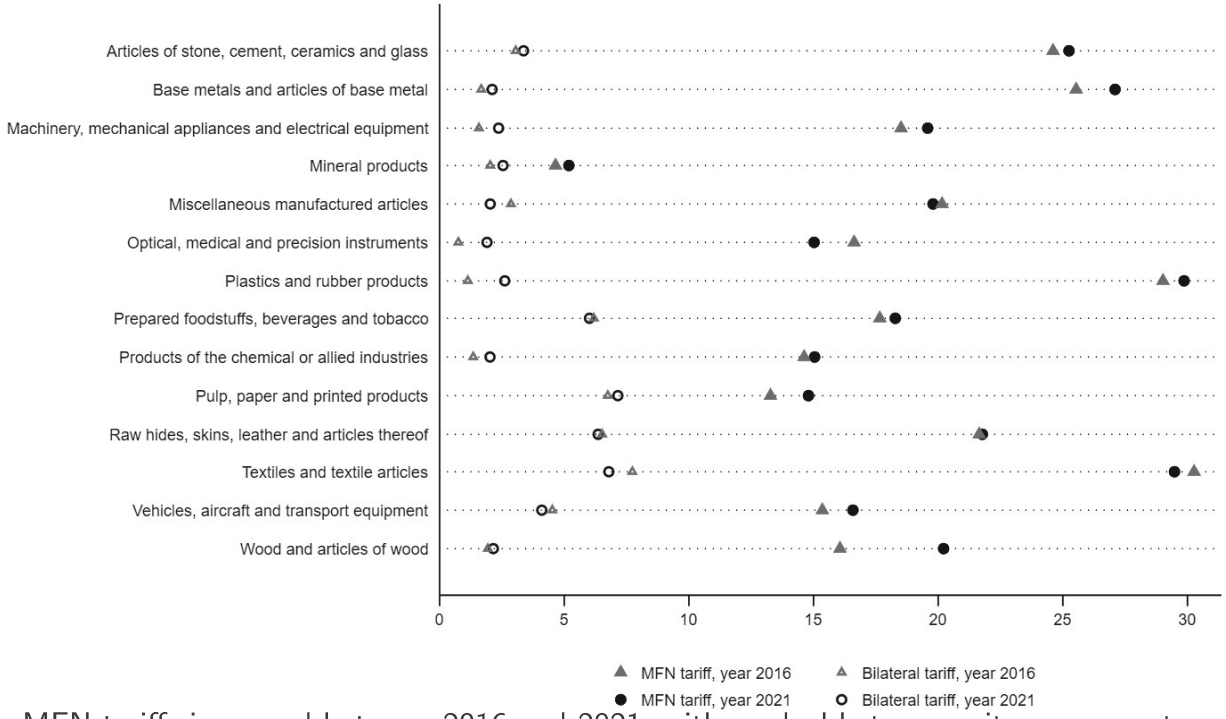
- WITS–TRAINS
- MFN tariffs and applied tariffs
- UN Comtrade
- U.S. imports at the exporter–product–year level

Production Data

- USITC International Trade and Production Database for Estimation (ITPDE)
- Domestic production

Descriptive analyses

Evolution of U.S. MFN Tariffs



Average U.S. MFN tariffs increased between 2016 and 2021, with marked heterogeneity across sectors.

U.S. Trade Composition by Tariff Regime

- **Preferential trade accounts for most U.S. imports**
  - More than 85% of U.S. imports occur under preferential arrangements in machinery, transport equipment, chemicals, textiles, and base metals.
- **MFN trade represents a relatively small share of imports**
  - MFN imports remain relevant mainly in food products (19%) and transport equipment (14%).
- **Duty-free trade is concentrated in a few sectors**
  - Particularly important for mineral products (52%), wood products (32%), and paper products (21%).

Implication

Since most U.S. imports already benefit from preferential access, **MFN tariff increases** can substantially alter relative preference margins and **reallocate imports across trading partners**.

Empirical Strategy

From MFN Margins to CES Margins

1. Compute initial bilateral tariff margins using MFN tariffs as the reference tariff factor.
2. Estimate product-level trade elasticities using PPML:

$$M_{ikt} = \exp\left[\beta_k \ln(btm_{ikt}) + \gamma_{it} + \delta_{kt}\right.$$

3. Use the estimated elasticities to compute CES reference tariff factors:

$$T_{kt} = \left(\sum_i \alpha_i (1 + \tau_{ikt})^{1-\sigma_k}\right)^{\frac{1}{1-\sigma_k}}$$

4. Recalculate bilateral tariff margins using CES reference tariff factors.
5. Re-estimate the PPML gravity model and obtain updated elasticities.
6. Repeat the procedure until the elasticity estimates converge.

From Estimation to Counterfactual Analysis

1. **Simulate the February 2026 U.S. tariff schedule**:
   - 10% surcharge on imports from selected partners
   - 25% tariffs on steel, aluminum, automobiles and auto parts
   - 50% tariff on copper products
2. Recompute CES tariff margins and predict counterfactual bilateral imports (*TradePrefSIM*).
3. Compare simulated counterfactual and baseline predictions, following Lai & Zhu (2004).

How do U.S. MFN tariff increases affect bilateral import patterns?

$$TradeEffect_{ikt} = Trade_{ikt}\left(\frac{TradePrefSIM_{ikt} - TradePref_{ikt}}{TradePref_{ikt}}\right)$$

Results

Estimated Elasticities of Substitution

HS	Sector	All	Sig.
IV	Foodstuffs	27.9	41.9
V	Minerals	6.3	7.4
VI	Chemicals	33.9	57.9
VII	Plastics	46.6	46.6
VIII	Leather	4.5	5.6
IX	Wood	5.0	4.1
X	Paper	2.0	2.0
XI	Textiles	7.0	9.4
XIII	Stone/Glass	6.8	7.2
XV	Base Metals	17.3	26.8
XVI	Machinery	9.7	11.7
XVII	Transport Eq.	13.6	16.8
XVIII	Optical/Medical	64.3	64.3
XX	Miscellaneous	8.5	10.0

Sector averages of product-level substitution elasticities.
Negative estimates are set equal to 2. "Sig." includes only coefficients significant at the 10% level.

- Large heterogeneity across sectors.
- Highest elasticities:
  - Optical instruments
  - Plastics
  - Chemicals
- Lowest elasticities:
  - Paper
  - Leather
  - Wood

U.S. MFN tariff increases generate stronger trade-reallocation effects in sectors with high substitution elasticities.

Results

Changes in CES Bilateral Tariff Margins Across Country Groups

Region	2016	2021	Change
East Asia & Pacific	0.986	0.985	↓ -0.001
Europe & Central Asia	0.978	0.975	↓ -0.003
Latin America & Caribbean	1.001	0.995	↓ -0.006
Middle East & North Africa	0.989	0.987	↓ -0.002
North America	0.997	0.984	↓ -0.013
South Asia	0.997	0.992	↓ -0.005
Sub-Saharan Africa	1.003	1.004	↑ +0.001
Income Group	**2016**	**2021**	**Change**
High income: OECD	0.986	0.986	→ 0.000
High income: non-OECD	0.974	0.955	↓ -0.019
Low income	0.999	1.000	↑ +0.001
Lower middle income	0.996	0.998	↑ +0.002
Upper middle income	0.995	0.994	↓ -0.001
Total	0.991	0.988	↓ -0.003

Main findings

- CES bilateral tariff margins **declined** for most regions.
- The largest regional decline is observed for **North America**.
- **High-income non-OECD** countries experienced the strongest deterioration in relative market access.
- Only **Sub-Saharan Africa and lower- and lower-middle-income countries** show slight improvements.

Simulation Scenario

Trump Tariffs, February 2026

Scenario

- Based on the *Trump Tariff Tracker* by the Atlantic Council.
- Benchmark scenario: tariff schedule in force as of February 2026.
- Combines:
  - economy-wide tariff increases;
  - sector-specific tariff increases.

$$\tau_{ijkt}^{sim} = \tau_{ijkt} + rate_{ijkt}$$

where $rate_{ijkt}$ is the additional tariff surcharge applied in the counterfactual simulation.

Source: Atlantic Council, *Trump Tariff Tracker*, accessed May 2026.

Measure	Additional tariff
Selected countries	10%
Bolivia	15%
Steel and aluminium	25%
Copper	50%
Automobiles	25%
Automobile parts	25%

Objective

Assess how simulated MFN tariff increases reshape tariff margins, relative market access, and the allocation of imports across trading partners.

Simulation Results

Trade Effects by HS Section

Sector	U.S. gain (%)	3rd gain (%)	3rd loss (%)	Net effect (USD mn)	Effect share (%)
Foodstuffs	0.0	4.2	-0.3	2,835	**3.9**
Wood	5.6	0.0	-1.8	1,036	**3.8**
Minerals	0.0	1.4	-9.1	-5,504	**-7.7**
Chemicals	0.0	0.0	-49.9	-12,995	**-49.9**
Plastics & Rubber	0.0	0.8	-2.6	-3,185	**-1.8**
Leather	-3.3	3.5	-1.5	-356	**-1.3**
Textiles	-53.5	90.3	-3.6	11,166	**33.2**
Stone, Glass & Ceramics	-8.4	1.5	0.0	-5,334	**-6.9**
Base Metals	0.0	0.0	-11.4	-14,041	**-11.4**
Machinery	-16.7	5.2	-0.1	-6,766	**-11.6**
Transport Equipment	0.0	0.2	-23.1	-23,482	**-22.9**
Optical & Medical	-38.5	0.9	-0.4	-48,115	**-38.0**
Miscellaneous Manufactures	9.5	0.1	-1.2	11,404	**8.5**
Total	-5.9	3.6	-5.6	-93,338	**-7.9**

- **Main beneficiaries:**
  - Textiles
  - Miscellaneous manufactures
- **Largest positive effect share:**
  - Textiles: **+33.2%**
- **Main losers:**
  - Chemicals
  - Optical & Medical
  - Transport Equipment
- **Aggregate effect: -7.9%**

The tariff scenario generates substantial sectoral redistribution, but its aggregate effect is negative as losses in major manufacturing sectors outweigh gains elsewhere.

Simulation Results

Trade Effects by Broad Economic Categories

BEC category	U.S. gain (%)	3rd gain (%)	3rd loss (%)	Net effect (USD mn)	Effect share (%)
Capital goods	-9.5	0.9	-3.4	-29,872	**-12.1**
Consumption goods	-2.0	7.9	-7.6	-6,706	**-1.7**
Intermediate goods	-7.1	1.6	-5.1	-56,759	**-10.5**

Notes: Net effects are in million of U.S. dollars. Effect shares measure the combined net effect of U.S. and third-country trade relative to preferential trade.

- **Largest losses**
  - Intermediate goods: **USD -56.8 bn**
  - Capital goods: **USD -29.9 bn**
- **Most negative effect shares**
  - Capital goods: **-12.1%**
  - Intermediate goods: **-10.5%**
- **Smallest decline**
  - Consumption goods: **-1.7%**

The tariff scenario generates losses across all BEC categories, with the largest losses concentrated in capital and intermediate goods. This **highlight the vulnerability of production networks and global value chains**.

Simulation Results

Trade Effects by Region Group

Region	Net effect (USD mn)	Effect share (%)
East Asia & Pacific	2,907	**2.5**
European Union	-10,800	**-25.5**
Europe & Central Asia	-2,510	**-15.7**
Latin America & Caribbean	-2,061	**-3.6**
Middle East & North Africa	-30	**-0.2**
North America	-9,972	**-16.5**
South Asia	2,235	**19.1**
Sub-Saharan Africa	-257	**-5.1**
United States	-69,576	**-8.2**

The effects of MFN tariff increases are highly uneven across regions.

- **Only two regions show positive net effects**
  - South Asia
  - East Asia & Pacific
- **Main beneficiary**
  - South Asia: **+19.1%**
- **Largest losses**
  - European Union: **-25.5%**
  - North America: **-16.5%**
- **Domestic loss: -8.2%**

Simulation Results

Trade Effects by Income Group

Income group	Net effect (USD mn)	Effect share (%)
High income: OECD	-700	**-3.6**
High income: non-OECD	-28,790	**-20.9**
Low income	332	**20.8**
Lower middle income	5,284	**15.0**
Upper middle income	3,386	**2.6**

MFN tariff increases reallocate trade away from high-income exporters towards developing economies.

Main findings

- **Main beneficiaries**
  - Low income: **+20.8%**
  - Lower middle income: **+15.0%**
- **Largest absolute gains**
  - Lower middle income: **USD 5.3 bn**
  - Upper middle income: **USD 3.4 bn**
- **Main losers**
  - High income non-OECD: **-20.9%**
  - High income OECD: **-3.6%**

Conclusions

Protectionism and trade preferences interact: raising MFN tariffs reshapes relative market access and modifies the structure of trade opportunities across countries, sectors, and income groups.

- MFN tariff increases generate both trade diversion and trade contraction through changes in bilateral tariff margins.
- Some exporters benefit from improved relative market access, while others experience substantial losses.
- Trade diversion redistributes import demand across sectors, regions, and income groups, but gains remain insufficient to offset the overall decline in trade.
- Under the February 2026 scenario, aggregate trade falls despite the reallocation of imports toward alternative suppliers.

Take home message:

Higher MFN tariffs reallocate imports across trading partners, but their aggregate effect is trade-reducing.

Thank you!

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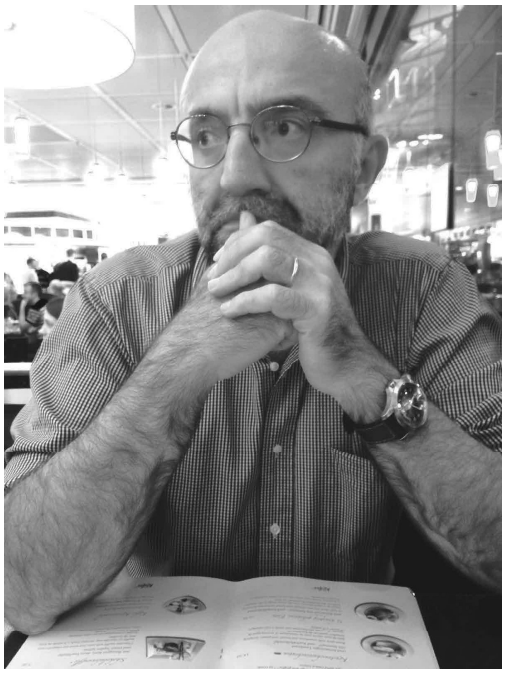
Thanks Luca


Augmented Gravity Models:
Measurement and Trade impact of
Policies: day 3
Luca De Benedictis (University of Macerata)
Luca Salvatici (Roma Tre University)
AGRODEP Training – Dakar, 2015

Thanks Luca



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