

# The Dynamics of Trade Fragmentation: a Network approach

J. Quintana



23/07/2024

**B. Meunier (ECB)** 

### Approach

• Develop a multi-country multi-sector model with production and **investment networks** 

 Simulate scenarios of trade fragmentation along geopolitical lines (West, East, and Neutral bloc)

#### Results

 Dynamic effects of trade fragmentation – higher in short-run due to inflexibility of supply chains

 Impact of capital accumulation channel – around half of effects in the long-run

Consequences of trade fragmentation on inflation rates

Dynamic Stochastic General Equilibrium (DSGE) models

- **Dynamic** effects
- Limited granularity in terms of countries and sectors

Multi-country multi-sector (MCMS) General Equilibrium models

- Static effects
- Features detailed global sectoral linkages



Nice modelling contribution

• High **policy relevance** with many applications on the inflationary effects of trade fragmentation and more generally the role of GVCs for inflation

• Paper with tons of potential

• Still in **drafting** stage

# A nice contribution: capital accumulation channel



#### Source: Quintana (2024). Note: Effects relate to the Cold War scenario (150% increase in iceberg trade costs across all products between West and East blocs).

 Ignoring capital accumulation effects underestimates real GDP losses form trade fragmentation by around half

 Complements the literature on the importance of global capital linkages (Foerster, Sarte, and Watson, 2011; Ravikumar, Santacreu, and Sposi, 2019)

Very close to Fernandez (2017)

# Real GDP and GNE (Neutral)

(percentage deviation from initial steady state)



#### Source: Quintana (2024).

Note: Effects relate to the Cold War scenario (150% increase in iceberg trade costs across all products between West and East blocs).

### **CPI inflation (West)**

#### (percentage points deviation from steady state)



#### Source: Quintana (2024).

Note: Effects relate to the Cold War scenario (150% increase in iceberg trade costs across all products between West and East blocs).

# Dynamics of fragmentation – nominal side

### In the paper

• Dynamic model with nominal impact (CPI) based on investment decisions over time

- Might miss central bank bloc whose reaction would affect inflation rates and investment
- Might need price stickiness (e.g., Calvo pricing) to stagger price hikes over time – above all with supply chains

 Prices likely pinned down in relative terms as in most MCMS models – could be more explicit on the assumptions needed to derive CPI inflation (e.g., nominal anchor, FX)

# **CPI inflation (West)**

(percentage points deviation from steady state)



Sources: Quintana (2024) and Lechthaler and Mileva (2024). Note: Effects relate to the Cold War scenario (150% increase in iceberg trade costs across all products between West and East blocs). DSGE model with three blocs (East, West, Neutral) and calibrated on same IO table as Quintana (2024).  DSGE model calibrated with same shock and same trade linkages

More inflation persistence

 Could also look at Ravikumar, Santacreu, and Sposi (2019)

# Dynamics vs. capital accumulation

### In the paper

• Dual focus on **capital accumulation** channel and on **dynamic MCMS** with the possibility to recover nominal impacts

- Nice and clear contribution on capital accumulation – complementing the literature
- Some concerns about dynamic effects on the **nominal side**

#### Suggestions

- Could focus the paper rather on **capital** accumulation effects (as alleviates remarks on solving the model)
- Rework inflation dynamics and / or make caveats more explicit on dynamic nominal effects

# Scenario calibration

#### In the paper

 Different trade elasticities for short-run (Boehm et al., 2023) and long-run (Fontagné et al., 2022)

# $\sum_{i=1}^{n}$

- Boehm et al. (2023) gives both SR and LR elasticities
- Large **differences** in LR estimates across the papers

#### In the paper

• **Time-varying** trade elasticities but not the case for other elasticities

# $\sum_{i=1}^{n}$

- **Practical** rationale? Can be that other elasticities have limited effects (Baqaee et al., 2024)
- But limited economic rationale

#### Suggestion

 Try introduce time-variation in production elasticities – as in Baqaee et al. (2022)

#### In the paper

Across-the-board trade shock
(i.e., on all sectors) along three
blocs

# $\geq$

- Limited use of multi-country multi-sector dimension of the model
- Most real-life trade measures are targeted



#### Suggestion

Run scenario with **sectoral** trade shocks on **specific** countries (e.g., CN-US tariffs)

### Suggestion

 Directly use sectoral timevarying trade elasticities from Boehm et al. (2023) • Are there conditions on **balanced trade** as in Alvarez (2017)? Or does it allow for capital account **imbalances** (Ravikumar, Santacreu, and Sposi, 2019)

• How are **investment goods** produced? Is it combining labour, capital, energy, and intermediate inputs as for other producers?

• Maybe the paper could play around with **expectations**, moving away from perfect foresight? What implications if producers have rather **myopic expectations**?

• Some effects (e.g., CPI in West, stock of capital) abruptly **change at 10 years**: is it imposed by the calibration of the model where, e.g., 10-year is the horizon where "long-run" is set?