Mega-regional Trade Agreements and Sustainability in Asia Pacific

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Introduction

• Mega-regional Trade Agreements are still relevant despite the issues with TPP, TTIP and even RCEP.
• How can they affect sustainability?
• Sustainability comprises many things; we consider 3 broad aspects:
  – CO2 Emissions
  – Food Security
  – Wage Income Inequality across skill categories
Introduction

• Trade ➔ Food policies ➔ Food prices and Supply ➔ Food Security

• Trade ➔ Production in ‘dirty’ and ‘green’ sectors ➔ Emissions can rise or fall

• Trade ➔ Production in ‘skilled labor-intensive’ and ‘unskilled labor-intensive’ sectors ➔ Wages can skilled and unskilled may rise or fall ➔ Wage Income Inequality may rise or fall
Data Sources

• GDyn 9.2 Data Base (including emissions)
• FAO data on the following measures of food security (1990 to 2015, for 217 countries):
  – Calories Supply (kcal/capita/day)
  – Dietary Energy Supply Adequacy (%), 3y average
  – Protein Supply (g/capita/day) (3y average)
  – Food Production (const $/capita) (3y average)
  – Undernourishment Prevalence (%), 3y average
Methodology (Empirics)

• Estimation of the relationship between our different measures of food security:
  – We run panel regressions (Hausman’s test to choose between random and fixed effects) between different combinations logs of these variables, assuming Food and Protein as exogenous and others endogenous.
  – Diet = f(Food, Protein, Calories)
  – Calories = g(Diet, Food, Protein)
  – Undernour(r) = h(Calories, Diet, Food, Protein) ;
Methodology (NTBs)

• Estimation of NTBs:
  – Extend Novy(2012) to GTAP sector level using Armington Elasticities in GTAP
  – Trade Costs: \( T(i,r,s) + 1 = \left( \frac{\text{Dom}(i,r) \times \text{Dom}(i,s)}{(\exp(i,r,s) \times \exp(i,s,r))} \right)^{\frac{1}{2} \times \text{Elast}_i} \)
  – NTBs’ AVE = \( T(i,r,s) - \text{tms}(i,r,s) - \text{TransCost}(i,r,s) \)
  – This is a broad measure of non-tariff non-transportation related barriers, but not all of it is actionable.
Methodology (GDyn Model)

• GDyn model modifications:
  – We add an equation for emissions to be tracked across the economy
  – We compute Gini Coefficient based on real wage changes by skill before and after every simulation
  – We introduce the 5 new variables that represent food security.
  – Food Production and Protein Supply are defined as function of GTAP variables ‘qo’ and ‘qp’ respectively, adding up across respective sectors.
  – Other variables are introduced based on the results of our econometric analysis.
Methodology (GDyn Simulations)

- Baseline: GDP, labor force, population till 2030 (IIASA SSPs)
- Scenario 1: RCEP
  - We assume a 100% reduction in tariffs and 20% reduction in NTBs in all sectors in our simulations.
- Scenario 2: RECI
  - We assume a 100% reduction in tariffs and 20% reduction in NTBs in all sectors in our simulations.
- Scenario 3: TPP11 (USA is out of TPP)
  - We assume a 100% reduction in tariffs and 20% reduction in NTBs in all sectors in our simulations.
Results (Empirics)

All co-efficients have a p-value < 0.00001 and R-Squared of all models below were > 0.95.

\[
\text{Diet}(r) = 0.6654791 \times \text{Calories}(r) + 0.1394042 \times \text{Protein}(r);
\]

\[
\text{Calories}(r) = 0.8868586 \times \text{Diet}(r) + 0.0183356 \times \text{FoodProd}(r) + 0.1430583 \times \text{Protein}(r);
\]

\[
\text{Undernour}(r) = -1.088108 \times \text{Calories}(r) - 3.221273 \times \text{Diet}(r) - 0.5709213 \times \text{Protein}(r)
\]
Results (Emissions)
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• If cleaner sectors gain more, emissions fall
• If dirtier sectors gain more, emissions rise
• Most countries see a rise in emissions
• India, Bangladesh, Malaysia, Iran, Netherlands, China, rest of ESCAP and Malaysia may cut their emissions owing to these agreements
• Common observation for all variables: RECI has the biggest effect across the board, but RCEP and TPP are important for few countries; NTBs are more significant than tariffs.
Results (Undernourishment)
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- Trade increases availability of food (lower prices due to cheaper imports) and hence reduces undernourishment.
- Rise in undernourishment happens particularly for excluded countries in each agreement.
- The general observations hold good.
Results (Inequality)

• With the exception of Lao, Sri Lanka, Kyrgyzstan, Georgia, Viet Nam, Hong Kong, New Zealand, Cambodia and Peru, all included countries in any given agreement see a reduction in inequality.

• These exceptions are due to greater real wage gains by skilled as opposed to unskilled laborers.

• Changes in inequality happen due to sector-level responses that are different for different countries and scenarios.
Preliminary Conclusions

• RECI has the biggest effect across the board, but RCEP and TPP are important for few countries; NTBs are more significant than tariffs.

• Countries that actively participate in any of the trade agreements can reduce undernourishment

• If cleaner sectors gain more than dirtier sectors, emissions may get reduced

• If unskilled-labor-intensive sectors gain more than others, wage income inequality may fall
Policy Implications and Caveats

• While preparing for sector-level negotiations, focus on opening up sectors in such a way that more skill-labor-intensive sectors and cleaner sectors are benefitted. (Not obvious how)

• Trade may reduce inequality, undernourishment and emissions, in certain ways in certain instances.

• Caveat: NOT always – these may be specific to our simulations and these specific sectors/countries.
Thank You!

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