Pakistan-India Trade: Analysis of the Health Sector

Hadia Majid

Department of Economics, Lahore University of Management Sciences
Pak-India Trade: Background

• Despite sharing a border of about 1800 miles, trade between India and Pakistan has been low

• The primary reason for this poor trade performance is not economic but is largely due to the two nations’ fractious history
Pak-India Trade: Background

India's Total Trade - Apr '11 to Mar '12
(US $ Millions)

Data source: Department of Commerce, India
Pak-India Trade: Background

• India’s trade with Pakistan totaled $1.9 billion in 2011-2012

• Pakistan ranked 52 among trading partners, with the top slot going to the People’s Republic of China
Pak-India Trade: Background

• There has been some move towards stabilizing trade relations between the two nations.
  – MFN status

• The bid to improve the environment for bilateral trade and investment is rooted in the economic and political gains from greater market integration
  – Gains from trade in the health sector
Outline

• Why Focus on the Health Sector?
• Our Study Focus
  – Commodities
  – Services
• Existing Patterns of Trade
• Potential
Health Sector Commodities

• We focus on
  – Pharmaceutical products
    • Antibiotics, pro-vitamins, hormones & steroids, medicament for therapeutic use
  – Surgical goods
  – Medical equipment
    • Breathing apparatus, orthopedic appliances, medical furniture, medical dummies
Health Services

• We focus on
  – Research and collaborative work in medicine and pharmaceuticals
  – Documented movement of medical personnel and patients at the institutional level
  – Student exchange or training programs
The State of the Health Sector in Pakistan

• A wide gap between the population’s needs and the existing supply of infrastructure and trained medical personnel
  – 1,183 individuals per licensed/registered doctor
  – 1,592 persons per hospital bed
The State of the Health Sector in Pakistan

• Several health intervention programs and strategies to raise the nutritional and health status of the population

BUT

• Public expenditure on health remains low
  – Pakistan public health expenditure as percent of GDP was 0.86 in 2009 (Source: World Bank data)
  – Public expenditure on health was 38.5% of total health expenditure in 2010 (Source: World Bank data)
The State of the Health Sector in Pakistan

• In contrast, health-related commodities have been performing well
  – Pakistan has exhibited strong performance in surgical goods’ industry and pharmaceutical products in 2011-12
  – There is a large (and growing) market for medical devices and equipment

• National policy of deregulation of prices along with easier registration and import policies
Health Sector Commodities in Pakistan

• Pharmaceutical and surgical goods’ manufacturing have been performing well.
  – Pharmaceutical industry displayed a 10.9 percent growth in 2011-12
  – The surgical goods industry, which is largely export oriented, saw its exports grow by 13.7% in 2010-11
  – Pakistan’s medical devices market is small in value terms given its population size. The market is heavily supplied by imports
Trade Trends: Health-Related Commodities

Pakistan Exports to India

Data source: UN Comtrade data
Trade Trends: Health-Related Commodities

Pakistan Imports from India

- Medical Equipment
- Pharmaceutical Products
- Surgical Instruments

Data source: UN Comtrade data
Putting the Figures in Context

• Examining the countries which Pakistan traded with in the three commodities in 2011-12

<table>
<thead>
<tr>
<th>Commodity</th>
<th>Share of Total EX</th>
<th>Share of Total IM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Surgical Instruments</td>
<td>India: 2%</td>
<td>USA: 29%</td>
</tr>
<tr>
<td></td>
<td>Top Country</td>
<td>0.2%</td>
</tr>
<tr>
<td></td>
<td>China: 22.7%</td>
<td></td>
</tr>
<tr>
<td>Pharmaceuticals</td>
<td>India: 3%</td>
<td>Afghanistan: 16%</td>
</tr>
<tr>
<td></td>
<td>Top Country</td>
<td>4.9%</td>
</tr>
<tr>
<td></td>
<td>China: 15%</td>
<td></td>
</tr>
<tr>
<td>Medical Equipment</td>
<td>India: 0%</td>
<td>Sri Lanka: 13%</td>
</tr>
<tr>
<td></td>
<td>Top Country</td>
<td>0.2%</td>
</tr>
<tr>
<td></td>
<td>USA: 14%</td>
<td></td>
</tr>
</tbody>
</table>

Data source: UN Comtrade data
Analyzing Relative Strengths

• Estimate Revealed Comparative Advantage to ascertain the relative strengths and competitiveness of each country

\[ RCA_{ik} = \frac{x_{ik}}{x_i} \frac{x_w}{x_{wk}} \]

where the RCA of country \( i \) in commodity \( k \) is given by the share of commodity \( k \) in the country’s total exports relative to the share of this commodity in world trade

• If the commodity’s share in total national exports is higher than the commodity’s share in the total world exports, the RCA value is greater than 1
  – The country is then considered to have a revealed comparative advantage in the particular commodity
### RCA: Results

**Table 1- Revealed Comparative Advantage**

<table>
<thead>
<tr>
<th>Year</th>
<th>Pakistan Med Equip</th>
<th>Pakistan Pharma</th>
<th>Pakistan Surgical</th>
<th>India Med Equip</th>
<th>India Pharma</th>
<th>India Surgical</th>
</tr>
</thead>
<tbody>
<tr>
<td>2003</td>
<td>0.092</td>
<td>0.152</td>
<td>2.130</td>
<td>0.362</td>
<td>1.378</td>
<td>0.430</td>
</tr>
<tr>
<td>2004</td>
<td>0.020</td>
<td>0.176</td>
<td>2.285</td>
<td>0.389</td>
<td>1.305</td>
<td>0.395</td>
</tr>
<tr>
<td>2005</td>
<td>0.029</td>
<td>0.202</td>
<td>2.155</td>
<td>0.408</td>
<td>1.253</td>
<td>0.367</td>
</tr>
<tr>
<td>2006</td>
<td>0.036</td>
<td>0.207</td>
<td>1.952</td>
<td>0.372</td>
<td>1.281</td>
<td>0.407</td>
</tr>
<tr>
<td>2007</td>
<td>0.032</td>
<td>0.247</td>
<td>2.742</td>
<td>0.311</td>
<td>1.328</td>
<td>0.398</td>
</tr>
<tr>
<td>2008</td>
<td>0.022</td>
<td>0.236</td>
<td>2.833</td>
<td>0.295</td>
<td>1.324</td>
<td>0.346</td>
</tr>
<tr>
<td>2009</td>
<td>0.040</td>
<td>0.248</td>
<td>2.207</td>
<td>0.206</td>
<td>0.872</td>
<td>0.268</td>
</tr>
<tr>
<td>2010</td>
<td>0.038</td>
<td>0.227</td>
<td>2.159</td>
<td>0.279</td>
<td>1.254</td>
<td>0.378</td>
</tr>
<tr>
<td>2011</td>
<td>0.018</td>
<td>0.223</td>
<td>2.244</td>
<td>0.217</td>
<td>1.368</td>
<td>0.371</td>
</tr>
<tr>
<td>Average</td>
<td><strong>0.036</strong></td>
<td><strong>0.213</strong></td>
<td><strong>2.301</strong></td>
<td><strong>0.316</strong></td>
<td><strong>1.262</strong></td>
<td><strong>0.373</strong></td>
</tr>
</tbody>
</table>

Data source: UN Comtrade data
Relative Strengths

• Pakistan has a revealed comparative advantage in surgical instruments

• India has a revealed comparative advantage in pharmaceutical products
Analyzing the Existing Patterns of Trade

• Inter- or Intra-Industry Trade?

• Degree of trade intensity
  – Imports
  – Exports
Inter- or Intra-Industry Trade?

- Calculated the Grubel-Lloyd Index

$$GL_k = 1 - \frac{|X_k - M_k|}{X_k + M_k}; 0 \leq GL_i \leq 1$$

where $X_k$ and $M_k$ denote the export and the import of commodity $k$ respectively

- $GL_i = 1$, there is only intra-industry trade, and no inter-industry trade implying that there is exchange of similar products belonging to the same industry.

- $GL_i = 0$, there is no intra-industry trade, only inter-industry trade.
Inter- or Intra-Industry Trade?

Table 2 - Grubel-Lloyd Index: Pakistan-India

<table>
<thead>
<tr>
<th></th>
<th>Pakistan – India Trade</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Med Equip</td>
</tr>
<tr>
<td>2003</td>
<td>0.351</td>
</tr>
<tr>
<td>2004</td>
<td>0.046</td>
</tr>
<tr>
<td>2005</td>
<td>0.061</td>
</tr>
<tr>
<td>2006</td>
<td>0.039</td>
</tr>
<tr>
<td>2007</td>
<td>0.046</td>
</tr>
<tr>
<td>2008</td>
<td>0.025</td>
</tr>
<tr>
<td>2009</td>
<td>0.014</td>
</tr>
<tr>
<td>2010</td>
<td>0.050</td>
</tr>
<tr>
<td>2011</td>
<td>0.038</td>
</tr>
<tr>
<td>Average</td>
<td>0.074</td>
</tr>
</tbody>
</table>

Data source: UN Comtrade data
Inter- or Intra-Industry Trade?

- Trade between Pakistan and India in surgical instruments, pharmaceutical products and medical equipment is predominantly inter-industry in nature
  - Simultaneous exchange of similar but differentiated goods is largely absent
Inter- or Intra-Industry Trade?

• Less than 1 percent of intra-industry trade in pharmaceuticals
  – The Pakistan pharmaceutical industry has been growing at a 10 percent rate and so could gain from exchange with the Indian pharmaceutical industry which India has RCA in

• Reservations of the pharmaceutical industry

• The lack of a streamlined drug certification process between the countries which would make trade of, particularly finished, products easier may be a significant contributing factor
Trade Intensities

\[ m_{ijk} = \frac{M_{ijk}}{M_{ik}} / \left( \frac{X_{jk}}{(X_{wk} - X_{ik})} \right) \quad \text{and} \quad x_{ijk} = \frac{X_{ijk}}{X_{ik}} / \left( \frac{M_{jk}}{(M_{wk} - M_{ik})} \right) \]

Kojima (1964) quoted from Rahman (2012)

where import trade intensity is the share of imports of country \( i \) from country \( j \) in commodity \( k \) in total imports of commodity \( k \) as a fraction of share of exports of country \( j \) in rest of world exports.

- The value of each index ranges from 0 to 100
  - If the value is zero, it implies that there is no trade relationship between partner countries.
# Trade Intensities

## Table 3- Trade Intensities: Pakistan-India

<table>
<thead>
<tr>
<th></th>
<th>Import Trade Intensity</th>
<th>Export Trade Intensity</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Med Equip</td>
<td>Pharma</td>
</tr>
<tr>
<td>2003</td>
<td>1.227</td>
<td>4.440</td>
</tr>
<tr>
<td>2004</td>
<td>1.715</td>
<td>4.551</td>
</tr>
<tr>
<td>2005</td>
<td>2.059</td>
<td>4.833</td>
</tr>
<tr>
<td>2006</td>
<td>1.336</td>
<td>4.023</td>
</tr>
<tr>
<td>2007</td>
<td>0.902</td>
<td>4.385</td>
</tr>
<tr>
<td>2008</td>
<td>1.308</td>
<td>5.142</td>
</tr>
<tr>
<td>2009</td>
<td>1.049</td>
<td>3.009</td>
</tr>
<tr>
<td>2010</td>
<td>0.840</td>
<td>4.258</td>
</tr>
<tr>
<td>2011</td>
<td>0.659</td>
<td>3.249</td>
</tr>
<tr>
<td>Average</td>
<td>1.233</td>
<td>4.210</td>
</tr>
</tbody>
</table>

Data source: UN Comtrade data
Trade Intensities

- While intra-industry trade is low in pharmaceuticals, import trade intensity in pharmaceuticals is consistently higher than that for any other product (and is higher than export trade intensity)
  - May be driven by the size of the Indian pharmaceutical industry: India is among the top five manufacturers of bulk drugs in the world
What Do the Results Suggest?

• Low levels of import and export trade intensities as well as intra-industry trade indicate that there is potential to improve bilateral trade between India and Pakistan

• Calculate estimates on trade complementarities
Trading Potential

- Trade complementarity index between countries $i$ and $j$ for commodity $k$

$$TCI_{ijk} = 1 - 0.5(|m_{ik} - x_{jk}|); \quad 0 \leq TCI_{ijk} \leq 1$$

Based on Pasha and Imran (2012)

where $m_{ik}$ denotes the share of the $k^{th}$ commodity in the total imports of country $i$ and $x_{jk}$ denotes the share of the $k^{th}$ commodity in the total exports of country $j$

- The higher the magnitude of TCI, the greater the trade complementarity between the two countries
## Trading Potential

### Table 4 – Trade Complementarity Indices

<table>
<thead>
<tr>
<th></th>
<th><strong>India EX &amp; Pakistan IM</strong></th>
<th></th>
<th><strong>Pakistan EX and India IM</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Med Equip</td>
<td>Pharma</td>
<td>Surgical</td>
<td>Med Equip</td>
</tr>
<tr>
<td>2003</td>
<td>0.9993</td>
<td>0.9917</td>
<td>0.9986</td>
<td>0.9968</td>
</tr>
<tr>
<td>2004</td>
<td>0.9994</td>
<td>0.9910</td>
<td>0.9989</td>
<td>0.9969</td>
</tr>
<tr>
<td>2005</td>
<td>0.9994</td>
<td>0.9918</td>
<td>0.9981</td>
<td>0.9969</td>
</tr>
<tr>
<td>2006</td>
<td>0.9996</td>
<td>0.9865</td>
<td>0.9999</td>
<td>0.9972</td>
</tr>
<tr>
<td>2007</td>
<td>0.9706</td>
<td>0.9386</td>
<td>0.9795</td>
<td>0.9971</td>
</tr>
<tr>
<td>2008</td>
<td>0.9987</td>
<td>0.9893</td>
<td>0.9991</td>
<td>0.9975</td>
</tr>
<tr>
<td>2009</td>
<td>0.9988</td>
<td>0.9941</td>
<td>0.9987</td>
<td>0.9980</td>
</tr>
<tr>
<td>2010</td>
<td>0.9992</td>
<td>0.9897</td>
<td>0.9988</td>
<td>0.9973</td>
</tr>
<tr>
<td>2011</td>
<td>0.9987</td>
<td>0.9900</td>
<td>0.9990</td>
<td>0.9976</td>
</tr>
<tr>
<td><strong>Average</strong></td>
<td><strong>0.9960</strong></td>
<td><strong>0.9848</strong></td>
<td><strong>0.9967</strong></td>
<td><strong>0.9973</strong></td>
</tr>
</tbody>
</table>

Data source: UN Comtrade data
Conclusions Thus Far

• Low levels of trade but high trade complementarity (and potential) in health commodities

• But what about health services?
The Story is Short and Straight-forward…

• Little to no empirical data to rely on

• No institutional level involvement when it comes to services

• There is people mobility (patients, doctors) and research collaboration (conferences, lectures) but all on individual initiative
Why Is This Troubling?

- India is quickly becoming an important international center for the healthcare industry (medical tourism) yet Pakistan has no institutional access to this industry.

- Both countries have a highly respected and well-trained medical diaspora.
  - 80 percent of students trained at the top medical students in Pakistan state that they will move abroad (Aga Khan University survey).

- Despite the presence of exceptional medical and nursing colleges and training programs on both sides of the border, there is no student exchange or common training program between India and Pakistan.
Concluding Remarks

• Health and consumer welfare

• Commodities’ sector is doing well, although trade intensity is low the potential is high

• Healthcare sector is in poor shape but there are synergies which may be realized
  – Medical tourism and organ transplant are on political agenda but no mention of gains in consumer welfare through institutional access to Indian health services
Thank you