Globalisation and trade

Class 3 Lecture notes

Globalisation and trade patterns

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Outline

- One: Some basic trends in world trade
- Two: Why do countries trade?
- Three: Does trade benefit everyone?
- Four: Can globalisation hurt poor/rich countries?
- Five: Why trade is good and protection is harmful?
One: Trends in world trade

Evolution of world GDP and Exports
Growth in volume of world trade and GDP
1500-2003 (annual average rates, in %)

- World trade much more dynamic than world output (up to 4.5 times), except during the short interventionism period (1913-1950)

<table>
<thead>
<tr>
<th></th>
<th>World trade</th>
<th>World GDP</th>
<th>Ratio trade/GDP</th>
</tr>
</thead>
<tbody>
<tr>
<td>1500-1820</td>
<td>0.96</td>
<td>0.32</td>
<td>3.0</td>
</tr>
<tr>
<td>1820-1870</td>
<td>4.18</td>
<td>0.94</td>
<td>4.4</td>
</tr>
<tr>
<td>1870-1913</td>
<td>3.40</td>
<td>2.12</td>
<td>1.6</td>
</tr>
<tr>
<td>1913-1950</td>
<td>0.90</td>
<td>1.82</td>
<td>0.5</td>
</tr>
<tr>
<td>1950-1973</td>
<td>7.88</td>
<td>4.90</td>
<td>1.6</td>
</tr>
<tr>
<td>1973-2003</td>
<td>5.38</td>
<td>3.17</td>
<td>1.7</td>
</tr>
</tbody>
</table>

Increase (times the initial period)

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1500-1820</td>
<td>21.3</td>
<td>2.8</td>
<td></td>
</tr>
<tr>
<td>1820-1870</td>
<td>7.7</td>
<td>1.6</td>
<td></td>
</tr>
<tr>
<td>1870-1913</td>
<td>4.2</td>
<td>2.5</td>
<td></td>
</tr>
<tr>
<td>1913-1950</td>
<td>1.4</td>
<td>1.9</td>
<td></td>
</tr>
<tr>
<td>1950-1973</td>
<td>5.7</td>
<td>3.0</td>
<td></td>
</tr>
<tr>
<td>1973-2003</td>
<td>4.8</td>
<td>2.6</td>
<td></td>
</tr>
<tr>
<td>1820-2003</td>
<td>1,253</td>
<td>59</td>
<td></td>
</tr>
</tbody>
</table>

Trends in imports

<table>
<thead>
<tr>
<th>Country</th>
<th>Growth of import volume (annual compound rate)</th>
<th>Imports as ratio to GDP at 1990 prices</th>
</tr>
</thead>
<tbody>
<tr>
<td>France</td>
<td>9.3</td>
<td>4.6</td>
</tr>
<tr>
<td>Germany</td>
<td>12.6</td>
<td>4.7</td>
</tr>
<tr>
<td>Italy</td>
<td>11.3</td>
<td>4.0</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>4.8</td>
<td>4.0</td>
</tr>
<tr>
<td>Japan</td>
<td>16.0</td>
<td>4.0</td>
</tr>
<tr>
<td>Arithmetic Average</td>
<td>10.8</td>
<td>4.3</td>
</tr>
<tr>
<td>United States</td>
<td>6.6</td>
<td>5.6</td>
</tr>
</tbody>
</table>
Two: Why do countries trade?

Causes for trade:

- Availability of products (natural resources, new products, etc.)
- International price differential as a consequence of:
  - Productivity differential
  - Differences in technology
  - Differences in factor endowments
  - Economies of scale
- Product differentiation and market structure
Three: Does trade benefit everyone?

- Yes, in general, all countries benefit from trade.
- Few exemptions only:
  - In the course of trade liberalization some sectors (factor owners) can be hurt, while country as a whole benefits from increased specialization.
  - In a theoretical case, when there are substantial external economies of scale small countries can be worse off if forced to specialize in the decreasing returns to scale sectors.
Brief overview of main theories

**Classic trade theories**

- **Classic trade theory**
  (Ricardo-Torrens-Mill model)

- **Neoclassic trade theory**
  (Heckscher-Ohlin-Samuelson model)

**New trade theories**

- **Models with external economies of scale**
  (Panagariya-Markusen-Melvin model)

- **Models with internal economies of scale**
  (Helpman-Krugman model)
Classic theory of comparative cost advantage (Ricardo-Torrens-Mill)

Evolution of the model:
1701: RTM model is based on the »18th Century Rule«, which was published this year in a pamphlet Considerations Upon the East-India Trade by an anonymus author.
   “a country should import that goods that cannot be produced at home or that can be more cheaply produced abroad“
1776: Smith in the book “Wealth of Nations” gives an idea of absolute cost advantage
1815: Torrens in the book “Essay on the External Corn Trade” develops an idea of comparative advantage, which he, however, completes into a thorough principle only in 1827
1817: Ricardo in the book “On the Principles of Political Economy and Taxation” in famous three small paragraphs develops the principle of comparative advantage based upon comparison of cost ratios between two countries
1818: J.S.Mill in an article “Colonies” and later in a book “Elements of Political Economy” presents completed exposition of comparative cost principle
ASSUMPTIONS:
- 1 product factor (labor), 2 countries and 2 goods;
- constant returns to scale;
- goods in international trade are homogenous and identical irrespective of the country of origin;
- two countries can differ only in terms of technology.

SOURCES OF INTERNATIONAL TRADE:
- differences in technology are the driving force of cost differential for same product

SUMMARY:
- trade is beneficial for both countries as it makes possible for each country to acquire a good at absolutely/relatively lower price comparative to its home costs.
Concept Of Absolute Advantage
(Adam Smith)

<table>
<thead>
<tr>
<th>Good</th>
<th>Unit costs (units of labor)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Textile</td>
<td>4 6</td>
</tr>
<tr>
<td>Wine</td>
<td>8 3</td>
</tr>
</tbody>
</table>

Under assumption of terms of trade equalling 1, it holds:

- for 4 units of labor (i.e. cost of 1 unit textile) England can acquire 1 unit of wine via trade, for which it takes home 8 units of labor;
- for 3 units of labor (cost of 1 unit of wine) Portugal can acquire 1 unit of textile, for which it takes home 6 units of labor.
Concept Of Absolute Advantage (Adam Smith)

- Both countries are better off as they use their labor twice as productive if they specialize completely in production of only one good and if they buy the less efficiently produced good abroad.

- Hence, Smith's case shows that trade is beneficial for both countries when each country has an absolute cost advantage in production of one good.
Concept Of Comparative Advantage (RTM)

<table>
<thead>
<tr>
<th>Good</th>
<th>Unit costs (units of labor)</th>
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<tbody>
<tr>
<td></td>
<td>England</td>
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<td>Textile</td>
<td>4</td>
</tr>
<tr>
<td>Wine</td>
<td>8</td>
</tr>
</tbody>
</table>

- Comparison of relative costs (T/W) among countries:
  - England: TWA = 4/8 = 0.5
  - Portugal: TWP = 6/10 = 0.6.
- Terms of trade should lie inside the autarchy relative costs, i.e. between 0.5 and 0.6, in order the trade to take place. Let us (arbitrarily) assume that terms of trade equal 0.55, then it holds:
Concept Of Comparative Advantage (RTM)

- in internal trade a unit of textile is worth 0.5 unit of wine, while in international trade England can get for it 0.55 units of wine;
- similarly, in Portugal's internal trade a unit of textile is worth 0.6 units of wine, while via international trade it can acquire it for only 0.55 units of wine.

CONDITIONS FOR TRADE:

- **Necessary condition**: relative cost differential
- **Sufficient condition**: international terms of trade should lie inside the autarchy relative costs of both countries.
Figure 1:  Gains from trade in classic trade theory

A) England  
B) Portugal  

- Trade shifts outward the consumption curve
Neoclassic Trade Theory
Heckscher-Ohlin-Samuelson (HOS)

Evolution of the model

- **E. Heckscher (1919):** a statement that relative scarcity of production factors is a necessary condition for comparative cost differential and trade

- **B. Ohlin (1933):** goods can be produced with different factor intensity, hence, due to internationally different factor prices each country specializes in good that requires a larger employment of relative abundant factor

- **P. Samuelson (1948, 1949):** formulates both statement into a rigorous model – HOS theorem

- **J. Vanek (1968):** factor-content version of HOS theorem: each country is a net exporter of factor services of its more abundant factor and a net importer of factor services of its more scarce factor

- **Stolper-Samuelson (1941):** Stolper Samuelson theorem

- **Rybczynski (1955):** Rybczynski theorem
4 MAJOR THEOREMS

- Heckscher-Ohlin (HO) theorem
- Factor price equalization theorem (FPE theorem)
- Stolper-Samuelson (SS) theorem
- Rybczynski (R) theorem

**HO THEOREM**

- Given relative goods prices, a country specializes in production of good in which its more abundant factor is used more intensively

**FACTOR-CONTENT VERSION OF HO THEOREM**

- Each country is a net exporter of factor services of its more abundant factor and a net importer of factor services of its more scarce factor
HOS MODEL

ASSUMPTIONS:
- 2x2x2 model: 2 PF (labor and capital), 2 goods and 2 countries
- perfect competition in goods and factor markets
- identical technology, i.e. identical production functions, so that it holds:
  - factors are perfectly mobile within a country but immobile internationally
  - goods in trade are identical irrespective of the country of origin
  - homothetic and internationally identical consumer preferences
- two countries differ only in terms of relative endowments of factors of production (strict HOS); but also differences in consumer preferences can be allowed for (broad neoclassic theory)
CONDITIONS FOR EQUILIBRIUM TO ESTABLISH:

- The slope of relative price line should equal simultaneously to:
  - marginal rate of transformation (MRT) in production
  - marginal rate of substitution (MRS) in consumption.

Figure 2: Gains from trade in neoclassic theory

- Both countries trade at international terms of trade PM, which is tangent to their transformation curves.
TWO EFFECTS OF TRADE

- **Consumption effect** or *gain from trade*: at given production it is possible to consume on a higher indifference curve (I')

- **Production effect** or *gain from specialization*: due to increased specialization in production consumption can take place on higher indifference curve (I'')

- Trade lowers the price of the imported good

- Trade shifts consumption outward
NEW TRADE THEORIES

INCLUSION OF NEW INSIGHTS:

- modern forms of competition are far from perfect (i.e. monopolistic competition, oligopolies, monopolies); in most of industries economies of scale (increasing returns to scale) are significant;
- product differentiation is more important than homogenous goods;
- intra-industry trade in differentiated goods is a dominating pattern of trade among developed countries.
ECONOMIES OF SCALE (IRS):

- INTERNAL: a firm can lower its average costs by increasing its production (a firm moves along its AC curve).
- EKSTERNAL: a firm is subject to decreasing average costs due to external effects stemming from favorable geographic agglomeration and size of the industry (AC curve for the whole industry moves downward).
Models with external economies of scale


- One or two factor model
- Specialization of countries is determined by their size: large country exports goods with external IRS, while small country exports goods with CRS or DRS
- This holds only in case of identical relative factor abundance; when this assumption is violated the pattern of trade is indeterminant
ASSUMPTIONS:

- 1 factor (labor), 2 goods (sectors) in 2 countries;
- variable returns to scale (IRS, DRS, CRS) and perfect competition;
- firms cannot affect their average costs, they are subject to the size of the industry);
- goods in trade are identical irrespective the country of origin
- both countries are identical in terms of technology (identical production functions);
- two countries differ only in terms of consumer preferences (different indifference curves) and size (absolute endowments of factors).
Figure 3: Gains and losses from trade in case of IRS

- Trade is possible and mutually beneficial also in the case of two completely identical countries.
- Countries of similar size can both lose with trade due to incomplete specialization (when they differ in terms of preferences).
Figure 4: Gains and losses from trade in case of variable RS

- small country can lose with trade as it may be forced to specialization in sector with CRS or DRS
When small country enters the market first it can produce $Q_B$ at lower costs due to IRS.

Due to IRS a large country can potentially not enter the market as small country is more efficient at the given quantity (remember: when entering the market large country's AC is equal to A).
Models with internal economies of scale


- One- or two- factor model
  When there are no differences in relative factor abundance, it holds:
- Pattern of trade is determined in the sense that both countries export varieties of differentiated goods, while it is not determined which of varieties will be produced in which country
- Trade between country in intra-industry, the volume of it is determined by the combined size of both countries
Krugman (1980)
Model with internal IRS and monopolistic competition

ASSUMPTIONS:

- 1 factor (labor), 1 good in 2 countries;
- monopolistic competition with large number of similar sized firms, individual firm produces with IRS, but in equilibrium it sets prices according to AC;
- product differentiation – each firm produces its own variety;
- large number of identical consumers with symmetrical demand for all of the varieties (a love-for-variety preference);
- countries are identical in terms of technology and preferences, they can only differ in terms of size;
- trade is of intra-industry type – exchange of varieties of the same differentiated good.
Gains from trade (Krugman)

- Consider total utility of individual consumer for $n$ varieties:

\[ U(n) = n\bar{c}^\theta \]

- Given identical income and goods prices, assume that this consumer is offered to consume $nk$ number of varieties. Then the difference in the level of consumer utility between $nk$ in $n$ varieties is equal to:

\[ U(nk) - U(n) = n\bar{c}^\theta (k^{1-\theta} - 1) \]
When $k > 1$, (2) will be positive. Each consumer consumes smaller proportion of each variety ($l/nk$ instead of $l/n$), but it consumes more varities, hence, its utility increases without respect to identical income and prices.

Assume that two identical countries start to trade. Both countries gain from trade.

For two countries it holds $k = 2$, and the level of utility increase $2^{1-\theta}-1$-times.
Two gains from trade

- In general, in model with monopolistic competition and internal IRS the gains from trade arise due to:
  - *larger number of varieties* (larger choice) and/or
  - *larger production* of individual variety, resulting in a *larger real income* (lower prices at the given income).
Four: Can globalisation hurt poor/rich countries?

Trade to GDP Ratios Rose
Dramatically over the Last Decade
(Export plus import as a percentage of GDP)
Impact of Globalization on Rich Countries’ Labour Markets

- Open economies are more responsive to changes in prices, including wages
  - Costs of improved working conditions cannot be shared with employers as easily as before (see previous slide)
  - Increased volatility of wages and/or employment
  - Decrease in labour’s bargaining power
- There are sound basis to argue that globalization will have an adverse impact on capital-abundant countries low-skilled workers
- However, since the aggregate gain from free trade is larger than the aggregate loss, it is possible to compensate the losers and achieve a Pareto improvement. This might also explain the welfare states of some small, open economies.

Impact of Globalization on Poor Countries’ Labour Markets

• Globalization critics
  - developing world workers are not able to bargain efficiently and are thus exploited ➔ rich countries should impose universal minimum standards (wages, working conditions etc.)

• Mainstream economists
  - trade and FDI increase the demand for labour (and productivity) in the developing world ➔ labour markets become “tighter”* ➔ wages and working conditions improve

* By “tighter” it is meant that there will be more opportunities from employees to choose from. In other words, their “outside option” increases, which increases their bargaining power.
Five: Why trade is good and protection is harmful?

- Trade benefits both trade partners
- Trade promotes growth and jobs
- Trade enhances individual welfare through real price effect and through increased choice of goods
- Open countries grow faster than closed ones
- GDP growth is higher in the liberalization periods
- Protection contracts trade and reduces welfare
- Infant industry argument for protection is not consistent
- Asian countries are the best example how trade can promote growth and convergence
World Average Tariff, 35 Countries, 1860-2000 (%)
US Customs Tax Revenue as a Percentage of Merchandise Imports

Percent

50%
40%
30%
20%
10%
0%

Year

1800 1850 1900 1950 2000

Average of Regional Tariffs Before World War II

Figure 2 Unweighted Average of Regional Tariffs Before World War II
A CONTRACTING SPIRAL OF WORLD TRADE

JANUARY, 1929, TO MARCH, 1933:
TOTAL IMPORTS OF 75 COUNTRIES
MONTHLY VALUES IN TERMS OF OLD U.S. GOLD DOLLARS (MILLIONS)

DATA: LEAGUE OF NATIONS, MONTHLY BULLETIN OF STATISTICS, FEBRUARY, 1934
Effects of trade on GDP and convergence in per capita income
Share in world GDP of major countries, 1500-2030 (in %)

<table>
<thead>
<tr>
<th>Year</th>
<th>China</th>
<th>Japan</th>
<th>India</th>
<th>W Eur.</th>
<th>US</th>
</tr>
</thead>
<tbody>
<tr>
<td>1500</td>
<td>24.9</td>
<td>24.4</td>
<td>16.0</td>
<td>8.8</td>
<td>2.6</td>
</tr>
<tr>
<td>1820</td>
<td>32.9</td>
<td>16.0</td>
<td>23.0</td>
<td>6.6</td>
<td>7.5</td>
</tr>
<tr>
<td>1913</td>
<td>33.0</td>
<td>8.9</td>
<td>3.0</td>
<td>7.5</td>
<td>1.8</td>
</tr>
<tr>
<td>1950</td>
<td>26.2</td>
<td>3.0</td>
<td>4.2</td>
<td>4.6</td>
<td>2.6</td>
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<tr>
<td>1973</td>
<td>25.6</td>
<td>15.1</td>
<td>6.6</td>
<td>4.6</td>
<td>3.1</td>
</tr>
<tr>
<td>2003</td>
<td>22.1</td>
<td>19.7</td>
<td>5.5</td>
<td>6.6</td>
<td>3.8</td>
</tr>
<tr>
<td>2030</td>
<td>23.8</td>
<td>13.0</td>
<td>3.8</td>
<td>10.4</td>
<td>17.3</td>
</tr>
</tbody>
</table>

Note: The chart shows the share of GDP for China, Japan, India, Western Europe, and the US from 1500 to 2030.
Per capita GDP of major countries, 1500-2030 (relative to W. Europe)
In the last five decades open Asian countries:
- dramatically improved their shares in world GDP
- substantially converged their levels of development to advanced western countries

Why?

...because they expanded their trade dramatically!
Rates of growth of merchandise exports, 1870-1998 (%)
Table 1
Elements of recent trade liberalisations

<table>
<thead>
<tr>
<th>Country</th>
<th>Average nominal tariffa</th>
<th>Taxb</th>
<th>ER</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pre-Reform</td>
<td>Current</td>
<td>Ratio</td>
</tr>
<tr>
<td>South Asia</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bangladesh (1989, 1992)</td>
<td>94</td>
<td>50</td>
<td>0.53</td>
</tr>
<tr>
<td>India (1990, 1993)</td>
<td>128</td>
<td>71</td>
<td>0.55</td>
</tr>
<tr>
<td>Pakistan (1987, 1990)</td>
<td>69</td>
<td>65</td>
<td>0.94</td>
</tr>
<tr>
<td>Sri Lanka (1985, 1992)</td>
<td>31</td>
<td>25</td>
<td>0.81</td>
</tr>
<tr>
<td>Average</td>
<td>80</td>
<td>53</td>
<td>0.71</td>
</tr>
<tr>
<td>East Asia</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>China (1986, 1992)</td>
<td>38</td>
<td>43</td>
<td>1.13</td>
</tr>
<tr>
<td>Philippines (1985, 1992)</td>
<td>28</td>
<td>24</td>
<td>0.88</td>
</tr>
<tr>
<td>Indonesia (1985, 1990)</td>
<td>27</td>
<td>22</td>
<td>0.81</td>
</tr>
<tr>
<td>Korea (1984, 1992)</td>
<td>24</td>
<td>10</td>
<td>0.42</td>
</tr>
<tr>
<td>Thailand (1986, 1990)</td>
<td>13</td>
<td>11</td>
<td>0.88</td>
</tr>
<tr>
<td>Average</td>
<td>29</td>
<td>25</td>
<td>0.82</td>
</tr>
<tr>
<td>SSA</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cote d’Ivoire (1985, 1989)</td>
<td>26</td>
<td>33</td>
<td>1.27</td>
</tr>
<tr>
<td>Ghana (1983, 1991)</td>
<td>30</td>
<td>17</td>
<td>0.57</td>
</tr>
<tr>
<td>Kenya (1987, 1992)</td>
<td>40</td>
<td>34</td>
<td>0.85</td>
</tr>
<tr>
<td>Madagascar (1988, 1990)</td>
<td>46</td>
<td>36</td>
<td>0.78</td>
</tr>
<tr>
<td>Nigeria (1984, 1990)</td>
<td>35</td>
<td>33</td>
<td>0.93</td>
</tr>
<tr>
<td>Senegal (1986, 1991)</td>
<td>98</td>
<td>90</td>
<td>0.92</td>
</tr>
<tr>
<td>Tanzania (1986, 1992)</td>
<td>30</td>
<td>33</td>
<td>1.10</td>
</tr>
<tr>
<td>Average</td>
<td>41</td>
<td>38</td>
<td>0.94</td>
</tr>
<tr>
<td>Latin America</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Colombia (1984, 1992)</td>
<td>61</td>
<td>12</td>
<td>0.20</td>
</tr>
<tr>
<td>Peru (1988, 1992)</td>
<td>57</td>
<td>17</td>
<td>0.30</td>
</tr>
<tr>
<td>Costa Rica (1985, 1992)</td>
<td>53</td>
<td>15</td>
<td>0.28</td>
</tr>
<tr>
<td>Brazil (1987, 1992)</td>
<td>51</td>
<td>21</td>
<td>0.41</td>
</tr>
<tr>
<td>Venezuela (1989, 1991)</td>
<td>37</td>
<td>19</td>
<td>0.51</td>
</tr>
<tr>
<td>Chile (1984, 1991)</td>
<td>35</td>
<td>11</td>
<td>0.31</td>
</tr>
<tr>
<td>Argentina (1986, 1992)</td>
<td>29</td>
<td>12</td>
<td>0.41</td>
</tr>
<tr>
<td>Mexico (1985, 1987)</td>
<td>29</td>
<td>10</td>
<td>0.34</td>
</tr>
<tr>
<td>Average</td>
<td>44</td>
<td>15</td>
<td>0.35</td>
</tr>
</tbody>
</table>

Years given in parenthesis are pre-reform and current.
aUnweighted average nominal tariff (tends to be biased upwards), rounded Ratio is Current Pre-Reform—lower ratio implies greater tariff reductions.
bTax dependence is tariff revenue as proportion of tax revenue in 1984.
cFigure is the rank correlation between countries ranked in descending order of tax dependence against descending order of tariff ratio; i.e. a high positive correlation implies that countries most dependent on tariffs are least able to reduce average tariffs.
11.2 Share of Manufactures in Developing Country Merchandise Exports, Actual and Projected, 1965–2005

Source: Hertel and Martin (2000).
Impact of trade liberalisation on GDP growth
(Greenaway et al, JDE, 2002)

| Growth equations incorporating Dean et al. (1994) liberalisation index |
|-----------------------------|-----------------------------|-----------------------------|
| Variable                  | 1 (Coefficient) | t-ratio | 2 (Coefficient) | t-ratio | 3 (Coefficient) | t-ratio |
| Constant                  | 0.020           | 1.026   | 0.023           | 1.146   | 0.034           | 5.491*   |
| Δ ln y_{t-1}              | -0.006          | -3.023**| -0.007          | -3.330**| -0.005          | -4.708** |
| Δ ln y_{t-2}              | -0.139          | -2.173**| -0.139          | -2.173**| -0.003          | 0.382    |
| ln y_{65}                 | -0.006          | -3.023**| -0.007          | -3.330**| -0.005          | -4.708** |
| SCH_{65}                  | 0.008           | 2.664** | 0.008           | 2.711** | 0.004           | 2.454**  |
| Δ ln TTI                  | 0.027           | 1.655*  | 0.028           | 1.767*  | 0.004           | 2.454**  |
| Δ ln POP                  | -1.068          | -4.436**| -1.034          | -4.215**| -0.003          | 0.382    |
| INV/GDP                   | 0.214           | 6.418   | 0.220           | 6.544** | 0.101           | 3.287**  |
| dean1                     | 0.009           | 1.777*  | -0.001          | -0.132 | -0.005          | -0.924   |
| dean2                     | 0.002           | 0.289   | 0.002           | 0.289   | 0.004           | 0.803    |
| dean2_{t-1}               | 0.018           | 2.380** | 0.018           | 2.380** | 0.001           | 2.615**  |
| 1st Order serial correlation | 3.763**         | 3.814** | -2.470**        |
| 2nd Order serial correlation | 2.324**         | 2.620** | 0.048           |
| Sargan Test               |                 | 0.916   |                 |
| No of countries           | 73              | 73      | 73              |

(a) Heteroskedastic robust asymptotic t-ratios are in parentheses.
(b) The Sargan Test for the validity of the set of instruments is defined as Prob(J > \( \chi_p^2 \)), where \( p \) is the number of over-identifying instruments.
(c) Time dummies are not reported.
* Indicates significance at the 90% level.
** Indicates significance at the 95% level.
Impact of trade liberalisation on GDP growth

(Greenaway et al, JDE, 2002)