Interaction between Trade, Conflict and Cooperation: the case of Japan and China

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Outline

- Context and background
- The trade-conflict literature
- Data
- Linear Granger causality
- Nonlinear Granger causality
- Discussion
- Conclusions and further work
Background

- Japan-China economic relationship
- Cold politics and hot economics
- Taiwan, North Korea, Yasukuni shrine, disputed islands, protests
- China-US?
- Politics-trade?
Some definitions

- Cooperation
  - positive action towards another: eg ODA, security alliance, cultural exchange

- Conflict
  - negative action or stance against another: eg protest, vote against in UN, or even war

- Net cooperation index = cooperation - conflict

- Interdependence
  - vulnerability
  - sensitivity dependence

- Trade or interdependence?
Liberal school of thought

- “Peace is the natural effect of trade” – Montesquieu, 1748
- Positive relationship between cooperation and trade, negative relationship between conflict and trade
- Trade is influenced significantly by politics – trade relationship with allies and won’t trade with the enemy.
- Mutual gains from trade raise opportunity cost of conflict: disputes, sanctions and wars lead to a loss in welfare
- Kissinger’s détente with Soviet Union, Richard Nixon’s opening up to China, formation of EU.
Realist school of thought

- Trade causes increased interactions with higher probability of disputes, trade wars and dispute escalations.
- Hirschman, 1945: gains from trade can have unequal distribution within and between nations.
- Asymmetry can cause a shift in power relations which can lead to conflict in the extreme case.
- Trade or war to acquire resources.
Other causes of conflict/cooperation

- Distance
- Extent of political liberalisation
- Enduring rivalries
- Counter examples of trade during war, changes in behaviour
- How does trade affect conflict/cooperation and vice versa?
  - trade embargo or war
  - customs union or economic cooperation
  - cumulative low level negative events adds up
  - instantaneous response? Trade contracts are long, statistics are not reported so frequently.
Previous empirical studies

- Mixed results but mainly supporting liberal view
- Recognition of causality running both ways between trade and cooperation/conflict
- Main data sources are COPDAB, WEIS and MID
- Time series and Granger causality in two papers
  - relationship dependent
  - reciprocal
  - quarterly data
Data

- Monthly from 1990-2004
- Trade data
  - exports
  - Hirschman’s index of vulnerability and dependence
    \[ T_{ij} = \frac{(X_{ij}+M_{ij})}{(X_{iw}+M_{iw})} \]
- Conflict data
  - IDEA dataset from Gary King, coded from Reuters
  - net cooperation = cooperation – conflict
- Japan-China, China-US and US-Japan
Japan-China net cooperation

- Li Peng visits Japan
- NK asylum seekers
- NK ship in E Ch Sea
- 6 party talks, FDI growth
- Orgy
- ODA cut, dispute over island
- Yasukuni Shrine??

China towards Japan
Japan towards China
China-US net cooperation

Agree to solve NK probs
Satisfactory trade talks
Trade dispute
Taiwan issues

-60
-40
-20
0
20
40
60
80
100
2002
April
July
October
2003
April
July
October
2004
April
July
October

US towards China
China towards US
Linear Granger causality

- **VAR:**
  \[
  T_t = \sum_{i=1}^{\infty} \alpha_i T_{t-1} + \sum_{i=1}^{\infty} \beta_i C_{t-1}
  \]
  \[
  C_t = \sum_{i=1}^{\infty} \alpha'_i T_{t-1} + \sum_{i=1}^{\infty} \beta'_i C_{t-1}
  \]

- Null hypothesis of no Granger causality:
  - \(\beta_i\)'s = 0 in 1\textsuperscript{st} equation, \(\alpha'_i\)'s = 0 in 2\textsuperscript{nd} equation
  - X Granger causes Y if lagged values of X help explain values of Y

- Trade de-trended, seasonality controlled for, unit roots tested and series’ made stationary
### Results: trade-cooperation, 1990-2004

<table>
<thead>
<tr>
<th>Lags</th>
<th>Sum of coefficients</th>
</tr>
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<tr>
<td>7***</td>
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<td>8***</td>
<td>8.72</td>
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<td>9**</td>
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</table>

**a. Japanese exports to China**

\[ = f(\text{Chinese net cooperation}) \]

**b. Japanese net cooperation**

\[ = f(\text{Chinese exports to Japan}) \]
### Dependence-cooperation, 1990-2004

<table>
<thead>
<tr>
<th>Lags</th>
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<td>7**</td>
<td>1516**</td>
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<td>2244***</td>
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<td>10**</td>
<td>1983**</td>
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<tr>
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#### a. Japanese net cooperation

\[= f(\text{Chinese dependence on Japan})\]

#### b. Japanese net cooperation

\[= f(\text{Japanese dependence on China})\]
<table>
<thead>
<tr>
<th>Trade and cooperation</th>
<th>1990-1997</th>
<th>1998-2004</th>
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<td><strong>a. Japanese exports to China</strong></td>
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<td><strong>c. Japanese exports to China</strong></td>
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<td>16*</td>
<td>22.5</td>
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</table>
Nonlinear Granger causality

- Causality, direction of causality and lag lengths vary by country pair
- Within country pairs the dynamics and interactions change over time?
- Nonlinear relationship such as intensity of relationship different for different levels of cooperation or trade?
- After linear causality stripped from relationship, any remaining structural relationship in residuals from VAR?
Nonlinear Granger causality

- From Baek and Brock (1992) extended by Jones and Hiemstra (1994), used in financial market analysis

\[
\Pr\left(\left|X_t^m - X_s^m\right| < e \mid \left|X_{t-Lx}^{Lx} - X_{s-Lx}^{Lx}\right| < e, \left|C_t^{Lc} - C_s^{Lc}\right| < e\right)
\]

\[
= \Pr\left(\left|X_t^m - X_s^m\right| < e \mid \left|X_{t-Lx}^{Lx} - X_{s-Lx}^{Lx}\right| < e\right)
\]

\[
\frac{C_1(m + Lx, Lc, e)}{C_2(Lx, Lc, e)} = \frac{C_3(m + Lx, e)}{C_4(Lx, e)}
\]
## Results

e. Trade from Japan to China causes net cooperation from Japan to China

\[ e = 1.42 \]

<table>
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<th>( L_x = L_c )</th>
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<td>3</td>
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f. net cooperation from Japan to China causes trade from Japan to China

\[ e = 1.25 \]

<table>
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</tbody>
</table>
Conclusions for Japan-China 1

- From linear results:
  - Ch exports to J increases negative political events from J to China
  - Increased Ch dependence on J increases positive political events from J to Ch
  - Rise in positive political events from Ch to J leads to increased trade from J to Ch

- From nonlinear results: (direction of causality known, not direction of effect)
  - Increased Ch imports from J causes a reaction from Ch
  - J political events affect trade from Ch to J AND trade from J to Ch
  - Trade from J to Ch cause a reaction from J towards Ch
Conclusions for Japan-China 2

- Which can be summarised…. 
- Japan’s stance towards China has implications for its trade relationship with China (trade both ways) 
- Japan’s trade flows to China cause potentially mixed reactions from both sides 
- Political relationship is constrained by the economic relationship 

- Strong evidence of nonlinear causality found for all relationships: importance of testing beyond traditional tests 
- 2SLS or 3SLS cross sectional analysis difficult
Trade asymmetry and conclusions

- Huge Chinese trade flows to the United States causes a negative reaction from US
- Low intensity conflict between J-Ch and US-Ch underpinned by a strong stable economic relationship
  - for domestic political gain?
  - fear of China in Japan?
- Growing interdependence and the effect on politics
  - moves to settle differences, SED
  - Recent improved relations
Further work

- FDI flows and services trade
- Causality tests and analysis of conflict and cooperation separately
- Exploring and explaining the nonlinear dynamics
- Restriction of net cooperation variable
- Multi country world, not in a bilateral vacuum
- Structural breaks: WTO, 2005 protests