Engaging Small and Medium Enterprises in Production Networks
Firm-level Analysis of Five ASEAN Economies

Ganeshan Wignaraja
Director of Research
Asian Development Bank Institute
gwignaraja@adbi.org

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1. Background, motivation and outline
Global Production Networks are Expanding in ASEAN

Share of World Production Network Exports, (%) 1992-2011

Source: Compiled from UN Comtrade database using a methodology from Athukorala (2011) - Gross Trade Approach
Background and Motivation

- ASEAN’s rapid trade-led growth linked to spread of production networks and regional division of labour
- SMEs are the economic backbone of ASEAN economies and more SME engagement in production networks can bring welfare gains (Harvie, 2010; Lim and Kimura, 2010)
- Little is known on whether SMEs are active in production networks in ASEAN and determinants
- Empirical work on SME’s role in ASEAN constrained by absence of published data at industry level
  - available national/industry studies rudimentary
Firm-level Econometric Studies

- Approach useful to shed light on determinants of SMEs in production networks in ASEAN economies
- But few firm studies exist of SMEs in production networks (or exporting) in ASEAN (Harvie *et al.* 2010; Kyophilavong, 2010; Rasiah *et al.* 2010)
- Difficult to draw conclusions from studies due to:
  1. limited coverage of countries and sectors;
  2. small samples of enterprises; and
  3. insufficient comparative firm-level analysis.
Outline of the Research

• Paper tries to remedy gaps in previous work by:
  – drawing on an established body of trade, industrial organization and technology literature emphasizing the notion of firm heterogeneity
  – covering five ASEAN economies (Malaysia, Thailand, Philippines, Indonesia and Vietnam) and wide range of industrial sectors;
  – using large Randomly selected data set from the World Bank of 5,900 firms for late-2000s along with other data;
  – using two alternative econometrics models, one for all firms in production networks and one for sustained exporters only
Key Research Questions

- Research on ASEAN economies informed by 3 overarching questions:
  1. How much do SMEs engage in production networks?
  2. What enterprise-level and policy factors influence SME participation in production networks?
  3. What implications can be drawn for SME support?
- Following OECD (1997) definition, an SME has less than 100 employees
2. Literature and methodology
Theory

• Four main strands of theory can explain trade and production network activity of firms which is the focus of research:
  – Neo-Hecksher-Ohlin model & Vernon’s product cycle
  – Fragmentation of production approach (Jones and Kierzkowski, 1990; Arndt and Kierzkowski, 2001)
  – Technological capability and national innovation systems approach (Bell and Pavitt, 1993; Lall, 1992, Iammarino et al 2008)

• Theory and available empirical work suggest various hypotheses
Hypotheses (1/2)

1. **Firm size** expected to have positive effect on participation in production networks up to given threshold, but may not matter later.

2. **Foreign ownership** positively related to participation in production networks as provides access to superior marketing, technology etc.

3. **Human capital** at higher levels positively related to participation in production networks.
Hypotheses (2/2)

4. **Technological capabilities** – SMEs that have acquired high levels more likely to succeed in production networks

5. **Firm age** needs to be controlled for when looking for relationships between factors affecting firm-level participation in production networks

6. **Access to credit** – SMES with access more likely to join production networks
Empirical Methodology

\[ Y = bX + e \]

- where \( Y \) is vector denoting participation in production networks at firm-level, \( X \) is the matrix of explanatory variables \( b \) is the matrix of coefficients, and \( e \) is the matrix of error terms

- Probit estimation using explanatory variables \( X \): 1) Firm size; 2) Foreign ownership; 3) Human capital; 4) Technological capabilities; 5) Age; 6) Access to credit
3. Findings and implications
Are SMEs in Production Networks?

• Large firms are the leading players but a reasonable base of SMEs exist (as direct exporters or suppliers to MNCs)
  – 22% of SMEs as a % of all sample SMEs in production networks compared with 72% for large firms.

• Higher SME participation in more industrially developed ASEAN economies with more FDI and exposure to production networks
  – Malaysia (28%), Thailand (34%)

• SMEs do export directly but less than large firms.
SME Export Shares Rising, but Differences Remain in ASEAN

Share of SMEs in total exports (%)

Most Exports are Concentrated in Some Firms

Figure 2: Share of Top 25% SME Exporters

Late 2000s

<table>
<thead>
<tr>
<th>Country</th>
<th>All Countries</th>
<th>Malaysia</th>
<th>Thailand</th>
<th>Philippines</th>
<th>Indonesia</th>
<th>Viet Nam</th>
</tr>
</thead>
<tbody>
<tr>
<td>Top 25%</td>
<td>85.8%</td>
<td>69.9%</td>
<td>85.0%</td>
<td>78.9%</td>
<td>96.3%</td>
<td>76.2%</td>
</tr>
<tr>
<td>All other SMEs</td>
<td>14.2%</td>
<td>30.1%</td>
<td>15.0%</td>
<td>21.1%</td>
<td>3.7%</td>
<td>23.8%</td>
</tr>
</tbody>
</table>

# Key Drivers of SME Participation in Production Networks in ASEAN

## T-Test: Mean(SMEs in Production Networks) Minus Mean (SMEs Outside Production Networks)

<table>
<thead>
<tr>
<th></th>
<th>All Countries</th>
<th>Malaysia</th>
<th>Thailand</th>
<th>Philippines</th>
<th>Indonesia</th>
<th>Viet Nam</th>
</tr>
</thead>
<tbody>
<tr>
<td>Size (mean)</td>
<td>+***</td>
<td>+***</td>
<td>+***</td>
<td>+***</td>
<td>+***</td>
<td>+***</td>
</tr>
<tr>
<td>Foreign ownership, (mean %)</td>
<td>+***</td>
<td>+***</td>
<td>+***</td>
<td>+***</td>
<td>+***</td>
<td>+***</td>
</tr>
<tr>
<td>ISO, dummy (%)</td>
<td>+***</td>
<td>+***</td>
<td>+***</td>
<td>+***</td>
<td>+***</td>
<td>+***</td>
</tr>
<tr>
<td>Workers HS, dummy (%)</td>
<td>+***</td>
<td>+</td>
<td>+***</td>
<td>+***</td>
<td>+***</td>
<td>+***</td>
</tr>
<tr>
<td>Age (mean)</td>
<td>+</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>+</td>
</tr>
</tbody>
</table>

Note: *** Significance at 1%, ** at 5%, * at 10%

- Larger firms more likely to participate in PNs; Size effect shows across all and within each country -- Size of **Malaysia** SMEs largest in ASEAN and most likely to participate in PN
- Foreign ownership and ISO significant in all countries
- High school education significant for **Philippines, Indonesia & Viet Nam**, but not significant for **Malaysia**; Average for not in PN **Malaysia** higher than the former three (72% vs. 4-33%)
- Firm age significant for **Viet Nam**, but difference for SME in & not in PN narrow (9 vs. 8 years)
### Econometrics Results

<table>
<thead>
<tr>
<th>Variable</th>
<th>SMEs in PN</th>
<th>All firms in PN</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Sign</td>
<td>Significance</td>
</tr>
<tr>
<td>Firm Size</td>
<td>+</td>
<td>1%</td>
</tr>
<tr>
<td>Firm Size squared</td>
<td></td>
<td>-</td>
</tr>
<tr>
<td>Foreign Ownership</td>
<td>+</td>
<td>1%</td>
</tr>
<tr>
<td>GM has degree</td>
<td>+</td>
<td></td>
</tr>
<tr>
<td>GM’s experience</td>
<td>+</td>
<td></td>
</tr>
<tr>
<td>Firm ISO certified</td>
<td>+</td>
<td>1%</td>
</tr>
<tr>
<td>Firm has Patents</td>
<td>+</td>
<td>1%</td>
</tr>
<tr>
<td>Access to Credit</td>
<td>+</td>
<td>10%</td>
</tr>
<tr>
<td>Firm Age</td>
<td>-</td>
<td>10%</td>
</tr>
<tr>
<td>Philippines</td>
<td>+</td>
<td>5%</td>
</tr>
<tr>
<td>Indonesia</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Viet Nam</td>
<td>+</td>
<td>1%</td>
</tr>
<tr>
<td>Malaysia</td>
<td>+</td>
<td>1%</td>
</tr>
</tbody>
</table>

*Dependent variable is binary: 1 if part of production network, 0 otherwise*
**Policy Influences (Obstacles)**

**Perceived Major Obstacles to Conducting Business, SME firms (% of SME firms)**

<table>
<thead>
<tr>
<th>Major Obstacles</th>
<th>All countries</th>
<th>Malaysia</th>
<th>Thailand</th>
<th>Philippines</th>
<th>Indonesia</th>
<th>Viet Nam</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Trust deficit</td>
<td>(39%)</td>
<td>1. Tax rates (31%)</td>
<td>1. Skills Gap (60%)</td>
<td>1. Trust deficit (45%)</td>
<td>1. Access to credit (39%)</td>
<td>1. Access to credit (39%)</td>
</tr>
<tr>
<td>2. Access to credit</td>
<td>(35%)</td>
<td>2. Crime etc. (25%)</td>
<td>2. Trust deficit (56%)</td>
<td>2. Tax rates (43%)</td>
<td>2. Trust deficit (37%)</td>
<td>2. Trust deficit (35%)</td>
</tr>
<tr>
<td>3. Electricity</td>
<td>(30%)</td>
<td>3. Skills Gap (24%)</td>
<td>3. Tax rates (55%)</td>
<td>3. Electricity (37%)</td>
<td>3. Electricity (31%)</td>
<td>3. Access to land (25%)</td>
</tr>
</tbody>
</table>

- **“Other” obstacles** – trust deficit hampers intra-firm cooperation; smuggling also disincentive
- **Supply-side factors** – Lack of access to finance; inadequate worker skills; high electricity costs; poor transport systems
- **Policy incentives** – high corporate tax rates; economic uncertainty; cumbersome customs and corruption
FTA Use and Firm Size – Large Firms Use FTAs More

T-test: Mean (FTA user) – Mean (FTA non-user)

<table>
<thead>
<tr>
<th></th>
<th>Thailand</th>
<th>Philippines</th>
<th>Malaysia</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Firm size</strong></td>
<td>+***</td>
<td>+*</td>
<td>+**</td>
</tr>
<tr>
<td>Years of establishment</td>
<td>+*</td>
<td>+***</td>
<td>+**</td>
</tr>
<tr>
<td>Foreign ownership</td>
<td>+***</td>
<td></td>
<td>+***</td>
</tr>
<tr>
<td>Knowledge about FTA provisions</td>
<td>+*</td>
<td></td>
<td>+***</td>
</tr>
<tr>
<td>Change/may change business plans</td>
<td>+***</td>
<td>+*</td>
<td>+***</td>
</tr>
<tr>
<td><strong>Total number of firms surveyed</strong></td>
<td>221</td>
<td>155</td>
<td>234</td>
</tr>
</tbody>
</table>

*** Significance at 1%, ** at 5%, * at 10%

- Relationship between firm size and FTA use is significant across all countries.
  Potential reasons:
  - larger firms have greater resources that can be put to use in claiming preferences – e.g. dedicated export departments
  - greater incentive to use FTAs - have more to gain
  - more likely to be part of a production network
Summary

• Global production networks are expanding in ASEAN countries
• The role of SMEs in production networks in ASEAN is an under-researched area, but of growing policy interest
• Micro-level study undertaken in the research was useful
  – It is found that although large firms dominate production networks engagement, there are signs that SMEs have modestly increased their participation over time
  – SME participation is linked to firm-specific factors (e.g. firm size, foreign ownership, skills, technological capabilities, and access to credit) as well as a supportive business environment
  – Tackling residual supply-side and policy constraints can further the participation of ASEAN SMEs in production networks
  – Large firms use FTAs more than SMEs. Integrated business support for SMEs to use FTAs essential