# APPENDIX A

## CALCULATION OF COMPETITORS' PRICE

Competitors' price is defined in this study as the export prices of major competitors in the same export industry in the world market. Major competitors are the top largest suppliers of export products in each industry categorized in the same Harmonized System (HS) 4-digit and 6-digit as those classified by the Ministry of Commerce (MOC), Thailand. Owing to large amounts of product groups classified into 4-digit and 6-digit HS code according to the MOC, samples of these product groups that have large share in each export industry are selected.

Export prices of the same sampled HS code of the major competitors are used to calculate export price index of each competitor in each industry. Export price indexes of four major competitors are weighted averaged by export share, resulting in the competitors' price index of each industry.

Since the period of this study covers seven year period, there is possibly a change in export structure or the compositions of exports. Regarding to this, the fixed base price index may not efficiently represent the real movement of price. The chained price index is preferred because the prices of the current period are compared to those of the previous period instead of the base year. In this study, the competitors' price index is constructed using the similar method applied by MOC in export price index construction.

**Export price index in the year 2000 (base year)**

The export price index in the year 2000 which is the base year (the same base year as of MOC in Thailand's export price index calculation) is calculated using the ***Fixed Laspeyres*** price index which has the following formula.

$$\mathrm{I_t} = \frac{\sum_{i=1}^{n} p_i^t q_i^0}{\sum_{i=1}^{n} p_i^0 q_i^0} \times 100$$

$$\mathrm{I_t} = \frac{\sum_{i=1}^{n} (p_i^0 q_i^0) \times \frac{p_i^t}{p_i^0}}{\sum_{i=1}^{n} p_i^0 q_i^0} \times 100$$

where $\mathrm{I_t}$ is export price index in dollar terms at period *t*

$p_i^t$ is export price in dollar terms of goods *i* at period *t*

$p_i^0$ is export price in dollar terms of good *i* at the base year (average in 2000)

$p_i^0 q_i^0$ is value of export of good *i* at the base year

**Export price index after the year 2000 (base year)**

The formula used is ***Chain Fixed Laspeyres***

$$\mathrm{I_{t,n}} = \mathrm{I_{t\text{-}1,Dec}} \left( \frac{\sum_{i=1}^{n} \left( \frac{p_i^{t,n}}{p_i^{t-1,Dec}} \times p_i^{t-1} q_i^{t-1} \right)}{\sum_{i=1}^{n} p_i^{t-1} q_i^{t-1}} \right)$$

where *n* is month 1,2,…………,12

$\mathrm{I_{t,n}}$ is export price index at month *n* of year *t*

$\mathrm{I_{t\text{-}1,Dec}}$ is export price index at December of year *t-1*

$p_i^{t,n}$ is export price in dollar terms of good *i* at month *n* of year *t*

$p_i^{t-1,Dec}$ is export price in dollar terms of good *i* at December of year *t-1*

$p_i^{t-1} q_i^{t-1}$ is value of export of good *i* of year *t-1* (used as weight)

The export price in dollar terms ($p$) and quantity ($q$) are extracted from the "*average price*" and "*quantity*" series of World Trade Atlas (WTA), respectively. Only products that are continuously exported are included in the construction of price index.

For each export industry, the competitors' price index is the weighed average of the four major competitors' export price index. The components of export products and the weights of each competitor are presented as follows.

Table A1

List of Countries and Export Products at HS 4-digit and 6-digit Level

Selected in Calculation of Competitors' Price Index

| **Canned fish & seafood** | | | |
|---|---|---|---|
| China | Denmark | Spain | Germany |
| 160520 | 160520 | 160520 | 160520 |
| 160414 | 160414 | 160414 | 160414 |
| 160420 | 160420 | 160420 | 160420 |
| 160510 | 160590 | 160590 | 160510 |
| 160590 | 160411 | 160413 | 160590 |
| 160413 | 160415 | 160415 | 160413 |
| 160411 | 160540 | 160540 | 160411 |
| 160415 | 160419 | 160419 | 160415 |
| 160540 | | | 160419 |
| 160419 | | | |

| **Chemical products** | | | |
|---|---|---|---|
| Germany | USA | Belgium | Japan |
| 3824 | 2901 | 3204 | 2902 |
| 3204 | 2933 | 2803 | 2901 |
| 2803 | 3204 | 3808 | 2933 |
| 3808 | 2803 | 2916 | 3824 |
| 292241 | 3808 | 292241 | 3204 |
| | 2916 | | 2803 |
| | 292241 | | 3808 |
| | | | 2916 |
| | | | 291736 |
| | | | 292241 |

| Garments | | | |
|---|---|---|---|
| China | Hong Kong | Italy | Turkey |
| 6111 | 6113 | 6209 | 6209 |
| 6209 | 610510 | 610510 | 610510 |
| 6113 | 610910 | 610910 | 610910 |
| 610510 | 620342 | 620342 | 620342 |
| 610910 | 611020 | 611020 | 611020 |
| 620342 | 620462 | 620462 | 620462 |
| 611020 | 610990 | 610990 | 610990 |
| 620462 | 611030 | 611030 | 611030 |
| 610990 | 610711 | 610711 | 610711 |
| 611030 | 620520 | 620520 | 620520 |
| 610711 | 620630 | 620630 | 620630 |
| 620520 | 620343 | 620343 | 620343 |
| 620630 | 610343 | 610343 | 610343 |
| 620343 | 610610 | 610610 | 610610 |
| 610343 | 610520 | 610520 | 610520 |
| 610610 | 611090 | 611090 | 620333 |
| 610520 | 620333 | 620333 | 620452 |
| 611090 | 620452 | 620452 | 620443 |
| 620333 | 620443 | 620443 | 620463 |
| 620452 | 620463 | 620463 | 610821 |
| 620443 | 610821 | 610821 | 620530 |
| 620463 | 620530 | 620530 | 620469 |
| 610821 | 620469 | 620469 | 610822 |
| 620530 | 610822 | 610822 | 611430 |
| 620469 | 611430 | 620193 | 620193 |
| 610822 | 620193 | 620433 | 620433 |
| 611430 | 620433 | | |
| 620193 | | | |
| 620433 | | | |

| Furniture and parts | | | |
|---|---|---|---|
| China | Italy | Germany | Denmark |
| 940360 | 940360 | 940360 | 940360 |
| 940161 | 940161 | 940161 | 940161 |
| 940169 | 940169 | 940169 | 940169 |
| 940340 | 940190 | 940190 | 940190 |
| 940390 | 940340 | 940340 | 940340 |
| 940320 | 940390 | 940390 | 940390 |
| 940350 | 940320 | 940320 | 940320 |
| 940380 | 940350 | 940350 | 940350 |
| | 940380 | 940380 | 940380 |

| Motor cars, parts and accessories | | | |
|---|---|---|---|
| Germany | USA | Canada | France |
| 870421 | 870421 | 870421 | 870421 |
| 870323 | 870323 | 870323 | 870323 |
| 870431 | 870431 | 870431 | 870431 |
| 870322 | 870322 | 870322 | 870322 |
| 854430 | 870332 | 870332 | 854430 |
| 870332 | 870333 | 870333 | 870332 |
| 870333 | 870324 | 870324 | 870333 |
| 851220 | | | 851220 |
| 870324 | | | 870324 |

| Plastic products | | | |
|---|---|---|---|
| Germany | USA | China | Italy |
| 3820 | 3920 | 3920 | 3920 |
| 3821 | 3918 | 3921 | 3918 |
| 3819 | 392321 | 3918 | 3919 |
| 392321 | 392329 | 3919 | 392321 |
| 392690 | 630533 | 392321 | 392690 |
| 392329 | | 392690 | 392329 |
| 392490 | | 392329 | 392490 |
| | | 392330 | |
| | | 630533 | |
| | | 392490 | |

| Rubber products | | | |
|---|---|---|---|
| Germany | Japan | USA | France |
| 4011 | 4011 | 4011 | 4011 |
| 4014 | 4014 | 4005 | 4014 |
| 4005 | 4005 | 4007 | 4005 |
| 4007 | 4007 | 4009 | 4007 |
| 4013 | 4009 | 4013 | 4013 |
| 401519 | 4013 | 401519 | 401519 |
| 401699 | 401519 | 401511 | 401699 |
| 401511 | 401699 | | 401511 |
| 401693 | 401693 | | 401693 |

| Iron & steels and their products | | | |
|---|---|---|---|
| Germany | Japan | Belgium | Italy |
| 7326 | 7326 | 7326 | 7326 |
| 7208 | 7208 | 7208 | 7208 |
| 7209 | 7209 | 7209 | 7209 |
| 7219 | 7219 | 7219 | 7219 |
| 7318 | 7308 | 7318 | 7318 |
| 7307 | 7318 | 7307 | 7307 |
| 7306 | 7307 | 7306 | 7306 |
| 7216 | 7306 | 7216 | 7216 |
| 7210 | 7216 | 7210 | 7210 |
| | 7210 | | |

The importance of each competing country in each export industry is ranked by their export value in the world market. Data for each country's export value is obtained from the Global Trade Atlas (GTA). Competitors' price (*pc*) of each export industry is measured by:

$$pc = \sum_{i=1}^{4} w_i \, pc_i$$

where $pc_i$ be the export price index of competing country *i* and $w_i$ be weight assign to competing country *i*.

The weights assigned to countries selected in calculation of competitors' price index for each export industry are tabulated in Table A2.

Table A2

Weights Assigned to Countries Selected in

Calculation of Competitors' Price Index

Canned fish & seafood

| China | Denmark | Spain | Germany |
|---|---|---|---|
| 0.64 | 0.13 | 0.12 | 0.11 |

Chemical products

| Germany | USA | Belgium | Japan |
|---|---|---|---|
| 0.27 | 0.27 | 0.26 | 0.20 |

Textiles

| China | Hong Kong | Italy | Turkey |
|---|---|---|---|
| 0.49 | 0.28 | 0.12 | 0.11 |

Furniture and parts

| China | Italy | Germany | Denmark |
|---|---|---|---|
| 0.36 | 0.33 | 0.23 | 0.08 |

Motor vehicles

| Germany | USA | Canada | France |
|---|---|---|---|
| 0.43 | 0.22 | 0.20 | 0.15 |

Plastic products

| Germany | USA | China | Italy |
|---|---|---|---|
| 0.34 | 0.31 | 0.18 | 0.17 |

Rubber products

| Germany | Japan | USA | France |
|---|---|---|---|
| 0.29 | 0.28 | 0.24 | 0.19 |

Iron & steels

| Germany | Japan | Belgium | Italy |
|---|---|---|---|
| 0.34 | 0.25 | 0.21 | 0.20 |