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# On Linking National Econometric Models of Japan, U.S.A., and the East and Southeast Asian Countries

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## Introduction

In a pilot study[1] conducted by CSEAS last year, Mitsuo Ezaki stresses the economic interdependence between the Southeast Asian countries, Japan and the United States. There is a need for disaggregating these countries' import functions in the research of international trade linkage. He called for further research to be done by disaggregating the international trade of these countries by the SITC commodities classification.

This paper follows this suggestion and presents the work done on the accumulation of data and the results of some intitial models using these data. This step appears to be necessary for the next phase of the Sub-LINK which is to develop multiple Asian country–Japan–U.S.A. trade models. A system of six equation models representing five countries of LINK is offered here. They are the trade functions based on their trade data with Japan and the export price indexes. A large amount of work has been done by all participants in LINK on the Export Price Indexes of each country, and this is shown. A concordance for all countries' price indexes has been constructed to help make consistent these countries' data. Explanations of symbols and new LINK language follows:

## Notations for Variables

*M1* Japanese imports classification from exporting country corresponding to SITC 0+1

*M2* Japanese imports classification from exporting country corresponding to SITC 2+4

*M3* Japanese imports classification from exporting country corresponding to SITC 3

*M4* Japanese imports classification from exporting country corresponding to SITC 5–9

*PM1* Exporting country's (i.e., Taiwan's, Korea's, Singapore's, etc.) index for prices of exported goods corre-

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1) Mitsuo Ezaki, "Linking National Econometric Models of Japan, U.S.A., and the East and Southeast Asian Countries; A Pilot Study," *Southeast Asian Studies*, Vol. 17, No. 2, 1979, pp. 178–200.

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| | sponding to the export price index of those goods found mostly in SITC 0+1 |
| *PM2* | Exporting country's index for prices of goods corresponding to SITC 2+4 |
| *PM3* | Exporting country's index for prices of goods corresponding to SITC 3 |
| *PM4* | Exporting country's index for prices of goods corresponding to SITC 5-9 |
| *JMC1* | Japanese imports of food and beverages, custom clearance basis |
| *JMC24* | Japanese imports of crude materials, custom clearance basis |
| *JMC3* | Japanese imports of metal ores and scraps, custom clearance basis, sa. |
| *JMC5* | Japanese imports of mineral fuels, custom clearance basis, sa. |
| *JMC6* | Japanese imports of chemical products, c c basis, sa. |
| *JMC78* | Japanese imports of machineries, and other mfg. products, c c basis, sa. |
| *JPMC1* | Deflator for *JMC1*, derived from BOJ import index, 1970 =100, US $ |
| *JPMC24* | Deflator for *JMC24*, derived from BOJ import index, 1970 =100, US $ |
| *JPMC3* | Deflator for *JMC3* |
| *JPMC5* | Deflator for *JMC5* |
| *JPMC6* | Deflator for *JMC6* |
| *JPMC78* | Deflator for *JMC78* |
| *Q1* | Seasonal dummy for 1st quarter |
| *Q2* | Seasonal dummy for 2nd quarter |
| *Q3* | Seasonal dummy for 3rd quarter |

## Country Trade Functions

The trade model disaggregated by country by SITC commodity classification is shown. A system of six equations for each country is designed.[2] The equations predict Japanese imports from individual countries deflated by that country's export price indexes by estimating total Japanese demand deflated by total import price deflators. Some log equations have been done also.

Of the forty-six (46) equations run, twenty-seven (27) are significant and have potential for prediction. The nineteen (19) that are not significant are mostly comprised of 11 in Thailand and the Philippines, where few data are available. More data are expected later. But, of the twenty-seven (27) significant equations, most have very high $R^2$, and the Durbin-Watson statistics are acceptable.

The importance of the equations is that they are estimated in such a disaggregated form for the first time. Notes on individual country functions follow.

2) Korean export price indexes do not contain oil export price indexes, so *PM3* could not be calculated, thus leaving only four equations for Korea. So far there are not quite enough years covered for Hong Kong's export price indexes to have enough degrees of freedom to do the equations, but perhaps soon there will be.

## TAIWAN

1) Japanese imports from Taiwan standardized by Taiwan's export price index of unit values equals constant plus Japanese imports of food and beverages deflated, minus Taiwan's export price index, deflated, plus 3 seasonal dummy variables. Read in the similar fashion.

$$\frac{M1}{PM1} = \underset{(-0.044)}{-7.86} + \underset{(2.87)}{47.87}\frac{JMC1}{JPMC1} \underset{(-1.81)}{-169.19}\frac{PM1}{JPMC1} + \underset{(1.54)}{0.30}\left(\frac{M1}{PM1}\right)_{-1} + \underset{(0.92)}{35.46}Q1 + \underset{(6.22)}{233.17}Q2 + \underset{(1.20)}{50.05}Q3$$

$R^2=0.839$, $S^2=66.58$, $d=1.74$

2) $$\ln\frac{M1}{PM1} = \underset{(3.49)}{2.85} + \underset{(3.52)}{1.25}\ln\frac{JMC1}{JPMC1} \underset{(-2.12)}{-0.55}\ln\frac{PM1}{JPMC1} + \underset{(0.22)}{0.04}\ln\left(\frac{M1}{PM1}\right)_{-1} + \underset{(0.003)}{0.0003}Q1 + \underset{(5.21)}{0.58}Q2 + \underset{(1.93)}{0.22}Q3$$

$R^2=0.812$, $S^2=0.19$, $d=1.87$

3) $$\frac{M2}{PM2} = \underset{(2.56)}{501.03} \underset{(-2.21)}{-17.36} \times\left(\frac{JM24}{JPMC24} + \frac{JMC3}{JPMC3}\right) \underset{(-2.33)}{-35469.15}\frac{PM2}{\frac{JMC24}{JPMC24} + \frac{JMC3}{JPMC3}} + \underset{(2.42)}{0.45}\left(\frac{M2}{PM2}\right)_{-1} + \underset{(0.012)}{0.18}Q1 \underset{(-1.00)}{-15.32}Q2 \underset{(-0.43)}{-6.45}Q3$$

$R^2=0.44$, $S^2=28.97$, $d=1.63$

4) $$\frac{M3}{PM3} = \underset{(-1.00)}{-61.77} + \underset{(1.51)}{6.47}\frac{JMC5}{JPMC5} + \underset{(0.43)}{8.79}\frac{PM3}{JPMC5} + \underset{(1.28)}{0.26}\left(\frac{M3}{PM3}\right)_{-1} + \underset{(0.011)}{0.11}Q1 + \underset{(0.85)}{8.00}Q2 \underset{(-1.04)}{-9.52}Q3$$

$R^2=0.25$, $S^2=16.84$, $d=1.60$

5) $$\ln\frac{M3}{PM3} = \underset{(-1.86)}{-12.92} + \underset{(2.20)}{6.65}\ln\frac{JMC5}{JPMC5} + \underset{(1.48)}{1.29}\ln\frac{PM3}{JPMC5} + \underset{(0.28)}{0.056}\ln\left(\frac{M3}{PM3}\right)_{-1} \underset{(0.07)}{-0.05}Q1 + \underset{(0.92)}{0.67}Q2 \underset{(-0.94)}{-0.68}Q3$$

$R^2=0.11$, $S^2=1.30$, $d=1.87$

6) $$\frac{M4}{PM4} = \underset{(0.33)}{108.55} + \underset{(3.50)}{65.92}\left(\frac{JMC6}{JPMC6} + \frac{JMC78}{JPMC78}\right) \underset{(-3.06)}{-781.63} \times\frac{PM4\left(\frac{JMC6}{JPMC6} + \frac{JMC78}{JPMC78}\right)}{JMC6+JMC78} + \underset{(0.43)}{0.095}\left(\frac{M4}{PM4}\right)_{-1} \underset{(-1.22)}{-82.57}Q1 + \underset{(0.33)}{21.79}Q2 \underset{(-0.05)}{-3.05}Q3$$

$R^2=0.92$, $S^2=123.73$, $d=0.81$

## MALAYSIA

1) $$\frac{M1}{PM1} = \underset{(-7.91)}{-204.36} + \underset{(11.69)}{23.44}\frac{JMC1}{JPMC1} + \underset{(5.85)}{82.36}\frac{PM1}{JPMC1} + \underset{(0.04)}{0.21}Q1 + \underset{(2.28)}{11.85}Q2 \underset{(-0.11)}{-0.60}Q3$$

$R^2=0.86$, $S^2=8.46$, $d=1.84$

2) $$\ln\frac{M1}{PM1} = \underset{(-4.38)}{-2.05} + \underset{(13.26)}{2.99}\ln\frac{JMC1}{JPMC1} + \underset{(7.40)}{1.06}\ln\frac{PM1}{JPMC1} \underset{(-0.54)}{-0.03}Q1 + \underset{(1.93)}{0.13}Q2 \underset{(-0.28)}{-0.02}Q3$$

$R^2=0.89$, $S^2=0.11$, $d=1.90$

3) $$\frac{M2}{PM2} = \underset{(1.73)}{3659.65} \underset{(-1.24)}{-119.87} \times\left(\frac{JMC24}{JPMC24} + \frac{JMC3}{JPMC3}\right)$$

$$-423330.94\underset{(-2.19)}{\frac{\frac{PM2}{JMC24+JMC3}}{\frac{JMC24}{JPMC24}+\frac{JMC3}{JPMC3}}}+0.63\underset{(2.31)}{\left(\frac{M2}{PM2}\right)_{-1}}-178.54\underset{(-1.37)}{Q1}+208.86\underset{(1.63)}{Q2}+22.28\underset{(0.17)}{Q3}$$

$R^2=0.644$, $S^2=206.27$, $d=1.90$

4) $$\frac{M3}{PM3}=-46.02+4.91\underset{(0.62)}{\frac{JMC5}{JPMC5}}-25.23\underset{(-0.47)}{\frac{PM3}{JPMC5}}+0.93\underset{(5.76)}{\left(\frac{M3}{PM3}\right)_{-1}}+59.41\underset{(2.98)}{Q1}+26.06\underset{(1.35)}{Q2}+0.96\underset{(0.05)}{Q3}$$

$R^2=0.859$, $S^2=29.66$, $d=1.98$

5) $$\ln\frac{M3}{PM3}=-9.41+4.17\underset{(1.82)}{\ln\frac{JMC5}{JPMC5}}-1.33\underset{(-1.48)}{\ln\frac{PM3}{JPMC5}}+0.41\underset{(2.06)}{\ln\left(\frac{M3}{PM3}\right)_{-1}}+1.47\underset{(2.85)}{Q1}+0.81\underset{(1.62)}{Q2}+0.77\underset{(1.62)}{Q3}$$

$R^2=0.754$, $S^2=0.77$, $d=1.96$

6) $$\frac{M4}{PM4}=213.82+6.73\underset{(2.27)}{\left(\frac{JMC6}{JPMC6}+\frac{JMC78}{JPMC78}\right)}-214.36\underset{(-1.86)}{\times\frac{PM4\left(\frac{JMC6}{JPMC6}+\frac{JMC78}{JPMC78}\right)}{JMC6+JMC78}}+0.51\underset{(1.94)}{\left(\frac{M4}{PM4}\right)_{-1}}-9.21\underset{(-0.38)}{Q1}+48.90\underset{(2.04)}{Q2}+4.85\underset{(0.19)}{Q3}$$

$R^2=0.577$, $S^2=38.05$, $d=1.56$

## KOREA

1) $$\frac{M1}{PM1}=357.16+54.73\underset{(1.75)}{\frac{JMC1}{JPMC1}}-901.24\underset{(-2.42)}{\frac{PM1}{JPMC1}}+0.56\underset{(3.28)}{\left(\frac{M1}{PM1}\right)_{-1}}-303.54\underset{(-4.41)}{Q1}-30.10\underset{(-0.46)}{Q2}-65.98\underset{(-1.06)}{Q3}$$

$R^2=0.865$, $S^2=102.87$, $d=2.25$

2) $$\ln\frac{M1}{PM1}=0.18+1.32\underset{(2.48)}{\ln\frac{JMC1}{JPMC1}}-0.89\underset{(-2.94)}{\ln\frac{PM1}{JPMC1}}+0.45\underset{(2.76)}{\ln\left(\frac{M1}{PM1}\right)_{-1}}-0.51\underset{(-5.05)}{Q1}-0.10\underset{(-1.05)}{Q2}-1.10\underset{(-1.12)}{Q3}$$

$R^2=0.929$, $S^2=0.15$, $d=1.83$

3) $$\frac{M2}{PM2}=-1393.52+82.86\underset{(2.83)}{\times\left(\frac{JMC24}{JPMC24}+\frac{JMC3}{JPMC3}\right)}+140923.19\underset{(1.48)}{\frac{\frac{PM2}{JMC24+JMC3}}{\frac{JMC24}{JPMC24}+\frac{JMC3}{JPMC3}}}-47.06\underset{(-1.11)}{Q1}-50.90\underset{(-1.18)}{Q2}-67.69\underset{(-1.59)}{Q3}$$

$R^2=0.48$, $S^2=69.45$, $d=1.52$

4) n. a.

5) n. a.

6) $$\frac{M4}{PM4}=2505.13+89.25\underset{(2.32)}{\left(\frac{JMC6}{JPMC6}+\frac{JMC78}{JPMC78}\right)}-4896.51\underset{(-3.19)}{\times\frac{PM4\left(\frac{JMC6}{JPMC6}+\frac{JMC78}{JPMC78}\right)}{JMC6+JMC78}}+0.52\underset{(3.13)}{\left(\frac{M4}{PM4}\right)_{-1}}-170.56\underset{(-0.76)}{Q1}-115.91\underset{(-0.54)}{Q2}+74.64\underset{(0.36)}{Q3}$$

$R^2=0.899$, $S^2=345.72$, $d=0.89$

## SINGAPORE

1) $$\frac{M1}{PM1}=5.27+2.29\underset{(2.70)}{\frac{JMC1}{JPMC1}}-10.89\underset{(-1.75)}{\frac{PM1}{JPMC1}}-7.28\underset{(-3.43)}{Q1}-3.20\underset{(-1.53)}{Q2}-2.60\underset{(-1.24)}{Q3}$$

$R^2=0.60,\ S^2=3.09,\ d=1.78$

2) $$\ln\frac{M1}{PM1}=\underset{(-0.40)}{-0.42}+\underset{(2.88)}{1.37}\ln\frac{JMC1}{JPMC1}-\underset{(-2.58)}{0.74}\ln\frac{PM1}{JPMC1}-\underset{(-4.13)}{0.55}Q1-\underset{(-1.3)}{0.17}Q2-\underset{(-1.09)}{0.14}Q3$$

$R^2=0.70,\ S^2=0.19,\ d=1.80$

3) $$\frac{M2}{PM2}=\underset{(1.80)}{54.77}-\underset{(-1.62)}{1.88}\times\left(\frac{JMC24}{JPMC24}+\frac{JMC3}{JPMC3}\right)-\underset{(-1.70)}{5936.79}\frac{PM2}{\frac{JMC24+JMC3}{\frac{JMC24}{JPMC24}+\frac{JMC3}{JPMC3}}}+\underset{(4.29)}{0.76}\left(\frac{M2}{PM2}\right)_{-1}-\underset{(-0.53)}{1.75}Q1+\underset{(2.57)}{8.22}Q2+\underset{(0.45)}{1.41}Q3$$

$R^2=0.708,\ S^2=4.54,\ d=2.74$

4) $$\frac{M3}{PM3}=\underset{(-1.47)}{-1191.95}+\underset{(1.98)}{83.27}\frac{JMC5}{JPMC5}+\underset{(0.80)}{457.03}\frac{PM3}{JPMC3}+\underset{(1.94)}{0.47}\left(\frac{M3}{PM3}\right)_{-1}+\underset{(1.29)}{112.42}Q1+\underset{(0.99)}{80.73}Q2+\underset{(0.013)}{0.86}Q3$$

$R^2=0.464,\ S^2=87.34,\ d=1.52$

5) $$\ln\frac{M3}{PM3}=\underset{(-1.56)}{-4.97}+\underset{(2.37)}{3.46}\ln\frac{JMC5}{JPMC5}+\underset{(0.95)}{1.11}\ln\frac{PM3}{JPMC5}+\underset{(1.72)}{0.41}\ln\left(\frac{M3}{PM3}\right)_{-1}+\underset{(1.23)}{0.33}Q1+\underset{(0.92)}{0.23}Q2+\underset{(0.12)}{0.025}Q3$$

$R^2=0.453,\ S^2=0.27,\ d=1.74$

6) $$\frac{M4}{PM4}=\underset{(-0.13)}{-36.71}+\underset{(1.03)}{4.90}\left(\frac{JMC6}{JPMC6}+\frac{JMC78}{JPMC78}\right)+\underset{(0.21)}{70.72}\times\frac{PM4\left(\frac{JMC6}{JPMC6}+\frac{JMC78}{JPMC78}\right)}{JMC6+JMC78}-\underset{(-0.31)}{15.80}Q1+\underset{(0.003)}{0.18}Q2+\underset{(0.47)}{24.00}Q3$$

$R^2=0.10,\ S^2=74.59,\ d=0.41$

## AUSTRALIA

1) $$\frac{M1}{PM1}=\underset{(-3.35)}{-3399.35}+\underset{(6.43)}{484.30}\frac{JMC1}{JPMC1}+\underset{(2.08)}{3161.15}\frac{PM1}{JPMC1}+\underset{(1.18)}{0.16}\left(\frac{M1}{PM1}\right)_{-1}-\underset{(-1.81)}{246.10}Q1-\underset{(-1.15)}{147.69}Q2+\underset{(0.021)}{2.87}Q3$$

$R^2=0.896,\ S^2=246.37,\ d=0.87$

2) $$\ln\frac{M1}{PM1}=\underset{(4.99)}{3.11}+\underset{(6.51)}{2.11}\ln\frac{JMC1}{JPMC1}+\underset{(1.75)}{0.70}\ln\frac{PM1}{JPMC1}+\underset{(0.75)}{0.10}\ln\left(\frac{M1}{PM1}\right)_{-1}-\underset{(-1.65)}{0.14}Q1-\underset{(-1.48)}{0.12}Q2-\underset{(-0.49)}{0.04}Q3$$

$R^2=0.869,\ S^2=0.15,\ d=0.80$

3) $$\frac{M2}{PM2}=\underset{(0.58)}{1470.78}+\underset{(0.12)}{11.24}\times\left(\frac{JMC24}{JPMC24}+\frac{JMC3}{JPMC3}\right)-\underset{(-0.62)}{215385.69}\frac{PM2}{\frac{JMC24+JMC3}{\frac{JMC24}{JPMC24}+\frac{JMC3}{JPMC3}}}+\underset{(4.86)}{0.70}\left(\frac{M2}{PM2}\right)_{-1}-\underset{(-0.25)}{35.84}Q1+\underset{(0.57)}{79.47}Q2+\underset{(2.21)}{313.27}Q3$$

$R^2=0.871,\ S^2=264.88,\ d=2.19$

4) $$\frac{M3}{PM3}=\underset{(0.84)}{855.28}+\underset{(0.15)}{10.00}\frac{JMC5}{JPMC5}-\underset{(-1.24)}{933.84}\frac{PM3}{JPMC5}-\underset{(6.77)}{0.857}\left(\frac{M3}{PM3}\right)_{-1}-\underset{(-2.62)}{471.04}Q1-\underset{(-1.08)}{187.87}Q2-\underset{(-1.31)}{218.93}Q3$$

$R^2=0.898,\ S^2=318.65,\ d=2.47$

5) $$\ln\frac{M3}{PM3}=\underset{(1.41)}{1.07}+\underset{(0.78)}{0.20}\ln\frac{JMC5}{JPMC5}$$

$$\underset{(-1.58)}{-0.16}\ln\frac{PM3}{JPMC5}\underset{(6.27)}{+0.79}\ln\left(\frac{M3}{PM3}\right)_{-1}$$
$$\underset{(-3.22)}{-0.22}Q1\underset{(-1.08)}{-0.07}Q2\underset{(-1.32)}{-0.083}Q3$$
$R^2=0.940$, $S^2=0.12$, $d=2.25$

6) $$\frac{M4}{PM4}=\underset{(3.36)}{557.55}+\underset{(19.70)}{49.33}\left(\frac{JMC6}{JPMC6}+\frac{JMC78}{JPMC78}\right)\underset{(-4.19)}{-1127.23}\times\frac{PM4\left(\frac{JMC6}{JPMC6}+\frac{JMC78}{JPMC78}\right)}{JMC6+JMC78}$$
$$\underset{(-2.70)}{-93.49}Q1\underset{(-1.10)}{-38.20}Q2\underset{(-0.11)}{-3.94}Q3$$
$R^2=0.93$, $S^2=66.34$, $d=2.33$

## INDONESIA

1) $$\frac{M1}{PM1}=\underset{(-4.22)}{-466.07}+\underset{(10.83)}{37.98}\frac{JMC1}{JPMC1}\underset{(-2.05)}{-252.27}\frac{PM1}{JPMC1}$$
$R^2=0.94$, $S^2=50.04$, $d=1.84$

2) $$\ln\frac{M1}{PM1}=\underset{(-2.32)}{-2.81}+\underset{(7.57)}{2.58}\ln\frac{JMC1}{JPMC1}\underset{(-1.23)}{-0.42}\ln\frac{PM1}{JPMC1}$$
$R^2=0.89$, $S^2=0.15$, $d=2.15$

3) $$\frac{M2}{PM2}=\underset{(0.44)}{1369.71}+\underset{(2.46)}{66.64}\times\left(\frac{JMC24}{JPMC24}+\frac{JMC3}{JPMC3}\right)\underset{(-2.02)}{-12655388.0}\frac{\frac{PM2}{JMC24+JMC3}}{\frac{JMC24}{JPMC24}+\frac{JMC3}{JPMC3}}$$
$R^2=0.81$, $S^2=403.85$, $d=2.94$

4) $$\frac{M3}{PM3}=\underset{(-0.03)}{-127.15}+\underset{(1.66)}{250.73}\frac{JMC5}{JPMC5}\underset{(-0.68)}{-5862.97}\frac{PM3}{JPMC5}$$
$R^2=0.412$, $S^2=1081.42$, $d=0.90$

5) $$\ln\frac{M3}{PM3}=\underset{(0.12)}{0.47}+\underset{(2.19)}{2.12}\ln\frac{JMC5}{JPMC5}\underset{(-0.82)}{-1.05}\ln\frac{PM3}{JPMC5}$$
$R^2=0.57$, $S^2=0.18$, $d=0.86$

6) $$\frac{M4}{PM4}=\underset{(-1.42)}{-109.44}+\underset{(1.10)}{1.78}\left(\frac{JMC6}{JPMC6}+\frac{JMC78}{JPMC78}\right)\underset{(1.39)}{+205.43}\times\frac{PM4\left(\frac{JMC6}{JPMC6}+\frac{JMC78}{JPMC78}\right)}{JMC6+JMC78}$$
$R^2=0.78$, $S^2=46.69$, $d=2.20$

## THAILAND

1) $$\frac{M1}{PM1}=\underset{(1.06)}{3794.91}+\underset{(2.66)}{234.98}\frac{JMC1}{JPMC1}\underset{(-2.14)}{-20842.07}\frac{PM1}{JPMC1}$$
$R^2=0.50$, $S^2=1035.70$, $d=1.28$

2) $$\ln\frac{M1}{PM1}=\underset{(-0.40)}{-1.56}+\underset{(2.31)}{2.11}\ln\frac{JMC1}{JPMC1}\underset{(-2.06)}{-2.37}\ln\frac{PM1}{JPMC1}$$
$R^2=0.43$, $S^2=0.32$, $d=1.51$

3) $$\frac{M2}{PM2}=\underset{(1.62)}{1972.55}\underset{(-0.06)}{-0.71}\times\left(\frac{JMC24}{JPMC24}+\frac{JMC3}{JPMC3}\right)\underset{(-0.95)}{-3029860.0}\frac{\frac{PM2}{JMC24+JMC3}}{\frac{JMC24}{JPMC24}+\frac{JMC3}{JPMC3}}$$
$R^2=0.29$, $S^2=71.67$, $d=1.67$

4) $$\frac{M3}{PM3}=\underset{(0.07)}{18.75}+\underset{(0.02)}{0.10}\frac{JMC5}{JPMC5}\underset{(-0.33)}{-64.54}\frac{PM3}{JPMC5}$$
$R^2=0.10$, $S^2=24.87$, $d=2.40$

5) n. a.

6) $$\frac{M4}{PM4} = \underset{(1.59)}{1007.77} + \underset{(6.16)}{28.26}\left(\frac{JMC6}{JPMC6} + \frac{JMC78}{JPMC78}\right) - \underset{(-2.97)}{3878.63} \times \frac{PM4\left(\frac{JMC6}{JPMC6} + \frac{JMC78}{JPMC78}\right)}{JMC6+JMC78}$$

$R^2=0.85$, $S^2=211.65$, $d=1.85$

## PHILIPPINES

1) $$\frac{M1}{PM1} = \underset{(-0.32)}{-5726.30} - \underset{(-0.66)}{131.76}\frac{JMC1}{JPMC1} + \underset{(-0.80)}{15483.88}\frac{PM1}{JPMC1}$$

$R^2=0.10$, $S^2=1071.75$, $d=0.80$

2) $$\ln\frac{M1}{PM1} = \underset{(1.06)}{18.77} - \underset{(-0.57)}{2.85}\ln\frac{JMC1}{JPMC1} + \underset{(0.50)}{5.07}\ln\frac{PM1}{JPMC1}$$

$R^2=0.10$, $S^2=0.71$, $d=0.77$

3) $$\frac{M2}{PM2} = \underset{(-0.15)}{-1348.94} + \underset{(1.03)}{109.99} \times \left(\frac{JMC24}{JPMC24} + \frac{JMC3}{JPMC3}\right) - \underset{(-1.44)}{19213664.0}\frac{\frac{PM2}{JMC24+JMC3}}{\frac{JMC24}{JPMC24} + \frac{JMC3}{JPMC3}}$$

$R^2=0.31$, $S^2=779.31$, $d=1.87$

4) $$\frac{M3}{PM3} = \underset{(0.21)}{8.68} - \underset{(-0.46)}{0.38}\frac{JMC5}{JPMC5} + \underset{(2.72)}{22.72}\frac{PM3}{JPMC5}$$

$R^2=0.64$, $S^2=2.02$, $d=1.89$

5) n. a.

6) $$\frac{M4}{PM4} = \underset{(-0.48)}{-166.18} + \underset{(1.44)}{5.81}\left(\frac{JMC6}{JPMC6} + \frac{JMC78}{JPMC78}\right) - \underset{(-0.29)}{87.50} \times \frac{PM4\left(\frac{JMC6}{JPMC6} + \frac{JMC78}{JPMC78}\right)}{JMC6+JMC78}$$

$R^2=0.13$, $S^2=98.34$, $d=2.40$

*Taiwan*—Three of the Taiwan equations show a high $R^2$, indicating that we may be able to predict the food and beverages equations plus the SITC 5–9 trade equation. Low $R^2$ for crude materials and for oil exports may be understandable as these are not strong exports for Taiwan and data is sparse. The Durbin-Watson statistics are not out-of-line.

*Korea*—High $R^2$ in equations 1 and 2 indicate we are capturing rather well the relation between food and beverages in Korean exports and Japanese imports. Equation 3 describing Korean crude material exports has low $R^2$, possibly since there is not yet data enough. As mentioned, Korean 4 and 5 are not determinable.

*Malaysia*—These equations display high $R^2$ throughout, indicating strong ability to predict Malaysian exports to Japan. The Durbin-Watsons seem reasonable in most cases, but *M2* crude materials, and *M4* seem to show positive autocorrelation.

*Singapore*—There exists good data coverage for Singapore quarterly indexes for 1972 through 1977, but unfortunately most of the equations are not significant. The equation capturing food, beverages and raw materials only seems significant and can be used for prediction.

*Australia*—Though not actually considered an Asian country, Australian data became available through the cooperation of Dr. Ironmonger of Australia and were tested out for possible future inclusion. All of the trade functions are significant, but *M3* and *M4* show positive autoconelation.

*Indonesia*—Once again equations four and five are troublesome possibly as there is an exceptionally high export price index for 1974, 1975, 1976 and 1977 for oil. This elevated the data quite a bit and possibly threw the correlations out of line. Nevertheless, the other four equations are significant.

*Thailand*—Only *M4* quation is significant leaving some room for improvement here. Possibly when we get quarterly data for Thailand and the Philippines which have no significant equation, this will be changed.

All these seem to show the degree of difficulty involved in estimating the import functions of Asian developing countries. Further work to be done includes the gathering of more data for quarterly export price index and thereby perfecting the trade functions between the individual countries and Japan. The crucial part is the export price indexes, which will be discussed below.

## Export Price Indexes

Data for the Export Price Indexes for these countries of the LINK project of necessity come from many different sources. In most cases, the data have been provided to this Center by economists involved directly in LINK, and then organized by the Center's staff to be consistent throughout.

The data for price indexes is arranged by SITC groupings to fall into four weighted-by-trade categories. That is, SITC 0 and 1 make up *PM1*; SITC 2 and 4 make *PM2*, SITC 3=*PM3* and SITC 5–9=*PM4*. The trade weights were calculated by taking actual figures for the base year of the index and dividing totals by the SITC individual category total to get a percentage weight of the total for each *PM1–4*. Base years varied by country but mostly centered around 1974 or 1975. The years available varied by country. An attempt has been made to collect data for 1964–1978, but in most cases, only 1970's data are available. Below are the details for each country.

*Taiwan*—Dr. S. Y. Lii of the Economic Planning Council, sent to this Center export unit values 1964–1978 and import unit values 1971–1978 from the Taiwan Monthly Statistics of Exports and Imports—The Republic of China, April 1978, no. 104. Trade figures were available through the Commodity Trade Statistics of the Republic of China 1954–74 of the Research, Development and Evaluation Commission, Executive Yuan, August, 1976. Exports of Taiwan were used to trade-weight the price indexes. The base year for the Taiwan data is 1971. In preparing a concordance for Taiwan price indexes and Standard

International Trade Classification, an initial correspondance was made based on one (1) digit SITC and one (1) digit Taiwan price index. Since these are (1) one digit only, it is necessary to call them approximations.

Therefore,

| *SITC* | *Taiwan Indexes* |
|---|---|
| 0+1 | 0+2 |
| 2+4 | 3 |
| 3 | 1+4 |
| 5—9 | 5—8 |

Within this 1 digit correspondance, some three (3) digit SITC categories are placed in one Taiwan index and some in another. For example, SITC 1 includes beverages and tobacco only, while Taiwan price index category 2 includes some food as well as beverage and tobacco. Thus, on a 3 digit breakdown, some commodities in SITC 0 correspond to Taiwan price index 0 and some in Taiwan price index 2. The following is a detail of the concordance:

| | | |
|---|---|---|
| 0 | Agriculture, Forestry, Livestock, Hunting, Fish: | 001, 031, 032, 041, 042, 043, 044, 045, 051 |
| 1 | Minerals: | none |
| 2 | Food, Beverages, Tobacco: | 011, 012, 013, 022, 023, 024, 025, 046, 047, 048, 052, 053, 054, 055, 061, 062, 071, 072, 073, 074, 075, 081, 091, 099, 111, 112, 121, 122 |
| 3 | Textiles, Leather, Wood, Paper and related products: | All-SITC 2, 311, 321, 331, 332, 341, 351 All-SITC 4 |
| 4 | Non-metallic mineral products: | SITC 3 |
| 5 | Chemicals: | SITC 5 |
| 6 & 7 | Basic Metals, Products: | SITC 6 & 7 |
| 8 & 9 | Miscellaneous mfg. products: | SITC 8 & 9 |

*Korea*—Dr. Jung-Soo Lee in cooperation with Dr. Jae-Yoon Kim of the Research Department, the Bank of Korea sent unit value indexes on an annual basis from 1963 and on a qurterly basis from 1971 to 1977. The indexes were classified differently than had been the Taiwanese or Japanese data. Thus, Korean data were concorded separately to coincide with SITC groupings. Korean data was given as foodstuffs, fibers, logs and lumber, rubber, clay and stone, metals, machinery and miscellaneous. Foodstuffs became *PM1*; fibers, logs and

| SITC | Korean Index | | |
|---|---|---|---|
| 0, 1 | 1 | =$ 602,339 (a) | a/c=0.8991 |
| 2, 4 | 2, 3, 4, 5 | = 67,565 (b) | b/c=0.1008 |
| 3 | | 669,904 (c) | |
| 5-9 | 6 | = 1,484,646 (A) | A/D=0.358 |
| | 7 | = 702,090 (B) | B/D=0.169 |
| | 8 | = 1,882,604 (C) | C/D=0.454 |
| | | 4,144,137 (D) | |

lumber, rubber, clay and stone* became *PM2*; *PM3* is non-existent for Korea, as recorded oil/petroleum export prices were not sent; and *PM4* is metals, machinery and miscellaneous. These indexes were collapsed into four indexes by averaging and then weighting the averages. (See the table on p. 773.) The trade weights were constructed by using Monthly Trade Statistics and Bank of Korea Export Price Indexes. Base year is 1975. SITC 4 does not exist in Korean Price Indexes, so SITC 2 will suffice for constructing *PM2*. *Rubber, clay and stone could have gone into *PM4*. The decision was arbitrary. Calculation of Korean Price Index 6, 7, and 8 and corresponding SITC 5–9 presented one problem. Korean 6, 7, 8 included no energy export index; therefore, the decision was made to count the weight as zero for SITC 5. The total value of SITC 5 was less than 2 percent (2%) of the total SITC 5–9.

*Hong Kong*—Dr. Tzong-biau Lin, Faculty of Social Sciences, The Chinese University of Hong Kong, sent Trade Index Numbers for Domestic Exports, *Hong Kong Monthly Digest of Statistics,* July, 1978. These data were categorized by SITC in a useable form for the LINK model, but are on an annual basis only for 1974–1978. In *Hong Kong Monthly Trade Statistics* at the Center's Library, we located 1976–1978 quarterly, so Hong Kong data could be carried to a quarterly basis from 1976 on. The SITC categories are consistent with LINK. Food, beverages and tobacco are collapsed together by the Digest and so make up *PM1*. *PM2* and *PM3* will be identical, as *Statistics* calculated 2, 3, and 4 (SITC) together. SITC 5 to 8 are given as one index and therefore, can be used for *PM4*. Base year for Hong Kong data is 1973=100.

*Malaysia*—Dr. Fong Wenk Phak of the Bank Negara Malaysia sent quarterly SITC export price indexes for 1971–77 and annual for 1962–1977. Since the data existed in perfectly corresponding SITC categories, this staff affixed trade weights to each SITC category to calculate *PM1–4*. Base year is 1970 and trade weights are calculated by using Annual Statistics of External Trade, 1972, v. 1, p. 13–14, the Dept. of Statistics Malaysia. Each categories' 1970 value was divided by the total 1970 trade to arrive at the weight.

*Indonesia*—Dr. J. L. Tamba, National Institute of Economic and Social Research Indonesian Institute of Sciences, sent annual export price indexes 1968–1977 on an SITC basis. The data was based both on Laspeyres', Paasche and Fisher indexes, so the decision was made to use Fisher to be consistent with afore-used data. (See Korean index.) The data is annual, and only exists for *PM1* through *PM4*. The base year is 1970 and the indexes were weighted by trade figures found in the United Nations Yearbook of International Trade Statistics, 1972–73, pp. 384–5. Since Tam-

ba's data came in corresponding SITC categories to the LINK model, weights were affixed simply by the following method:

$0+1$ export data 1970=\$197203

$\frac{0}{0+1} = .910$

$\frac{1}{0+1} = .089$

$2+4$=\$482248

$\frac{2}{2+4} = .905$

$\frac{4}{2+4} = .094$

$5+6+7+8+9$=\$36874

$\frac{5}{5+6+7+8+9} = .150$

$\frac{6}{5+6+7+8+9} = .675$

$\frac{7}{5+6+7+8+9} = .173$

$8=0$

$9=0$

These weights were multiplied by the respective indexes and *PM1* through *PM4* resulted. Annual—1970 is base year.

*Singapore*—Miss Ng Kim Neo of the Monetary Authority of Singapore sent import and export price indexes from 1972 through second (2nd) quarter 1978, quarterly by 2 digit SITC. This staff collapsed the 2 digits into 1 digit by averaging and then calculated *PM1-PM4* by the usual method. Weights (percentages of total category were derived for the data from the Yearbook of Statistics, Singapore, 1976–77 and 1975–76, 77–78 and were used to calculate *PM1-PM4*. Base year is 1972=100, so trade for that year, 1972 was of course used to calculate the weighted percentage to be multiplied by the index. Data before 1972 is not available in Singapore.

*Thailand*—Dr. Olarn Chaipravat of the Bank of Thailand Laspeyre's formula for Export and Import Price Indexes by SITC groupings from 1960 through 1977, annual basis. Quarterly and monthly data were soon to be prepared. Since the data came in classifications common to the LINK classifications, the data coincides exactly. Weights by SITC groupings will be assigned as quarterly data arrives.

Meanwhile, annual data have been transposed to *PM1* through *PM4* to cover the years where possible from 1964 through 1977. Trade weights for annual data were constructed by using United Nations Yearbook of International Trade Statistics, 1973. Base year for Thailand export price index is 1975, but SITC trade by commodity for Thailand does not exist at this Center. Therefore, 1973 trade is used as a proxy for 1975 trade.

$0+1$=\$687731

$\frac{0}{0+1} = .976$

$\frac{1}{0+1} = .023$

$2+4^{*}=2=1.00$

$3=3=1.00$

$5$=\$ 7830 $5/T$= .019

$6$=\$283439 $6/T$= .696

$7$=\$ 4148 $7/T$= .010

$8$=\$ 50170 $8/T$= .123

$9$=\$ 61397 $9/T$= .150

$T=5+6+7+8+9$

* No trade figures for SITC **4** exist

*Philippines*—Mr. Tito A. Mijares sent export and import price indexes at the 3-digit level of the SITC for 1973–77. The commodity classification used by the National Census and Statistics office is comparable to SITC even though 1977 data were based on SITC Revision 2; and 1973–76 data was patterned after SITC original. Base year is 1972. The three (3) digit SITC had to be collapsed into single (1) digit SITC to be used by LINK, so this staff averaged division groupings to achieve the single category. Therefore, after the compilation of single SITC classifications the weighted percentages were calculated by using trade data of 1972 taken from the Foreign Trade Statistics of the Philippines, Bureau of the Census and Statistics, Manila, pp. 245–345. The exact details are given below:

Total exports=$1,168,047,273
*SITC*

**0**=$333,677,611 $\frac{\mathbf{0}}{\mathbf{0+1}}$= .949
**1**=$ 17,891,446 $\frac{\mathbf{1}}{\mathbf{0+1}}$= .050
**2**=$547,842,166 $\frac{\mathbf{2}}{\mathbf{2+4}}$= .867
**4**=$ 83,345,152 $\frac{\mathbf{4}}{\mathbf{2+4}}$= .132
**5**=$ 6,282,258 **5/T**= .036
**6**=$102,346,902 **6/T**= .591
**7**=$ 2,918,647 **7/T**= .016
**8**=$ 14,955,500 **8/T**= .086
**9**=$ 46,527,139 **9/T**= .268
**T**=$173,030,446

*Australia*—Dr. Ironmonger of the University of Melbourne set Australian Bureau of Statistics data to this Center in quarterly implicit price indexes for exports and imports. Base year is 1974–75 and covers the period September 1966 through March 1978. The data is listed on a fiscal year basis (i. e. 66–67) but since it is broken out quarterly, each quarter can be easily transposed into LINK's annual arrangement (i. e. 1978 quarters should be Jan.–Mar., Apr.–June, July–Sept., etc.). The Australian data was listed initially by SITC 01, 04, 06 and "other" so this category was weighted by SITC 0+1 trade figures supplied also by the Bureau. The second category was wool and sheep skins, SITC 21 and 26, and trade figures were listed accordingly. Therefore, weights were used for 21 as well as 26. SITC 32 sufficed for *PM3* and metals and other exports 76, 73, 61–69 were weighted by trade in those same categories to make *PM4*. Trade and price indexes both have 1974–75 base. The SITC categories 0+1, 2+4, 3, 5–9 that are used in making up LINK model grouping—*PM1*, *PM2*, *PM3*, and *PM4* are concorded below with each country's price index classification. For example, SITC 0+1 equals Japan's CCCN classification 0 and Korea's classification of 1, etc.

| SITC | Japan | Taiwan | Korea | Hong Kong | Malay-sia | Indo-nesia | Singa-pore | Thai-land | Philip-pines | Aus-tralia |
|---|---|---|---|---|---|---|---|---|---|---|
| 0+1 | 0 | 0, 2 | 1 | 0+1 | 0+1 | 0+1 | 0+1 | 0+1 | 0+1 | 0+1 |
| 2+4 | 1, 2, 3 | 3 | 2, 3, 4, 5 | 2, 3, 4 | 2+4 | 2+4 | 2+4 | 2+4 | 2+4 | 2 |
| 3 | 4 | 1, 4 | — | 2, 3, 4 | 3 | 3 | 3 | 3 | 3 | 3 |
| 5—9 | 5, 6, 7 | 5, 8 | 6, 7, 8 | 5—8 | 5—9 | 5—9 | 5—9 | 5—9 | 5—9 | 6, 7 |

Summary

| | | | |
|---|---|---|---|
| Taiwan | Quarterly | 1964—78 1st quarter | Base year 1971 |
| Korea | Quarterly | 1971—77 | 1975 |
| Singapore | Quarterly | 1972—78 1st quarter | 1972 |
| Indonesia | Annually | 1968—77 | 1971 |
| Malaysia | Quarterly | 1971—77 | |
| | Annually | 1964—70 | 1970 |
| Hong Kong | Annually | 1974—78 | |
| | Quarterly | 1976—78 | 1973 |
| Thailand | Annually | 1972—74 | 1968 |
| Philippines | Annually | 1973—77 | 1972 |

TAIWAN

| | *PM1* | *PM2* | *PM3* | *PM4* |
|---|---|---|---|---|
| 1964/ 1 | 162.775 | 106.428 | 97.550 | 89.439 |
| 1964/ 2 | 140.895 | 109.218 | 100.130 | 89.780 |
| 1964/ 3 | 128.119 | 111.428 | 101.120 | 92.711 |
| 1964/ 4 | 108.860 | 113.668 | 101.780 | 90.579 |
| 1965/ 1 | 102.645 | 108.438 | 96.050 | 90.217 |
| 1965/ 2 | 97.814 | 108.879 | 91.350 | 92.160 |
| 1965/ 3 | 94.229 | 105.968 | 91.410 | 104.918 |
| 1965/ 4 | 95.578 | 103.989 | 94.010 | 96.051 |
| 1966/ 1 | 99.615 | 106.518 | 100.270 | 99.885 |
| 1966/ 2 | 95.346 | 105.538 | 104.600 | 104.174 |
| 1966/ 3 | 89.650 | 105.189 | 111.980 | 102.928 |
| 1966/ 4 | 96.225 | 106.259 | 114.880 | 106.070 |
| 1967/ 1 | 99.081 | 106.149 | 111.540 | 96.089 |
| 1967/ 2 | 94.830 | 109.618 | 110.870 | 104.173 |
| 1967/ 3 | 106.627 | 111.178 | 106.880 | 102.176 |
| 1967/ 4 | 107.910 | 106.799 | 109.030 | 95.205 |
| 1968/ 1 | 101.605 | 109.808 | 109.820 | 89.696 |
| 1968/ 2 | 100.904 | 112.538 | 112.550 | 86.889 |
| 1968/ 3 | 102.041 | 115.728 | 115.740 | 97.428 |
| 1968/ 4 | 101.347 | 112.888 | 112.900 | 100.012 |
| 1969/ 1 | 110.695 | 114.827 | 109.470 | 103.949 |
| 1969/ 2 | 113.293 | 111.308 | 118.910 | 100.812 |
| 1969/ 3 | 113.645 | 113.618 | 109.550 | 98.078 |

| | | | | |
|---|---|---|---|---|
| 1969/ 4 | 112.954 | 112.418 | 103.890 | 101.408 |
| 1970/ 1 | 113.051 | 112.945 | 100.770 | 105.648 |
| 1970/ 2 | 119.670 | 113.207 | 98.660 | 112.658 |
| 1970/ 3 | 127.718 | 114.247 | 100.900 | 118.492 |
| 1970/ 4 | 127.034 | 117.497 | 93.990 | 118.242 |
| 1971/ 1 | 118.017 | 107.098 | 119.900 | 104.389 |
| 1971/ 2 | 123.018 | 108.159 | 120.110 | 103.086 |
| 1971/ 3 | 118.411 | 110.738 | 120.900 | 111.645 |
| 1971/ 4 | 127.381 | 110.466 | 119.920 | 104.986 |
| 1972/ 1 | 141.695 | 110.938 | 92.620 | 98.861 |
| 1972/ 2 | 141.569 | 112.647 | 90.730 | 93.859 |
| 1972/ 3 | 142.671 | 117.571 | 91.830 | 97.880 |
| 1972/ 4 | 151.868 | 120.577 | 89.320 | 104.326 |
| 1973/ 1 | 151.458 | 133.675 | 94.540 | 106.046 |
| 1973/ 2 | 152.985 | 150.804 | 99.750 | 102.192 |
| 1973/ 3 | 154.531 | 161.763 | 112.180 | 104.471 |
| 1973/ 4 | 167.575 | 173.211 | 119.380 | 108.424 |
| 1974/ 1 | 195.156 | 184.531 | 121.730 | 114.918 |
| 1974/ 2 | 215.371 | 183.310 | 135.880 | 122.177 |
| 1974/ 3 | 167.164 | 166.472 | 170.450 | 127.546 |
| 1974/ 4 | 305.850 | 158.043 | 206.820 | 130.392 |
| 1975/ 1 | 271.302 | 134.775 | 175.990 | 128.674 |
| 1975/ 2 | 214.458 | 134.225 | 188.440 | 121.826 |
| 1975/ 3 | 178.169 | 141.405 | 176.060 | 123.101 |
| 1975/ 4 | 176.980 | 149.764 | 201.970 | 130.025 |
| 1976/ 1 | 187.014 | 150.814 | 249.240 | 132.121 |
| 1976/ 2 | 180.039 | 156.913 | 219.060 | 132.055 |
| 1976/ 3 | 184.444 | 165.932 | 184.730 | 132.908 |
| 1976/ 4 | 180.397 | 170.862 | 180.810 | 130.980 |
| 1977/ 1 | 177.295 | 175.801 | 206.620 | 137.428 |
| 1977/ 2 | 177.043 | 182.630 | 195.580 | 140.952 |
| 1977/ 3 | 183.540 | 183.981 | 210.020 | 138.994 |
| 1977/ 4 | 189.035 | 189.451 | 211.840 | 133.800 |
| 1978/ 1 | 190.374 | 192.060 | 232.610 | 133.066 |

## KOREA

| | *PM1* | *PM2* | *PM3* | *PM4* |
|---|---|---|---|---|
| 1971/ 1 | 60.280 | 67.650 | 0.0 | 76.510 |
| 1971/ 2 | 63.640 | 69.900 | 0.0 | 76.050 |
| 1971/ 3 | 58.710 | 71.020 | 0.0 | 76.220 |
| 1971/ 4 | 61.440 | 70.240 | 0.0 | 77.060 |
| 1972/ 1 | 66.110 | 71.510 | 0.0 | 75.200 |
| 1972/ 2 | 71.280 | 74.560 | 0.0 | 73.390 |
| 1972/ 3 | 68.880 | 76.070 | 0.0 | 73.210 |
| 1972/ 4 | 72.630 | 75.800 | 0.0 | 74.260 |

| | | | | |
|---|---|---|---|---|
| 1973/ 1 | 76.240 | 83.010 | 0.0 | 76.420 |
| 1973/ 2 | 79.180 | 98.180 | 0.0 | 77.280 |
| 1973/ 3 | 82.840 | 99.690 | 0.0 | 82.410 |
| 1973/ 4 | 90.580 | 106.410 | 0.0 | 87.150 |
| 1974/ 1 | 99.410 | 111.510 | 0.0 | 89.950 |
| 1974/ 2 | 102.510 | 109.260 | 0.0 | 98.710 |
| 1974/ 3 | 100.440 | 100.230 | 0.0 | 104.190 |
| 1974/ 4 | 98.110 | 95.140 | 0.0 | 102.910 |
| 1975/ 1 | 95.540 | 98.580 | 0.0 | 100.800 |
| 1975/ 2 | 93.840 | 100.520 | 0.0 | 96.520 |
| 1975/ 3 | 97.580 | 100.390 | 0.0 | 96.560 |
| 1975/ 4 | 107.340 | 100.200 | 0.0 | 97.680 |
| 1976/ 1 | 111.610 | 102.640 | 0.0 | 99.680 |
| 1976/ 2 | 113.640 | 107.960 | 0.0 | 101.760 |
| 1976/ 3 | 118.210 | 115.970 | 0.0 | 104.510 |
| 1976/ 4 | 122.080 | 119.460 | 0.0 | 103.750 |
| 1977/ 1 | 120.880 | 118.010 | 0.0 | 104.570 |

## MALAYSIA

| | *PM1* | *PM2* | *PM3* | *PM4* |
|---|---|---|---|---|
| 1971/ 1 | 105.380 | 96.730 | 110.130 | 105.380 |
| 1971/ 2 | 103.960 | 98.800 | 120.960 | 106.630 |
| 1971/ 3 | 102.480 | 96.320 | 134.700 | 106.610 |
| 1971/ 4 | 104.910 | 94.040 | 110.300 | 106.360 |
| 1972/ 1 | 110.090 | 92.510 | 108.800 | 107.870 |
| 1972/ 2 | 105.540 | 93.040 | 112.930 | 108.090 |
| 1972/ 3 | 102.630 | 92.280 | 122.160 | 108.130 |
| 1972/ 4 | 104.090 | 94.020 | 128.700 | 117.310 |
| 1973/ 1 | 106.590 | 101.070 | 119.900 | 118.840 |
| 1973/ 2 | 110.400 | 104.350 | 116.260 | 120.520 |
| 1973/ 3 | 109.170 | 109.550 | 157.400 | 128.710 |
| 1973/ 4 | 115.560 | 118.460 | 143.930 | 146.870 |
| 1974/ 1 | 133.590 | 138.800 | 309.460 | 160.870 |
| 1974/ 2 | 138.880 | 154.450 | 191.700 | 175.800 |
| 1974/ 3 | 137.980 | 153.900 | 191.160 | 184.640 |
| 1974/ 4 | 141.150 | 149.400 | 209.800 | 186.710 |
| 1975/ 1 | 149.270 | 147.650 | 247.800 | 180.550 |
| 1975/ 2 | 152.220 | 137.130 | 239.900 | 169.060 |
| 1975/ 3 | 153.770 | 146.120 | 234.700 | 170.290 |
| 1975/ 4 | 155.750 | 143.310 | 262.200 | 179.050 |
| 1976/ 1 | 161.140 | 139.920 | 271.100 | 183.050 |
| 1976/ 2 | 159.550 | 144.640 | 257.330 | 177.860 |
| 1976/ 3 | 160.970 | 152.100 | 260.700 | 180.600 |
| 1976/ 4 | 165.340 | 151.630 | 266.430 | 181.770 |
| 1977/ 1 | 173.690 | 167.070 | 264.500 | 182.110 |

| | | | | |
|---|---|---|---|---|
| 1977/ 2 | 186.430 | 168.570 | 310.730 | 183.630 |
| 1977/ 3 | 186.090 | 174.160 | 272.600 | 180.260 |
| 1977/ 4 | 187.720 | 175.510 | 270.660 | 180.360 |

## HONG KONG

| | *PM1* | *PM2* | *PM3* | *PM4* |
|---|---|---|---|---|
| 1971/ 1 | 105.380 | 96.730 | 110.130 | 105.380 |
| 1971/ 2 | 103.960 | 98.800 | 120.960 | 106.630 |
| 1971/ 3 | 102.480 | 96.320 | 134.700 | 106.610 |
| 1971/ 4 | 104.000 | 94.000 | 110.000 | 106.000 |
| 1972/ 1 | 110.090 | 92.510 | 108.800 | 107.870 |
| 1972/ 2 | 105.540 | 93.040 | 112.930 | 108.090 |
| 1972/ 3 | 102.630 | 92.280 | 122.160 | 108.130 |
| 1972/ 4 | 104.000 | 94.000 | 128.000 | 117.000 |
| 1973/ 1 | 106.590 | 101.070 | 119.900 | 118.840 |
| 1973/ 2 | 110.400 | 104.350 | 116.260 | 120.520 |
| 1973/ 3 | 109.170 | 109.550 | 157.400 | 128.710 |
| 1973/ 4 | 115.000 | 118.000 | 143.000 | 146.000 |
| 1974/ 1 | 133.590 | 138.800 | 309.460 | 160.870 |
| 1974/ 2 | 138.880 | 154.450 | 191.700 | 175.800 |
| 1974/ 3 | 137.980 | 153.900 | 191.160 | 184.640 |
| 1974/ 4 | 141.000 | 149.000 | 209.000 | 186.000 |
| 1975/ 1 | 149.270 | 147.650 | 247.800 | 180.550 |
| 1975/ 2 | 152.220 | 137.130 | 239.900 | 169.060 |
| 1975/ 3 | 153.770 | 146.120 | 234.700 | 170.290 |
| 1975/ 4 | 155.000 | 143.000 | 262.000 | 179.000 |
| 1976/ 1 | 161.140 | 139.920 | 271.100 | 183.050 |
| 1976/ 2 | 159.550 | 144.640 | 257.330 | 177.860 |
| 1976/ 3 | 160.970 | 152.100 | 260.700 | 180.600 |
| 1976/ 4 | 165.000 | 151.000 | 266.000 | 181.000 |
| 1977/ 1 | 173.690 | 167.070 | 264.500 | 182.110 |
| 1977/ 2 | 186.430 | 168.570 | 310.730 | 183.630 |
| 1977/ 3 | 186.090 | 174.160 | 272.600 | 180.260 |
| 1977/ 4 | 187.000 | 175.000 | 270.000 | 180.000 |

## SINGAPORE

| | *PM1* | *PM2* | *PM3* | *PM4* |
|---|---|---|---|---|
| 1972/ 1 | 106.550 | 94.360 | 101.000 | 98.530 |
| 1972/ 2 | 100.820 | 97.400 | 98.000 | 99.010 |
| 1972/ 3 | 98.880 | 100.190 | 100.000 | 100.770 |
| 1972/ 4 | 104.590 | 103.750 | 100.000 | 101.140 |
| 1973/ 1 | 109.360 | 111.040 | 102.000 | 104.260 |
| 1973/ 2 | 114.920 | 121.660 | 103.000 | 108.280 |
| 1973/ 3 | 121.490 | 132.750 | 110.000 | 112.720 |

| | | | | |
|---|---|---|---|---|
| 1973/ 4 | 123.570 | 141.510 | 132.000 | 118.380 |
| 1974/ 1 | 134.420 | 226.280 | 237.000 | 133.130 |
| 1974/ 2 | 151.380 | 217.260 | 291.000 | 145.670 |
| 1974/ 3 | 152.390 | 190.240 | 297.000 | 148.850 |
| 1974/ 4 | 149.600 | 160.300 | 321.000 | 142.060 |
| 1975/ 1 | 160.840 | 155.650 | 321.000 | 140.700 |
| 1975/ 2 | 156.680 | 154.070 | 315.000 | 140.190 |
| 1975/ 3 | 142.930 | 161.190 | 336.000 | 140.710 |
| 1975/ 4 | 152.490 | 167.900 | 377.000 | 151.310 |
| 1976/ 1 | 161.180 | 176.330 | 370.000 | 150.530 |
| 1976/ 2 | 157.310 | 202.500 | 346.000 | 151.260 |
| 1976/ 3 | 177.490 | 213.260 | 350.000 | 159.990 |
| 1976/ 4 | 181.380 | 211.210 | 347.000 | 159.280 |
| 1977/ 1 | 179.550 | 212.140 | 354.000 | 155.530 |
| 1977/ 2 | 195.840 | 218.200 | 371.000 | 155.110 |
| 1977/ 3 | 184.870 | 219.830 | 383.000 | 165.290 |
| 1977/ 4 | 175.890 | 214.790 | 374.000 | 164.050 |
| 1978/ 1 | 167.180 | 189.290 | 359.000 | 161.070 |
| 1978/ 2 | 165.760 | 192.110 | 376.000 | 159.110 |

## AUSTRALIA

| | *PM1* | *PM2* | *PM3* | *PM4* |
|---|---|---|---|---|
| 1966/ 1 | 0.0 | 0.0 | 0.0 | 0.0 |
| 1966/ 2 | 0.0 | 0.0 | 0.0 | 0.0 |
| 1966/ 3 | 48.120 | 63.770 | 50.600 | 52.880 |
| 1966/ 4 | 45.750 | 65.820 | 49.500 | 51.060 |
| 1967/ 1 | 46.190 | 67.920 | 51.700 | 51.730 |
| 1967/ 2 | 46.600 | 64.670 | 51.000 | 53.420 |
| 1967/ 3 | 47.660 | 64.740 | 52.100 | 53.440 |
| 1967/ 4 | 45.740 | 64.480 | 51.600 | 52.440 |
| 1968/ 1 | 43.550 | 68.090 | 50.800 | 50.960 |
| 1968/ 2 | 45.610 | 67.190 | 54.300 | 52.750 |
| 1968/ 3 | 47.850 | 65.520 | 52.100 | 52.940 |
| 1968/ 4 | 44.830 | 70.540 | 51.800 | 52.500 |
| 1969/ 1 | 33.050 | 70.660 | 53.500 | 53.840 |
| 1969/ 2 | 47.570 | 68.520 | 55.600 | 55.760 |
| 1969/ 3 | 48.870 | 69.060 | 57.300 | 56.700 |
| 1969/ 4 | 45.940 | 69.940 | 59.800 | 58.110 |
| 1970/ 1 | 45.470 | 71.960 | 65.900 | 61.680 |
| 1970/ 2 | 48.330 | 69.040 | 64.900 | 60.540 |
| 1970/ 3 | 48.850 | 65.830 | 65.000 | 61.050 |
| 1970/ 4 | 46.470 | 64.750 | 64.100 | 60.780 |
| 1971/ 1 | 47.350 | 66.510 | 62.600 | 60.000 |
| 1971/ 2 | 52.250 | 63.790 | 61.400 | 61.100 |
| 1971/ 3 | 53.110 | 62.610 | 61.500 | 61.520 |

| | | | | |
|---|---|---|---|---|
| 1971/ 4 | 49.300 | 59.270 | 60.100 | 60.390 |
| 1972/ 1 | 51.560 | 63.810 | 59.900 | 60.600 |
| 1972/ 2 | 55.720 | 67.760 | 59.800 | 62.220 |
| 1972/ 3 | 55.050 | 72.160 | 60.700 | 65.410 |
| 1972/ 4 | 56.490 | 81.642 | 59.900 | 65.650 |
| 1973/ 1 | 58.270 | 88.540 | 60.600 | 64.270 |
| 1973/ 2 | 61.820 | 100.070 | 63.300 | 65.250 |
| 1973/ 3 | 67.050 | 106.230 | 70.600 | 68.530 |
| 1973/ 4 | 73.700 | 106.120 | 72.700 | 71.440 |
| 1974/ 1 | 84.220 | 103.150 | 82.700 | 80.530 |
| 1974/ 2 | 92.370 | 99.500 | 96.300 | 90.920 |
| 1974/ 3 | 95.690 | 95.250 | 93.500 | 92.310 |
| 1974/ 4 | 101.470 | 98.120 | 103.800 | 101.570 |
| 1975/ 1 | 103.070 | 102.990 | 105.400 | 105.640 |
| 1975/ 2 | 100.200 | 103.910 | 98.000 | 100.960 |
| 1975/ 3 | 92.990 | 104.900 | 92.100 | 100.530 |
| 1975/ 4 | 91.550 | 106.350 | 91.400 | 102.030 |
| 1976/ 1 | 97.790 | 108.750 | 92.800 | 106.320 |
| 1976/ 2 | 99.090 | 117.840 | 96.400 | 110.090 |
| 1976/ 3 | 92.160 | 119.410 | 100.700 | 113.040 |
| 1976/ 4 | 85.900 | 126.560 | 102.000 | 116.630 |
| 1977/ 1 | 82.420 | 145.690 | 112.980 | 128.110 |
| 1977/ 2 | 100.250 | 143.740 | 113.300 | 124.270 |
| 1977/ 3 | 93.710 | 139.460 | 105.300 | 127.920 |
| 1977/ 4 | 86.680 | 141.110 | 104.600 | 125.150 |
| 1978/ 1 | 88.720 | 139.740 | 102.200 | 123.830 |

## INDONESIA

| | *PM1* | *PM2* | *PM3* | *PM4* |
|---|---|---|---|---|
| 1968 | 76.200 | 80.690 | 79.390 | 72.590 |
| 1969 | 58.580 | 86.429 | 79.380 | 72.080 |
| 1970 | 86.590 | 105.190 | 83.430 | 81.720 |
| 1971 | 99.901 | 99.903 | 100.000 | 99.803 |
| 1972 | 106.110 | 101.130 | 125.490 | 115.230 |
| 1973 | 129.530 | 170.930 | 174.980 | 127.510 |
| 1974 | 171.270 | 236.830 | 546.620 | 196.830 |
| 1975 | 185.210 | 208.070 | 582.280 | 183.600 |
| 1976 | 274.500 | 253.910 | 586.630 | 191.890 |
| 1977 | 424.590 | 297.400 | 617.220 | 247.820 |

## THAILAND

| | *PM1* | *PM2* | *PM3* | *PM4* |
|---|---|---|---|---|
| 1964 | 39.130 | 77.620 | 0.0 | 66.180 |
| 1965 | 38.830 | 80.990 | 0.0 | 69.850 |

| | | | | |
|---|---|---|---|---|
| 1966 | 42.840 | 78.390 | 0.0 | 67.340 |
| 1967 | 47.780 | 65.300 | 0.0 | 65.570 |
| 1968 | 49.400 | 61.810 | 0.0 | 64.980 |
| 1969 | 44.500 | 79.380 | 0.0 | 69.700 |
| 1970 | 40.656 | 71.215 | 45.950 | 57.140 |
| 1971 | 31.996 | 65.695 | 35.060 | 60.370 |
| 1972 | 42.876 | 64.915 | 29.470 | 53.340 |
| 1973 | 71.706 | 103.450 | 26.140 | 62.970 |
| 1974 | 103.060 | 121.720 | 88.920 | 91.510 |
| 1975 | 99.900 | 100.000 | 100.000 | 84.800 |
| 1976 | 88.990 | 122.860 | 94.720 | 87.640 |
| 1977 | 81.400 | 140.780 | 0.0 | 106.140 |

PHILIPPINES

| | *PM1* | *PM2* | *PM3* | *PM4* |
|---|---|---|---|---|
| 1973 | 126.540 | 149.100 | 122.320 | 121.460 |
| 1974 | 176.030 | 266.460 | 256.780 | 174.340 |
| 1975 | 212.390 | 184.380 | 246.410 | 194.060 |
| 1976 | 177.750 | 183.760 | 225.080 | 189.050 |
| 1977 | 202.140 | 206.360 | 459.950 | 193.330 |