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A LONG-TERM PROJECTION FOR THE CHINESE LONG-TERM PLAN FOR 2010

- research based on the Kyoto Univ. Pacific Rim Model -

Hiroshi Ohnishi

Faculty of Economics, Kyoto University

Sakyo-ku, Kyoto-shi, Japan

Faculty of Economics
Kyoto University
Kyoto, 606-01 JAPAN

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ABSTRACT

For the sake of the Chinese long-term plan for 2010, this paper offers a long-term projection by using a post-war Asian Pacific model termed 'KYPAC-4'. This model has been reconstructed through co-research financed by the Chinese Educational Committee and the Japan Society for the Promotion of Science, and its estimated average growth rate of GDP for the plan is 19.2% in current yuan, or 19.6% in current dollars. Although this growth figure is both unexpectedly high and higher than other countries, there are some basic reasons to support this figure. This paper considers the realism of this figure and other key indicators, especially when comparing with our projections to those of other Asian Pacific countries.

KEYWORDS

the Chinese long-term plan for 2010, long-term projection, the Asian Pacific, competitiveness, balance of power, depreciation function

INTRODUCTION

The APEC meeting held in Osaka in November 1995 strongly demonstrated the Chinese presence in the Asian Pacific region. However, China's true power comes not only from its present economic activity but also from its huge potential for power. In fact, after some major western magazines published special editions on China's potential in 1992 and 1993 (See Rohwer(1992), Barnathan *et al.*(1993), Engrdio *et al.*(1993)), the potential became the major interest not only for investors but also for economists. For example, the World Bank (1993a) projected that GDP of the Chinese Economic Area(CEA), which includes mainland China, Taiwan and Hong Kong, will surpass those of France, Italy and U.K. by 2002. Furthermore, it also projected that the CEA's GDP will surpass those of the US and Japan by 2002 if they are measured in PPP terms of the ICP (International Comparison Project) method.

In this sense, to estimate China's potential power has become an important issue for economists, and the major purpose of this paper is to provide a long-term projection for the Chinese long-term plan for 2010 by using the Kyoto University Pacific Rim Model. This model was first reported at the Asian Conference on Statistical Computing held in Beijing University in 1993 (See Ohnishi (1993)), and after that was reconstructed several times, for example as a project of BAPPENAS (National Development Planning Agency, Republic of Indonesia) (See Ohnishi (1995)). Because the present version 4 model (KYPAC-4) has eight countries and 104 equations[1], we cannot discuss its details here in this paper.

Therefore, we will focus only on what are appropriate

characteristics for long-term projections. Section 1 shows that our model(KYPAC-4) can fulfill these demands. Section 2 considers our assumptions for the forecast. Then, sections 3 and 4 show the results of our projection for some key indicators, for example, GDP growth rate, trade balance and so on. In the final section, we discuss some implications that can be obtained from these results.

1. REQUIRED CHARACTERISTICS FOR LONG-TERM PROJECTIONS

Long-term projections need some special characteristics for forecasting models which are quite different from short-term ones. For example, short-term models have to express temporal fluctuations, because monetary or fiscal policies can temporally influence economies. However, long-term models need not show these effects, because these policies cannot maintain their influence for long periods of time.

In other words, we can neglect the demand-side effects which can be created by monetary or fiscal policies. Therefore, models for the use of long-term projections must to be supply-side models, and our model is one such model. Because long-term models have to describe economic structures which are stable or constant for at least several decades, demand-side fluctuations are regarded merely as disturbances when we estimate the statistical parameters of structural equations.

Besides the properties previously mentioned, some special issues exist which are related to the long-term projections or policy making in Asia-Pacific region. One issue is the rise and fall of Asian-Pacific countries. The relative power of these countries has changed

dramatically, for instance, witness American decline, Japanese growth and the present rapid growth of Asian countries. Long-term models must express the trend, because this trend is likely to continue into the next century. Our model expresses this rise and fall by simultaneous equations whose statistical parameters are constant through the simulation period (at least 1954-1993) with the exception of several equations.

The second important economic issue for long-term projections is international capital movement, because the direction of capital flow is from advanced countries to developing countries. Typically, a special characteristic of our model is that the international capital flows are explained by functions of relative wages between advanced countries and developing countries[2]. For example, the Chinese balance of capital after its opening policy is estimated by using the OLS method as follows.

$$BCc = \underset{(2.50)}{11.1157} - \underset{(-1.76)}{196.38}\frac{Wc/12}{(Wj+4*Wu+Wk+25*Wi+25*Wt+25*Wp+4*Wa)/7}$$

Adjusted R square = 0.161 D.W.=1.679 estimated period; 1982-1993

where BCc is the Chinese capital inflow[3], and Wc, Wj, Wk, Wt, Wp, Wj, Wu and Wa indicate average yearly wage in China, average daily wages in manufacturing in Indonesia, Thailand, the Philippines, the average monthly wage in Japan, South Korea, and the average weekly wage in manufacturing in the US and Australia respectively[4]. In order to adjust these units as monthly wage rates, we apply multipliers 1/12, 25 or 4 on Wc, Wi, Wt, Wp, Wu and Wa.

Needless to say, these foreign wages depend on the economic conditions of these countries, and the conditions are also functions of

foreign wages which include Chinese wage rates. Therefore, it is better for the models to have foreign country sectors; in other words, to be multicountry models. Countries which are included in the KYPAC model are Japan, the US, China, South Korea, Thailand, the Philippines, Indonesia and Australia[5].

In addition, also from a technical viewpoint, the fewer the number of exogenous variables which are necessary for forecasts, the more reliable the result of the projection is. This is because values of exogenous variables cannot be artificial, especially in long-term projections. As we will soon see, population numbers are the only exogenous variables, except for a few dummy variables, when our model is used for projections.

The required properties for long-term forecasting models can be summed up as follows.

1) Short-term fluctuations can be neglected, and focus is on the supply-side.

2) Long-term estimating periods to capture stable structures are necessary. Furthermore, with the stable structures, the models have to express the changes of the phases of economic rise and fall.

3) International capital movements must to be endogenous.

4) The number of exogenous variables is few.

Because our model undertakes all of the required demands, we will use this model for our projection.

2.ASSUMPTIONS FOR THE PROJECTION

In this section, we show what the assumptions for the projection

are. We make three kinds of special assumptions for the projection: population growth, the depreciation ratios of the eight countries and the Chinese production function.

(1)Depreciation Ratios

Because GDPs(Y) are decided by capital stocks(K) as well as by population(N) through production functions, and because depreciation ratios are crucial in the identification equation of K in our model, artificial value of the depreciation ratios make the value of K, Y and their whole economies artificial. Therefore, it is better to make a reasonable assumption or formation on the depreciation ratios. To do so, the best way is to estimate depreciation functions under proper specifications.

For this purpose, in our model and when it is used for projections, we used depreciation equations specified as functions of capital coefficients (K/Y) or investment ratios to K (I/K). The reason for this specification is that depreciation ratios may depend on characteristics of capital, and if it becomes capital intensive, firms have to depreciate rapidly in order to remove older machines. Therefore, in our depreciation functions, the coefficients of K/Y or I/K are estimated as plus values.

For example, the Chinese depreciation function was estimated as follows:

$$dc=-0.0739765+0.13635*Kc_{-9}/Yc_{-9}$$

$$(-1.19) \quad (3.37)$$

Adjusted R square = 0.6917 D.W.=1.8 Estimated Period; 1962–1993

where dc, Kc and Yc are the Chinese depreciation ratio, capital stock and GDP respectively, and the estimating method is the Cochrane Orcutt method under an assumption that error term has 1st order autocorrelation[6].

One more notable point in this equation is that the time lag of its explaining variable is very long, that is nine years. This is reasonable, because the machines that must be scrapped are old ones. However, this characteristic shortens our estimating period, because one of our explaining variable (Kc/Yc) starts only after 1953, and then our estimating period changed from 1962 to 1993.

Furthermore, not only for this reason but also because some depreciation functions could be estimated only after 1975 or 1983, our the simulation period of our final test before the present was shortened, covering only 1983–1993. For this reason, we used these depreciation functions only for projections.

(2)Populations

After making depreciation ratios endogenous, the only exogenous variables are population number, except for a few dummy variables. Needless to say, populations are also crucial in our production functions.

Population projections can be made reliably by special research, and we can use these results. In our case, we used the projections based on a report entitled *World Population Prospects: Estimates and Projections as Assumed in 1985*, United Nation(1987). According to this projection, the absolute population levels and their annual growth rates in our eight countries are shown in Table 1.

(3)Chinese Production Function

For the projection, we used a different production function from the original one shown as equation (25) in the APPENDIX. This is because the original production function cannot follow well the actual time series especially after the Chinese opening policy which was started by Dongxiao Ping, although it is better to follow actual data in the final test during the entire period 1954–1993. Figure 1 show the actual data and partial test estimate, and shows that its fitness becomes worse after the second half of 1980s.

Therefore, for our projections, we estimated a new production function of China that is shown in the last page of the APPENDIX. This new production function performs better not only for projections but also for the final test, which is done with the depreciation functions after 1983. In order to identify the latter model that is added the depreciation functions and has new production function, we call this model the TYPE II model; the former model is called the TYPE I.

3. PROJECTED CHINESE FUTURE GDP

Under the assumptions previously discussed, we projected the Chinese future GDP and GDP growth rates in current dollar terms, although these projections do not include the GDPs in Hong Kong, Macao and Taiwan because of their structural difference from mainland China. That result in current dollar terms is shown in Table 2–1, a comparison with other seven countries.

(1)Comparison with Other Countries

First in this table we can notice a surprisingly China's high growth

rate in current dollar terms, compared with other countries. However, if we compare in Table 2-2 from a longer perspective, we can find some over-twenty percent growth periods in South Korea and Indonesia. In this sense, our projection for future Chinese growth is not so unbelievable.

Second, this table shows that the high growth periods for these countries are different, and we can observe that these high growth periods are moving from Japan to South Korea, Thailand, Indonesia and the Philippines. (Refer Figure 2.)[7] We have to notice that this order of take-off is almost same as the order of GDP per capita. Although, the Australian high growth rate period was from 1970 to 1985, and this is an exception to the order, we can understand why its growth period was the same as ASEAN countries', because the Australian economy is strongly influenced by ASEAN economies. Furthermore, Australia's exceptional characteristics can be explained by understanding that it is an agricultural and mining country and such a structure can be characterized as that of a developing country. With this exception, all the countries have their own high growth rate, and this order goes with their GDP per capita. Therefore, the Chinese high growth rate period will come immediately.

In addition, not only are the future Chinese growth rates interesting, but also so are its absolute values. The Chinese GDP will also surpass both the Japan and the US before 2010. Therefore, at the end of the next long-term plan, China will have the biggest economic power in the world.

(2)Estimating Nominal Growth Rate

Although we can assume that current dollar terms can express each economy's true power from an international and long-term perspective, some targets of a long-term plan are set in each country's currency terms. Therefore, it is better to also forecast the exchange rate, and translate dollar term values to each currency's terms. For this purpose, we estimated the following exchange rate function of China:

$$ERc/ERc_{-1}=1.02339-1.41836*BTc_{-1}/Yc_{-1}$$

(39.16) (−1.36)

Adjusted R Square = 0.3691 D.W.=1.827 Estimated Period;1954–1993

where ERc and BTc indicate the Chinese exchange rate and balance of trade respectively. Because of its low R square value it is not listed in our equation list, but we made a projection of the Chinese exchange rate using this equation as a reference as follows. That is,

projected absolute value(¥/$)				projected annual growth rate		
1995	2000	2005	2010	1995/2000	2000/2005	2005/2010
830	865	863	787	0.8%	−0.0%	−1.8%

As we will soon discuss, in our projection China's future competitive power against foreign industries will become stronger, and resulting in a better trade balance. In this sense, our projection is reasonable, and if so, the future GDP growth rates in current yuan terms become 13.5 percent during 1995–2000, 21.2 percent during 2000–2005 and 23.0 percent during 2005–2010. These figures can be averaged as 19.2 percent for these fifteen years, and this figure is lower than China's actual rate 29.6 percent in 1993, 30.4 percent in 1994 and 27.3 percent

in 1995[8].

In addition, there are two econometric forecasts on the Chinese nominal GDP until 2000, one is provided by Bi(1994) and the other by the Chinese State Statistical Bureau. According to the former, the annual growth rate between 1995 and 2000 will be 21.8 percent, and this figure is larger than ours. On the other side, the State Statistical Bureau projected that the real term GDP growth rate between 1995 and 2000 will be 8.7 percent[9], and that the inflation rate will be 8 or 9 percent. Therefore, its projection on GDP growth rate in yuan terms is 16.7 or 17.7 percent, and this figure is also larger than ours.

(3)Comparison with the official plan

Besides the above-mentioned comparison, there are some official targets set by the government. Here we will discuss them.

First, the government has set the real term GDP growth rate and their inflation target in 1996 at 9 percent and 10 percent respectively. These figures make a nominal term GDP growth rate target of 19 percent, and this figure is larger than our figure 13.5 percent during 1995-2000. In this sense, our projection can be regarded as not so extreme.

Second, the ninth five-year plan is set at 8-9 percent GDP growth in real terms. Therefore, if this figure is consistent with our projection in current yuan terms, the annual inflation rate will have to be suppressed to around 5 percent. This figure requires that the government to continue its tight credit policy, and in fact curbing inflation is the top priority of its plan. This need is consistent with our exchange rate projection.

Third, the document adopted by the Fourth Plenary Session of the 8th National People's Congress reported that real term GNP in 2010 should be double that of GNP in 2000, and this target can be achieved by 7.2 percent real term GNP growth rate during this 10 year period. However, in my opinion, this target is too low, because our projection of nominal term GDP growth rate during this period is 22.1 percent[10], and the inflation rate can be assumed not to significantly surpass 10 percent. Certainly this figure of 7.2 percent annual GNP growth rate in real terms is too small when compared with the actual rate for recent years. For example, 13 percent growth was achieved in 1993, 11.8 percent in 1994, and 10.2 percent in 1995. Surely, after the reformation of state enterprise system, China will develop a more favorable system for economic activities. Therefore, a higher growth rate can be expected rather than the official target.

4. PROJECTIONS OF OTHER KEY INDICATORS

Our projections are created not only for GDP or its growth rate but also for other important indicators. Therefore, in this section, we show the results of our projection on other indicators and analyze them, sometimes by comparison with other projections.

(1)Projected GDP per capita

The projected GDP per capita is shown in Table 3, comparing China with other countries, and many notable points are the same as for the GDP discussed in the previous section. However, unlike in the previous section, we can compare the projected results with ASEAN countries. For example, this table shows that the Chinese GDP per

capita will surpass the Indonesian or the Philippine's GDP per capita, and approach to the Thailand's until 2010. One explanation may be that the Chinese high growth period will start at the present and another is China's lower growth rate of population.

The above-mentioned document of the Fourth Session of the 8th National People's Congress also provides a goal that real term GNP per capita in 2000 should be four times larger than that in 1980, and to quadruple in 20 years requires only 7.3 percent annual growth in real term. In addition, the Department of Integrated Statistics of the State Statistical Bureau of China projected 7.7 percent annual growth rate of GDP per capita in real term. However, these figures are too small for the same reason that we discussed on the GNP target in the last section.

(2)Projected Balance of Capital

Another point which we have to pay our attention to in our projection is balance of capital, because our model emphasizes this issue. Table 4 shows the result that the China's net capital inflow will maintain its high level until 2005, but after that it will decrease. This trend can be understood by the rapid increase in Chinese wage levels in the future[11], because net capital inflow is explained by relative wage versus other countries as shown in section 1. Needless to say, decrease in net capital inflow does not always mean that foreign capital will decrease in China, because this figure is a 'net' term, and sometimes increasing capital inflow is accompanied with increasing capital outflow. In the 21st century, China may become a country which can export capital to some extent, and this means that China will get its own autonomous growth power without so much 'net' capital inflow. In this sense, some

of the ongoing administrative controls on foreign capital will be able to be continued, or the present exceptional tax reduction for foreign companies will be able to ended as some recent official documents declare.

In addition, Table 4 shows that almost all of the net capital outflow will come from Japan[12]. In this sense, also for China, the international capital relationship with Japan will continue to be important also in the future.

(3)Projected International Competitiveness and balance of trade

As the Chinese state planning committee stresses its international competitive power (see Lan & Ning (1995)), let us next discuss its competitiveness.

First, from a different viewpoint, GDP per capita can be understood as averaged national labor productivity, and its growth rate through this long-term plan is estimated to be 18.4 percent during whole period, although this is not expressed in any table. However, if wages rise more rapidly than labor productivity, competitive power decreases. Therefore, we must compare the growth rates of wages and productivity. The projected wage growth rate is 8.1 percent during the same period. Therefore, the relative productivity measured by wage level (here called 'wage productivity') tends to rise; furthermore, in order to compare this with other countries', we formulated an indicator as a ratio of 'wage productivity' which is called 'COMP' in our model and is expressed as follows.

$$COMPc=WPROc/(\Sigma_{x=j,u,k,i,t,p,a}\ WPROx/7)$$

WPROc('wage productivity' in China)=Yc/(Nc*Wc/12)

WPROj('wage productivity' in Japan)=Yj/(Nj*Wj)

WPROu('wage productivity' in the USA)=Yu/(Nu*4*Wu)

WPROk('wage productivity' in South Korea)=Yk/(Nk*Wk)

WPROi('wage productivity' in Indonesia)=Yi/(Ni*25*Wi)

WPROt('wage productivity' in Thailand)=Yt/(Nt*25*Wt)

WPROp('wage productivity' in the Philippines)=Yp/(Np*25*Wp)

WPROa('wage productivity' in Australia)=Ya/(Na*4*Wa)

where Y, N and W indicate GDP, population and average wage respectively, and their subscripts show their countries, and this indicator is used to explain trade balance and ratio of custom duties as shown in equation (32) and (35) in our APPENDIX. Therefore, we can investigate the trends of trade balance and ratio of custom duties related to this indicator.

Then by observing Table 5, 6 and 7 the rising trend of China's competitive power in comparison to foreign economies will create larger trade surplus and allow China to cut its custom duties during the period. In the APEC meeting held in Osaka in 1995, the Chinese president Jiang Zemin pledged China's largest trade liberalization policy to date: slashing tariffs on imports by up to 30 percent starting in 1996. Due to its increasing economic power China will be able to keep this promise. Furthermore, another common purpose for APEC members is to create more liberalized trade, and the deadline it was discussed is 2000 for advanced countries, and 2010 for developing countries. According to our projection, this goal will also be easy for China to keep, because in 2010 the Chinese ratio of custom duties to GDP will become the same as the

US.

In addition, we should notice that in 2010 China, Korea and Japan will have the only trade surplus among our 8 countries, and the Chinese ratio of trade surplus will be larger than the others.

(4)Comparisons of Projected Military Presence in the Asia-Pacific Region

Finally, Tables 8 and 9 show projected ratio of military spending to GDP and its absolute level, and we have projected this indicator to estimate the future balance of political power in the region. Although very few econometric projections calculate these indexes, they are very important for analyzing the future balance of power in the political field which is sometimes critical(for example in the trade friction between Japan and the US). Furthermore, military spending is a burden for an economy, which can pull down economic growth (as in the US). In this sense, the US, Japan, South Korea and Australia have a special relationship of 'burden sharing' which is expressed in equations (12), (24), (48) and (96) in the APPENDIX, although we do not explain the details of these equations.

Assuming that Japan, Korea and Australia form a group, and that three ASEAN countries can be characterized as one group, we can compare the ratio of the military spending between these four groups shown in Table 10.

As shown in this table, we cannot neglect the trend of the shrinking American military presence and of the expanding Chinese presence, although the Chinese ratio of military expenditure will not change during the period. However, if Japan, South Korea and Australia

will continue their stance as members of a 'Western Alliance', their military presence can compensate for the shrinking U.S. presence to some extent.

5. CONCLUDING REMARKS

In this paper, we have provided a long term projection of the Chinese economy and checked some official targets utilizing an econometric analysis. Our conclusion is that projections for the Chinese economy should be more optimistic, although the government's one year projection is higher than ours.

However, this does not necessarily mean that China does not need any special efforts to maintain its high growth, perhaps because in the future China will have to face unparalleled restrictions as a result of such unprecedented high growth. These restrictions may include natural resources, infrastructures or environmental problems. These problems are recognized as key points for China's sustainable development by its state planning committee (see Lan & Ning (1995)). Furthermore, we can not neglect a possibility that there will be more severe trade frictions with advanced countries, because the advanced countries fear China's strong competitive power in the future.

As we discussed previously, every country will experience a high growth rate period, and maybe trade frictions will probably accompany this growth. In this sense, China can learn much from formerly developed countries like Japan.

REFERENCES

Barnathan,J. *et al.*, 1993, China: The Emerging Economic Powerhouse

of the 21st Century, *Business Week*, May 17, 1993.

Bi,J., 1994, *Zhongguo Hongguan Jingji Jiliang Moxing (China Macro Econometric Model)*, Peking University Press, Beijing.

Chinese State Statistical Bureau, 1995, *Chinese Statistical Yearbook*, China Statistical Publishing House, Beijing.

International Monetary Fund, 1994, *International Financial Statistics: Yearbook*, Washington.

Lan,S. and Ning,J., 1995, Zuanbian Jingji Zengzhang Fangshi Shi Shixian 2010 Nian Zhanlüe Mubiao De Guanjan (To Change the Way of Economic Growth is the Key to Realize the Strategic Targets for 2010), *Hongguan Jingji Guanli (Macro Economic Management)*, 1995, November.

Ohnishi,H., 1993, The Rise and Fall of RIM-PAC Countries -- a research by a long-term econometric model of the post-war RIM-PAC relations, *Proceedings of the Asian Conference on Statistical Computing,* Beijing.

Ohnishi,H., 1995, A Long-term Projection for the 25 Year Development Plan of Indonesia -- research based on the Kyoto Univ. Pacific Rim Model, *Discussion Paper*, No.9503, BAPPENAS, Indonesia.

Engardio,P. *et al.*, The Spark Plug of Asia's Future, *Business Week*, May 17, 1993.

Rohwer,J., 1992, China, *The Economist*, Nov. 28, 1992, London.

Suzuki,Y., 1990, *Japan's Economic Performance and International Role*, University of Tokyo Press, Tokyo.

United Nations, 1987, *World Population Prospects: Estimates and Projections as Assumed in 1985*, New York.

World Bank, 1993a, *Grobal Economic Prospects and the Developing*

Countries 1993, World Bank, New York.

World Bank, 1993b, *The East Asian Miracle: Economic Growth and Public Policy*, Oxford University Press for the World Bank, New York.

World Bank, 1994, *Grobal Economic Prospects and the Developing Countries 1994*, World Bank, New York.

Zhang,Z., 1995, International Trade and Foreign Direct Investment: Further Evidence from China, *Asian Economic Journal*, Vol.9, No.2.

1.All of the equations of this model are shown in the APPENDIX.

2.Zhang(1995) showed that foreign direct investment in China are a function of cheap Chinese labor as well as its domestic market. In the sense that foreign direct investment is the most important part of capital inflows(BCc), our specification of BCc function can be regarded as a function of Zhang's first explaining variable.

3.These data are the sum total of China's 'direct investment, nie', 'portfolio investment, nie' and 'other capital, nie' in the *international financial statistics* of IMF.

4.The functions of other countries are shown as equations(10), (22), (46), (58), (70), (82) and (94) in the APPENDIX.

5.From version 1 to version 2.3, the KYPAC model had only three sectors: Japan, the USand 'ASEAN'. The Chinese sector was added in the version 3 model, and at the same time the 'ASEAN' sector was divided into Indonesia, Thailand and the Philippines.

6.The functions of other countries are shown as equations(97), (98), (100), (101), (102), (103) and (104) in the APPENDIX.

7.The World Bank (1993b) did not include the Philippines and China as 'high-performing Asian economies (HPAEs)'. However, according to these tables, figures and our projections of China's future economy, we should include these two countries in the 'HPAEs'.

8.The figures in 1993 and 1994 are cited from Chinese State Statistical Bureau (1995), and the figure in 1995 was from *Japan-China Economic News*, no.21, 1996, Tokyo. These figures were calculated by summing up its period's real GDP growth rates and retail price indexes.

9.TheWorld Bank(1994) provides another projection of the real term GDP growth rate from 1994 to 2003, and it is 8.5 percent. This figure is almost same as the projection by the Department of Integrated Statistics of the State Statistical Bureau of China.

10.This figere 22.1 percent was calculated as a geometric mean of our growth rate during 2000-2005 and during 2005-2010.

11.As we can see, the Chinese wage function as equation(29) in the APPENDIX, its wage is explained by its GDP per capita. Therefore, a higher increase in wage must be given by the higher growth rate of GDP per capita.

12.Suzuki(1990) stresses this Japanese role in the international economic relationship, although he said that it is too early to tell whether the US will continue to be the world's largest debtor.

Table 1 Projections of Future Population of Eight Countries (million persons)

year	1995	2000	2005	2010	growth rate 2000/ 1995	growth rate 2005/ 2000	growth rate 2010/ 2005
China	1185	1223	1295	1392	1.2	0.8	0.6
Japan	125	126	129	132	0.4	0.3	0.1
USA	255	258	266	281	0.6	0.6	0.5
Korea	44	46	48	52	0.9	0.8	0.6
Indonesia	189	195	208	232	1.4	1.1	1.0
Thailand	59	60	64	72	1.3	1.2	1.1
Philippines	66	70	77	92	2.1	1.9	1.6
Australia	18	18	19	20	1.0	0.9	0.9

Figure 1. Fitness of the Partial Test of the Chinese Production Function in Type I model

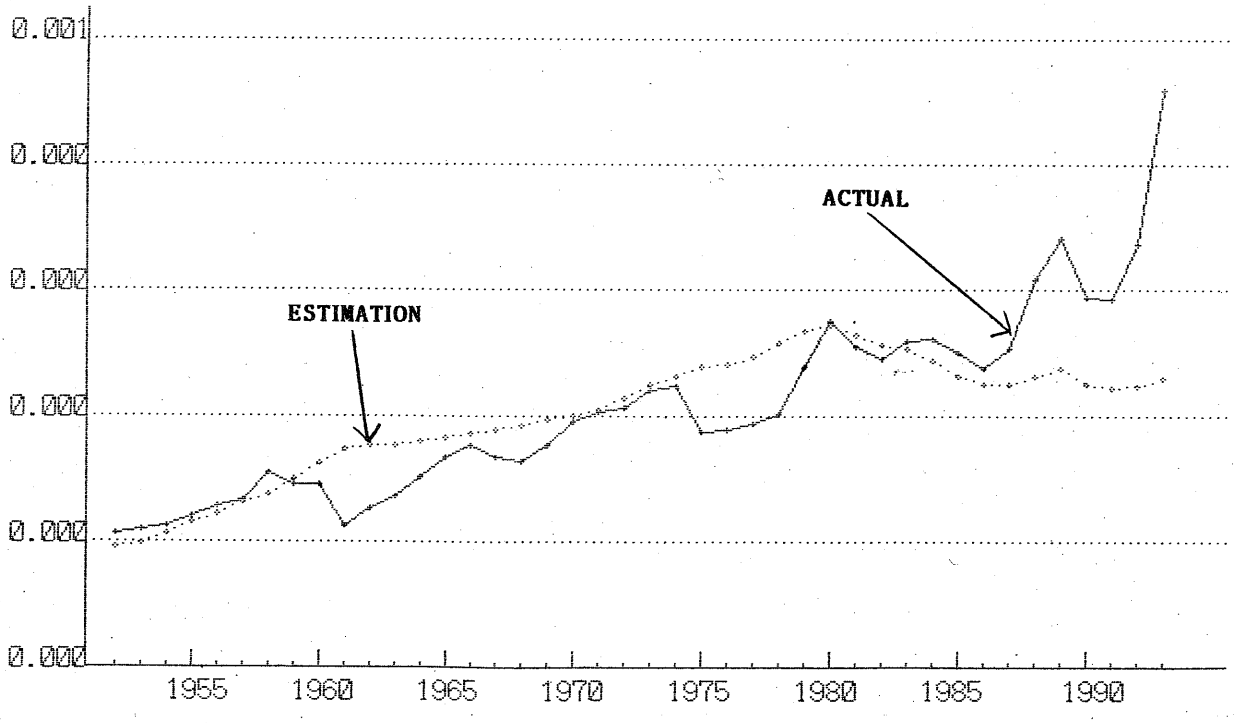

Table 2-1 Comparisons of Projected GDPs of 8 Countries (bn.$)

year	1995	2000	2005	2010	growth rate 2000/ 1995	growth rate 2005/ 2000	growth rate 2010/ 2005
China	695	1263	3298	9970	12.7%	21.2%	24.8%
Japan	4711	5119	5434	5657	1.7%	1.2%	0.8%
USA	7118	7954	8658	9252	2.2%	1.7%	1.3%
Korea	431	675	906	1080	9.4%	6.1%	3.6%
Indonesia	172	277	492	791	10.0%	12.2%	9.9%
Thailand	137	218	364	604	9.8%	10.8%	10.7%
Philippines	70	112	181	295	9.9%	10.1%	10.2%
Australia	350	563	847	1190	10.0%	8.5%	7.0%

Table 2-2. Dollar Term GDP Growth Rates of 8 Countries after 1950(%)

year	55/ 50	60/ 55	65/ 60	70/ 65	75/ 70	80/ 75	85/ 80	93/ 85
China	--	5.4	4.7	6.0	1.2	9.5	-0.5	9.4
Japan	16.0	14.4	14.6	17.4	19.6	19.5	6.3	12.8
USA	6.9	5.3	6.5	7.6	9.5	11.3	8.1	5.9
Korea	-0.7	10.6	-4.8	22.6	20.3	25.0	8.2	17.2
Indonesia	--	-3.0	2.6	-1.7	25.4	18.9	3.5	6.0
Thailand	4.5	6.9	8.9	9.9	17.6	17.0	3.6	15.9
Philippines	4.1	3.4	3.3	2.7	19.0	17.9	-1.6	6.7
Australia	--	-1.4	8.7	1.5	17.6	16.9	4.2	6.4

Figure 2. Each Country's Period of High Growth Rate

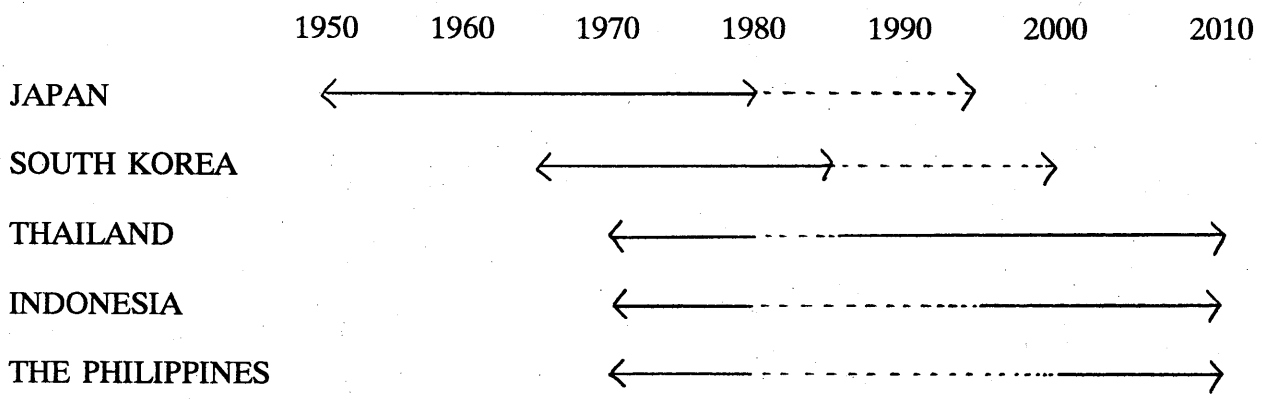

Table 2–3. Each Currency Term GDP Growth Rates of 8 Countries after 1950 (%)

year	55/ 50	60/ 55	65/ 60	70/ 65	75/ 70	80/ 75	85/ 80	93/ 85
China	--	5.4	4.7	6.0	-4.3	5.3	13.9	18.2
Japan	16.0	14.4	14.6	17.4	15.8	14.3	7.3	3.7
USA	6.9	5.3	6.5	7.6	9.5	11.3	8.1	5.9
Korea	81.4	16.0	28.2	25.7	29.2	29.6	15.7	-16.2
Indonesia	--	28.6	121.3	175.3	28.0	27.5	15.9	14.0
Thailand	8.9	7.1	8.6	10.1	17.0	17.2	8.9	15.3
Philippines	5.8	8.5	10.1	13.2	22.1	18.2	18.6	11.3
Australia	--	6.5	8.9	8.4	17.7	13.2	4.9	7.8

Table 3 Comparisons of Projected GDP per capita of 8 Countries ($)

year	1995	2000	2005	2010	growth rate 2000/ 1995	growth rate 2005/ 2000	growth rate 2010/ 2005
China	569	975	2440	7162	11.4%	20.1%	24.0%
Japan	37291	39652	41453	42960	1.2%	0.9%	0.7%
USA	27571	29882	31637	32903	1.6%	1.1%	0.8%
Korea	9391	14036	18098	20906	8.4%	5.2%	2.9%
Indonesia	883	1331	2231	3407	8.5%	10.9%	8.8%
Thailand	2299	3427	5372	8432	8.3%	9.4%	9.4%
Philippines	991	1431	2113	3171	7.6%	8.1%	8.5%
Australia	19807	30257	43458	58503	8.8%	7.5%	6.1%

Table 4 Comparisons of Projected Balance of Capital of 8 Countries (bn.$)

year	1995	2000	2005	2010	growth rate 2000/ 1995	growth rate 2005/ 2000	growth rate 2010/ 2005
China	32.7	32.2	29.3	23.6	-0.3%	-1.9%	-4.2%
Japan	-83.0	-64.3	-49.6	-38.8	-5.0%	-5.1%	-4.8%
USA	128.4	168.7	207.0	241.5	5.6%	4.2%	3.1%
Korea	8.6	3.9	2.8	4.3	-14.9%	-6.4%	9.0%
Indonesia	3.8	3.7	3.3	2.9	-0.5%	-2.1%	-2.5%
Thailand	14.7	14.0	7.2	-15.2	-1.0%	-12.5%	---
Philippines	3.3	3.0	2.7	2.2	-1.7%	-2.4%	-4.1%
Australia	10.5	7.2	3.9	1.1	-7.2%	-11.4%	-22.9%

Table 5 Comparisons of Projected 'COMP' of 8 Countries

year	1995	2000	2005	2010	growth rate 2000/ 1995	growth rate 2005/ 2000	growth rate 2010/ 2005
China	1.067	1.433	2.307	4.001	6.1%	10.0%	11.6%
Japan	0.896	0.839	0.736	0.598	−1.3%	−2.6%	−4.1%
USA	1.413	1.348	1.191	0.968	−0.9%	−2.4%	−4.1%
Korea	0.999	0.983	0.882	0.723	−0.3%	−2.1%	−3.9%
Indonesia	1.115	0.927	0.763	0.604	−3.6%	−3.8%	−4.6%
Thailand	0.699	0.736	0.727	0.663	1.0%	−0.2%	−1.8%
Philippines	0.691	0.640	0.561	0.458	−1.5%	−2.6%	−4.0%
Australia	1.171	1.163	1.075	0.910	−0.1%	−1.6%	−3.3%

Table 6 Comparisons of Projected Ratios of Balance of Trade to GDPs of 8 Countries (%)

year	1995	2000	2005	2010	growth rate 2000/ 1995	growth rate 2005/ 2000	growth rate 2010/ 2005
China	2.9	3.2	4.3	6.3	2.0%	6.1%	7.9%
Japan	2.3	1.7	1.5	1.5	−6.5%	−1.1%	−0.3%
USA	−1.6	−1.1	−1.2	−1.3	−2.2%	2.2%	4.2%
Korea	0.7	0.5	0.5	0.4	−6.6%	−2.4%	−0.5%
Indonesia	6.1	3.9	−2.6	−5.4	−8.6%	---	15.7%
Thailand	−4.2	−9.5	−14.8	−16.4	17.5%	9.4%	2.1%
Philippines	−3.9	−6.5	−10.3	−12.3	10.6%	9.6%	3.5%
Australia	−1.5	−5.1	−6.8	−6.9	27.7%	5.9	0.3%

Table 7 Comparisons of Projected Ratios of Custom Duties to GDPs of 8 Countries (%)

year	1995	2000	2005	2010	growth rate 2000/ 1995	growth rate 2005/ 2000	growth rate 2010/ 2005
China	0.7	0.5	0.4	0.3	-4.6%	-6.4%	-7.1%
Japan	0.2	0.1	0.1	0.1	-5.6%	-3.3%	-1.6%
USA	0.3	0.3	0.3	0.3	-0.4%	-0.1%	0.2%
Korea	1.2	1.4	1.5	1.5	2.6%	0.8%	0.3%
Indonesia	1.1	1.1	1.2	1.2	0.5%	0.9%	0.4 %
Thailand	3.5	3.8	4.0	4.3	2.2%	1.1%	0.6%
Philippines	5.3	5.0	4.9	4.7	-0.8%	-0.6%	-0.6%
Australia	0.8	0.9	1.0	1.2	3.1%	2.9%	4.1%

Table 8 Comparisons of Projected Ratios of Military Expenditures to GDPs of 8 Countries (%)

year	1995	2000	2005	2010	growth rate 2000/ 1995	growth rate 2005/ 2000	growth rate 2010/ 2005
China	1.1	1.1	1.1	1.0	-1.3%	-1.4%	-0.7%
Japan	0.9	0.9	0.9	0.9	-0.4%	-0.4%	-0.4%
USA	4.7	4.8	4.8	4.7	0.4%	-0.1%	-0.2%
Korea	3.8	4.5	4.9	5.2	3.1%	1.9%	1.1%
Indonesia	1.5	1.3	1.1	0.9	-3.0%	-4.1%	-3.4%
Thailand	3.0	2.9	3.0	3.1	-1.0%	0.7%	0.7%
Philippines	1.9	1.9	1.8	1.8	-0.3%	-0.1%	-0.1%
Australia	2.4	2.5	2.5	2.6	0.8%	0.3%	0.1%

Table 9 Comparisons of Projected Military Expenditures of 8 Countries (bn.$)

year	1995	2000	2005	2010	growth rate 2000/ 1995	growth rate 2005/ 2000	growth rate 2010/ 2005
China	7.7	13.1	32.0	93.5	11.2%	19.5%	23.9%
Japan	41.8	44.5	46.4	47.5	1.3%	0.8%	0.4%
USA	270.3	308.1	333.4	352.6	2.7%	1.6%	1.1%
Korea	16.6	30.3	44.6	56.0	12.8%	8.0%	4.7%
Indonesia	2.3	3.1	4.5	6.1	6.8%	7.5%	6.2%
Thailand	4.0	6.1	10.5	18.0	8.7%	11.6%	11.5%
Philippines	1.4	2.1	3.4	5.6	9.5%	9.9%	10.1%
Australia	7.8	13.1	20.0	28.3	10.8%	8.9%	7.2%

Table 10. Projected Balance of Military Presence of 4 Groups of Nations

	1993	2010
The US/2[1]	69	41
Japan + South Korea + Australia	25	31
Indonesia + Thailand + The Philippines	3	7
China	3	22
total	100	100

[1] The reason why the US's figure is divided by 2 in this comparison is that the US can use half of its military armaments in the Asia-Pacific region.

APPENDIX THE EQUATIONS OF THE KYOTO UNIVERSITY PACIFIC RIM MODEL (KYPAC-4)

TYPE I MODEL USED FOR FINAL TEST

I. JAPAN MODEL

1:Yj --- (Production)

$\log Yj/Nj = -1.32094 + 0.81800 * \log Kj/Nj [+0.82448 * AR(1)]$

(-7.03) (22.23)

adj.RR=0.9974 D.W.=2.4 (1953-1993)

2:Ij --- (Investment)

$\log IJ = -0.22078 + 1.03319 * \log(Sj+BCj) - 0.09881444 * \log(CDj_{-1}/Yj_{-1})$

(-0.93) (77.40) (-2.00)

adj.RR=0.9961 D.W.=1.2 (1952-1993)

3:Kj --- (Capital Stock)

$Kj = (1-dj) * Kj_{-1} + Ij_{-1}$

4:Sj --- (Saving)

$Sj = 7.30310 + 0.20250 * \log Yj_{-1} [+0.37347 * AR(1)]$

(0.96) (39.42)

adj.RR=0.9894 D.W.=1.9 (1954-1993)

5:Wj --- (Monthly Wage)

$Wj = 57.5290 + 114544 * Yj_{-1}/Nj_{-1}$

(1.87) (40.91)

adj.RR=0.9761 D.W.=1.4 (1952-1993)

6.EXj --- (Exports)

EXj=BTj+IMj

7.IMj --- (Imports)

$\log IMj = -1.79461 + 0.91941 * \log Yj_{-1} [+0.48137 * AR(1)]$

(-11.94) (53.34)

adj.RR=0.9910 D.W.=1.8 (1948-1993)

8:BTj --- (Balance of Trade)

$BTj/Yj = 0.07381 - 0.00000057084 * Wj_{-1}/(Yj_{-1}/Nj_{-1}) [+0.64888 * AR(1)]$

(3.13) (-3.01)

adj.RR=0.6989 D.W.=1.8 (1952-1993)

9:COMPj --- (Competitiveness)

COMPj=Yj/(Nj*Wj)/(((Yu/(Nu*4*Wu))+(Yc/(Nc*Wc/12))+(Yk/(Nk*Wk))
+(Yi/(Ni*25*Wi))+(Yt/(Nt*25*Wt))+(Yp/(Np*25*Wp))+(YA/(Na*4*Wa)))/7)

10:BCj --- (Balance of Capital)

BCj=18.3458-16.7996*(Wj/((4*Wu+Wc/12+Wk+25*Wi+25*Wt+25*Wp+4*Wa)/7))

(3.45) (-7.86)

adj.RR=0.6031 D.W.=0.7 (1953-1993)

11:CDj --- (Custom Duty)

CDj/Yj=0.0037297-0.0117192*BTj/Yj

(2.12) (-1.53)

adj.RR=0.9099 D.W.=1.7 (1954-1993)

12:MEj --- (Military Expenditure)

$MEj = 0.19700 + 0.0082885 * Yj_{-1}$

(11.17) (31.19)

adj.RR=0.9828 D.W.=1.2 (1952-1969)

$MEj/Yj = 0.0081048 + 0.00428127 * Yj_{-2}/(Yu_{-2}+Yk_{-2}+Yi_{-2}+Yt_{-2}+Yp_{-2}+Ya_{-2})$

(30.77) (5.75)

adj.RR=0.5824 D.W.=1.1 (1970-1993)

II. USA MODEL

13.Yu --- (Production)

logYu/Nu=-0.28206+0.90959*logKu/Nu[+0.65415*AR(1)]

(-3.54) (60.46)

adj.RR=0.9985 D.W.=2.0 (1946-1993)

14:Iu --- (Investment)

logIu=-0.63326+0.87317*log(Su_{-1}+BCu_{-1})-0.34042*log(MEu/Yu)

(-1.56) (15.48) (-2.48)

adj.RR=0.9964 D.W.=1.9 (1952-1993)

15:Ku --- (Capital Stock)

$Ku=(1-du)*Ku_{-1}+Iu_{-1}$

16:Su --- (Saving)

Su=37.5201+0.15473*Yu[+0.87491*AR(1)]

(1.04) (17.33)

adj.RR=0.9962 D.W.=1.9 (1951-1993)

17:Wu --- (Weekly Wage)

logWu=9.07529+0.77883*Yu/Nu[+0.79645*AR(1)]

(103.75) (44.43)

adj.RR=0.9991 D.W.=2.3 (1946-1993)

18:EXu --- (Exports)

EXu=BTu+IMu

19:IMu --- (Imports)

IMu=-41.3562+0.0964024*Yu[+0.69298*AR(1)]

(-5.84) (42.39)

adj.RR=0.9970 D.W.=1.9 (1948-1993)

20:BTu --- (Balance of Trade)

BTu/Yu=-0.0131584+0.0153314*COMPu-0.32434*EXj/Yu

(-0.61) (0.97) (-1.42)

adj.RR=0.8473 D.W.=1.4 (1954-1993)

21:COMPu --- (Competitiveness)

COMPu=Yu/(Nu*4*Wu)/(((Yj/(Nj*Wj))+(Yc/(Nc*Wc/12))+(Yk/(Nk*Wk))
+(Yi/(Ni*25*Wi))+(Yt/(Nt*25*Wt))+(Yp/(Np*25*Wp))+(Ya/(Na*4*Wa)))/7)

22:BCu --- (Balance of Capital)

BCu/Yu=0.0066184-0.0017475*(4*Wu/((Wj+Wc/12+Wk+25*Wi+25*Wt+25*Wp+4*Wa)/7))

(0.67) (-0.84)

adj.RR=0.6417 D.W.=1.8 (1954-1993)

23:CDu --- (Custom Duty)

CDu/Yu=0.0025712-0.0122889*BTu/Yu[+0.87062*AR(1)]

(10.98) (-2.05)

adj.RR=0.8735 D.W.=2.6 (1954-1993)

24:MEu --- (Military Expenditure)

MEu/Yu=0.0472726+0.0055780*Yu/(Yj+Yk+Yi+Yt+Yp+Ya)[+0.73133*AR(1)]

(8.79) (3.93)

adj.RR=0.9082 D.W.=1.4 (1954-1993)

III. CHINA MODEL

25:Yc --- (Production)

logYc/Nc=-6.12727+0.27350*logKc/Nc

(-22.28) (8.52)

adj.RR=0.6358 D.W.=0.2 (1952-1993)

26:Ic --- (Investment)

Ic=25.0765+0.69395*(Sc+BCc)[+0.84204*AR(1)]

(2.19) (10.74)

adj.RR=0.9562 D.W.=1.5 (1953-1993)

27:Kc --- (Capital Stock)

$Kc=(1-dc)*Kc_{-1}+Ic_{-1}$

28:Sc --- (Saving)
logSc=-22.1441+0.61242*logYc[+1.00657*AR(1)]
(-6.38) (3.10)
adj.RR=0.9944 D.W.=1.0 (1953-1993)
29:Wc --- (Yearly Wage)
logWc=9.89230+0.47955*logYc/Nc[+0.93013*AR(1)]
(13.42) (4.41)
adj.RR=0.9510 D.W.=1.6 (1953-1994)
30:EXc --- (Exports)
EXc=BTC+IMC
31:IMc --- (Imports)
logIMc=-5.85894+0.76426*logYc[+1.01971*AR(1)]
(-3.82) (3.05)
adj.RR=0.9870 D.W.=1.4 (1952-1994)
32:BTc --- (Balance of Trade)
$BTc/Yc=-0.0195698+0.0128539*COMPc_{-1}+0.0303828*D9091$
(-2.41) (2.01) (3.48)
adj.RR=0.23087 D.W.=1.0 (1954-1993)
33:COMPc --- (Competitiveness)
COMPc=Yc/(Nc*Wc/12)/(((Yj/(Nj*Wj))+(Yu/(Nu*4*Wu))+(Yk/(Nk*Wk))
+(Yi/(Ni*25*Wi))+(Yt/(Nt*25*Wt))+(Yp/(Np*25*Wp))+(Ya/(Na*4*Wa)))/7)
34:BCc --- (Balance of Capital)
BCc=0 (1945-1981)
BCc=5.20770-35.3497*(Wc/12/((Wj+4*Wu+Wk+25*Wi+25*Wt+25*Wp+4*Wa)/7))
(3.84) (-2.98)
adj.RR=0.1679 D.W.=1.3 (1982-1993)
35:CDc --- (Custom Duty)
logCDc/Yc=-4.99989-0.61104*logCOMPc[+0.93926*AR(1)]
(-6.92) (-1.36)
adj.RR=0.9013 D.W.=1.9 (1954-1993)
36:MEc --- (Military Expenditure)
MEc=2.07678+0.0128417*Yc[+0.93107*AR(1)]
(0.69) (2.89)
adj.RR=0.8767 D.W.=1.4 (1953-1994)

IV. KOREA MODEL

37.Yk --- (Production)
logYk/Nk=-1.74210+0.77145*logKk/Nk
(-5.72) (19.31)
adj.RR=0.9029 D.W.=0.2 (1953-1993)
38:Ik --- (Investment)
$Ik=2.71222+0.94569*(Sk+BCk)-164.737*CDk_{-1}/Yk_{-1}$
(2.01) (78.01) (-2.63)
adj.RR=0.9964 D.W.=1.9 (1954-1993)
39:Kk --- (Capital Stock)
$Kk=(1-dk)*Kk_{-1}+Ik_{-1}$
40:Sk --- (Saving)
$logSk=-2.89139+1.39621*logYk_{-1}[+0.57437*AR(1)]$
(-8.21) (13.90)
adj.RR=0.9648 D.W.=1.8 (1954-1993)
41:Wk --- (Monthly Wage)
logWk=11.5598+0.94431*logYk/Nk[+0.81866*AR(1)]
(37.64) (22.21)
adj.RR=0.9951 D.W.=2.3 (1954-1993)
42:EXk --- (Exports)

EXk=IMk+BTk

43:IMk --- (Imports)

logIMK=−2.12442+1.19222*logYk

(−21.18) (39.58)

adj.RR=0.9745 D.W.=0.6 (1952−1993)

44:BTk --- (Balance of Trade)

BTk/Yk=−0.17083+0.0180763*Yk/(Nk*Wk)[+0.83081*AR(1)]

(−2.24) (1.67)

adj.RR=0.7873 D.W.=1.4 (1954−1993)

45:COMPk --- (Competitiveness)

COMPk=Yk/(Nk*Wu)/(((Yj/(Nj*Wj))+(Yu/(Nu*4*Wu))+(Yc/(Nc*Wc/12))
+(Yi/(Ni*25*Wi))+(Yt/(Nt*25*Wt))+(Yp/(Np*25*Wp))+(Ya/(Na*4*Wa)))/7)

46:BCk --- (Balance of Capital)

BCk=1.30449−0.0446701*(BCj+BCu+BCc+BCi+BCt+BCp+BCa)[+0.66425*AR(1)]

(1.57) (−3.41)

adj.RR=0.6549 D.W.=1.3 (1954−1993)

47:CDk --- (Custom Duty)

logCDk/Yk=−3.44899+0.33823*logIMk/Yk[+0.74065*AR(1)]

(−13.00) (2.00)

adj.RR=0.6091 D.W.=1.6 (1954−1993)

48:MEk --- (Military Expenditure)

MEk/Yk=0.0396957+0.0761997*Yk/Yj[+0.86289*AR(1)]

(6.72) (1.67)

adj.RR=0.7314 D.W.=1.8 (1954−1993)

V. INDONESIA MODEL

49:Yi --- (Production)

logYi=−3.97769+0.93825*logKi+0.28969*logNi

(−2.92) (29.88) (2.31)

adj.RR=0.9910 D.W.=1.0 (1951−1993)

50:Ii --- (Investment)

$Ii=0.88541*(Si_{-1}+BCi_{-1})$

(31.11)

adj.RR=0.9593 D.W.=1.5 (1952−1993)

51:Ki --- (Capital Stock)

$Ki=(1-di)*Ki_{-1}+Ii_{-1}$

52:Si --- (Saving)

Si=−3.81338+0.38397*Yi[+0.54429*AR(1)]

(−4.07) (26.65)

adj.RR=0.9857 D.W.=2.2 (1954−1993)

53:Wi --- (Daily Wage)

Wi=−0.42604+4733.11*Yi/Ni[+0.91410*AR(1)]

(−0.85) (7.24)

adj.RR=0.9051 D.W.=1.8 (1952−1993)

54:EXi --- (Exports)

$EXi=-3.88200+3.32830*COMPi_{-1}+0.0028503*(Yj+Yu+Yc+Yk+Yt+Yp+Ya)$

(−0.73) (1.02) (5.97)

[+0.86276*AR(1)]

adj.RR=0.9646 D.W.=2.1 (1954−1993)

55:IMi --- (Imports)

IMi=0.0538563*Yi+0.43338*Ii

(1.62) (4.48)

adj.RR=0.9718 D.W.=1.4 (1951−1993)

56:BTi --- (Balance of Trade)

BTi=EXi−IMi

57:COMPi --- (Competitiveness)

COMPi=Yi/(Ni*25*Wi)/((((Yj/(Nj*Wj))+(Yu/(Nu*4*Wu))+(Yc/(Nc*Wc/12))+
(Yk/(Nk*Wk))+(Yt/(Nt*25*Wt))+(Yp/(Np*25*Wp))+(Ya/(Na*4*Wa)))/7)

58:BCi --- (Balance of Capital)

BCi=2.33521−4.62093*(25*Wi/((Wj+4*Wu+Wc/12+Wk+25*Wt+25*Wp+4*Wa)/7))
(6.01) (−2.76)

adj.RR=0.1455 D.W.=0.4 (1954−1993)

59:CDi --- (Custom Duty)

CDi/Yi=0.0063400+0.314330*IMi/Yi[+0.84070*AR(1)]
(1.51) (1.68)

adj.RR=0.6938 D.W.=1.4 (1953−1993)

60:MEi --- (Military Expenditure)

logMEi=−2.27941+0.63185*logYi
(−7.41) (7.17)

adj.RR=0.8743 D.W.=1.8 (1952−1993)

VI. THAILAND MODEL

61.Yt --- (Production)

logYt=−11.6624+0.67796*logKt+1.18524*logNt
(−2.72) (8.25) (2.79)

adj.RR=0.9980 D.W.=1.3 (1951−1993)

62:It --- (Investment)

It=3.77451+0.78294*(St+BCt)−109.279*(CDt/Yt)[+0.27049*AR(1)]
(2.33) (48.43) (−2.32)

adj.RR=0.9901 D.W.=2.0 (1953−1993)

63:Kt --- (Capital Stock)

$Kt=(1-dt)*Kt_{-1}+It_{-1}$

64:St --- (Saving)

logSt=−1.99625+1.20315*logYt[+0.40303*AR(1)]
(−22.49) (38.22)

adj.RR=0.9897 D.W.=1.6 (1951−1993)

65:Wt --- (Daily Wage)

logWt=7.24453+0.76937*log(Yt/Nt)[+0.66925*AR(1)]
(23.14) (19.48)

adj.RR=0.9885 D.W.=1.8 (1954−1993)

66:EXt --- (Exports)

logEXt=−10.8517+0.19245*logCOMPt
(−13.39) (1.06)
+1.53618*log($Yj_{-1}+Yu_{-1}+Yc_{-1}+Yk_{-1}+Yi_{-1}+Yp_{-1}+Ya_{-1}$)[+0.81535*AR(1)]
(15.86)

adj.RR=0.9942 D.W.=1.6 (1954−1993)

67:IMt --- (Imports)

IMt=−1.70311+0.38172*Yt[+0.81781*AR(1)]
(−1.61) (21.45)

adj.RR=0.9913 D.W.=1.5 (1947−1993)

68:BTt --- (Balance of Trade)

BTt=EXt−IMt

69:COMPt --- (Competitiveness)

COMPt=Yt/(Nt*25*Wt)/((((Yj/(Nj*Wj))+(Yu/(Nu*4*Wu))+(Yc/(Nc*Wc/12))+
(Yk/(Nk*Wk))+(Yi/(Ni*25*Wi))+(Yp/(Np*25*Wp))+(Ya/(Na*4*Wa)))/7)

70:BCt --- (Balance of Capital)

BCt/Yt=0.13493−0.40612*(25*Wt/((Wj+4*Wu+Wc/12+Wk+25*Wi+25*Wp+4*Wa)/7))
(3.53) (−2.64)

adj.RR=0.1326 D.W.=0.5 (1954−1993)

71:CDt --- (Custom Duty)

CDt/Yt=0.013904-0.0736522*IMt/Yt[+0.89097*AR(1)]
(1.78) (3.53)
adj.RR=0.4632 D.W.=2.1 (1954-1993)

72:MEt --- (Military Expenditure)
logMEt=-3.71094+1.06793*logYt[+0.52424*AR(1)]
(-28.67) (23.56)
adj.RR=0.9888 D.W.=1.8 (1949-1993)

VII. THE PHILIPPINE MODEL

73:Yp --- (Production)
logYp=-13.1167+0.70662*logKp+1.22625*logNp
(-12.71) (12.31) (10.61)
adj.RR=0.9814 D.W.=0.2 (1951-1993)

74:Ip --- (Investment)
logIp=1.10952+0.46279*(Sp+BCp)
(2.41) (4.83)
adj.RR=0.9802 D.W.=1.8 (1951-1993)

75:Kp --- (Capital Stock)
$Kp=(1-dp)*Kp_{-1}+Ip_{-1}$

76:Sp --- (Saving)
logSp=-2.10901+1.13745*logYp[+0.82958*AR(1)]
(-8.36) (9.06)
adj.RR=0.9827 D.W.=2.3 (1951-1993)

77:Wp --- (Daily Wage)
Wp=-0.52412+5854.52*Yp/Np[+0.94689*AR(1)]
(-0.91) (11.61)
adj.RR=0.9651 D.W.=2.0 (1951-1993)

78:EXp --- (Exports)
logEXp=-7.19393+0.38122*log*COMPp+1.02273*log(Yj+Yu+Yc+Yk+Yi+Yt+Ya)
(-17.70) (2.04) (20.57)
[+0.61987*AR(1)]
adj.RR=0.9887 D.W.=1.6 (1954-1993)

79:IMp --- (Imports)
logIMp=-0.68717+0.78947*logYp+0.33654*logIp
(-3.69) (4.34) (2.45)
adj.RR=0.9817 D.W.=2.2 (1947-1993)

80:BTp --- (Balance of Trade)
BTp=EXp-IMp

81:COMPp --- (Competitiveness)
COMPp=Yp/(Np*25*Wp)/((((Yj/(Nj*Wj))+(Yu/(Nu*4*Wu))+(Yc/(Nc*Wc/12))+
(Yk/(Nk*Wk)+(Yt/(Nt*25*Wt))+(Yi/(Ni*25*Wi))+(Ya/(Na*4*Wa)))/7)

82:BCp --- (Balance of Capital)
BCp=1.60820-2.95494*(25*Wp/((Wj+4*Wu+Wc/12+Wk+25*Wi+25*Wt+4*Wa)/7))
(6.36) (-3.81)
adj.RR=0.2578 D.W.=0.5 (1954-1993)

83:CDp --- (Custom Duty)
CDp/Yp=-0.0053074+0.17470*IMp/Yp
(-1.22) (8.03)
adj.RR=0.6017 D.W.=0.9 (1951-1993)

84:MEp --- (Military Expenditure)
MEp=0.0369452+0.0182341*Yp[+0.84679*AR(1)]
(0.45) (8.05)
adj.RR=0.9687 D.W.=1.5 (19521-1993)

VIII. AUSTRALIA MODEL

85:Ya --- (Production)
logYa=-10.6553+1.10267*logNa+0.83500*logKa[+0.68717*AR(1)]
(-3.10) (2.77) (12.44)
adj.RR=0.9989 D.W.=2.0 (1953-1993)
86:Ia --- (Investment)
logIa=0.84059*log(Sa+BCa)-0.0990418*logCDa/Ya
(49.37) (-1.40)
adj.RR=0.9871 (1953-1993)
87:Ka --- (Capital Stock)
$Ka=(1-da)*Ka_{-1}+Ia_{-1}$
88:Sa --- (Saving)
Sa=0.84043+0.22281*Ya
(0.33) (14.65)
adj.RR=0.9853 D.W.=1.6 (1954-1993)
89:Wa --- (Weekly Wage)
logWa=9.44078+0.83820*logYa/Na[+0.88331*AR(1)]
(35.81) (16.03)
adj.RR=0.9970 D.W.=1.8 (1953-1993)
90:EXa --- (Exports)
EXa=-6.51929+1120000*Ya/(Na*4*Wa)+0.0032351*(Yj+Yu+Yc+Yk+Yi+Yt+Yp)
(-1.19) (1.45) (8.28)
[+0.75630*AR(1)]
adj.RR=0.9857 D.W.=1.4 (1953-1993)
91:IMa --- (Imports)
logIMa=-1.86607+0.97114*logYa
(-32.68) (71.08)
adj.RR=0.9921 D.W.=1.0 (1953-1993)
92:BTa --- (Balance of Trade)
BTa=EXa-IMa
93:COMPa --- (Competitiveness)
COMPa=Ya/(Na*4*Wa)/((((Yj/(Nj*Wj))+(Yu/(Nu*4*Wu))+(Yc/(Nc*Wc/12))+
(Yk/(Nk*Wk)+(Yi/(Ni*25*Wi))+(Yt/(Nt*25*Wt))+(Yp/(Np*25*Wp)))/7)
94:BCa --- (Balance of Capital)
BCa=19.4044-5.95505*(4*Wa/((Wj+4*Wu+Wc/12+Wk+25*Wi+25*Wt+25*Wp)/7))
(5.83) (-4.78)
adj.RR=0.3589 D.W.=0.4 (1954-1993)
95:CDa --- (Custom Duty)
CDa/Ya=0.0248329-0.0132494*COMPa[+0.86468*AR(1)]
(4.24) (-2.43)
adj.RR=0.8358 D.W.=1.6 (1954-1993)
96:MEa --- (Military Expenditure)
logMEa/Ya=-3.13617+0.17720*logMEu/Yu[+0.87036*AR(1)]
(-6.60) (1.07)
adj.RR=0.8585 D.W.=1.5 (1953-1993)

TYPE II MODEL USED FOR PROJECTIONS

---- the following equations are changed or added;

25:Yc --- (Production)
Yc=-911.923+0.36484*Kc+0.0010339*Nc[+0.95113*AR(1)]
(-1.95) (2.93) (2.58)
adj.RR=0.9362 D.W.=0.9 (1952-1993)

97:dj --- (Depreciation Rates)

$dj=-0.63845+0.33088*Kj_{-1}/Yj_{-1}[+0.24162*AR(1)]$

(-2.11) (2.14)

adj.RR=0.1586 D.W.=1.9 (1975-1993)

98:du --- (Depreciation Rates)

$du=-0.57067+0.68099*Ku_{-1}/Yu_{-1}$

(-3.64) (3.91)

adj.RR=0.4430 D.W.=1.1 (1975-1993)

99:dc --- (Depreciation Rates)

$dc=-0.0739765+0.13635*Kc_{-9}/Yc_{-9}[+0.56435*AR(1)]$

(-1.19) (3.37)

adj.RR=0.6917 D.W.=1.8 (1962-1993)

100:dk --- (Depreciation Rates)

$dk=-0.53053+0.43016*Kk_{-3}/Yk_{-3}[+0.50246*AR(1)]$

(-1.32) (1.50)

adj.RR=0.2560 D.W.=2.4 (1975-1994)

101:di --- (Depreciation Rates)

$di=-1.17249+0.51625*Ki_{-4}/Yi_{-4}[+0.32413*AR(1)]$

(-1.53) (1.49)

adj.RR=0.1810 D.W.=2.0 (1972-1993)

102:dt --- (Depreciation Rates)

$dt=-0.17936+1.12580*It_{-5}/Kt_{-5}[-0.22303*AR(1)]$

(-1.71) (2.81)

adj.RR=0.2802 D.W.=2.2 (1979-1993)

103:dp --- (Depreciation Rates)

$dp=-0.13998+1.31290*Ip_{-7}/Kp_{-7}[-0.21362*AR(1)]$

(-1.69) (1.29)

adj.RR=0.1039 D.W.=2.8 (1983-1994)

104:da --- (Depreciation Rates)

$da=-0.77372+0.26155*Ka_{-1}/Ya_{-1}[+0.59618*AR(1)]$

(-2.72) (2.64)

adj.RR=0.3182 D.W.=2.2 (1954-1993)

LIST OF VARIABLES

		unit
N	Population	thousand
Y	GDP	billion dollar
S	Domestic Saving	billion dollar
I	Investment	billion dollar
K	Capital Stock	billion dollar
BT	Balance of Trade	billion dollar
EX	Exports	billion dollar
IM	Imports	billion dollar
BC	Balance of Capital	billion dollar
ME	Military Spending	billion dollar
CD	Custom Duty	billion dollar
d	Depreciation Rate	
W	Average Wage	dollar/month; in Japan, Korea /week; in USA, Australia /day; in Indoneasia, Thailand, The Philippines /year; in China
COMP	Relative Competitive Power	

Each subscripts j, u, c, k, i, t, p, a indicates Japan, USA, China, South Korea,

Indonesia, Thailand, The Philippines and Australia
AR(1) indicates Autoregressive Error Component of 1st Order