Title	Immiserising growth in the Thai economy : a pre-crisis analysis of trade-industrial Structures
Sub Title	
Author	Banchong-Silpa, Rapipongs
Publisher	Society of Business and Commerce, Keio University
Publication year	2001
Jtitle	Keio business review No.39(2001) ,p.21- 41
JaLC DOI	
Abstract	This paper indicates a possible expiry date of the Export-led Growth policy thathas long been pursued by developing countries. The zero export growth rate experiencedby Thailand in 1996, which later on has been regarded as a trigger to thecountry's prolonged economic crisis, is one clear evidence. Deteriorating terms oftrade can normally be observed in developing countries as their export incomesincrease. The study suggests that this may induce the so-called "ImmiserisingGrowth". In this paper, the situation of deteriorating terms of trade in Thailand isexamined by analysing its representative export and import commodities,regarded asrice and crude petroleum,respectively.As the limitation of export-led growth policyis proved in the study, an alternative inward-looking policy is proposed. That is toreallocate the domestic factor of production;here is the labour,between agriculturaland non-agricultural sectors.The result shows that higher GDP of the country can bereached by driving more labours to the non-agricultural sector, rather than bypursuing the export-led growth policy.
Notes	
Genre	Journal Article
URL	https://koara.lib.keio.ac.jp/xoonips/modules/xoonips/detail.php?koara_id=AA00260481-20010000-0021

Immiserising Growth in the Thai Economy: A Pre-crisis Analysis of Trade-Industrial Structures*

By

Rapipongs Banchong-Silpa

Abstract

This paper indicates a possible expiry date of the Export-led Growth policy that has long been pursued by developing countries. The zero export growth rate experienced by Thailand in 1996, which later on has been regarded as a trigger to the country's prolonged economic crisis, is one clear evidence. Deteriorating terms of trade can normally be observed in developing countries as their export incomes increase. The study suggests that this may induce the so-called "Immiserising Growth". In this paper, the situation of deteriorating terms of trade in Thailand is examined by analysing its representative export and import commodities, regarded as rice and crude petroleum, respectively. As the limitation of export-led growth policy is proved in the study, an alternative inward-looking policy is proposed. That is to reallocate the domestic factor of production; here is the labour, between agricultural and non-agricultural sectors. The result shows that higher GDP of the country can be reached by driving more labours to the non-agricultural sector, rather than by pursuing the export-led growth policy.

Key Words

1. Introduction

There is a consensus among classical and neo-classical economists that, theoretically, higher welfare can be reached through free trades and specialisations. If the welfare of such theories is a higher level of goods and services enjoyed by open economies, it is simply equivalent to a higher real income level.

In practice, the export-led growth hypothesis (ELG) is widely accepted and thus internationally applied. The rapid growth of East Asian economies since the 1980's has also stimulated many scholars to review the links between export and growth. A study by Krueger (1996) shows that the growth rates for the world's output are associated

with those of trade in the long run. Observations of trade orientation and growth imply an even more concrete solution. Countries with a stronger outward-orientation are likely to grow faster than those with a stronger inward-orientation. Analysing the data from twelve countries, Chowdhury (1998) finds that 75 percent of cases have unambiguous unidirectional causality from trade to growth. While Karunaratne (1998), proves that trade acts as a growth engine during the period of study in an Australian case.

Thailand is another example for countries that have pursued the export-led growth policy. Thus, when export growth halted in 1996, it was later considered as a trigger to the country's financial and then economic crisis that started in the following year. The 1996 export slowdown brought about some doubts on validity of the policy. This study aims at analysing whether the policy the country has been pursuing for decades is a sustainable path of economic growth. And if not, what alternative does Thailand have for its future development? Here a possibility of "Immiserising Growth" occurring in the export promotion policy, through deteriorating terms of trade, is then analysed. Finally we come up with a more inward-looking way of domestic resource allocation as a new policy option for the country.

The second section of this paper will present a brief review of Thai export pattern in the past three decades by industrial categories. Section 3 devotes to the export-led growth policy in Thailand as well as its limitations. Section 4 will focus on the problem of deteriorating terms of trade, by raising rice and oil as representatives for export and import industries, respectively. In section 5, we come up with an alternative policy of domestic labour allocation that can provide us a higher income level. Finally, section 6 presents conclusions of the paper and its policy implications.

2. Export as a Trigger to the Crisis

The financial crisis in Thailand was implicitly announced upon the floatation of the country's national currency in July 1997. Following the decision, the domestic economy was in disarray, with contracting output and investment, rising poverty, and collapsed exchange rate. And Thailand has been viewed as *the initiator of a 'contagion effect' in Asian financial markets undermining economic and political stability and bringing hardship to millions of people* (Warr 1999, p. 631).

Before the financial and economic crisis broke out in Thailand, many signs indicating this phenomenon could be observed. One is the export slowdown in 1996, which came after rapid growth in real exports at well beyond ten percent annually from 1991 to 1995. Zero export growth experienced by Thailand at that time was attributed to a number of factors. While many studies place emphasis on the dollar appreciation against the Yen, there are evidences showing that the Thai Baht had been appreciating in real term even before that year, due to large amount of capital inflows.

In order to get a clearer idea, we shall divide the country's exports as classified by SITC 1-digit category into four groups, regarding land-intensive (SITC 0, 1, 2, 4), mineral-intensive (SITC 3), capital-intensive (SITC 5, 7), and labour-intensive (SITC 6, 8, 9) exports, as applied by Warr (2000), with service exports as another group. From Figure 2.1, we can see that exports in the labour-intensive category, which had been showing great performance and accounted the highest proportion in total exports prior to the crisis, made a sudden downturn in 1996. In explaining this situation, Warr

Figure 2.1: Export Components at Constant 1990 Prices
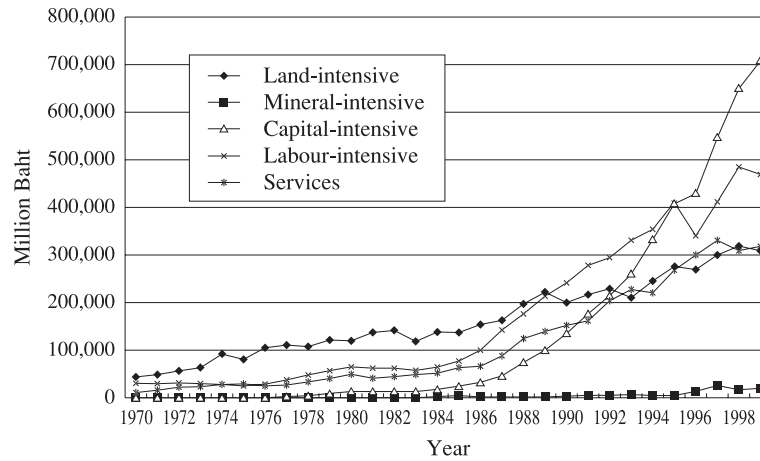
Source: Calculated from ADB data

indicates that *data on real wages provide the single most significant explanation for Thailand's export slowdown and its concentration in labour-intensive industries* (Warr 2000, p. 370). Thus, it seems that the real wage in the country has been increasing because the large pool of cheap unskilled labours that used to exist in Thailand became scarcer. This limited supply, and then the increasing demand led to a bid for higher real wage. As a result, higher production cost and less competitiveness of Thai exports in the world market are inevitable. Although the high price elasticities of the industries seem to bring about fast recovery, this only eased the problem temporarily as the real root lies in the export structure itself.

Changes in the composition of Thailand's exports can be seen in Figure 2.2. It is

Figure 2.2: Proportions of Export Components
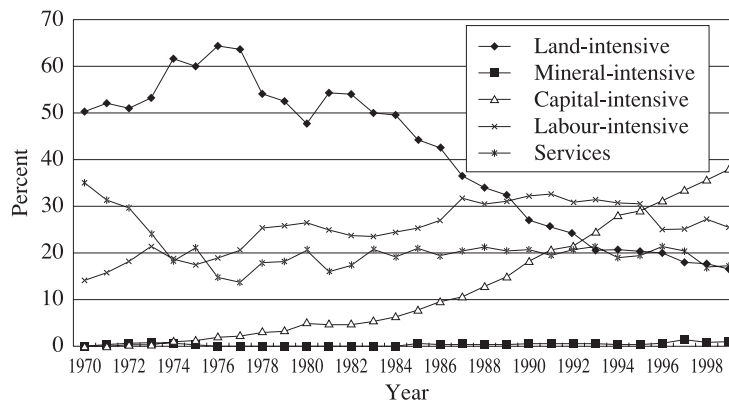
Source: Calculated from ADB data

obvious that the land-intensive, or agro-based exports, which used to account more than 60 percent of total exports, have been substantially decreasing over time, although the export volumes have been increasing. This might be caused by the comparatively falling price of such export products. On the other hand, capital-intensive exports have been constantly performing well. However, it should be noted that such products are likely to be produced and traded under networks of multinational corporations. Thus, very little value added can be enjoyed by the Thais.

3. Export-led Growth in Thailand and its Limitations

In Thailand, the export-led growth policy has been explicitly pursued since the early 1980s. This policy can be clearly seen in the National and Social Development Plans, which started in 1961. According to comprehensive reviews by Suphachalasai (1995) and Warr (1993), in the first (1961-66) and second (1967-71) plans, an import-substitution policy was the main target. However, strategy had begun to change in favour of export promotion since the third plan (1972-76), and policies to promote exports continued to be emphasised later on. During the fourth plan (1977-81), the export-processing zone was established and large-scale exporting firms were encouraged, while the fifth plan (1982-86) indicated the industrial policy that promotes export-oriented industries. The sixth (1987-91) and seventh (1992-96) plans placed more attention on restructuring tax incentives, as well as diversifying export products and markets.

In line with the above policies determined in the five years plans, the Board of Investment (BOI) has been playing an important role in implementing them. Since 1986, three more types of firm, apart from those who already receive promotion privileges, have qualified for promotions. And among these were the export-oriented firms, which export at least 80 percent of their production. Tax incentives given to exporting firms are the full exemptions from import duties and business and sales taxes on raw materials for five years (See Suphachalasai 1995). Considering such privileges, it seems that Thailand's industrial policies have been in favour of exports, even more than domestic sectors.

3.1 Role of Exports in the Thai Economy

The export slowdown in 1996 raised much concerns among authorities in Thailand. The reason is the belief that export is the most important engine of growth for the economy (TDRI 1998). In order to prove this, here the *absorption approach* is applied in examining the role of export in the Thai economy. Considering that GDP is simply equal to the summation of domestic absorption and trade balance, if we let Y represent GDP, while A represents domestic absorption, then B represents trade balance, and the relationship can be expressed as:

$$Y = A + B$$

The domestic absorption usually consists of private consumption, C, public consumption, G, and investment, I. Let X represent export while M represent import, if we assume that changes in output, y, are jointly determined by changes in variables on the right hand side, c, i, g, x, m:

$$y = f(c, i, g, x, m).$$

However, the domestic consumption, C, and import, I, are both endogenously related to income, Y, on the left. Thus, in order to examine the effects from exogenous variables, the two terms are omitted from the model. We then get the following relationship:

$$y = f(i, g, x). \tag{3.1.1}$$

Table 3.1 shows log-linear regression output of the constant elasticity model as expressed in equation 3.1.1, where each parameter on the right hand side shows the partial elasticity of the dependent variable with respect to that explanatory variable, holding other variables constant. Natural log values of the Thai data at constant 1995 US$ from 1960 to 1998 are applied for empirical test. Realising the possibility of non-contemporaneous relationships between explanatory and dependent variables, the lagged value of y_{t-1} is included, and thus provides us the autoregressive model that also incorporate the dynamic trend. Thus, it can be implied from the regression result that when each explanatory variable increases by 1 percent, the GDP increases by 0.14 percent for investment, 0.19 percent for public consumption, and 0.21 percent for export. Note here that the most significant effect comes from changes in GDP itself in the previous period. Nevertheless, among the three contemporaneous factors, export appears to have the strongest influence in determining changes in the current GDP. Thus, it is not exaggerating to indicate the evidence of export-led growth in Thailand.

It should be noted that, instead of net exports, the total export values are used in the calculation. This is to emphasise the fact that policy makers in Thailand too have probably been stuck with illusions of total export figures, and thus continuously issued policies to encourage total export values, regardless of falling prices or rising imports of intermediate and capital products. This may lead to problems that can be considered as sources for the expiry date of the export-led growth policy.

Table 3.1: Absorption Approach of Role of Export

Dependent Variable: ln (GDPt)
Method: Least Squares
Sample (adjusted): 1961–1998
Included observations: 38 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Constant	3.959271	0.444776	8.901715	0.0000
ln (Investment$_t$)	0.140157	0.016262	8.618912	0.0000
ln (Government$_t$)	0.190455	0.027742	6.865147	0.0000
ln (Export$_t$)	0.206479	0.032277	6.397055	0.0000
ln (GDP$_{t-1}$)	0.339417	0.070020	4.847454	0.0000
R-squared	0.999579	F-statistic		19581.76
Adjusted R-squared	0.999528	Prob (F-statistic)		0.000000
Log likelihood	102.7294	Durbin-Watson stat		0.853924

Source: Calculated from WDI data

3.2 Export Determinants: Domestic and International Factors

For examining the determinants of export, the *elasticity approach* is applied in the simple imperfect substitutes model. In our analysis, rather than dividing between

export demand and supply, determinants for both terms are included in a single equation, assuming the export volume to be simultaneously determined by equilibrium between the two terms. International trade theories provide models for demand, and supply of exports from country i, as follows:

Demand for exports from country i; $X_i^d = g(\overset{+}{Y^*}e, \overset{-}{PX_i}, \overset{+}{P^*}e)$ (3.2.1)

Supply of export from country i; $X_i^s = j\left[PX_i\overset{+}{(1+S)}, \overset{-}{P_i}\right]$ (3.2.2)[1]

Volumes of export from country i; $X_i = x(Y^*, P^*, PX_i, P_i, e)$ (3.2.3)

where Y^*, P^*, PX_i, P_i, and e represent foreign income, foreign price, domestic export price, domestic price, and exchange rate, respectively. It can be seen that explanatory variables in 3.2.1 and 3.2.2 can be combined into 3.2.3.

In Table 3.2, Thai indexed data from 1970 to 1999 from variables in 3.2.3 are regressed on the export quantum index, with 1972 being the base year for all series, except for the exchange rate that is transformed into its natural log value. Here, US data are used as a representative for foreign countries because of its dominance in the Thai export market. The result shows that all variables are included in the regression, but has no intercept term. While other variables appeared with expected signs, the US price level and real exchange rate turn out negative. This can be explained by the import contents of export products. Thai exports may have low local contents comparatively, and thus imports from the US are somewhat complementary to exports, rather than substitute. When the prices of capital and intermediate goods from the US faced by Thai importers become higher either due to the US domestic price level itself, or the effect of Baht depreciation, it adversely affect export-oriented industries in Thailand. This leads to the higher production costs, which are faced by Thai exporters, and thus results in lower export volumes. Note that the export values in Baht might be higher since one dollar is worth more as the Baht depreciates.

From the regression result, it can also be seen that the domestic price level, which appears with a positive sign, is also not relevant to what is suggested by theories. Regarding this, we can imply that Thai exports contain high volume of primary and

Table 3.2: Elasticity Approach of Export Determinants

Dependent Variable: Export Quantum Index
Method: Least Squares
Sample: 1970-1998
Included observations: 29

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Export Unit Price Index	−5.205096	0.608843	−8.549159	0.0000
Domestic Price Index	12.51929	1.411315	8.870652	0.0000
US GDP Index	14.04846	3.263861	4.304245	0.0002
US Domestic Price Index	−10.57136	1.146883	−9.217467	0.0000
ln (Real Exchange Rate)	−319.0703	85.36595	−3.737677	0.0010
R-squared	0.979795	Log likelihood		−163.6099
Adjusted R-squared	0.976427	Durbin-Watson stat		1.043769

Source: Calculated from ADB data

[1] Details of equations 3.2.1 and 3.2.2 are provided in Goldstein and Khan 1985, p. 1045.

labour-intensive products. This kind of products has relatively high price elasticities of supply, while its price elasticities of demand are rather constant. Thus, a high domestic price, which is likely to be under government control, may bring about the expansion of domestic production. When domestic consumption does not change much, the excess supply must be exported. Resultantly, the export unit value index is seemingly determined by demand and supply in the world market, while the domestic price is more under control. Note that this domestic price, in other words, is a price faced by domestic consumers and producers, and therefore, might already include effects from government subsidies, S, as available in equation 3.2.2. The situation will be more clearly analysed in later sections of this paper.

It should be admitted here, that efforts have been made in order to eliminate the effect of time trend that is likely to exist. But the statistically satisfying results have yet been reached so far. Since this point is not a topic of our main interest, we shall leave this problem untouched and move on to the next part of our analysis.

3.3 Expiring Export-led Growth

Our analysis here examines the direct effects of export on growth by using Thai time series data from 1970 to 1999. The relationship between the 1972-based export volume index, and the index of the GDP at constant 1990 prices for the same base year, can be provided as shown in Figure 3.1.

According to this graph, it can be implied that export has been serving as an important growth engine for a long time. However, the recent trend in this relationship suggests that the expiry date for this engine is getting closer. From the calculation based on polynomial regression model as appeared in the Figure 3.1 the highest GDP index that can be reached by growing export stays at 5.65 times that of the base year level in 1972. The approximate value of maximum GDP is slightly over 3.3 trillion Baht, compared with the highest record in 1996 of 3.47 trillion Baht. The optimal export index is at 16.33 times of the level in 1972. Thus the optimal export value is approximately 1.85 trillion Baht, while the 1999 record stood at 1.835 trillion Baht. It

Figure 3.1: Indices of GDP at Constant Prices and Export Volume

$$y = -5.60 \ e-08 \ x^3 + 0.4484 \ x + 76.6294$$
$$R^2 = 0.9873$$
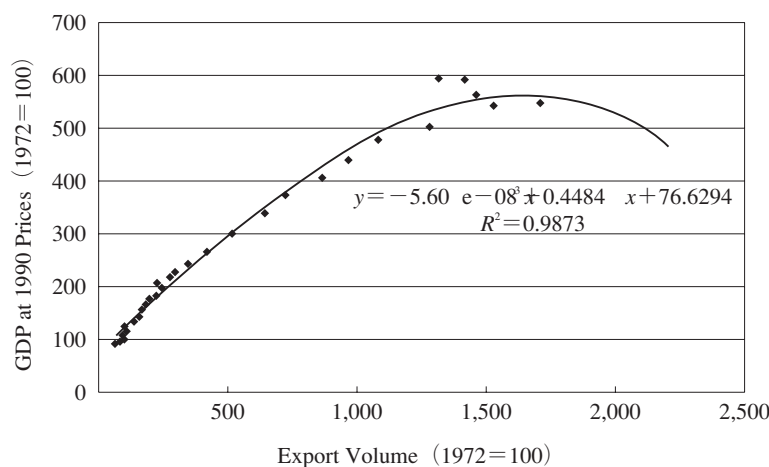
Source: Calculated from ADB data

should be, however, kept in mind that this data range covers also the period of economic and financial crisis, and that may more or less affect our analysis results. Still, it can be implied from the long-run trend as seen in the graph, that this ceiling, or the expiry date of export-led growth policy, is going to be reached sooner or later. The mechanism for deteriorating terms of trade in Thailand will be discussed in the following section.

4. Dealing with Deteriorating Terms of Trade

The problem of deteriorating terms of trade seems to be normally faced by most developing nations. In the Thai case, the index has dropped from 100 in 1972 to approximately 66.6 in 1999. However it should be noted here that export volume has been well above import volume for 20 years, while on the contrary, import price has been rising faster than export price.

4.1 Commodity and Income Terms of Trade

The terms of trade of a country can be defined as *the ratio of the price of its export commodity to the price of its import commodity*[2]. In practice, the commodity terms of trade can be calculated from the ratio of unit value indices of the country's exports and imports multiplied by 100:

Commodity Terms of Trade; $CTOT = (P_x/P_m)100$,

where P_x and P_m are export and import prices, respectively. Another kind of terms of trade is called income terms of trade, which can be defined as:

Income Terms of Trade; $ITOT = (P_x/P_m)Q_x$,

when Q_x is an index of the volume of exports. The income terms of trade index thus measures the country's export-based capacity to import. One implication is that even if the commodity terms of trade decline, the income terms of trade may rise, provided that export volume has risen high enough, and this is usually the case. The situation in Thailand is a good example, because the export quantum index has increased by 17 times from 1972 to 1999, and the income terms of trade has also risen by 11 times.

Taking into account the belief in export-led growth policy, that higher exports can lead to a higher level of GDP, as discussed earlier, it is likely that the government aims only at promoting export values, rather than concerning itself with the deteriorating terms of trade. Thus, it can be said that as long as the income terms of trade still rise, authorities can be satisfied[3]. This cannot be denied, because export is one of the main components of GDP, but questions arise about the sustainability of this concept. This issued shall be discussed in the next section.

---

[2] See more explanations in Salvatore 1995, p. 93.

[3] It is noteworthy that this is actually the case. Thai government authorities appeared to be deeply concerned about how can the total export values can be encouraged during the slowdown in 1996. The author provides a study about policies to promote maximum total exports via more efficient allocations of the official export credits supported by the Bank of Thailand in Banchong-Silpa and Wake, "Official Export Credits in Thailand: The Reallocation Analysis", 1998.

4.2 Views on Terms of Trade

It has been widely accepted that oil prices have a dominant role in determining terms of trade. Backus and Crucini (2000, p. 209) found that *changes in the terms of trade in major industrialised countries during the period 1972 to 1987 were driven primarily by the dramatic changes in the relative price of a single commodity-oil*. Bloch and Sapsford (1997) review the evidence of a downward-trend in the terms of trade between primary producers and manufacturers, which was previously found by Prebisch and Singer. The study finds an average decline in the terms of trade of primary producers of over 1 percent annually during the post-war period, proving the result of Prebisch and Singer, that *there is a secular decline in the terms of trade for developing countries in their dealings with industrialised countries, because exports from the developing countries are dominated by primary products and imports are dominated by manufactured goods* (Bloch and Sapsford 1997, p. 1873).

Kaneko (2000) analyses the terms of trade effects on growth rates, and concludes that the terms of trade can significantly affect growth when a country specialises in consumption products, while on the other hand, growth in a country that specialises in capital goods is not affected by terms of trade. Finally, a study by Mendoza (1997) suggests that the variability in terms of trade is a key determinant of growth, and that a mean-preserving increase of 1 percent in the variability of terms of trade reduces growth by slightly more than 0.5 percent, implying a large adverse effect of the variability of terms of on economic growth.

4.3 Rice-Oil Terms of Trade

In order to examine the deteriorating terms of trade situation in Thailand through a microeconomic approach, two representative commodities are presented for analysis, rice for export, and oil for import. It was discussed earlier that oil is well known as a major source of fluctuations in terms of trade, thus the commodity is assumed to have a dominant role in determining import movements. On the other hand, rice traditionally had been the single largest export commodity of Thailand until the early 1980's. And even now, Thailand is still the world's major rice exporter. Therefore, this commodity can be considered as a good representative for export products.

Before moving on to the analysis, it should be useful to provide some more ideas about the rice industry. It cannot be denied that rice is the main staple of the country's diet, and Thailand has always been a surplus-rice producing country (Krongkaew 1995). The rice sector has been intervened by the government since 1930s through various kinds of instrument, including export tax, rice reserve system, and most importantly, the Rice Premium that had remained in operations until 1986 (Dixon 1999). Although such policies appeared to be implicitly against rice producers, the practice has somehow changed to be more in favour of farmers from the early 1980s, with rising protection rates for imports (Siamwalla 1993). Rural credits have been provided, basically through the Bank for Agriculture and Agricultural Cooperatives (BAAC), while various price support schemes were introduced in order to maintain farm income, particularly rice growers. Sales through such support schemes account for high proportions of total sales, and the 52 percent peak was reached in 1989 (Dixon 1999).

Figure 4.1 compares between export/import and rice/oil commodity terms of trade. The ability of the two commodities to represent total terms of trade is provided in Figure 4.2. It can be seen that rice/oil terms of trade can explain 70 percent of the

Figure 4.1: Export/Import and Rice/Petroleum Commodity Terms of Trade
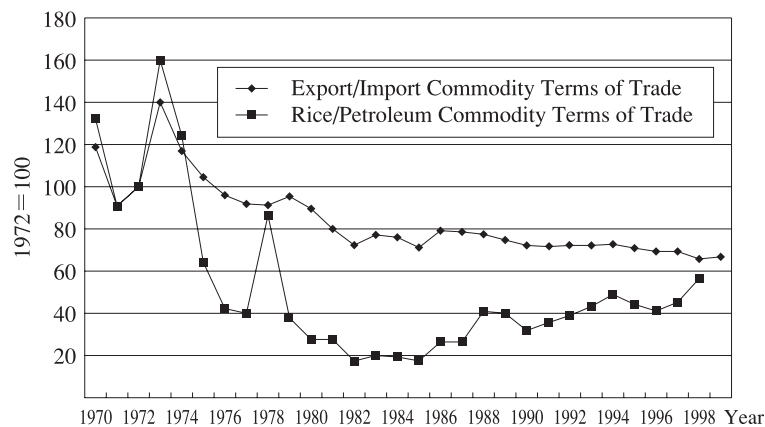
Source: Calculated from ADB and Bank of Thailand data

Figure 4.2: Export/Import and Rice/Petroleum Commodity Terms of Trade

$$y = 0.4039x + 63.367$$
$$R^2 = 0.6999$$
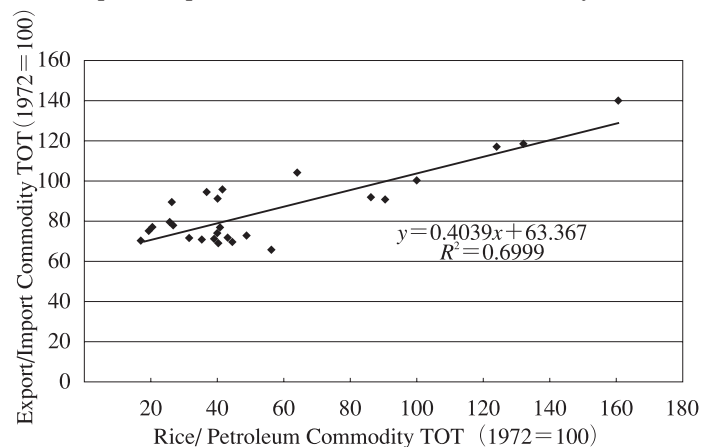
Source: Calculated from data in figure 4.1

fluctuations in the commodity terms of trade. Note here that relationships between both commodities have, however, lost their ability to represent the total terms of trade recently. A major reason is because rice has become the less important export item lately, with its continuously decreasing ratio to total exports. Nonetheless, taking into consideration the starting and ending points of our samples, it is obvious that the two commodities can be a fair combination for representing the long-run trend of total terms of trade.

Moreover, when the indices of oil import price and rice export price are used to explain movements in the commodity terms of trade from 1970 to1998, as shown in Table 4.1, it can be seen that both appeared as significant explanatory variables for the commodity terms of trade, with expected signs. This provides us a strong evidence that

Table 4.1: Determination of Commodity Terms of Trade[4]

Dependent Variable: Commodity Terms of Trade
Method: Least Squares
Sample: 1970–1998
Included observations: 29

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Constant	110.7985	4.363402	25.39269	0.0000
Oil Import Price Index	−0.016542	0.004221	−3.918573	0.0006
Rice Export Price Index	0.035018	0.016786	2.086156	0.0473
Number of Year	−1.553835	0.266491	−5.830724	0.0000
R-squared	0.810218	F-statistic		35.57665
Adjusted R-squared	0.787444	Prob (F-statistic)		0.000000
Log likelihood	−99.88245	Durbin–Watson stat		2.000654

Source: Calculated from ADB data

Figure 4.3: Indices of Domestic Rice Price and Production

$$y = 562.03 Ln(x) - 2496.6$$
$$R^2 = 0.7348$$
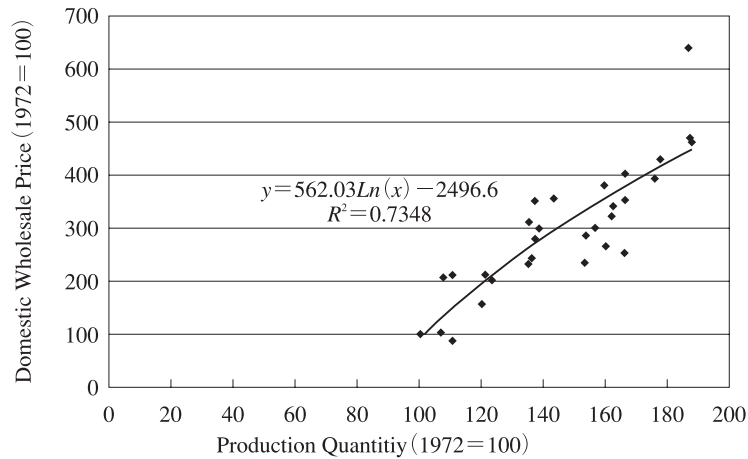
Source: Calculated from ADB and Bank of Thailand data

their market mechanisms that will be studied here and then applied for the general terms of trade, hence, should not be too far from reality.

With regard to rice product, we can see from Figure 4.3 that its production quantity is highly related to the domestic wholesale price of the commodity, which is more stable than the international price. As we discussed earlier, the domestic price also includes some government interventions. It can be inferred from the relationship that when the domestic wholesale price of rice is higher, there will be more rice production, and thus, a more domestic supply of rice.

---

[4]Results showed in the table are calculated from the indexed data, with 1972 being a base year, of export and import prices in Thai currency, while the commodity terms of trade are derived from the ratio of unit value indices of export to import, of the same base year. Needless to say that, here, the time variable is included in order to eliminate effects from using time series data. As a result, the problem of autocorrelation is not likely to occur, according to the Durbin–Watson d statistic here, which is extremely close to 2. Note that all independent variables are statistically significant at 1% level, except for rice export price index that is significant at 5% level.

Figure 4.4: Indices of Rice Domestic Price, Consumption and Export
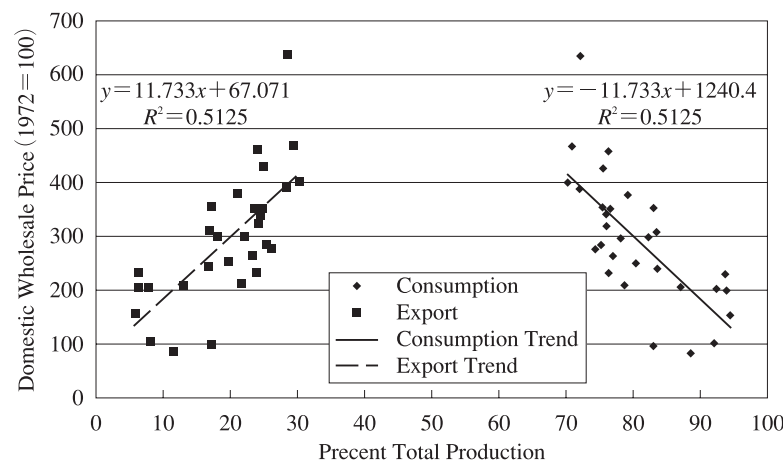
Source: Calculated from ADB and Bank of Thailand data

According to Figure 4.4, the domestic wholesale rice price not only determines domestic production, but also domestic consumption. It is observable that the ratio of domestic consumption falls at higher prices. The difference between domestic production and consumption are thus exported. Unlike consumption, export ratio rises as domestic wholesale prices increase. This should not be interpreted as consumption shrinks when price is higher. On the contrary, while the price and income elasticities of the demand for rice are rather low, the price elasticities of the supply for the commodity are higher. With a rising price, production increases while consumption stays constant, and the consumption to production ratio must naturally decrease. The export of rice, therefore, has a supply-pushed character as appeared in our previous analysis of the determinants of export. Hence, from the rice domestic wholesale price, we can ascertain the domestic production, consumption, and the export of the commodity simultaneously.

For the petroleum commodity, its import volume is related to GDP through an increasing polynomial function. The reason that supports this hypothesis is that, oil import demand is derived from domestic economic activities, rather than being determined by world prices. The oil import becomes greater as the GDP grows. Increases in oil import appear particularly with a sharper slope at higher levels of GDP. This can be explained by the fact that when the GDP grows higher, the demand for energy will also increase progressively, not only in manufacturing, but even more so in consumption at the household level. And it is reasonable to assume that fluctuations in oil prices are exogenously determined by the OPEC and world market, so the only remaining factor in our consideration of the terms of trade between both commodities is now just the rice export prices.

After leaving the oil import exogenous, now we can come back to the rice, our commodity of interest. From the nature of rice export, it is possible to explain how the export price mechanism works. Suppose the government wants to promote rice export by providing export subsidies[5] or price insurance, the selling price faced by producers

therefore becomes higher, and gives them more production incentive[6]. Now with higher production, if domestic consumption stays constant, the excess supply must then be exported. In the case of Thailand where it is a major supplier of the commodity, its exports can somehow affect the world price. It might seem unlikely to imagine that exports of a certain commodity from a country can significantly affect its international price. But it is also possible that many developing countries tend to specialise in similar primary products. In case that they happen to pursue such similar export promotion policies, the oversupply phenomenon that countries try to compete with one another with cheaper prices is likely to occur. This may lead to a lower level of the commodity's world price in the long run.

And for our above analysis, if one argues that there is no common consensus on results from interventions in rice industry, the sugar industry might be even a clearer example. Domestic price of sugar to consumers was maintained at a higher level than the world price in order to subsidise exports (Siamwalla 1993, p. 112). It is estimated that, without the government interventions, the Thai sugar industry would have shrunk to about a quarter of its size during a certain period. Thus, if the country's import (or oil) price is out of control, while its major export is suffering from a decline in the relative price caused by oversupply, the situation can be considered as deteriorating terms of trade.

4.4 Terms of Trade Effects on Immiserising Growth

The situation in Thailand as we have been through, somehow indicates the "Immiserising Growth" phenomenon, as firstly brought to attention by Bhagwati. Concerning this, Bhagwati (1998, p. 369) describes that *the welfare impact of growth in an open economy could be reduced because the primary gain from growth might be offset by the secondary loss from the possible deterioration in terms of trade. In some case, the secondary loss may even outweigh the primary gain, resulting in Immiserising growth.*

Now we shall link the immiserising growth to the deteriorating terms of trade. Imagine a developing country pursuing an export-led growth policy. The country then tries to promote its export industries by giving various forms of incentive to producers by transferring the economic surplus from other sectors to the export industry through allocations made by government. Developing countries are likely to specialise in primary products, and if the price of this export commodity declines due to a larger supply in the world market, this means that the country has transferred more and more surplus from other sectors, in an effort to promote more export which then gives back lower returns over time. In this way, the country must exhaust its resources sooner or later, and the return to labour in the (primary) export sector will show a downward trend. This may discourage domestic income distribution and international wage equality.

This brings us to the North and South model. Findley (1980) treats the terms of

---

[5] In the earlier study of the Official Export Credits, the writer shows that export credits given to rice industry made up one-fourth of total credits allocated, and sometimes can amount more than 60% of rice export values. However, the efficiency of credits distributed to this industry in encouraging its export is far from clear. (Banchong-Silpa and Wake 1998, op. cit.)

[6] Note that although this currently seems to be the case in Thailand, most benefits from such subsidies appeared to be taken by the rice exporters, rather than the farmers. However, here we shall ignore the existence of this middleman, assuming that the subsidies more or less are also transferred to the producers.

trade as a mechanism linking output growth rates in the North to those in the South. This study implies that *per capita income of the actual labour force will be continually rising in the North while it will be constant in the South* (p. 294). Findley then concludes that *trade is indeed an engine of growth for the economy of the South, but the power that drives that engine is generated by an exogenously determined natural growth rate of the North*. However, the most basic assumption is that *the South enjoys unlimited supplies of labour at a fixed real wage* (pp. 298-299). It is certain that the violation of this assumption was the main reason why Thai exports halted in 1996, which later led to the crisis.

Another study by Chichilnisky (1981) insists that as *export volume increases, the terms of trade of the South now worsen and real wages become more unequal across the two trading regions* (p. 184). This is not inconsistent with the Heckscher-Ohlin theory where they apply a different start line. The H-O theory makes comparisons between the situations of autarky and free trade, while Chichilnisky's model explains the situation when the volume of trade increases. The study suggests that *the relative advantage of the South, its abundant labour and labour-intensive exports, may be a handicap in export policies, bringing about a worsening of its terms of trade, and reinforcing a North-South factor price inequality. And a strong domestic structure is a better basis for a long-term success in export policies* (p. 185).

4.5 Deteriorating Terms of Trade: A Cost to Pay?

Most of the studies that we have been through have interpreted that an export-led growth policy brings about problems in the terms of trade in the long run, and therefore, is unsustainable. Moreover, evidences from the Thai case also indicate similar impressions. In the analysis of terms of trade between rice and oil, we assumed rice as a representative for traditional exports, such as land- and labour-intensives. But the relatively falling price of rice compared to oil brought about deteriorating terms of trade. If some export controls should be imposed in order to limit export supplies, then it would be against the ideal of free trade. The problem is that, in order to promote economic growth, which side deserves more of our attention, between the volumes and terms of trade, and what kind of international trade policy that should be conducted. Before making any policy decision on this, here we shall review the concepts of growth and terms of trade, as well as volume of trade[7].

Now let's picture the Heckscher-Ohlin theory with the standard $2 \times 2 \times 2$ model. Assume that country A is capital abundant, and thus exports capital intensive good, while imports labour intensive good from country B, which is of course, labour abundant. With a homothetic utility function of the two countries, it can be proved that when labour supply increases in B, while there is no economic growth in A, the terms of trade would move against B and in favour of A. The reverse is also true. This kind of growth is however regarded as pro-trade biased (as volume of trade has increased). On the contrary, if the capital stock increases in B, the terms of trade would move in favour of B, while the volume of trade decreases (therefore, becomes anti-trade biased economic growth).

Considering the economic growth occurred from technological progress. It can also be seen that technological progress in importable sector (capital intensives for B)

---

[7] The detailed graphical explanations of ideas in this part are available in Borkakoti, *International Trade: Causes and Consequences* (Chapter 17: International Trade and Economic Growth), 1998, pp. 249-262.

moves the terms of trade in favour of the growing country (B) and appears to be anti-trade biased growth. Similarly, the technology progress in the exportable sector (capital intensive for A) would lead to a deteriorating terms of trade for the growing country (A). This latter phenomenon would lead to a higher volume of trade, and thus is called pro-trade biased growth.

According to this idea, the economic growth is not necessarily associated with deteriorating terms of trade. On the other hand, improvement in terms of trade appears to bring about less international trade. A country can have growth through increasing stocks of its scarce (or less abundant) factor of production or technological progress in its importable sector, without being moved against by the terms of trade. But this results in anti-trade biased growth. But it should also be kept in mind that we should not, however, take for granted that *more trade is always free trade*. Within the framework we have discussed here, with economic growth (from a certain source) in one country, trade volume can decrease without any interference. This is also free trade. But again, note that being too much aware of adverse results from deteriorating terms of trade, a government is likely to impose some protectionist interventions. According to Meier (1998, p. 69), this may leads to *the possibility of retaliation by other countries, with a resultant trade war that makes everyone worse off*. As while *the free trade is based on a cosmopolitan viewpoint, with all trading nations benefiting in a positive sum game, in contrast, protectionist arguments are based on national advantage: What one country gains another loses in a zero sum game*.

5. Allocations of Domestic Labour Forces

Since the export-led growth policy appeared to provide unsustainable growth for the economy, here we are proposing a more inward-oriented solution. Consider a closed economy with two sectors, agricultural and non-agricultural, with labour as the only factor of production mobile between both sectors. Figure 5.1 illustrates value

Figure 5.1: Indices of Value Added GDP Components
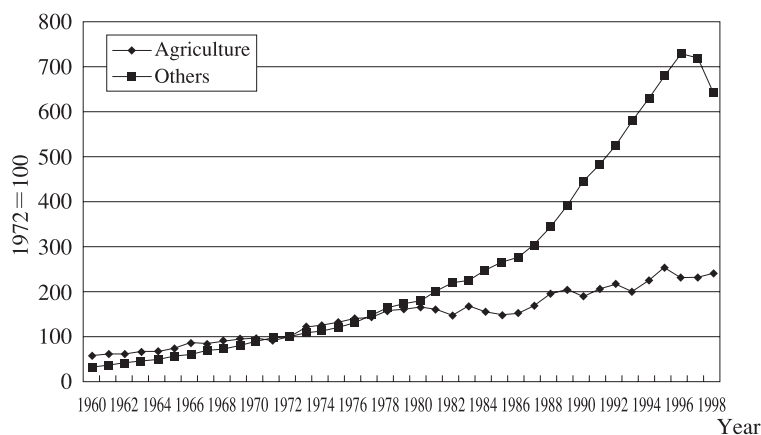
Source: World Development Indicators (WDI)

Figure 5.2: Agricultural Labour Proportion and Value Added

$$y = -8610907x^2 + 7.74E + 08x$$
$$R^2 = 0.9620$$
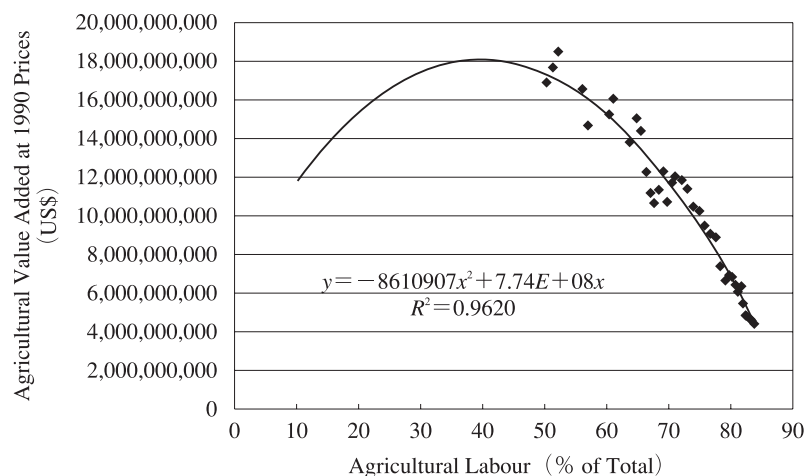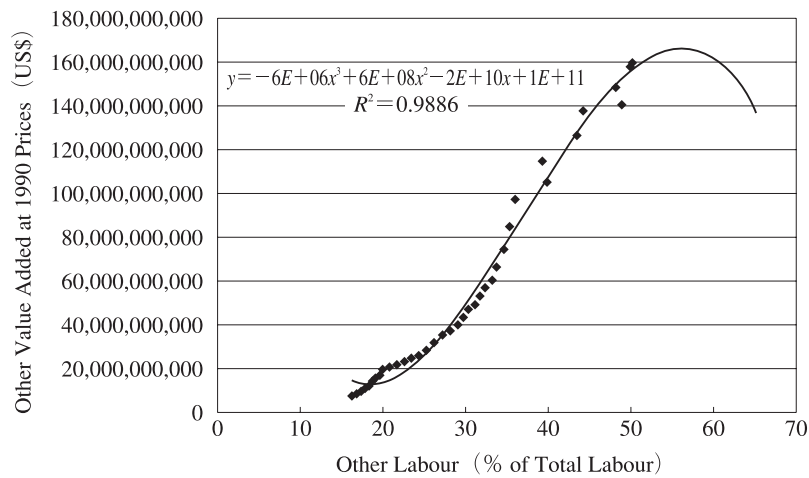
Source: Calculated from WDI data

added indices for each sector in Thailand, with 1972 as the base year. It can be seen that both sectors appear to have an upward trend of value added over time, wherever the non-agricultural sector has been growing with a much higher speed recently, and has made a downturn since the crisis.

Taking into account the labour productivity of each sector due to its labour allocation, it can be seen from Figure 5.2 that the agricultural value added has a backward decreasing relationship with the ratio of labour forces employed in the sector. Beyond its peak at around 40 percent of labour, the value added of the agricultural sector appears to incline sharply. Meanwhile, in Figure 5.3, it is observable that an increase in the ratio of labour employed in the non-agricultural sector brings about a rapid rise in its value added, until it reaches a certain level of labour ratio, between 50 and 60 percent. After that level, increases in the labour ratio also lead to a lower level of value added. One explanation for this situation lies in the theory of *the law of diminishing marginal productivity*[8].

Assuming the domestic pool of labour as a limited resource, we can apply logic to its allocation by using a similar concept as once used in a previous study from the Official Export Credits of Thailand. The principle is to put more emphasis on the comparative advantage of each sector, rather than on the total GDP. In other words, domestic labour should be allocated in order to reach the maximum possible level of value added in each sector firstly, and then secondly, the value added from the two sectors shall be combined together. Under this assumption, the optimal level of GDP is the summation of each optimal sectoral value added level[9].

The relationship between the ratio of labour and the value added of each sector are arranged in polynomial regression models. Agricultural value added is regressed on a ratio of labour in this sector in a second-degree polynomial regression, while that of

---

[8]See more about the production function in Maddala and Miller, *Microeconomics: Theory and Applications* (Chapter 6), 1989, pp. 159-191.

Figure 5.3: Other Labour Proportion and Value Added

$$y = -6E + 06x^3 + 6E + 08x^2 - 2E + 10x + 1E + 11$$
$$R^2 = 0.9886$$

Source: Calculated from WDI data

Figure 5.4: Optimal Allocations of Domestic Labours
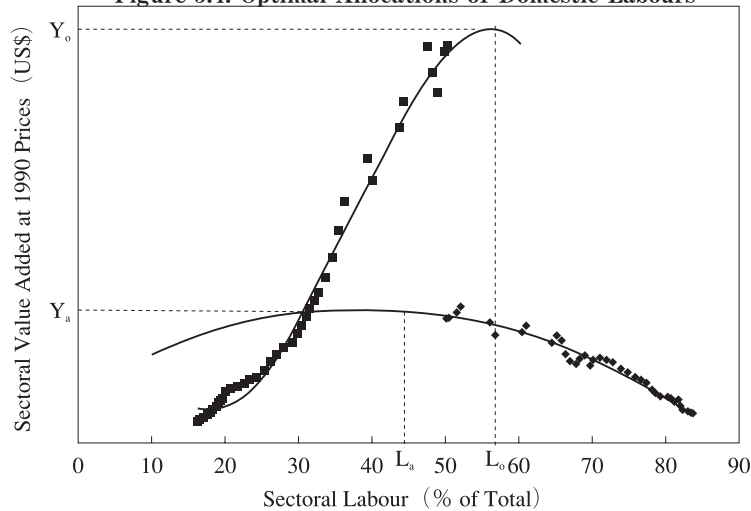
Source: Calculated from WDI data

the non-agricultural sector is in a third-degree function. Figures 5.2 and 5.3 can be presented together as in Figure 5.4.

By applying calculus tools, it is possible to obtain an optimal level of labour ratio

---

[9] In the previous study, the writer assumes the amount of the Official Export Credits provided by the Bank of Thailand to be limited resources used for subsidising export industries. The study focus how can this credit be most efficiently allocated to industries. However, this allocation is done under the concept of comparative advantage, which gives priority to the industry that has potential to reach its maximum output, although this maximum output may be far below the level that can be reached in other industries. The concept is named as comparative advantage because it emphasises more on the opportunity costs an industry will face by not receiving the optimal level of credits. Thus, it might be more accurate to call this idea as *the comparative optimal allocation*, not the maximum allocation. (Banchong-Silpa and Wake 1998, op. cit.)

Table 5.1: Results of the Labour Allocation Simulation

Sector	Labour Ratio (%)	Value Added (US dollar)
Agricultural	L_a=44.00	Y_a=17,385,284,050
Non-agricultural	L_o=56.00	Y_o=169,966,588,400
Total	100.00	Y_{total}=187,351,872,450

Sources: Authors' calculation

in each sector, L_a and L_o for agricultural and non-agricultural, respectively, which maximises the value added of each sector, Y_a and Y_o. However, since the explanatory variables used are the sectoral labour ratios, these are then subjected to the constraint that the summation of L_a and L_o must equal 100.

$$\bar{L}_t = L_a + L_o = 100$$

Surprisingly, the optimal labour ratios for each sector are 44.9430 and 55.9974 percent, for the agricultural and non-agricultural sectors, respectively. Thus their summation is 100.9404 percent, which is unusually close to the limit of 100. For simplicity, we rounded the ratios to 44 and 56 percent, and then calculated the maximum value added for both sectors, as well as their summation, as shown in Table 5.1. It should be noted here that the maximum total value added obtained from our calculations is higher than any actual figures up to 1998. The peak actual value added in 1996 stood at around US $177 billion, while the maximum value estimated by our study is over US $187 billion. That means the maximum GDP could be increased through our proposed labour allocation by approximately 5.6 percent. Concerning the actual labour ratios, 51.25 percent of labour is employed in the agricultural sector, while the other 48.75 percent is in the non- agricultural sector. This means that the country should shift another 6 percent of labours towards its non-agricultural sector. To be more concrete, at the moment, some half of 61 million population of Thailand, or 36 million are regarded as labour forces. Thus, according to the simulation result, another 6 percent out of 36 million, or another 2 million labours, have to be driven out from the agricultural sector.

Here, we can also compare the maximum GDP, which is derived from the optimal export level as in the second section, with the maximum GDP, obtained from the allocation of domestic labours, provided in this section. The former is 5.65 times of the 1972 base year level, while the latter is 6.35 times of the 1972 GDP level. This implies more effectiveness of the inward-oriented policy rather than export-oriented one. And through this inward-oriented policy, at least domestic resources are consumed domestically.

6. Concluding Remarks

What can be implied from the result of this study is that the terms of trade problem does matter. A country may be able to enjoy the benefits from trade with regards to its economic growth up to a certain level. Beyond that criteria, more trade would, instead adversely affect the country's welfare. This study finds that the situation is completed through the export price mechanism. Developing countries are likely to specialise in primary, or labour-intensive products. Export promotion schemes

appear to provide more incentives for producers, while domestic consumption is rather inelastic. Export supply thus increases and eventually leads to a reduction in the world price of that export product. At the same time, a surplus in the country is likely to be depleted by its being transferred to the export sector, with a diminishing return over time.

In order to avoid the negative impact from deteriorating terms of trade, our discussion implies that a country like Thailand can either increase its stocks of less abundant factor, or improve the production technology for its importable. Although that might bring about less volume of trade, it still does not violate any rules of free trade. However, one should be aware that the foreign-owned source of growth might convert the possibility of immiserisation into the necessity (Findlay 1984, p. 203).

With the idea that an export-led growth policy is not applicable in the long run, we must then try to place more emphasis on an inward-oriented policy that might lead us to a more sustainable development path. Our analysis via a microeconomic approach suggests that Thailand is likely to reach a higher level of domestic output, or GDP, by a more efficient allocation of its domestic labour forces. This study estimates the optimal proportion of labour employed in the agricultural and non-agricultural sectors. It can be inferred that the country should allocate slightly higher labour proportions in its non- agricultural sector. The important task to be prepared for this optimal allocation of domestic labours, is to ensure that the 2 million people driven out from agricultural sector can be absorbed by industrial and service sectors, with higher productivities.

Another important implication is that, in order to avoid the worsening terms of trade, the country should reconsider their interventions in export-oriented industries or expenses of others. Distorted prices in agricultural sector caused by interventions seem to discourage efficient resources allocation, both domestically and internationally. And to refrain from intervening perhaps may automatically help improving terms of trade, as well as indirectly drive out excessive labours out of the unproductive sectors. Trade and international specialisation are obviously beneficial, but they must lie on the fact that optimal resource allocation must not be distorted as well.

Although the crisis was mainly caused by a combination of financial factors, the export slowdown is claimed to be its trigger. The result of our study shows that one important reason for the slowdown is the worsening terms of trade. If the problem can be solved, then the validity of an export-led growth policy can be renewed for another while. An export-led growth policy does have its limitations, but with an appropriate combination of domestic conditions and related policies, exports should still be a high -powered engine for economic growth.

Bibliography

Asian Development Bank, *Key Indicators of Developing Asian and Pacific Countries*, ADB, Oxford University Press, NY, 1999.

Backus, David K. and Crucini, Mario J., "Oil Prices and the Terms of Trade", *Journal of International Economics*, Vol. 50, No. 1, February 2000, pp. 185-213.

Banchong-Silpa, Rapipongs and Wake, Yoko, "Official Export Credits in Thailand: The Reallocation Analysis", *Keio Business Review*, No. 36, 1998, pp. 1-24.

Bank of Thailand, *Monthly Bulletin*, 1980-2000, Bank of Thailand.

Bhagwati, Jagdish N. et al., *Lectures on International Trade 2nd Edition*, MIT Press, Cambridge, 1998.

Bloch, Harry and Sapford, David, "Some Estimates of Prebish and Singer Effects on the Terms of Trade between Primary Producers and Manufacturers", *World Development*, Vol. 25, No. 11, November 1997, pp. 1873-1844.

Borkakoti, Jitendralal, *International Trade: Causes and Consequences*, Macmillan Press, Hong Kong, 1998.

Chichilnisky, Graciela, "Terms of Trade and Domestic Distribution: Export-Let Growth with Abundant Labour", *Journal of Development Economics*, Vol. 8, 1981, pp. 163-192.

Chowdhury, Khorshed, "The Relationship between Trade and Growth: International Evidence", in Paul, Satya (ed.), *Trade and Growth: New Theory and the Australian Experience*, Allen & Unwin, Australia, 1998, pp. 123-131.

Dixon, Chris, *The Thai Economy: Uneven Development and Internationalisation*, Routledge, New York, 1999.

Findley, Ronald E., *International Trade and Development Theory*, Columbia University Press, USA, 1973.

Findley, Ronald E., "The Terms of Trade and Equilibrium Growth in the World Economy", *The American Economic Review*, Vol. 70, No. 3, June 1980, pp. 291-299.

Findley, Ronald E., "The Fundamental Determinants of the Terms of Trade", in Grassman, Sven and Lundberg, Erik (eds.), *The World Economic Order: Past and Prospects*, Macmillan Press, Hong Kong, 1981.

Findley, Ronald E., "Growth and Development in Trade Models", in Jones, Ronald W. and Kenen, Peter B. (eds.), *Handbook of International Economics*, vol. I (Chapter 4), Elsevier Science Publishers B.V., Amsterdam, 1984, pp. 185-236.

Goldstein, Morris and Khan, Mohsin S., "Income and Price Effects in Foreign Trade", in Jones, Ronal W. and Kenen, Peter B. (eds.), *Handbook of International Economics II*, Elsevier Science Publishers B.V., Amsterdam, 1985, pp. 1041-1105.

Kaneko, Akihiko, "Terms of Trade, Economic Growth, and Trade Patterns: A Small Open-Economy Case", *Journal of International Economics*, Vol. 52, No. 1, October 2000, pp. 169-181.

Karunaratne, Neil D., "Exogeniety Modelling of Growth and Trade", in Paul, Satya (ed.), *Trade and Growth: New Theory and the Australian Experience*, Allen & Unwin, Australia, 1998, pp. 132-143.

Krongkaew, Medhi, "Contributions of Agriculture to Industrialization", in Krongkaew, Medhi (ed.), *Thailand's Industrialization and its Consequences* (Chapter 2), St. Martin's Press, New York, 1995, pp. 33-65.

Krueger, Anne O., "Threats to 21st-Century Growth: The Challenge of the International Trading System", in Landao, Ralph et al. (eds.), *The Mosaic of Economic Growth*, Standford University Press, California, 1996, pp. 191-214.

Madala, G. S. and Miller, Ellen, *Microeconomics: Theory and Applications*, McGraw-Hill, International ed., Singapore, 1989.

Meier, Gerald M., *The International Environment of Business: Competition and Governance in the Global Economy*, Oxford University Press, New York, 1998.

Mendoza, Enrique G., "Terms-of-Trade Uncertainty and Economic Growth", *Journal of Development Economics*, Vol. 54., No. 2, December 1997, pp. 323-356.

Salvatore, Dominick, *International Economics 5th Edition*, Prentice Hall, USA, 1995.

Siamwalla, Ammar et al., "Agriculture", in Warr, Peter G. (ed.), *The Thai Economy in Transition* (Chapter 2), Cambridge University Press, Hong Kong, 1993, pp. 81-117.

Siamwalla, Ammar and Setboonsarng, Suthad, *Trade, Exchange Rate and Agricultural Pricing Policies in Thailand: Comparative Studies on the Agricultural Pricing Policy*, World Bank, Washington DC, 1989.

Suphachalasai, Suphat, "Export-led Industrialization", in Krongkaew, Medhi (ed.), *Thailand's Industrialization and its Consequences* (Chapter 3), St. Martin's Press, New York, 1995, pp. 66-84.

Thailand Development Research Institute Foundation (TDRI), *Study Project on Export*

Forecast of 20 Major Export Products from Thailand to the World Market, TDRI, Bangkok, 1998.

Warr, Peter G., "The Thai Economy", in Warr, Peter G. (ed.), *The Thai Economy in Transition* (Chapter 1), Cambridge University Press, Hong Kong, 1993, pp. 1–80.

Warr, Peter G., "What Happened to Thailand?", *The World Economy*, Vol. 22, No. 5, July 1999, pp 631–650.

Warr, Peter G., "Case Study: Thailand", in Das, Dilip K. (ed.), *Asian Exports*, Oxford University Press, Hong Kong, 2000.

Warr, Peter G., "Myths about Miracles: the Case of Thailand", *Journal of International Trade and Economic Development*, Vol. 9, No. 1, March 2000, pp. 115–134.

Warr, Peter G. and Chaiyindeepum, Soonthorn, "Thailand: Trade Shocks and Domestic Responses", in Collier, Paul et al. (eds.) *Trade Shocks in Developing Countries Volume 2: Asia and Latin America*, Oxford University Press, NY, 1999, p. 201–232.