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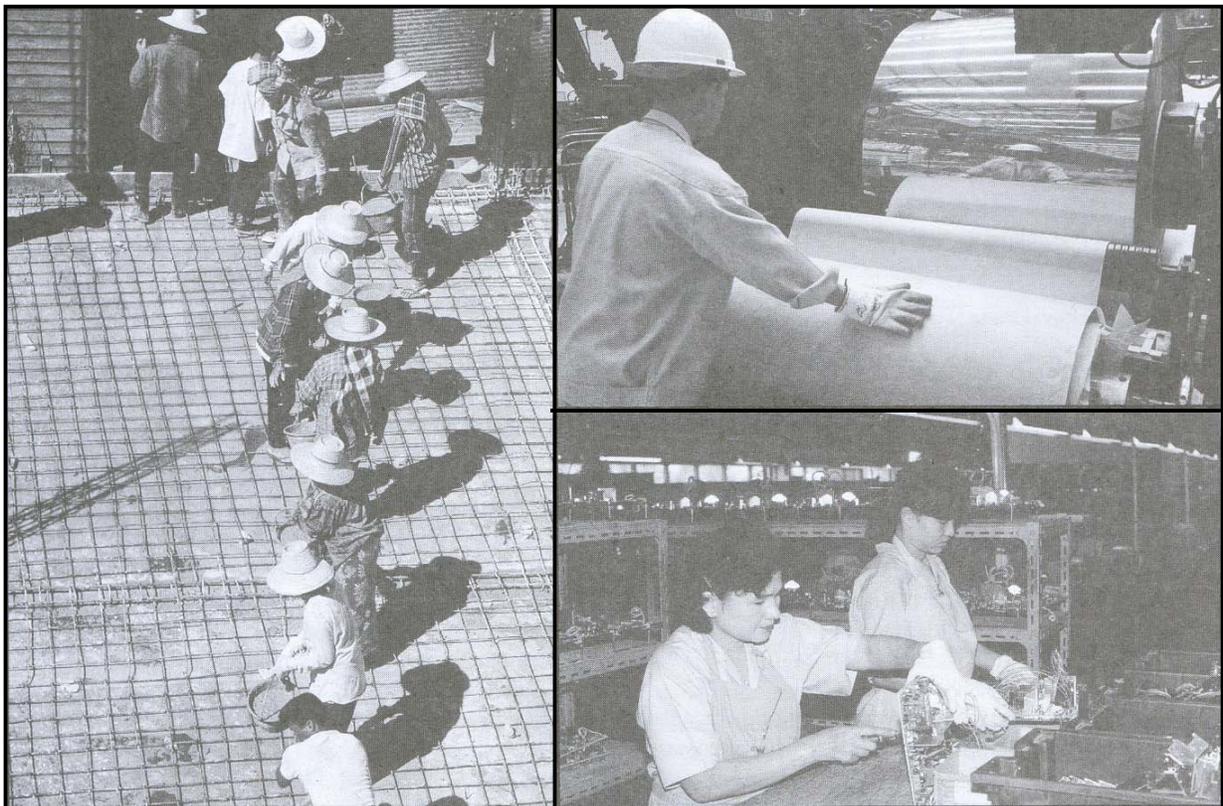
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Since the first release of the national development plan in 1961, Thailand has transformed from a less appealed place for foreign investors to become a remarkable regional investment 'hot spot.' This striking success was undeniably owing to all country's development plans that were employed throughout four decades. See related article on page 3.

The Thai Economy: A Picture from the Past

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HISTORICAL BACKGROUND

The origin of the Thai people can be traced to southern China around 1,000 years ago. After coming to present-day Thailand, they formed the Sukhothai Kingdom around 1238, following a rebellion against the ruling Khmers. In 1350 the Kingdom was moved to Ayutthaya. In 1767 Burmese invaders completely destroyed Ayutthaya. The Kingdom was reunified under King Taksin, a survivor of the rout. He established his base in 1768 at Thonburi along the western side of the Chao Phraya River. In 1782 the capital was moved to Bangkok on the opposite bank by King Buddha Yodfa (Rama I, 1782-1809), who was the first king in the Chakri Dynasty. The foundations of modern Thailand were laid by the Chakri Dynasty, which progressively extended the rule of Siam – south along the Malay peninsula, north to Laos and east into Cambodia.

Although there had been varied and long-established trading and diplomatic contacts with the West since the early sixteenth century (Ayutthaya period), the 1850s became a watershed in Thailand's development. From this period the Thai economy became incorporated into the Western-dominated global economy. The Kingdom also became a supplier of raw materials, a buyer of cheap manufactured goods and a field where foreign, particularly British, capital could develop economic activity (Dixon 1999, 27).

Indeed, from the early 1800s Thailand had been brought into close contact with Britain. During the era of rapid colonization, the British spread their influence into the Malay peninsula through Penang in 1786. Singapore was occupied in 1819, Malacca in 1824, and Assam, Arakan and Tenasserim of Burma in 1826. In the 1850s Britain annexed the whole of Lower Burma and in 1885 Upper Burma. Further, during the 1870s the major Malay states were occupied. Meanwhile, the French in the 1860s established control over Cambodia and Cochinchina.

During the reign of King Mongkut (Rama IV, 1851-1868), the relationship between Thailand and the

Western powers was strengthened, mainly owing to Thailand's awareness of the danger posed by imperialism. Moves were made to introduce into Thailand Western ideas, methods and institutions (Dixon and Parnwell 1991, 214).

European imperialism was a powerful force and Thailand could not escape its pressure. For example, the Bowring Treaty was negotiated and signed in the presence of the British navy (Dixon 1999, 30). Under the Bowring Treaty, Thailand agreed in its economic policy to embark on some free trade. However, unlike similar treaties Western powers signed around that time with China and Japan, the treaty with Thailand was apparently signed without much overt coercion from the British (Warr and Bhanupong 1996, 8). Nonetheless, in 1867 the Kingdom ceded its claim on Cambodia to France and later recognized French control over Laos.

King Chulalongkorn (Rama V, 1868-1910) is given credit for preventing the colonization of Thailand, for establishing its modern civil service, and for abolishing slavery. He also introduced cabinet government and created a standing army. During this period, free-trade policies promoted the expansion of agricultural exports but did not produce rapid economic growth, and there was virtually no structural change (Warr and Bhanupong 1996, 9). Agricultural exports were the main source of both foreign exchange and government revenue. Agricultural growth was not driven by improved productivity but by expansion of the area of land under cultivation (Ammar, Suthad, and Direk 1993 in Warr and Bhanupong 1996, 9). Land remained abundant until the 1960s. Those reforms and the country's pragmatism helped to preserve Thailand's independence: in 1917 the Kingdom entered the First World War on the side of the allies, while in the Second World War it sided with Japan.

King Vajiravudh (Rama VI, 1910-1925) succeeded the popular monarch, but during his rule, the government's financial position weakened, owing mainly to the expenditures required for the King's modernization program, as well as his own

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extravagance. For example, in 1911 the King organized his second coronation in grand style, with foreign dignitaries in attendance. The affair cost about 4.5 million baht, which at that time represented nearly 8 percent of the national budget. Such lavish spending provoked a plot in 1912 to overthrow him. During the period 1919-1922, Thailand experienced its first financial crisis when the global price of silver rose sharply. This resulted in the flight of silver out of the country and the revaluation of the baht against the pound sterling. At the same time the price of rice increased fivefold. Consequently, the real income of civil servants fell drastically in relation to those in commerce.

When King Prajadhipok (Rama VII) ascended the throne in 1925, the government was in serious financial trouble. Thailand had suffered severely during the deep global recession of the late 1920s and the Great Depression of the early 1930s. However, because of Thailand's less intensive assimilation into the market economy, and—for the majority of the population—a much lower level of direct dependence on the export of commodities generally, the adverse impacts of the recession were mitigated in Thailand. During the 1920s there was a movement against the monarchy. The absolute monarchy was increasingly criticized and depicted as a major barrier to Thailand's development. The economic difficulties and recession during this period gave additional impetus to the movement against the absolute monarchy (Dixon 1999, 59-61). On June 24, 1932 a coup d'état grasped power from the monarchy. Two days later a constitution was promulgated that reduced royal power to the absolute minimum without actually abolishing the monarchy.

The ensuing period (1932-1938) was far from politically stable: there was a second coup d'état in 1933, followed by elections in 1933, 1937 and 1938. In 1938 Field Marshal P. Phibun Songkhram became prime minister.

In 1939, the country's name was changed from "Siam" to its present English-language name "Thailand." "Siam" is a non-Thai word (possibly Khmer or Chinese) that came into use after its formal appearance in the nineteenth-century treaties with Britain and France. "Thailand" is a literal translation of the Thai-language name for the country (Warr and Bhanupong 1996, 9).

Phibun Songkhram's government was to an extent nationalistic and militaristic. The landing of Japanese troops in Thailand at the same time as the attack on Pearl Harbor was weakly resisted. The subsequent rapid passage of Japanese troops through Thailand to attack Malaya and Burma and the declaration of war on the Allied Powers resulted in serious damage to Anglo-Thai relations in the post-war period (Dixon 1999, 68).

Disaffection with the Japanese occupation and with the Phibun Songkhram regime gave rise to the Free Thai Movement (Seri Thai) under the leadership of Pridi

Banomyong. The Seri Thai conducted small-scale sabotage against the Japanese troops in cooperation with Chinese workers and businessmen. After 1941, underground communist organizations worked in a united front with the Seri Thai. With the decline of Japan, Thailand's military leaders were deposed and the Seri Thai group led by Pridi took over the offices of government (Pasuk and Baker 2002, 196).

The period from 1944 to 1947 was a rough one politically and economically, with five governments and ten cabinets. Inflation reached 100 percent during the period, and overt official corruption increased public unrest. The civilian government was further destabilized by the mysterious death of the young King Ananda (Rama VIII) who was found shot in bed in 1946 (Dixon 1999, 69). In 1947 a military coup overthrew the government and resulted in the establishment of a military government under Phibun Songkhram in 1948. Phibun Songkhram was prime minister from 1948 to 1957, when he was forced into exile as the result of a coup sparked by charges of election-rigging (Warr and Bhanupong 1996, 13). Field Marshal Sarit Thanarat, who took control, appointed two prime ministers, first Pote Sarasin (September-December 1957) and then General Thanom Kittikachorn (January-October 1958). In October 1958 Sarit assumed the premiership himself. Sarit's government soon arrested many people it suspected of being communists and dissolved Parliament. However, an important event, which may be considered a milestone in Thailand's modern economic system, was a World Bank advisory mission sent in 1957 to work with Thai counterparts. In addition to making a number of sensible economic recommendations, this technical assistance mission resulted in the adoption of Thailand's First National Economic Development Plan in 1961.

With Sarit's death in December 1963, power shifted to a new military alliance headed by Generals Thanom Kittikachorn and Prapass Charusathien. Thanom became the prime minister and Prapass assumed the powerful posts of the commander-in-chief of the army and minister of interior. After the military's dissolution of Parliament in November 1971, the government continued to ban political parties and political gatherings despite its promise to restore democratic institutions. The military government of Thanom Kittikachorn became unpopular, particularly among university students, the Bangkok-based middle class, heavily suppressed labor organizations, and farmer groups. The opposition centered on the increasingly politicized Bangkok-based student movement organized under the National Student Center of Thailand (NSCT) and the illegal rural-based Communist Party of Thailand (CPT). From the end of 1972 there was an escalation in the number of demonstrations and clashes with the police. In early October 1973, 13 students were arrested for distributing leaflets calling for a constitution. They were charged with treason and attempting to overthrow

the government. Protests against their arrest escalated. On October 14, 1973, riot police, the army and demonstrating students clashed. Several government buildings including police stations were attacked. Over 100 students were killed.

The military government, in preparation to suppress the demonstrators by force, was held back by another military power, Army Commander-in-Chief General Krit Sivara, who refused the order of Prime Minister Thanom and Supreme Commander and Deputy Prime Minister Prapass to use army tanks en masse to crush the demonstration. Following the resignation of the government on October 14, the King (Rama IX) personally selected Sanya Dharmasakti as the new prime minister. More importantly, the King the next day ordered Thanom, Prapass and Narong, Thanom's son, to leave the country. This unprecedented action shows clearly that the King was no longer a mere symbol to be manipulated by the government in power, he had become a significant center of authority in his own right (Keyes 1987, 84 quoted by Dixon 1999, 96). Indeed, it shows why the King is deeply respected and beloved by the people and even the army.¹

Subsequent to the Sanya government (1973-1975), there have been 15 governments including the present one. The last coup, led by General Suchinda Kraprayun, overthrew the Chatichai Chuhavan government in February 1991. The Suchinda government was ousted in May 1992.

ECONOMIC DEVELOPMENT IN THE 1960s

The economic development process involves a large number of social, political, administrative, and external factors, both in terms of causes and consequences. To give a full account of those factors is impossible, while to give a sufficient account of them would require a few thick books. Since there are a number of good books on the Thai economy, as already listed in the references, it is justified to keep this paper brief and focus on salient features of the country's economic development. For the sake of convenience, the paper refers to the National Economic and Social Development Plan periods as a reference.

The First National Economic Development Plan (1961-1966) can be taken as a milestone in the modern economic development of Thailand.² To be sure, many studies consider the coup of October 1958 and the establishment of the regime of Sarit Thanarat as marking the beginning of Thailand's modern economic development. Yet, it is also argued that the foundations (for modern economic growth) were laid during the 1950s by the Phibun Songkhram government. During 1957 and 1958 there were clear signs that the Phibun Songkhram government was beginning to shift economic policy in the directions recommended by the 1957 World Bank mission and toward those

subsequently followed under Sarit (Ingram 1971, 231, quoted in Dixon 1999, 77). Since the release of the First Plan, Thailand has now completed eight Plans³ and is currently in its Ninth Plan period (2002-2006). The national development plans, especially the earlier ones, have played an important role in guiding investment and public resource allocation in Thailand by putting forth guidelines for economic and social development, particularly during the first half of more than 40 years of development planning.

As a background, prior to the formulation of the First Plan, in 1946 the government obtained loans from India and the United States; from 1950 the World Bank began to lend money to Thailand for the construction of infrastructure such as roads, railways, irrigation and electric power generation. Foreign loans, grants and overseas investment became regular features of the economy from the early 1950s. These developments were closely related to the United States increasing involvement in the Asian and Pacific region (Dixon 1999, 78-79). The need to monitor and manage overseas loans, grants and investment led to the establishment of related agencies such as the National Economic Council (1950) to look after national income statistics, the Thai Technical and Economic Cooperation Committee to look after requests for aid, the National Economic Development Board (1959) to provide economic planning, followed by the Board of Investment, the Bureau of the Budget, and the Office of Fiscal Policy (1959-1960). In addition, a series of new agencies and councils were established to facilitate policy formulation and coordination in such areas as education and power generation. These agencies, including the established ministries, struggled with individual problems, conflicts of interest, and policy. However, in terms of development planning programs, these were increasingly coordinated.

The First Plan had a single objective, namely, economic growth, with the fundamental assumption that rapid economic growth was the key to development, and that this could not take place without an adequate infrastructural network, including transportation and communication facilities, irrigation systems, public utilities such as power, and so on (Abonyi and Bunyaraks 1989, 23). The fostering of the manufacturing sector was central to the Plan, while the expenditures on agriculture were low and myopic given the sector's importance, low productivity and the possibilities for crop diversification (Dixon 1999, 81). It was noted by a former Secretary General of the National Economic and Social Development Board (NESDB) that the First Plan set a variety of vague and generally unrealistic national targets which were at best projections of likely and desirable trends that seemed to correspond with the intentions of the planners (Phisit 1975, 8, quoted in Dixon 1999, 81). In terms of content, the Plan was primarily an aggregation of the perceived needs of various government agencies for infrastructure

development, or a financial allocation plan focusing on infrastructural development (Abonyi and Bunyaraks 1989, 23-24).

During the First Plan, economic growth was rapid and broadly based. The annual GDP growth rate averaged 8.1 percent.⁴ As could be expected, infrastructure and construction had the highest growth rates, at 22.3 and 17.8 percent, respectively (Warr and Bhanupong 1996, 71). Agricultural output also expanded rapidly, at an average growth rate of 6.2 percent. To a great extent this was due to a favorable internal and external climate, namely, the attitude of the government regarding expanded public expenditure, favorable global demand for Thai products, and U.S. military spending in the economy. The infrastructural investment during the First Plan also contributed significantly to the diversification and expansion of commercial agriculture (Hirsch 1990, 50). Despite a rapid rate of population growth, i.e., 3.5 percent annually, per capita income rose by 4.8 percent per year.

The Second Plan (1967-1971) was still largely a public expenditure program, although it was more comprehensive in design than the First Plan. The scope of the Plan was extended to consider social issues, and its title was changed to the "National Economic and Social Development Plan." The Plan touched on education and manpower planning, which had been studied but was not ready for inclusion in the previous Plan. It spelled out regional development plans and the goals of balanced as well as national economic growth. It paid greater attention to spatial and personal inequality as well as to agriculture (Dixon 1999, 82-83). It also touched on the role of the private sector in the development of the particular contexts of industry, trade and services. Selected policy measures were aimed at the development of the industrial and commercial sectors, including the enactment of several industrial promotion acts to provide incentives for investment, particularly foreign investment in manufacturing activities, and for promoting the banking system in order to provide a financial base for trade and production. Like the First Plan, its preparation was top-down, highly aggregate, and essentially the work of the government with no participation from the private sector; however, the Plan's analysis was based more on sectoral analysis at the ministry level than the First Plan.

The Second Plan was similarly successful, although the growth of real GDP was less impressive than it had been during the First Plan. The average growth rate of real GDP was 7.5 percent. The industrial sector, infrastructure and services maintained a steady growth rate, averaging 10.1 percent per year. The slowdown in overall economic performance was partly related to the slowdown in foreign investment and U.S. spending⁵ (Warr and Bhanupong 1996, 72), and global conditions (Dixon 1999, 83). However, the production structure began to diversify and growth was accompanied by structural changes. Within the

agricultural sector, the provision of infrastructure, in particular an improved road network, led to the expansion of the area under cultivation. In a way this was a reason for increased agricultural output, i.e., through an expansion of the land base rather than gains from increased production efficiency (Abonyi and Bunyaraks 1989, 27). The agricultural sector during this period did not show satisfactory performance, growing at an average annual rate of only 4.5 percent. However, the slow growth was due partly to the droughts in 1967 and 1968, and partly to the fluctuations in the global prices of major export commodities. Besides, this was also a period when expansion of the agricultural land base almost ceased (Warr and Bhanupong 1996, 72). Some studies maintained that Thailand remained dependent on a narrow range of primary exports with uncertain price levels and, for agricultural commodities, very variable production levels (Dixon 1999, 83). Partly because of these uncertainties, from 1968 the Plan was supplemented by annual plans, which updated targets and budget allocations to correspond changing situations.

ECONOMIC DEVELOPMENT IN THE 1970s

The Third Plan (1972-1976) focused more on maintaining stability. Although still aimed at economic growth, the Plan set specific priorities for reducing the growing disparities between urban and rural areas and between sectors. The Plan also emphasized more equitable income distribution and social services. Aside from the problems of income disparity, which became increasingly obvious, there was a domestic environment of rapid political change, including labor unrest and frequent changes in government, as well as the consequences of the Indochinese conflict. At the same time, a changing external environment placed constraints on the relatively open Thai economy: the decline in the value of the U.S. dollar, for example, followed by the first energy crisis (1973-1974), resulted in widespread stagflation in the world economy. Thus, the primary concern of the Third Plan was economic stability, income distribution, and other inequalities. Population growth was also seen as a threat to economic well-being. Thus, a population and family planning policy to lower the birth rate was incorporated in the Plan.

Economic growth during the Third Plan slowed to about 6.2 percent per year (Warr and Bhanupong 1996, 72),⁶ but there seemed to be a better distribution of income: the incidence of poverty declined from 52 percent of the population in 1962/63 and 34 percent in 1968/69 to 25 percent in 1975/76 (World Bank 1980, 62).⁷ Income disparity, measured by the incidence of poverty, between Bangkok and the Central region and the other regions improved. In 1975/76 the incidence of poverty in Bangkok and the Central region was 9 percent and 12 percent respectively compared with 36

percent in the Northeast, 27 percent in the North, and 25 percent in the South. The incidence of poverty in the latter three regions, particularly in the Northeast, declined substantially between 1968/69 and 1975/76.

Industrial development, which had been seriously pursued since 1960, with major emphasis on import substitution industries in the early stage, gradually showed a growing capacity to compete in the global market.⁸ These changes were the product of a combination of factors, including the government's policies, the dynamism of the private sector, and a favorable global market. Nevertheless, the World Bank noted that a consistent set of policy objectives was lacking in Thailand.⁹ Policy measures were changed frequently and institutions such as BOI retained considerable discretionary powers in the granting of promotional privileges and determining the extent of the incentives given. The range of incentives differed not only between industries, but between firms within the same industry. Aside from BOI, the ministries of industry, finance, and commerce, as well as the Bank of Thailand formulated and administered policies directly affecting industrial investment. The World Bank was surprised that, while inconsistent policies resulted in considerable consumption and uncertainty on the part of investors, the environment for industrial investment was generally favorable, and the manufacturing sector grew rapidly over the period (World Bank 1980, 13).

During the Third Plan period (1971-1976) the average growth of industrial production was about 8.6 percent per year (Warr and Bhanupong 1996, 72). A few problems may be pointed out, however. First, industry was concentrated in greater Bangkok and the Central region; these areas accounted for about 80 percent of the total industrial output. Second, the industries were generally large scale, and capital intensive, but did not have a sufficient effect on employment generation. Third, the rapid growth of many industries, particularly the import-substitution industries, led to greater dependence on the import of raw materials and equipment. The government's promotional privileges led to this situation, which in turn caused balance of payment problems. Fourth, the structure of export incentives was not appropriate as the increase in exports was due mainly to the favorable global market, as was evident in the case of the textile boom in 1973 and in the case of sugar in 1974. Finally, it was widely thought that the benefits of rapid industrial growth did not reach the majority of the population, and it resulted in rapid deterioration of the country's natural resources (Warr and Bhanupong 1996, 72).

It is interesting to note that small and medium-sized industries (SMEs) had been recognized and recommended as a measure to increase the dispersion of industrial activities to regions beyond Bangkok and the Central region, and to reduce the cost of transporting raw materials. Another interesting fact is that the World Bank study showed that during the period 1966-1972, 64

percent of the expansion in manufacturing was due to the expansion of the domestic market, 29 percent to import substitution, and 7 percent to exports. The role of import substitution declined to only 0.5 percent during the period 1972-1975, while the domestic market absorbed 91 percent of the manufacturing expansion and exports the remaining 8.5 percent.

During the 1970s a number of agro-based industries developed, particularly, rice milling and warehousing, feed and seed production, the raising of pigs and chickens, slaughtering, gunny-sack manufacturing, and the freezing and canning of a variety of marine and agricultural products. In addition, there was considerable expansion and diversification of agro-processing, most of it involving sugar, corn, kenaf and cassava. Some of these developments reflected a relaxation of government control, for example, over sugar refining in 1969 and slaughtering in 1973¹⁰ (Dixon 1999, 102). During this period the average annual growth rate of the agricultural sector dropped from 4.5 percent in the previous Plan period to about 4 percent. Migration from rural areas to the capital continued to be rapid (Warr and Bhanupong 1996, 72).

One of the serious economic problems during the Third Plan period was the OPEC oil crisis in 1973/74, which resulted in a fourfold increase in the price of oil internationally; this had considerable consequences on the Thai economy. During this period the cost of oil imports averaged about 10 percent of total imports. Between 1973 and 1974 the cost of oil imports almost trebled, and the share of import costs rose from 11.1 percent to 19.6 percent (Dixon 1999, 94). The rise in oil prices affected the GDP growth rate, which dropped to 4.1 percent in 1974. Some were of the view that Thailand was able to absorb the impacts of the 1973/74 oil price increases and the ensuing international upheaval with no significant slowing of growth (Abonyi and Bunyaraks 1989, 34). It was explained that the small impacts were, in part, due to high commodity (export) prices, and to transfer and account earnings. According to Warr (1993, 51), the reason that Thailand was less adversely affected by the oil crisis as compared with many other oil-importing countries, such as the Philippines, was because of the high prices and ready markets for Thai exports that tended to offset the increase in the cost of imported oil. A few government measures to mitigate the impacts of the oil shock included the adjustment of taxes on fuels, the imposition of fuel price controls, and the introduction of an oil fund. In combination these measures enabled the government effectively to subsidize fuel oil prices, and thereby the cost of electricity, kerosene and cooking gas. In the short run these interventions played a significant role in the comparative ease with which Thailand weathered the first oil shock. In addition, there was a substantial reduction in the average level of tariff protection. This was aimed at controlling inflation and boosting the domestic economy (Dixon 1999, 95).

During this period, the number of annual tourist arrivals increased from 485,366 in 1970 to 850,459 in 1975. Also, organized labor exports increased, although remittances during the Third Plan were still small (Dixon 1999, 108).

The Third Plan period suffered many political troubles. During the period 1972-1976 alone, there were six governments, a student uprising, three elections, and one coup. In addition, the American withdrawal from Vietnam and subsequent reduction in American expenditures tremendously affected the Thai economy. Furthermore, in 1975 the Khmer Rouge took over Cambodia, and after 1976 there was an escalation of rural insurgency in Thailand, as well as the threat posed by Vietnam, especially after its invasion of Cambodia in 1979. These troubles had an immediate impact not only on the Thai economy but also on the budget for development and economic management, which was reduced in order to increase the defence budget.

The Fourth Plan period (1977-1981) therefore was faced with difficulties from the beginning. NESDB admitted that political instability made it necessary to formulate the Plan and its strategy in broad terms, with less specific multiple objectives (www.nesdb.go.th-9/4/03). This was necessary in order to cope with rapid changes in political decision-making (i.e., the government) and to facilitate for the new government the allocation of priorities according to its own policy focus (Abonyi and Bunyaraks 1989, 31). The focus of the Plan was on economic recovery through restructuring of the economy. Its immediate objective was to revitalize the economy following the deleterious effects of the global economic recession as well as the oil crisis, and to implement desired structural adjustments. A major change in the planning approach was that the preparation of the Plan would involve greater participation by the private sector and the public instead of the formerly top-down approach.

Development during the Fourth Plan period had mixed results. In spite of the negative impact of the changing global economic conditions, including the second oil crisis (1979/80), high international interest rates, and declining demand and prices for Thailand's commodity exports, the growth of real output averaged 7.1 percent per year (Warr and Bhanupong 1996, 73). This was partly due to the government's attempts to maintain growth momentum by expanding public investment despite a drastic deterioration in domestic savings. However, it was pointed out that the Fourth Plan accommodated a wide range of concerns including income inequalities and inequalities in the distribution of social services, leading to continuing pressure for investment, with limited guidance for trade-offs. The result was high and relatively unconstrained investment policies by both the public and private sectors, and an era of overspending. In addition, the public sector failed to adjust the tariffs of state enterprises, key agencies in the provision of public services, to cover the costs of

production, particularly those of energy. As a consequence, the government had to borrow heavily to subsidize various state enterprises (Abonyi and Bunyaraks 1989, 34). Yet, on the bright side, the prevailing view appears to have been that Thailand could continue with its expansionary policy and simply grow itself out of the structural imbalances. For example, it was projected that, during the very early 1980s, many major projects in natural gas, chemicals, fertilizer and cement, mainly in connection with development of the Eastern Seaboard, would lead to an increase in productivity, which would enable the government to attend to adjustments in such areas as the low productivity of agriculture and the related problems of low rural incomes, urban unemployment, income distribution and the establishment of a national social security system. These expectations were, however, dashed by the 1979/80 oil crisis which left Thailand in a vulnerable position (Dixon 1999, 110).

During the Fourth Plan period the annual inflation rate averaged 11.6 percent per year. Toward the end of the Plan, three major issues were observed: first, increasingly unstable and complex domestic and external environments (e.g., a slowdown in global economic growth); second, emerging development issues (e.g., deterioration of natural resources, and unemployment); and, continuing unresolved concerns (e.g., poverty and inequity). The depth of the economic problems made it necessary for the government to borrow from the World Bank and the International Monetary Fund (IMF). This was the time when the first five-year program of structural adjustment was initiated with conditionality from the two funding agencies. The program became an integral part of the Fifth Plan in exchange for two structural adjustment loans (SALs); the first in March 1982 for US\$ 150 million and the second in April 1983 for US\$ 175.5 million.

ECONOMIC DEVELOPMENT DURING THE LAST 20 YEARS

The Fifth Plan (1982-1986), with problems spilling over from the Fourth Plan period, emphasized growth with stability, an area-targeting approach, restoring financial stability and maintaining "credibility" in the international financial markets, and restructuring the economy. At the early stage of the Plan period, the external economic conditions were depressed and the global economy did not recover as many had anticipated it would. In response, the government implemented strict fiscal austerity measures while developing measures to smooth out the debt profile (through refinancing and currency swaps) (Abonyi and Bunyaraks 1989, 37). The austerity policy resulted in the delay of a number of capital-intensive projects, including a number of projects under the Eastern Seaboard Development Program. However, other less

capital-intensive projects, including the Rural Poverty Alleviation Program, were less affected or not affected at all.

During this period, global economic growth and trade slowed down (as a result of the oil crises in the 1970s and 1980s), trade barriers increased, real interest rates rose, and commodity prices fell. Thailand's economic growth averaged about 5 percent per year. Behind this rate of growth were many serious economic problems faced by Thailand. For example, the current account deficit was persisting at the unsustainable level of 5 percent of GDP, while the investment-saving gap had reached a similar magnitude – savings declined from 20-22 percent of GDP in the late 1970s to about 16-17 percent of GDP in 1985. Furthermore, foreign reserves declined from 12 percent of GDP in 1970 to 3 percent in 1985. A stand-by loan of US\$ 500 million had to be borrowed from IMF in mid-1985. The external debt rose to US\$ 16 billion, of which about US\$ 12 billion was long-term debt. The debt-service ratio increased from 17 percent in 1980 to about 26 percent in 1985. The situation was made more difficult by the government's budget deficit of more than 5 percent of GDP over the five-year period (Warr and Bhanupong 1996, 74).

During this Plan period, the labor force increased at an average rate of 3.0 percent per year, including a sharp increase in the proportion of the labor force educated. With slow economic growth and the consequent slow employment-generation rate, unemployment increased. To sum up, at the end of the Fifth Plan period, the major economic issues faced by Thailand were economic instability, resource depletion, poverty, employment generation, development management system, and unfavorable external economic conditions (Abonyi and Bunyaraks 1989, 40-42).

The Sixth Plan (1986-1991) emphasized efficiency and improved quality in development activities, in order to improve the international competitiveness and self-reliance of the economy. It was intended to continue significant elements of the Fifth Plan, particularly to maintain financial and economic stability, while accelerating the restructuring and diversification of the economic base. An important theme of the Sixth Plan was the reduction in the investment and production role of the public sector through, for example, reform of the regulatory, legal and incentive frameworks, marginal extensions of physical infrastructure, and improving the efficiency of state enterprises. In this connection, the role of the private sector was strengthened in the context of production and investment, employment, and income generation (Abonyi and Bunyaraks 1989, 42).

Another major focus of the Sixth Plan was the diversification of the product-market base of the economy. This was intended to spread the risk burden both of individual producers, and the economy as a whole, through diversification of income sources. One of the main reasons for this strategy was because of the

anticipated decline in the role of production and the export of traditional agricultural products. Emphasis was placed on agricultural product diversification under a comprehensive diversification strategy, i.e., agriculture, manufacturing, and services. The government encouraged and created an appropriate environment for the development of progressive agriculture and for shifting from extensive to more intensive higher-productivity agriculture. There was also recognition of the need to address forest and other resource problems (Warin 1988, 141).

The Sixth Plan period (1986-1991) may be considered a golden age of Thailand (Pasuk and Baker 2002, 156) characterized by dramatic economic growth. The GDP growth rates during this period ranged from 5.5 percent in 1986 to the peak of 13.3 percent in 1988, with the average being about 10.3 percent per year. During the early 1980s the rapid re-establishment of political and economic stability, together with changed international and regional circumstances, laid the basis for a period of unprecedented GDP growth. In addition, it has been explained that the boom that began in 1987 was driven by three principal forces: the depreciation of the U.S. dollar in relation to other currencies and the fact that the baht was pegged to it, which made Thai exports more competitive internationally; foreign investment, especially from the then newly industrializing economies (NIEs), including Taiwan and Hong Kong,¹¹ which wished to avoid rising labor costs in their own economies; and, continuing low international petroleum prices in relation to Thailand's export commodities (Warr and Bhanupong 1996, 44-45).

The manufacturing-based export boom was reinforced in three ways: first, by the expansion of primary exports; second, by the promotion of tourism; and third, by the export of labor. According to Pasuk and Baker (2002, 156), the boom was driven by the export of manufactures and services: between 1985 and 1991, Thailand's total exports of goods almost quadrupled in value; manufactured exports grew almost sixfold in six years; remittances from overseas workers grew to over 20 billion baht per year by 1986 before leveling off; and total receipts from tourism grew from around 30 billion baht in 1985 to 110 billion baht in 1990.¹² Japanese investment also played a big role during this period. In addition to the rapid growth in manufactured exports, from 1987 Thailand became a major focus for Japanese and Asian NIE investment in labor-intensive manufacturing operations. As the Asian NIEs lost their competitive position in these activities, they sought alternative, stable, low-cost locations within the Asian and Pacific region. For Japan, the rapid change in its currency's value forced many Japanese firms to relocate outside the country. In the 1970s, Japan's first choices in Asia had been Taiwan, Singapore, and Hong Kong. The rise in the value of the yen in the mid-1980s caused a general realignment of currencies, which also affected the three Asian NIEs and

South Korea. Japanese capital therefore focused more on countries such as Thailand, Indonesia, Malaysia, and Sri Lanka.

The importance of Thailand's political stability during this period must also be emphasized. Prime Minister Prem Tinsulanonda was in power from March 1980 until July 1988. This was the longest parliamentary premiership in Thai history, which gave an air of continuity, robustness and stability rare in Thai politics. Overall, during this period both the economic and political situations changed radically. Thailand became regarded as politically and economically stable and an investment "hot spot." Thailand was able to take advantage of a clustering of favorable global, regional, and national circumstances (Dixon 1999, 126-128). Prime Minister Prem stepped down in July 1988 and Chatichai Chunhavan became Prime Minister from then until February 1991 when he was sacked in a coup organized by General Suchinda Kraprayun.

With respect to economic planning, the government abandoned policies to plan and control the direction of economic growth. In 1988, the NESDB was relieved of its role as supervisor of all major government projects. The stated intention of the Sixth Plan was to transform the role of the public sector into that of a planner, supporter and facilitator of private sector participation. The government would withdraw from activities which could be carried out better and more effectively by the private sector. In many respects, the government reacted to the boom by retreating toward a *laissez-faire* approach (Pasuk and Baker 2002, 161-162).

The Seventh Plan (1992-1996) was aimed at fostering economic sustainability and sustainable development; its broad objectives were balanced economic growth; improved income distribution, human resource development, and quality of life; and the environment. During the early 1990s signs began to emerge that, behind Thailand's remarkable growth, a series of long-term problems were emerging, such as rising costs of production, lack of skilled labor, overloaded infrastructure, congestion and pollution, the opening of such low-cost locations as Vietnam and China which would undermine Thailand's comparative advantage in labor-intensive manufacturing, inhibiting the transition to more skill- and capital-intensive activities (Dixon 1999, xi). The GDP growth rate, which remained between 8 and 9 percent between 1992 and 1995, dropped to 5.9 percent in 1996. In 1996 there was a sharp slowing of the rate of export growth, although the impact of this on economic growth was masked by rapid expansion of the property and financial sectors.

During this period, one of the major factors affecting the Thai economy was the financial liberalization over the years 1990 to 1993, and this was linked to the second phase of the boom in the first half of the 1990s.¹³ The liberalization coincided with a critical period in the capital markets of the developed world – both Europe and Japan suffered from low

domestic investment, high liquidity, and low interest rates. Thus, money flooded into Thailand. In the early 1990s, total private inflows were running at 20 times the level of the mid-1980s. In 1995 alone, more money flowed in than over the entire decade of the 1980s. The nature of money flows also differed. Instead of direct investment, more funds came in as bank loans and portfolio capital. Among others, these capital inflows undermined export growth, fuelled a domestic market boom, and created bubbles in asset markets. By the early 1990s the export boom had already begun to falter. A growing current account deficit, labor shortages, and infrastructure bottlenecks signaled a downturn in the Thai economy.

In 1996 the Thai economy began to collapse. In mid-1996, the collapse of the Bangkok Bank of Commerce provided the starting signal. Meanwhile, the property market topped out and began to crumble. Construction slowed. After a decade of export growth at around 20 percent a year, 1996 ended with zero growth. The finance industry collapsed. In early 1997, Finance One, one of the largest finance companies, folded. That collapse and the attack of currency speculators on the baht put the central bank into the awkward position of trying to cope with the problem through the mobilization of reserves and the Financial Institutions Development Funds (FIDF). By mid-1997 Thailand's foreign reserves were exhausted. Eventually, Thailand was forced to call on the IMF for help. On July 2, 1997, the baht was floated and immediately began to slide downward (Pasuk and Baker 2002, 174-175).

The Eighth Plan (1997-2001) started in the wake of the financial crisis of mid-1997. The Plan, which had been drawn up prior to the outbreak of the crisis, shifted from growth orientation to people-centered development: the well-being of the people was considered to be the ultimate goal; economic growth was viewed as a means to improve the people's well-being rather than as the final objective of development. The planning process also shifted from a compartmentalized to a more holistic approach, which enabled all stakeholders in the society to participate in the national development planning process. However, the Plan was later revised, particularly with respect to its economic targets and strategies, in order to cope with the problems resulting from the crisis. The economic problems during this critical period included insufficient international reserves, the instability of the Thai baht, weakness in the financial system, high levels of non-performing loans (NPLs), high interest rates, high inflation, liquidity shortage, large capital outflow, a dramatic contraction of GDP, and a very high unemployment rate (NESDB 2003, 55). In late 1998, the proportion of NPLs rose to 47 percent of all credit in the financial system; interest rates rose to around 19-20 percent annually; inflation reached 9.2 percent; and the unemployment rate rose to almost 5 percent.¹⁴ The financial crisis brought an abrupt halt to Thailand's decade of rapid growth. The economic

growth rate became negative for the first time in 1997 with a GDP growth rate of -1.4 percent; it reached -10.5 percent in 1998. The economy began to recover in 1999 with real GDP growth of about 4.1 percent, led by the manufacturing sector and increased domestic demand boosted by several government stimulus packages. Private consumption grew moderately, resulting in part from rising consumer confidence and modestly expanding farm income. Government stimulus measures, which included reducing the value-added tax rate from 10 to 7 percent and cutting taxes on petroleum products, also helped to boost private consumption. Tourism increased by 10 percent from 1998, partly as a result of the lower exchange rate, with the number of tourists reaching 8.5 million in 1999. The private investment index declined moderately in 1999, compared with its steep decline in 1998.

The Ninth Plan (2002-2006) was formulated based somewhat on the nightmare of the 1997 crisis. The Plan has adopted the philosophy of a sufficiency economy, a remarkable teaching of the King, which stresses the middle path, moderation, and due consideration, in all manner of conduct, as the guiding framework for national development. The Plan has also been built on the Eighth Plan's advocacy of holistic people-centered development (NESDB 2003, 51).

CONCLUSION

During the past 20 years, Thailand has undergone remarkable changes. At the beginning of that period, it seemed that Thailand could be characterized by remarkably uneven patterns of development, an unusual, non-colonial mode of incorporation into the global economy, and generally limited appeal to transnational corporations and foreign investors. The economic and political uncertainty that characterized Thailand during the early 1980s resulted in limited success in formal structural adjustments; imbalanced sectoral employment, particularly in the agricultural sector; low levels of urbanization; concentration of the population and modern activities in the Bangkok Metropolitan area; rural-urban development and income gaps; and underdevelopment of education and training.

Nevertheless, during the late 1980s, Thailand began to experience a period of growth and structural change, and became a regional investment 'hot spot,' particularly for labor-intensive manufacturing activities decanting from Japan and the Asian NIEs in search of lower-cost locations. In fact, over the last 30 years Thailand has experienced high and consistent rates of growth. Despite the various political and economic issues that remain, the Kingdom has shown great resilience in the face of both internal and external disruptions.

Yet, during the early 1990s signs began to emerge that, behind Thailand's remarkable growth, a

series of long-term problems were emerging such as rising costs of production, lack of skilled labor, overloaded infrastructure, congestion and pollution. Furthermore, the opening of such low-cost locations as Vietnam and China undermines Thailand's comparative advantage in labor-intensive manufacturing and inhibits the transition to more skill- and capital-intensive activities. All these factors lead to a slowing of growth. In 1996 there was a sharp slowing of the rate of export growth, although the impact of this on economic growth was masked by the rapid expansion of the property and financial sectors. However, in 1997, this page of Thailand's economic history closed with the start of the financial crisis in July of that year.

ENDNOTES

- ¹ For a brief but good account of the King's great role and how he has earned respect, see Pasuk and Baker (2002).
- ² Thailand's economic history prior to this period can be seen from Dixon (1999); Warr and Bhanupong (1996); Pasuk and Baker (2002); Sompop (1989).
- ³ Except for the First Plan, each plan covers a five-year period.
- ⁴ Average GDP growth during the First Plan was 7.2 percent annually, according to Dixon (1999, 81) while Abonyi and Bunyaraks (1989, 25) gave a figure of about 8 percent for the First and Second Plan periods (1961-1972), Warin and Ikemoto (1988, 4) gave figures of 7.6 percent and 7.1 percent for the periods 1957-1966 and 1966-1971 respectively. The World Bank (1980, 6) estimated the same rate of 7.6 percent for the period 1960-1965 but a higher rate of 8.2 percent for 1965-1970. The discrepancy could be due to varying national income estimates, and different sources of data and estimation methods.
- ⁵ American presence grew rapidly during the period 1966-1975 when major military bases were established. Thailand became a strategic country as a base for operations against Vietnam and as a "buffer" in preventing the "domino" spread of Communism (Dixon 1999, 83).
- ⁶ About 6.5 percent per year according to Abonyi and Bunyaraks (1989, 32).
- ⁷ According to Abonyi and Bunyaraks (1989, 32), the incidence of poverty was 32 percent in 1975.
- ⁸ Based on policy designs, industrial development since 1960 may be divided into four phases: the initial import substitution period (1961-1971), export promotion period (1972-1976), the Big Push (1977-

1982), and the transformation into an export-led economy (1983-1988).

⁹ This was unlike in Japan, whose industrial policy is clear-cut, e.g., it focused on certain sunrise industries.

¹⁰ See also Warr and Bhanupong (1996, 79).

¹¹ According to Pasuk and Baker (2002, 160), South Korea and Singapore should be included.

¹² See Pasuk and Baker (2002) for an interesting and more detailed discussion of Thailand's economic development during this period.

¹³ The discussion in this section is drawn mainly from Pasuk and Baker (2002, 164-178).

¹⁴ February 1998 and 2001, not including seasonal unemployment (about 3.9 percent) and underemployment (about 4.8 percent).

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Trade Responses to Prices and Exchange Rates: Evidence from Sectoral Differentials in Thailand*

Piriya Pholphirul**

I. INTRODUCTION

The economic turmoil that began toward the end of the 1990s forced Thailand to adopt a floating exchange rate regime. Currently, Thailand is moving toward economic recovery, with GDP growth estimated to be about 6.8 percent in 2003 and approximately 6-7 percent in 2004. One of the main components supporting recent GDP growth has been an improvement in the trade balance through the expansion of exports. In addition, followed by the dual-track policy under the Thaksin administration, a goal has been set to create linkages and strategically enhance the country's competitiveness in the global arena. This includes a number of trade liberalization agreements, both at the bilateral and multilateral levels, signed with a number of trade counterparts. Technically, a reduction in trade barriers should accelerate growth, provide stimulus to new forms of productivity-enhancing specialization, and lead to a more rapid pace of job creation and poverty reduction in Thailand. Conceptually and generally, tariff reduction of exported (imported) items pass-through traded price should encourage foreign (domestic) customers to purchase more goods, in line with the law of demand. Therefore, expansion of trade volumes, at least in the short run, is created by demand.¹ Therefore, the first concern of the demand-side approach, whether or not trade creation will be significant, also depends somewhat on how the law of demand would be significant in terms of Thailand's trade issues, or, whether or not foreign (domestic) customers will respond to Thailand's exported (imported) prices, the so-called export/import price elasticity. A low degree of export/import price elasticity indicates a lower likelihood of trade creation.

Second, the exchange rate is always another determinant for Thailand's international trade in terms of how prices respond to currency appreciation/depreciation. A percentage change in the exchange rate to

percentage change in the traded price, called the degree of exchange rate pass-through, is therefore another effective factor of concern for a number of economic policies. Since there were huge fluctuations in the value of the Thai baht after the 1997 financial crisis (see Figure 1), export volumes, for the first time, were greater than the import volumes, indicating positive numbers in Thailand's trade balance. Intuitively, without statistically proof, it may be stated that the depreciation of the baht currency since July 1997 made the prices of exported items more competitive, while making imported items relatively more expensive. If the law of demand holds in this case, export volumes rose while import volumes fell with respect to relative price changes. The trade balance then improved according to this argument. Figure 2 shows the improvement of Thailand's trade balance since 1998, following the floating of the baht in July 1997.

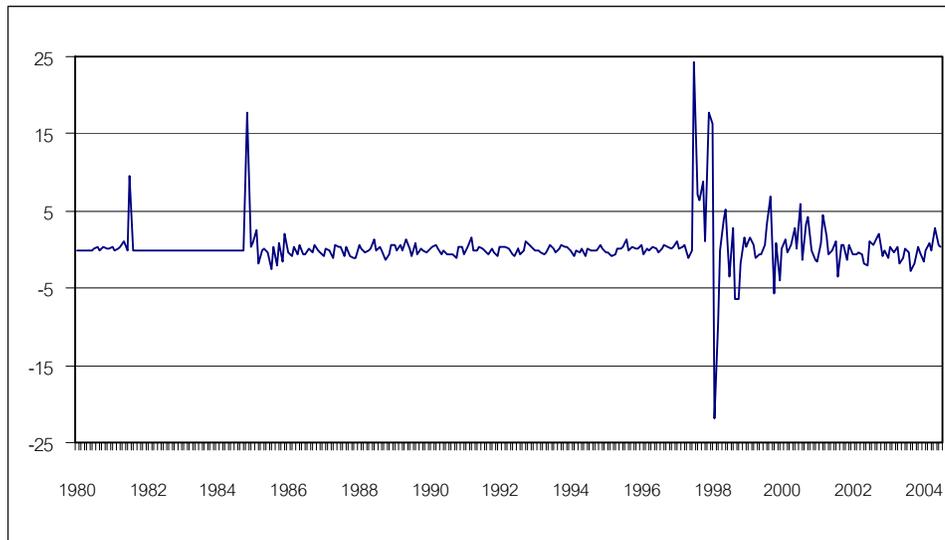
According to Bank of Thailand data, the export volume, as of the year 2003, totaled 3,326 billion baht, or about a 14 percent increase compared with the end of the year 2002. The expansion of Thailand's exports is due to the recovery of the global economy, especially recovery in those countries that are Thailand's major trading partners. Another stimulating factor is the increasing price of Thailand's export products in the global market; for example, agricultural exports increased about 5 percent in volume and 24.5 percent in value (price). The growth in export volume has been more dramatic than the growth in imports as far as Thailand's trade balance is concerned. The import volume in year 2003 totaled about 3,078 billion baht, or about a 13 percent increase over that of the same period in 2002. The recent improvement in the trade balance therefore supports internal business growth, higher employment nationally, and additional income through export promotion.

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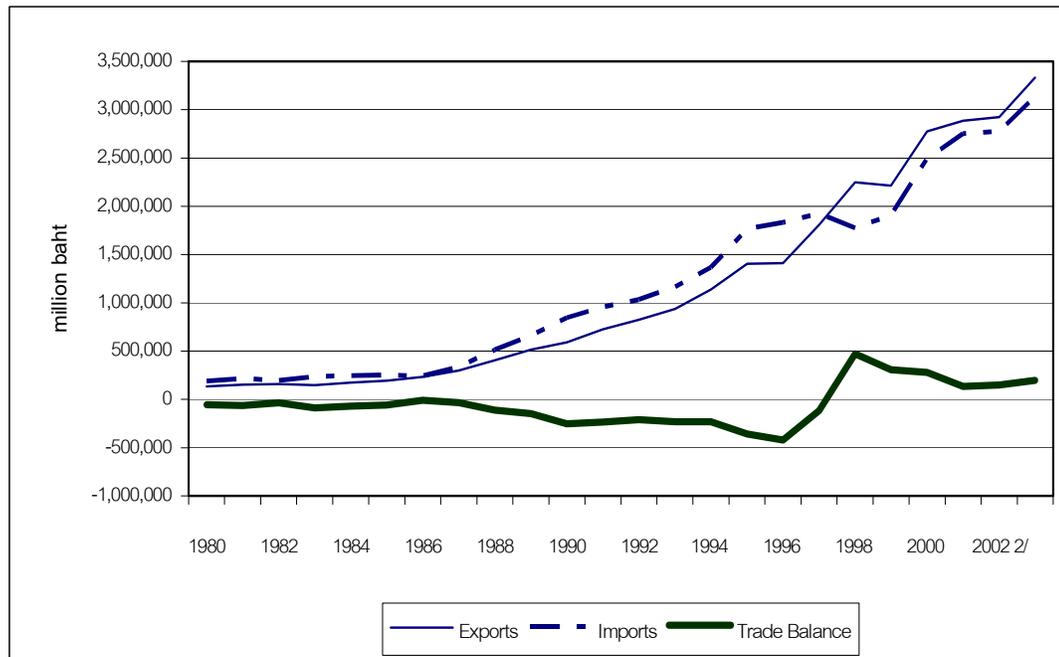
The author alone – not TDRI – is responsible for all mistakes that may appear in this paper. Corresponding address: TDRI, 565 Ramkhamhaeng 39, Wangthonglang, Bangkok 10310. Email: piriya@tdri.or.th.

Figure 1 Monthly Percentage Change of the Baht/US\$ Exchange Rate: January 1980 – July 2004



Source: Author's calculation. Data collected from Bank of Thailand.

Figure 2 Export and Import from/to Thailand to/from U.S.: 1980-2003



Source: Author's calculation. Data collected from Bank of Thailand.

Nevertheless, Thailand's economic recovery, which has led to increased aggregate demand, and consumer and investor confidence, has been a cause of worry; some fear that the baht might appreciate in the future. Because the baht currency has been appreciating recently and is anticipated to become even stronger in

the future, this could harm the business sector and exporters by adversely affecting the sales volume of exports and the revenue generated by them.

Nevertheless, the movement of the exchange rate not only affects exporters' decisions at the micro-level, but also reflects the larger scale of each industry's terms

of trade. In formulating commercial policy or exchange rate policy, the responsiveness of trade flows to relative price changes is an important consideration. In addition, the responsiveness of causes varies among sectors, which are differences in terms of the market structure of exported/imported items, government rules and regulations, and business conditions.

The effects of the baht's appreciation or depreciation on Thailand's trade balance traditionally and theoretically have been analyzed by examining the Marshall-Lerner Condition (MLC). MLC represents the conditions under which a change in the exchange rate of a country's currency leads to an improvement or worsening of the country's balance of payments. Under a floating exchange rate regime, a balance of payments disequilibrium should automatically be restored to equilibrium without the need for government intervention. In the case of a fixed exchange rate, the currency's devaluation or appreciation may be used to restore disequilibrium.² Therefore, MLC suggests that appreciation (devaluation) of the currency will worsen (improve) the country's trade balance in the long run if the sum of absolute value of import and export demand price elasticity exceeds "unity." See, for example, Bahmani-Oskooee (1986, 1998) and Bahmani-Oskooee and Niroomand (1998).³

The aims of this paper are threefold. First, how sensitive are the price of traded goods compared with changes in export and import volume by sector? The answer to this question would help exporters to determine their international markup decisions that would affect loss of export volume, considered by the degree of "export price elasticity." Also, domestic firms that may compete with importers should consider the degree of "import price elasticity" as "degree indicators" of their competitiveness outcomes. Let's say the higher (lower) the degree of import price elasticity is, the higher (lower) is the level of competitiveness that domestic firms should attain. Besides, in the view of policy makers, the degree of traded price elasticity can be used to determine how trade volumes adjust from trade liberalization caused by a tariff reduction.⁴ The higher (lower) is the degree of traded price elasticity, the more (less) is trade creation likely to be presented owing to a tariff reduction that would pass-through to exported prices. For the imported side, the lower (higher) is the degree of import price elasticity, the less likely are domestic firms to lose as a result of the reduction of the import tariffs from the effects of trade liberalization.

Second, besides own-price elasticity, cross-price elasticity can be estimated to observe the cross-correlation between the global (domestic) price and Thailand's export (import) volumes. The cross-price elasticity coefficients indicate how Thailand's international trade should be influenced by the prices for related goods. It also represents, among sectors, the de-

gree of substitution (with positive sign) of export/import volumes.

Third, this paper also aims to estimate income elasticity. Intuitively, with the normal goods assumption, the higher is the positive degree of coefficients, the greater is the degree of Thailand's exports (imports) that should be linked to the status of the global (Thai) economy. The higher is the degree of income elasticity, the more Thailand's export (import) volumes should be able to spur growth in the global (domestic) economy.

Lastly, for policy purposes, the paper considers how the trade balance, by sector, should be improved or the deficit reduced by the devaluation of the baht. Many empirical analyses, both multi-country and individual countries, have been conducted in order to show how exchange rate changes affect the trade balance of countries. The premise is that there is no clear resolution – neither analytical and empirical perspectives – regarding the effectiveness of the baht's effective devaluation as a tool for increasing Thailand's trade balance, or, on the contrary, whether or not the "J-curve" condition exists in Thailand's trading industries.⁵ In general case studies of various countries, the J-curve and MLC have been neglected in sectoral analysis, but have been considered at the national level to observe overall how the trade balance should be affected by the exchange rate.⁶

This paper therefore attempts to answer two questions. First, how sensitive are changes in the price of traded goods, reflected in changes in the exchange rate, to the volume of exports and imports? This would at least answer questions that business persons or exporters may have in trying to determine the sensitivity of the volume of their exports/imports to changes in the exchange rate. Second, for policy purposes, it is important to know the determinants of Thailand's export/import demand. How should trade balances be improved or the deficit subjected to exchange rate volatility through study of MLC? What is the effect of a change in domestic prices on exports/imports? Further, how do exports/imports behave when there is economic growth?

Section II starts with a basic econometrical approach to export and import demand. Section III interprets the estimated coefficients and intuitively explains the results. Section IV contains the conclusion.

II. ECONOMETRICAL MODEL AND DATA

Theoretical considerations should be employed. The standard import and export demand functions, in which both functions are determined from their own price, substitute price, and income level, are shown in the following equations:

$$X_t = f(PX_t, PW_t, YW_t) \quad (1.1)$$

$$M_t = f(PM_t, PD_t, YT_t) \quad (1.2)$$

By considering both the export and import sides, first, let X_t represent Thailand's export volume in time t , with PX being the export price in time t , PW the global price in time t , and YW the proxy of global income in time t . With regard to the import side, let M_t represent Thailand's import volume in time t , PM_t the import price in time t , PD_t the domestic price in time t , and YT_t the proxy for Thailand's national income.

Both equations (1.1) and (1.2) are known as absolute price formulations; they have been used extensively in a number of studies in the literature.⁷ However, in choosing between both forms of export and import demand, either linear or log-linear formulations can be specified.⁸ For this paper, the log-linear model has been chosen for estimating the key coefficients of prices and income elasticity, followed by calculation of the MLC.⁹ The log-linear form of partial adjustment models for export demand can be specified as follows:

$$\Delta \ln X_t = a(\ln X_t^* - \ln X_{t-1}), 0 < a < 1 \quad (2.1)$$

$$\ln X_t^* = b_0 + b_1 \ln PX_t + b_2 \ln PW_t + b_3 \ln YW_t + e_t \quad (2.2)$$

where Δ is a first-difference operator and a is the coefficient of adjustment. X_t^* is the desired level of exports. Models for import demand function can be specified as follows:

$$\Delta \ln M_t = c(\ln M_t^* - \ln M_{t-1}), 0 < c < 1 \quad (3.1)$$

$$\ln M_t^* = d_0 + d_1 \ln PM_t + d_2 \ln PD_t + d_3 \ln YT_t + e_t \quad (3.2)$$

Substitute (2.2) for (2.1) in terms of exports and substitute (3.2) for (3.1) in terms of imports and rearrange both the export and import demand functions in the following forms:

$$\ln X_t = ab_0 + ab_1 \ln PX_t + ab_2 \ln PW_t + ab_3 \ln YW_t + (1-a)\ln X_{t-1} + ae_t \quad (4.1)$$

$$\ln M_t = cd_0 + cd_1 \ln PM_t + cd_2 \ln PD_t + d_3 \ln YT_t + (1-c)\ln M_{t-1} + ce_t \quad (4.2)$$

Henceforth, both the export and import demand functions can be rewritten as:

$$\ln X_t = \alpha_0 + \alpha_1 \ln PX_t + \alpha_2 \ln PW_t + \alpha_3 \ln YW_t + \alpha_4 \ln X_{t-1} + \varepsilon_t \quad (5)$$

$$\ln M_t = \beta_0 + \beta_1 \ln PM_t + \beta_2 \ln PD_t + \beta_3 \ln YT_t + \beta_4 \ln M_{t-1} + \mu_t \quad (6)$$

where $\alpha_0 = ab_0$, $\alpha_1 = ab_1$, $\alpha_2 = ab_2$, $\alpha_3 = ab_3$, $\alpha_4 = ab_4$, $\beta_0 = cd_0$, $\beta_1 = cd_1$, $\beta_2 = cd_2$, $\beta_3 = cd_3$, $\beta_4 = cd_4$, $\varepsilon_t = ae_t$, and $\mu_t = ce_t$. The coefficients in (5) and (6) provide the short-run own-price (α_1 and β_1), cross-price (α_2 and β_2), and income elasticity (α_3 and β_3) of export and import demand functions respectively. In considering the long-

run adjustment or long-run elasticity, the results can be calculated directly from the coefficients by dividing those coefficients by $1 - \alpha_4$ for the export demand function and by $1 - \beta_4$ for the import demand function.¹⁰ Nevertheless, by generally employing the log-linear model, it is assumed from the beginning that the log-linear models must be parametric with constant coefficients.¹¹

The export and import demand functions are henceforth categorized into the following nine major trading industries based on Bank of Thailand data: 1) food, 2) beverages and tobacco, 3) crude materials, 4) mineral fuels and lubricants, 5) animal and vegetable oils and fats, 6) chemicals, 7) manufactured goods, 8) machinery, and 9) miscellaneous manufactured goods. In other words, items 1-2 are consumer goods, items 3-6 are raw materials and energy goods, and items 7-9 are manufactured and capital goods.

Let X_t represent export (f.o.b.) volume in thousands of baht and M_t the import (c.i.f.) volume in thousands of baht for each industry. PX and PM are the export price index and import price index respectively (1995 = 100) for each industry. PD is defined as the domestic price or the consumer price index (CPI) (1995 = 100) denoted for each industry. YT is the productivity index, defined as the proxy for Thailand's national income. These variables were collected from the Bank of Thailand's database. PW is the proxy for the global price index of each industry and YW is the global productivity index. Both of these variables were collected from the International Financial Statistics (IFS) database. Monthly data from January 1992 to December 2002 have been used.

The data are based on time-series analysis, in which assessing the persistence of shocks is important. Therefore, failure to account for the presence of a permanent shock such as unit roots and other non-stationary processes may lead to a spurious regression result (Granger and Newbold 1974). The Augmented Dickey-Fuller (ADF) unit-root test (Enders 1995) has been used to test this condition (the results of testing the unit-root test is shown in the appendix section). Based on the derivation of the export and import demand equations above, the empirical results will be discussed in the next section. Short-run and long-run price elasticity, cross-price elasticity, income elasticity, and the Marshall-Lerner Index will be presented to analyze which sector would be benefited (or harmed) in terms of its current account based on exchange rate appreciation (devaluation). The theoretical condition of MLC is proved in Appendix B.

III. RESULTS AND INTERPRETATIONS

Table 1 presents the export and import demand of Thailand's trading industries. Negative signs for PX or PM represent short-run own-price elasticity under which the law of demand condition holds. Short-run own-price

elasticity for export industries ranges from -0.082 for manufactured goods to -0.509 for mineral fuels and lubricants of the products exported globally from Thailand. The own-price elasticity of imported items ranges from -0.055 for machinery to -0.501 for mineral fuels and lubricants. The small value of own-price elasticity exports implies the markup condition and market power that Thai exporters in those sectors may have in the

global market. On the contrary, the small value of own-imported prices coefficients indicates what less competitive domestic firms may face compared with importers. Nevertheless, the estimated coefficients still neglect some factors that should influence price elasticity, such as different market structures and government policies, including some other external shocks.¹²

Table 1 Export and Import Demand Estimated Functions of Nine Industries

Export function			Import function		
Variable	Coefficient	T ratio	Variable	Coefficient	T ratio
Food					
In PX	-0.343***	3.51	In PM	-0.479***	-3.77
In PW	0.175*	1.64	In PD	0.468***	2.66
In YW	1.133***	4.05	In YT	0.669***	3.64
In X_{t-1}	0.493***	6.56	In M_{t-1}	0.386***	4.65
Constant	-0.925	-0.78	Constant	-2.335***	-3.37
Adjusted R ²	0.87		Adjusted R ²	0.79	
D.W.	2.16		D.W.	2.02	
Beverages and tobacco					
In PX	-0.482***	-2.15	In PM	0.012	0.051
In PW	0.119	1.18	In PD	0.408	0.436
In YW	1.545***	2.52	In YT	1.762***	4.082
In X_{t-1}	0.253***	2.79	In M_{t-1}	0.324***	3.709
Constant	-4.426**	-1.96	Constant	-2.025	-0.37
Adjusted R ²	0.49		Adjusted R ²	0.36	
D.W.	1.95		D.W.	2.18	
Crude materials					
In PX	-0.326***	-2.87	In PM	0.001	0.01
In PW	0.132*	1.88	In PD	0.293	1.38
In YW	1.196***	3.498	In YT	0.744***	5.02
In X_{t-1}	0.600***	7.91	In M_{t-1}	0.469***	6.38
Constant	-4.091***	-2.36	Constant	-0.059	-0.12
Adjusted R ²	0.85		Adjusted R ²	0.75	
D.W.	1.96		D.W.	2.23	
Mineral fuels and lubricants					
In PX	-0.509***	-2.28	In PM	-0.501***	-3.89
In PW	0.115	1.07	In PD	0.175***	2.94
In YW	3.702***	2.99	In YT	1.345***	5.02
In X_{t-1}	0.469***	5.36	In M_{t-1}	0.252	1.56
Constant	-15.522***	-2.93	Constant	-3.386***	-3.585
Adjusted R ²	0.77		Adjusted R ²	0.82	
D.W.	2.11		D.W.	2.05	
Animal and vegetable oils and fats					
In PX	-0.443*	-1.83	In PM	-0.206	-1.26
In PW	0.288	0.96	In PD	0.878***	2.28
In YW	2.746***	2.02	In YT	1.051***	2.19
In X_{t-1}	0.234***	8.474	In M_{t-1}	0.121	1.24
Constant	-10.573*	-1.671	Constant	-3.248***	-1.59
Adjusted R ²	0.82		Adjusted R ²	0.32	
D.W.	2.03		D.W.	1.98	
Chemicals					
In PX	-0.292*	-1.79	In PM	-0.257***	-2.67
In PW	0.169*	1.64	In PD	0.380*	1.92
In YW	2.938***	4.47	In YT	0.434***	3.83
In X_{t-1}	0.671***	10.78	In M_{t-1}	0.617***	8.98
Constant	-11.428***	-4.81	Constant	-1.270***	-2.85
Adjusted R ²	0.96		Adjusted R ²	0.92	
D.W.	2.18		D.W.	2.19	

(Continued on page 18)

Table 1 (Continued)

Export function			Import function		
Variable	Coefficient	T ratio	Variable	Coefficient	T ratio
Manufactured goods					
ln PX	-0.082 [*]	-1.81	ln PM	-0.075 [*]	-1.79
ln PW	0.136	0.79	ln PD	0.331	1.28
ln YW	1.042 ^{**}	2.05	ln YT	0.475 ^{***}	4.22
ln X _{t-1}	0.663 ^{***}	9.78	ln M _{t-1}	0.562 ^{***}	8.14
Constant	-2.487	1.52	Constant	0.402	0.76
Adjusted R ²	0.89		Adjusted R ²	0.88	
D.W.	2.34		D.W.	2.25	
Machinery					
ln PX	-0.178 ^{***}	2.23	ln PM	-0.055 [*]	-1.65
ln PW	0.517 ^{***}	3.12	ln PD	0.146	0.67
ln YW	1.166 ^{***}	2.47	ln YT	0.678 ^{***}	4.91
ln X _{t-1}	0.573 ^{***}	7.88	ln M _{t-1}	0.59 ^{***}	8.81
Constant	-4.049 ^{***}	-2.69	Constant	0.507	0.65
Adjusted R ²	0.97		Adjusted R ²	0.87	
D.W.	2.19		D.W.	2.19	
Miscellaneous manufactured goods					
ln PX	-0.205 ^{**}	-1.98	ln PM	-0.199	1.14
ln PW	-0.056	-0.39	ln PD	0.101	0.15
ln YW	0.446	0.96	ln YT	0.728 ^{***}	3.69
ln X _{t-1}	0.591 ^{***}	7.79	ln M _{t-1}	0.405 ^{***}	5.01
Constant	1.280	0.77	Constant	0.148	0.08
Adjusted R ²	0.78		Adjusted R ²	0.75	
D.W.	2.18		D.W.	2.13	

Note: ***, **, * represent significance at the 0.01, 0.05, and 0.10 levels.

In addition, the tariff reduction as a result of trade liberalization causing lower export prices should benefit sectors with higher own-price elasticity of exports, shown by ranking, as follows: 1) mineral fuels and lubricants, 2) beverages and tobacco, 3) animal and vegetable oils and fats, 4) food, 5) crude materials, 6) chemicals, 7) miscellaneous manufactured goods, 8) machinery, and 9) manufactured goods. For the import side, reduction of Thailand's import tariffs may not harm domestic suppliers in the sectors with lower own-price elasticity of imports shown, by ranking, as follows: 1) machinery, 2) manufactured goods, 3) miscellaneous manufactured goods, 4) animal and vegetable oils and fats, 5) chemicals, 6) food, 7) mineral fuels and lubricants.¹³ Nevertheless, own-price elasticity alone is not enough to justify the sectoral gains or losses. More market assessment, including cost structure, technology of production, and quality of goods, should be done for a clear-cut analysis. Nevertheless, own-price elasticity is not the only indicator measuring gain/loss of those nine major sectors from tariff reduction. The degree of substitution between exported (imported) products and global (domestic) products can be considered another indicator leading to the estimation of "cross-price elasticity." The global price (*PX*) of export demand and the domestic price (*PD*) of import demand lead to the estimation of cross-

price elasticity, in which a positive sign denotes the degree of substitutability between domestic goods and traded goods. A higher positive value of the long-run coefficients means higher substitutability among items exported from Thailand and those sold to other countries. In terms of imported items, a higher positive value of cross-price elasticity indicates a higher degree of substitution of imported items and domestic items sold in Thailand, implying the degree of substitution between the demand for domestic products and imported products.

Furthermore, the tariff reduction framework may benefit (harm) Thailand's export items, which have a higher (lower) degree of cross-price elasticity of export, and should benefit (harm) Thailand, which has a lower (higher) degree of cross-price elasticity of imports. Nevertheless, based on the estimated coefficients, the own-price and cross-price elasticity of exports and imports seems to be less elastic (inelastic), which indicates absolute values less than unity. Intuitively, this implies less sensitivity between prices and the quantities traded in the global context.

The inelastic price range can be explained by the fact that the bulk of Thailand's exported items not only are goods essential globally, but also those imported items are necessary domestically, such as exported and imported manufactured goods and

machinery. It may also be observed that the absolute value between short-run and long-run own-price elasticities is usually higher than that of cross-price elasticities, which

indicates that Thailand's exported (imported) items are more sensitive to changes in the prices of its own goods than to the prices of global (domestic) products.

In addition, in Table 2, a positive sign of long-run income elasticity for exports and imports means that those items are normal goods (positive value). The higher are the estimated coefficients, the more likely it is that the traded items from Thailand will be more sensitive to global income in the case of exports, and domestic income in the case of imports.

Income elasticity of both exported and imported items are found in the "elastic" range (greater than unity). Based on this concept, global economic growth should lead to higher exported volumes in, by ranking, chemicals, mineral fuels and lubricants, animal and vegetable oils and fats, and manufactured goods. Vice-versa, economic growth in Thailand should lead to more imported items in, by ranking, beverages and tobacco, mineral fuels and lubricants, machinery, and crude materials. Besides, the elastic range of long-run income elasticity of the import demand function indicates that, other things being equal, economic growth in Thailand,

measured by increased domestic income, is likely to increase Thailand's imports and worsen of the balance of payments. However, as for the range of long-run income elasticity of export demand, Thailand's export volume should also be substantially affected by increased global economic growth. Therefore, with relatively higher coefficients of income elasticity of exports than those of imports, Thailand is more likely to obtain a positive balance of payments should economic growth in Thailand as well as in global market exist.

Nevertheless, to explain how exchange rate policy or currency devaluation should benefit trade balance for each industry, MLC must hold. That is when the summation of the absolute value of export price elasticity and import price is greater than "unity." Table 3 presents MLC for the long-term basis.

The MLC shown in Table 3 indicates that devaluation of the Thai baht may harm the trade balance in some industries. The Marshall-Lerner Index, with a value greater than 1, can be applied to the industries that improve (harm) the trade balance once the baht currency depreciates or devalues (appreciates). The industries that should have positive (negative) effects on the trade balance from the currency's depreciation or devaluation (appreciation) are food; mineral fuels and lubricants; and chemicals.

Table 2 Long-run Cross-Price and Long-Run Income Elasticity

Industry	Export		Import	
	Cross-price	Income	Cross-price	Income
Food	0.345	2.235	0.762	1.090
Beverages and tobacco	0.159	2.068	0.604	2.607
Crude materials	0.177	2.990	0.433	1.401
Mineral fuels and lubricants	0.217	6.972	0.234	1.798
Animal and vegetable oils and fats	0.376	3.585	0.999	1.196
Chemicals	0.514	8.930	0.992	1.133
Manufactured goods	0.404	3.092	0.756	1.084
Machinery	1.742	2.731	7.293	1.654
Misc. manufactured goods	-0.137	1.090	0.170	1.224

Source: From author's calculation.

Table 3 Long-run Export/Import Price Elasticity and Marshall-Lerner Index

Industry	Export	Import	Marshall-Lerner
Food	0.677	0.780	1.457***
Beverages and tobacco	0.645	0.018	0.663*
Crude materials	0.815	0.002	0.817*
Mineral fuels and lubricants	0.959	0.670	1.628***
Animal and vegetable oils and fats	0.578	0.234	0.813**
Chemicals	0.888	0.671	1.559***
Manufactured goods	0.243	0.171	0.415***
Machinery	0.417	0.134	0.551***
Misc. manufactured goods	0.501	0.334	0.836**

Note: ***, **, * represent significance at the 0.01, 0.05, and 0.10 levels based on joint statistical tests.

Source: From author's calculation.

The MLCs are therefore less likely to hold in a number of sectors. And, the exchange rate policy vis-à-vis currency devaluation may not succeed in improving an industry's trade balance in the long run, which occurs when the Marshall-Lerner Index is less than unity.¹⁴ Those sectors are beverages and tobacco, crude materials, animal and vegetable oils and fats, manufactured goods, machinery, and miscellaneous manufactured goods. Nevertheless, criteria of Marshall Lerner Index also depend on a number of factors such as an industry's cost structure, use of resources, and efficiency in production, which are not explained in this paper.

However, the summation between short-run exports and imports own-price elasticity shows coefficients of all sectors at levels less than "unity." This means that the trade balance of all sectors deteriorated in the short run after the currency devaluation, which implies the relevance of the J-curve condition in food, mineral fuels and lubricants, and chemicals.

CONCLUSION

This paper estimates the export and import demand functions of Thailand's trading industries categorized into nine major industries. The own-price and cross-price elasticity of Thailand's exported and imported items are in an inelastic range, indicating the degree of competitiveness of the country's products in the global market and the import necessity of each item. A higher degree of own-price elasticity of exports indicates the sectors that should benefit from trade liberalization through exports, and a lower degree of own-price elasticity of imports also indicates the sectors in which domestic firms may not be harmed by tariff reduction. In addition, higher (lower) positive coefficients of long-run cross-price elasticity of exports indicate a higher (lower) degree of substitution between Thailand's exported items in the global market, while higher (lower) positive coefficients of long-run cross-price elasticity of imports also present the same argument.

In addition, the elastic range presented by the long-run income elasticity of the import demand function indicates that economic growth may worsen Thailand's balance of trade position. However, as for the elastic range of long-run income elasticity of export demand, the volume of Thailand's exports should also be substantially affected by increased global economic growth. Nevertheless, MLCs of each of the industries argue that only some industries have positive (negative) effects on the trade balance from the depreciation or devaluation (appreciation) of the baht, and it implies the relevance of the J-curve condition on those sectors. It can be intuitively concluded that those items may not be

globally competitive by their own structure and rather sensitive to the volatility of currencies.

APPENDIX A TESTING THE UNIT ROOT AND STATIONARY CONDITIONS

This section tests the unit-root conditions based on time-series variables used in the above estimation. A variety of methods can be used to test the unit root. This section utilizes the ADF test as the measurement, by estimating the following regression equation:

$$\Delta x_t = \phi + \beta\tau + \alpha x_{t-1} + \sum_{i=1}^p \delta_i \Delta x_{t-i} + e_t$$

The usual t-statistic associated with the estimated coefficient of x_{t-1} , (α) is employed for testing the null hypothesis (H_0) that the series (x_t) at level is non-stationary ($H_0: \alpha=0$) while the alternative hypothesis (H_1) set for testing stationarity requires that α be less than 0 ($H_1: \alpha < 0$). If the unit root cannot be rejected, higher order differences are tested until stationarity can be found, which can be tested by running the following regression:

$$\Delta^d x_t = \phi + \beta\tau + \alpha \Delta^d x_{t-1} + \sum_{i=1}^p \delta_i \Delta x_{t-i} + e_t$$

where Δ^d is the d th difference of that time series. By general test, x_t must be differenced until the d th difference contains the unit root. It is stationary. Then x_t is said to be integrated of order d , denoted as $x_t \sim I(d)$. Table A1 presents some variables of the unit-root tests.

Table A1 presents the estimation of the ADF test for time series concerning unit-root problems. The results presented in Table A1 show that all time series variables at level are also unit roots, which means that the null hypothesis of a unit root cannot be rejected. When all series' variables are characterized as unit roots at level, "first difference" of those series must be tested. The results show that the null hypothesis of non-stationarity was rejected, so that all variable time series in this study are characterized as integrated of order 1 or $I(1)$.

Besides, we also tested co-integration and found that error terms of all import and export equations estimated by ordinary least squares (OLS) are stationary or integrated of order zero $I(0)$. It follows the linear relationship condition of both estimated export and import demand equations. Thus, the regressions on the levels in this study are meaningful (not spurious) and do not lose any long-term information.

Table A1: Result of Unit-root Test

Industry	Variable	ADF Test			
		Level	Lag	First Diff.	Lag
Food	PM	-3.00	1	-7.12***	1
	PX	-1.92	1	-5.00***	3
	M	-2.16	1	-4.36***	1
	X	-1.36	1	-3.73**	1
Beverages and tobacco	PM	-1.68	3	-11.70***	2
	PX	-2.51	2	-7.67***	1
	M	-2.23	4	-6.32**	2
	X	-1.23	1	-7.11**	1
Crude materials	PM	-2.73	2	-6.99**	1
	PX	-2.75	1	-6.34**	1
	M	-2.60	2	-12.89***	1
	X	-1.25	2	3.45 ⁺	2
Mineral fuels and lubricants	PM	-2.37	1	-5.46***	1
	PX	-2.2	2	-4.86***	1
	M	-1.23	1	-3.47**	2
	X	-1.27	1	-4.47 ⁺	1
Animal and vegetable oils and fats	PM	-1.78	3	-6.17***	2
	PX	-2.63	1	-7.65***	1
	M	1.50	2	-5.40 ⁺	2
	X	1.20	1	-4.79**	1
Chemicals	PM	-2.76	3	-7.17***	2
	PX	-1.43	1	3.43 ⁺	1
	M	-3.00	1	-9.08***	1
	X	-2.78	1	-10.44***	1
Manufactured goods	PM	-2.75	1	-7.53***	1
	PX	-2.09	2	-8.37***	1
	M	-3.26	2	-10.29***	1
	X	-2.84	1	-3.18 ⁺	1
Machinery	PM	-2.87	1	-4.21***	3
	PX	-2.39	1	-6.76***	1
	M	-2.13	2	-12.73***	1
	X	-1.42	1	2.23 ⁺	2
Miscellaneous manufactured goods	PM	-2.27	1	3.27**	1
	PX	-1.23	2	3.23 ⁺	1
	M	-2.75	2	3.27**	1
	X	-2.10	1	-10.68**	1

Notes: *** Significance at level 99%
 ** Significance at level 95%
 * Significance at level 90%

APPENDIX B THE MARSHALL-LERNER CONDITION

The validity of MLC depends on the response of export and import volume to real exchange rate changes. This condition states that a real depreciation of currency would improve the current account if export and import volumes were sufficiently elastic with respect to exchange rate change. Named after the two economists

who formulated it, Alfred Marshall and Abba Lerner, MLC can be derived from the current account as the difference between exports and imports of goods and services as follows:

$$CA(EP^*/P, Y^d) = EX(EP^*/P) - IM(EP^*/P, Y^d) \quad (B1)$$

The above equation shows that export demand is a function of relative prices EP^*/P but import demand is

a function of EP^*/P and domestic income Y^d . Now to define import demand, IM : it is equal to the exports from a foreign country EX^* and denoted as $q = EP^*/P$

$$CA(q, Y^d) = EX(q) - q \times EX^*(q, Y^d) \quad (B2)$$

Now to denote EX_q and EX^*_q : they differentiate EX and EX^* with respect to q . Thus, EX_q is positive and EX^*_q is negative. The current account will improve owing to a currency change if the change in the current account with respect to the change in the real exchange rate must be greater than zero, so that

$$\Delta CA/\Delta q = EX_q - (q \times EX^*_q) - EX^* > 0 \quad (B3)$$

Now to define the elasticity of export demand with respect to q ,

$$\eta = (q/EX)EX_q \quad (B4)$$

and the elasticity of import demand with respect to q ,

$$\eta^* = -(q/EX^*)EX^*_q \quad (B5)$$

Substitute the elasticity of export demand η and the elasticity of import demand η^* in the current account function. Returning to the equation $\Delta CA/\Delta q$, we multiply it with (q/EX) to express the right-hand side in terms of trade elasticity. The positive sign of trade elasticity implies that the current account will improve from an exchange rate depreciation shown as the following equation:

$$(\Delta CA/\Delta q)(q/CA) = \eta + \eta^* - 1 > 0 \quad (B6)$$

MLC implies that

$$\eta + \eta^* > 1$$

The condition states that, if the current account is initially zero, real currency depreciation causes a current account surplus, if the sum of both export price elasticity and import price elasticity exceeds "one."

ENDNOTES

- ¹ The dynamism to the supply side from trade liberalization, for example, productivity enhancement, economies of scale, etc., is considered a longer run factor.
- ² However, this is based on certain key assumptions, which some economists argue do not apply to certain less developed or developing countries.
- ³ The decision whether or not to use price elasticity in trade in the short run or in the long run to form MLC

is quite vague. However, this paper uses long-run price elasticity for forming the conditions of the Marshall-Lerner Index.

- ⁴ Note that non-tariff barriers or liberalization in services will be neglected in this case; the reduction of the tariff barrier is just the main concern of what we mean by trade liberalization.
- ⁵ The J-curve depicts the circumstances under which the trade balance may not improve following the devaluation of a domestic currency. It is sometimes observed that a country's current account worsens immediately after real currency depreciation and begins to improve only some months later.
- ⁶ See, for example, Wilson (2001) on Malaysia, Korea, and Singapore; Akbostanci (2002) on Turkey; Piriya (2003) on Thailand; Hsing and Savvides (1996) on Korea and Taiwan; Bahmani-Oskooee (1985) on India, Korea, Thailand, and Greece; Himarios (1989) on 15 LDCs; Miles (1979) on 14 LDCs including the Philippines and Sri Lanka; Leonard and Stockman (2001), Bahmani-Oskooee and Brooks (1999), Rose (1990, 1991), Krugman and Baldwin (1987), and Rose and Yellen (1989) on U.S.; Marwah and Klein (1996) on the U.S. and Canada; Lal and Lowinger (2001), Guptar-Kapoor and Ramakrishnan (1999), and Noland (1989) on Japan; Boyd, Caporale, and Smith (2001), Onafowora (2003) on East Asia countries, and Bayoumi (1999) on various countries.
- ⁷ Relative price formulation, in which prices are in relative terms of PM_i/PD_i , is also widely used.
- ⁸ See Goldstein and Khan (1985) for summarized implications of using both formulations.
- ⁹ The Box-Cox transformation procedure can be used to justify a suitable model for each type of work. For details, see Sinha (1997).
- ¹⁰ It is both acceptable to implement the traded price elasticity in the short run or in the long run to form the MLC. However, this paper implements the long-run price elasticity as forming the condition of the Marshall-Lerner Index.
- ¹¹ However, it is well known that if the parametric model is not correctly specified then the estimates become biased and may give misleading results of estimated coefficients. The non-parametric technique can then be implemented. See, for example, Mahmud, Ullah, and Yucel (2004) for more details.
- ¹² Also, some imported items, for example, crude materials and machinery are globally produced by a small number of global firms that have own market power. Those sectors (crude materials and machinery) are also considered the factors of production for final products. Therefore, imports of those items are still

necessary, even though the estimated figures imply the loss of competitiveness of domestic firms in Thailand.

¹³ Own-price elasticity of imported items is not significant on the categories “beverages and tobacco” and “crude materials.”

¹⁴ Because the estimated data are based on monthly data, the long-run coefficients in this case are based on a monthly period lag. More than one such lag may generate different results.

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