Competitiveness, Income Distribution, and Growth in Thailand: What Does the Long-run Evidence Show?*

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Abstract

The paper addresses three fundamental issues under a long-run perspective: (1) growth and productivity, (2) competitiveness, and (3) income distribution. Unit labor costs (ulcs) and unit capital cost (ukcs) are calculated as the indicators of competitiveness in Thailand. Both series explain that Thailand did not gain in competitiveness during its boom period. However, during the 1997 financial crisis, when the Baht currency depreciated, both series dropped significantly.

The paper also discusses the dynamics of labor share and capital share in national income as well as the functional distribution of income. Some major features of Thailand's long-run economy are the following: (i) increasing average wage rates, (ii) stabilizing profit rates (slightly increasing during the boom decade after having dropped sharply during the 1997 crisis), (iii) substantially increasing capital-labor ratio, (iv) decreasing capital productivity and increasing capital-output ratio, (v) increasing labor productivity, and (vi) increasing mark-up. Functional income distribution can be determined during the periods studied. The gains in labor were greater than that of capital in the Thai economy, especially during the period of crisis when profit rates dropped substantially.

The paper also documents the growth in income per capita decomposed by ranges of labor market indicators. Labor productivity is observed as the only factor contributing to per capita output. Overall, to achieve the medium to long-term growth potential projected by the National Economic and Social Development Board (NESDB), Thailand needs to improve capital productivity and increase its capital stock.

This paper is organized as follows: after the Introduction, Sections II-III construct labor's shares, capital share, and ulc series, and observe the long-run pattern of the variables. Section IV analyzes the determinants of long-run competitiveness and growth. The determinants include wage rate, profit rate, capital-output ratio, capital-labor ratio, labor productivity, and capital productivity. Section V observes the degree of functional income distribution including its long-term evolution during the last 20 years. Section VI computes the degree of mark-up, which also implies the dynamism of the monopoly power of business in the Thai economy. Section VII analyzes the sources of growth in per capita income categorized by different labor compositions. Section IX estimates the medium-term growth potential as projected by the NESDB. Section X concludes the report.

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I.   Introduction: Main Features of the Thai Economy: 1980-2003

Despite the East Asian crisis of 1997, Thailand is considered as a successful, fast-growing, and stable economy among emerging economies. The 1997 crisis took most observers and policy makers by surprise owing to Thailand's moderate inflation and remarkably stable exchange rates during the pre-crisis period. Nevertheless, the crisis made clear not only the need for an immediate remedy, but also the need to understand the structural growth of the economy. More and deeper explanations of historical growth should be investigated. Crucial questions include the following: (1) What was the growth pattern of the economy and its share in the resources of production in Thailand? (2) How does the growth pattern imply the country's long-term competitiveness? and (3) Was there any inequality or imbalance between the effects of growth on the compensation to labor and that to capital? Long-run capacity and growth are affected by wage bills and total profits, as wage bills measure returns to labor and total profits measure returns to capital. This paper addresses the linkages between wage bills and total profits captured from Thailand's account identity. As mentioned previously, we explain the long-run economic patterns of Thailand in term of (1) growth and productivity, (2) competitiveness, and (3) income distribution. The variables used to explain these long-run perspectives include labor share, wage earnings, profit rate, labor productivity, capital productivity, capital-output ratio, and capital-labor ratio.

In the past three decades, the overall economy of Thailand has experienced a remarkable record of growth. However, that growth is not uniform; uneven growth rates in different sectors have resulted in a rapid transition of the structure of the Thai economy. *Growth and productivity* are determined by increases in the size of the country's output. Many factors are used to determine the size and the growth of a country's output and productivity. In terms of demand, the analysis is based on an input-output framework, where output growth can be decomposed into different demand elements: expansion of domestic demand, increase of exports, and import substitution.[1]

Most of the previous productivity studies in Thailand have relied on some specific forms of production function from the supply side, with the estimates of production function then being used to derive the total factor productivity (TFP) index. There are also other ways to analyze long-term productivity and growth without assuming the form of the production function. This approach is known as growth-accounting analysis. In this approach, under the assumption of profit maximization, the growth of output in a given period derived from the growth of each input, weighted by its income share, can be determined using the long-run historical pattern.

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[1]   For some literature on productivity in Thailand based on demand size, see Akrasanee (1975) and Ajanant et al. (1986).

In the production function approach, many studies have used the econometric approach, for example, Wannitikul (1972), Brimble (1987), Wiboonchutikula (1982), Limskul (1988), Brimble (1993), Kaipornsak (1995), and Sakonpan (1997). Wannitikul (1972) applied econometrics to estimate the Cobb-Douglas production function to study TFP growth during the period 1950-1969. Brimble (1987) applied the econometrics framework to estimate the trans-log production function. The main source of growth during the period studied, 1975-1983, was found in the factors of production (60.2 percent), of which 0.7 percent is from the labor factor, 10.7 percent from the capital factor, 48.7 from the intermediate factor, and 39.9 percent from TFP growth. He found that the industry which has the highest TFP growth is the automobile industry (7.62 percent); it is followed closely by electrical industries (6.96 percent). Wiboonchutikula (1982) analyzed the TFP growth of 25 industries during the period 1963-1976. He found that the growth of the industrial sector was higher in developing countries than in developed countries. He also compared the growth rates between two periods: the import-substitution period (1960s) and the export-promotion period (1970s), and found that the growth rate of industrial growth was lower during the import-substitution period. Limskul (1988) used the constant elasticity substitution (CES) production function to compare TFP growth in Thailand and the newly industrializing economies (NIEs) before and after the Second World War. The highest growth was found in the electricity and water supply sectors. In calculating TFP from sectoral trans-log production frontiers, Brimble (1993) found that simple descriptive variables such as a firm's size, its export performance, foreign ownership, and age did not perform well in terms of TFP growth. In contrast, variables reflecting a firm's level of activity such as profit rates, and inventory ratios had more explanatory power. Kaipornsak (1995) used the econometric approach based on the Cobb-Douglas production function comparing the trans-log production function in order to analyze TFP growth in Thailand. His findings were consistent with what Limskul (1988) explained. The highest growth of TFP was in electricity and water supply, and negative growth of TFP was found in the manufacturing sector. Finally, Sakonpan (1997) used the same methodology as Wiboonchutikula (1982) and concluded that the TFP growth of Thai industries was around 3.3 percent during the period 1979-1991.

For the growth accounting approach, some previous literature on TFP concerning Thailand includes, for example, Tinakorn and Sussangkarn (1998), Rattso and Stokke (2003), and Chandrachai et al. (2004). Although this growth-accounting approach has been used to observe TFP for many countries, the paper of Tinakorn and Sussangkarn (1998) is the first to have made such an analysis for Thailand. They used the growth-accounting method based on the framework of the Solow-Denison Approach to estimate TFP growth during the period 1970-1996. They concluded that the average growth of the whole economy during the period 1980-1995 was 5.01 percent, mainly contributed by capital. The contribution of TFP

growth varied from about 0.5 to 2.7 percent. Rattso and Stokke (2003) applied the method and the disaggregated data of Tinakorn and Sussangkarn (1998) for agriculture and industry in order to investigate the dynamic linkages between productivity and foreign spillover. They concluded that the long-run elasticity of productivity with respect to foreign trade is about 0.2 in both agriculture and industry. That means when foreign trade goes up by 10 percent, sectoral productivity must go up by 2 percent.[2] Finally, Chandrachai et al. (2004) computed TFP growth in Thailand during the period 1977-1999 using the growth-accounting method. They concluded that the main contribution to economic growth for the last 10 years was from capital. Other high contributors to TFP growth were agriculture, transportation, and communications. However, manufacturing made no significant contribution to TFP growth, and the service sector made only a small contribution.

Competitiveness is cross-linked with productivity. Competitiveness is the second measurement concerned with productivity, efficiency, and profitability generated by firms, industries, countries, or regions based on competitive advantage in parallel with improvements in living standards and the social welfare of the people. Even though there are many different factors affecting competitiveness, all aspects of Thailand's competitiveness to the time of the crisis, especially those of the manufacturing sector, came under scrutiny. These were macroeconomic factors such as the appreciating domestic currency, the rising cost of labor, the adequacy of the physical infrastructure, the adequacy of industrial skills, and the impact of the government's technological infrastructure (Dhanani and Scholtès, 2003). In this study, competitiveness measured by *unit labor costs* (ulcs) will be addressed in order to observe the long-term pattern of the Thai economy, including the pattern of international competition among countries. Ulc is defined as the ratio of the nominal wage to labor productivity (unit of output). Therefore, changes in ulc can be from changes in wages and/or changes in labor productivity. Dhanani and Scholtès (2003) estimated the relationship between wage and labor productivity changes. They found that labor productivity increased more rapidly than wages in the period of rapid manufacturing growth, 1986-1996, which was the period preceding the crisis. The causality between the cost of labor and higher labor productivity may be in both directions: more expensive labor encourages investment in mechanization and a shift to higher value production, whereas greater availability of capital per worker in the economy leads to wage raises. Hence, besides labor productivity, capital production (or its profit rate) also helps to explain the long-run competitiveness of a country. This study calculates ulc as a competitiveness indicator in the long run. In addition, another new but similar indicator, "unit-capital cost" (ukc), defined as the ratio of the nominal return of capital to capital productivity, can be adopted as an indicator in order to confirm the level of the country's long-run competitiveness.

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[2] Since the growth of foreign trade has been increasing and becoming more important to economic growth in Thailand, this seems to be another determinant of the country's productivity growth.

The third measurement concerning economic growth and productivity is how the growth is "neutrally distributed" among various groups. Generally, income distribution among groups of different ethnicity, religion, regions, or race can be a major cause of conflicts between groups. Nevertheless, a number of empirical studies show no relationship between growth rates and inequality (Ahluwalia, 1976). Historical evidence shows that countries with worsened income distribution (e.g., Thailand, Brazil, China, and Pakistan) as well as economies with improved income distribution (e.g., Malaysia, Taiwan, and South Korea) have achieved high levels of economic growth. Moreover, there are many countries with low growth and income inequality (Stewart, 2000). A number of studies conclude that more unequal income distribution leads to higher economic growth through higher savings.[3] Some earlier studies also argue that more capital intensivity in production also helps to maximize surplus and increase re-investible funds. From this point of view, an idea is emerging that countries should grow first and redistribute income later. Therefore, this study also discusses how functional income is shared between wages to households and profits to businesses. Wages and profits will be compared within different stages of economic evolution.

By any aggregated measure, over the past two decades Thailand has been undoubtedly one of the most successful economies in the world. The evolution of the country's economic history can be classified into three sub-periods as shown below:

I. 1980-1985, which was a period of macroeconomic adjustment, economic uncertainty, and hardship.

II. 1986-1996, which was a period of extraordinarily high economic growth, economic boom, speculation, and "bubbles."

III. 1997-2003, which was a period of financial crisis, economic distress, and emerging recovery.

Sub-period I: 1980-1985

Real per capita income grew every year during the period of stabilization and adjustment during the early 1980s, averaging growth of over 5 percent per annum. Sub-period I started in 1980; it was a consequence of the oil price hikes and world recession around that time. In the period 1982-1984, a series of stabilization measures and structural reforms were implemented in order to rectify the imbalances and distortions in the economy that had worsened since 1980. The policy reforms implemented during this period created fiscal imbalances, realigned the exchange rate, enhanced incentives in exports and production, and improved the climate for stimulating investment. The difficulties were also associated with

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[3] Alesina and Perotti (1993), Persson and Tabelllini (1994), Deininger and Squire (1996), and Larrain and Vergara (1997).

the two oil shocks and the global economic recession around that time, the consequence of a souring government budget deficit arising from increased government expenditures.

Nevertheless, sub-period I was considered as having a political atmosphere characterized as one of the most stable in Thailand's history consequent to General Prem Tinnasulanon taking the position of Thailand's Prime Minister in 1980. The Prem Tinnasulanon government managed to restore fiscal discipline during the period 1982-1985. In addition, following the collapse of the Bretton-Woods system, Thailand pegged its currency to the US dollar, which, as a result, became costly when the US currency appreciated against other currencies during the period.[4] In 1981, the Thai Baht had to be devalued by 15 percent, which damaged the country's competitiveness. In 1984, Thailand then started to use the system of a "basket of currencies." Thus, during sub-period I Thailand faced an unprecedented rise in economic uncertainties and hardships. This period was viewed as a period of transition in which many adjustments were necessary for the new economic structure that existed throughout the next sub-period.

<u>Sub-period II: 1986-1996</u>

In contrast with the previous sub-period, sub-period II (1986-1996) was considered the most prosperous for the Thai economy. Considering only aggregate figures, Thailand enjoyed its highest economic growth rate during this period, averaging 9.1 percent per annum. The Thai economy experienced a double-digit growth rate during the late-1980s. It recorded a growth rate of over 8 percent per annum in the period 1991-1994 and about 8.7 percent in 1995. These high growth rates were generated basically by the manufacturing sector. Such remarkable growth performance was attributed to favorable external factors and sound policy fundamentals. During this period, the domestic policies included conservative fiscal management in terms of controlling public expenditures, aggressively promoting exports and maintaining foreign exchange currency, and making market-friendly sectoral interventions.

The first important external factor attributed to the remarkable growth rate during this period was the 1985 Plaza Accords that effectively realigned major currencies following the depreciation of the dollar. This event caused the Baht to depreciate as the US dollar represented a heavily weighted share in the aforementioned currency "basket." The second external factor was the sharp decrease in the supply of petroleum products, a phenomenon that started in 1986. The supply of petroleum products remained low until the first Persian Gulf War in 1991.

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[4]   The US dollar started to appreciate against other major currencies in 1987.

The above internal and external factors largely benefited Thai exporters, especially those in the manufacturing sector. Another important factor was a byproduct of the exchange rate realignment, which resulted in relocation of multinational firms from Japan, Taiwan, and Hong Kong. Many firms in these economies chose Thailand as one of their major production bases because of the cost-effective production of Thai manufacturers. As a result, large inflows of foreign direct investment flooded into Thailand during this period. Manufacturing production also surged in response to growing export and investment demands.

In addition, the high rate of economic growth during this second sub-period was also induced by Thailand's stable political atmosphere. The relatively stable political environment associated with the Prem Administration was followed by a smooth transition to the Chatchai Choonhavan government in 1988. However, a coup d'etat in 1990 threw out that government. A period of instability followed the coup. After it was over however, Thailand experienced a moderately stable political environment, even though the political administration was represented by a number of different political parties during the period 1990-1997.

An interesting economic policy in this period was the policy to change the infrastructure buildup. Unlike in the 1960s when the government was mainly—perhaps entirely—responsible for providing basic infrastructure, infrastructure buildup in the late 1980s and 1990s was the responsibility of private companies. Some responsibility for building the infrastructure was often shared by both the private and the public sectors. This policy alleviated the cost burden on public funds and enhanced cost-effectiveness in construction.

Nevertheless, as a consequence of the rapid growth of the economy, speculation took place at an alarming rate, beginning around the end of the 1980s, in real estate and financial securities, especially in the stock market. Both domestic and international investors rushed into these markets without any proper risk analysis. The double-digit growth rates of that era led financial institutions to develop over-optimistic views. This, in turn, resulted in excessive credits to financially-constrained firms. In addition, during this period Thailand liberalized capital inflows and allowed banks to operate offshore banking facilities, e.g., the Bangkok International Banking Facilities (BIBF). BIBF banks acquired a large amount of US dollar funds for lending to local borrowers in US dollars.

In conclusion, sub-period II in general created a steady growth record, sound fiscal performance, rapid export growth, and remarkably high domestic savings and investment rates (even though investments remained far higher than savings), indicating that the Thai economy had become one of the world's best economic performers.

In 1997, as previously mentioned, Thailand experienced a crisis which combined the effects of both a currency crisis and an economic crisis. After the depletion of its international reserves, the Bank of Thailand (BOT) had to float the currency on July 2, 1997, ending decades of a fixed exchange rate regime, and marking the beginning of the crisis. A number of major factors contributed to the 1997 financial crisis, including currency mismatches of the external debt, the failure of BOT in reviewing and adjusting policies, and the inefficiency and the weakness of financial institutions, among others.

The Thai economy contracted by 1.4 percent in 1997 and 10.5 percent in 1998. Its recovery was gradual over the ensuing years. By the end of 2001, the level of real GDP was still lower than that of 1996. Growth accounting shows that a drop in GDP during the period 1997-1998 primarily led to lower uses of capital stock (capital utilization rates) and lower uses of labor inputs (unemployment). After the crisis period, the net capital stock started to expand gradually during the period of economic recovery. Nevertheless, the recovery period in 1999 and 2000 was shaky. Growth during the recovery period stagnated owing to the rising trend of unemployment. However, the Thai economy expanded substantially in 2002. The growth rate in 2002 was 5.4 percent compared with 2.1 percent in 2001; the year 2002 experienced the highest growth rate since the 1997 crisis.

II.　　The Evolution of Labor Share and Capital Share

This section analyzes the dynamics of factor share in Thailand during the period 1980-2003. In macroeconomics, factor shares are calculated within aggregated terms of national account. The National Income and Product Account (NIPA) denotes the composition of the nominal value added, which comprises the total nominal wage bill and total nominal profits. Therefore, the share of labor in the value added is computed as a ratio of the total wage bill to the value added in real terms.[5] NESDB is a Thailand's central planning agency; it arranges NIPA to provide the following series: the value added in both nominal and real terms and the total wage bill in terms of "compensation to employees."[6] Therefore, the "raw labor share" of Thailand is constructed as the ratio of the compensation to

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[5]　　$VA_n = W_n L + r_n K$, where VA_n is the nominal value added, $W_n L$ is the nominal wage bill, and $r_n K$ is the nominal profit. Then, $1 \equiv \dfrac{W_n}{V_n} + \dfrac{\Pi_n}{VA_n} \equiv \left(\dfrac{w_n L}{VA_n} \right) + \left(\dfrac{r_n K}{VA_n} \right) \equiv s^L + s^K$, where s^L is the raw labor share and s^k is the raw capital share.

[6]　　Compensation to employees in NESDB calculations consists of (i) wages and salaries and (ii) employers' contribution of social security.

employees to GDP at factor costs.[7] As shown in Figure 1, the series displays a slightly increasing trend, with a mean of 0.361, maximum value of 0.420, and minimum value of 0.312.

However, as commonly occurs in most developing countries employee compensation differs from labor income (Gollin, 2002). Labor income also includes some important parts of non-wage compensation, rents from particular jobs, and the returns to entrepreneurs. These specific components comprise the labor income of the people who are not wage-employees. Also in Thailand, a large proportion of the total labor force includes workers who are registered as "own-account" workers and "own-family workers," who do not receive regular earnings in terms of wages and salaries.[8] NESDB measures this part of labor income (or profits) as "Income from Unincorporated Enterprises" (IUE). The share of IUE represents a mixture of both wages and profits allocated to own-account workers, including small production units that are generally owned and managed by households.[9]

Also shown in Figure 1, the share of IUE (the ratio of IUE to the value added) decreased from 0.580 in 1980 to the minimum level of 0.305 in 1996. The ratio then started to increase after 1996. The upward trend of the IUE share during the period 1996-1999 was generally a result of decreased output during the crisis period. In 1980, the share of IUE was about twice as large as that of the compensation of employees. However, it dropped significantly in 1988. In 1994, the IUE share fell below the share of employee compensation.

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[7]   Provided by NESDB, GDP at factor cost = GDP at market price – indirect taxes + subsidies – provision for consumption of fixed capital.

[8]   In 2000, there were approximately 1.93 million own-account workers in Thailand. The majority of the own-account workers are in the agricultural sector (47.2 percent), commerce sector (23.9 percent), manufacturing (8.7 percent), services (9.8 percent), transportation and communications (5.8 percent), and others (4.6 percent).

[9]   Many studies define these as income of self-employed workers, which refers to income for own-account workers as well as the profits of unincorporated enterprises. Examples of own-account workers are doctors, barbers, and retailers, who work in independent units. They supply all the factors of production themselves and do not manage the accounts of production factors separately.

Figure 1: Raw Labor Share and Share of Income from Unincorporated Enterprises
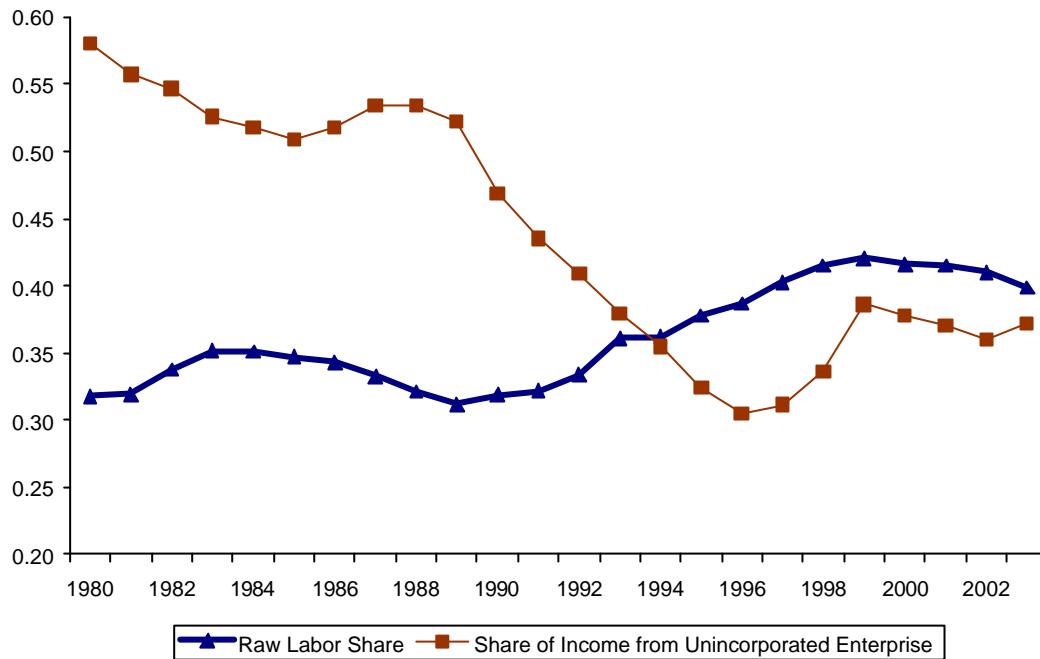
In Figure 1, the share of the IUE and the raw labor share move in opposite directions. The long-run changes resulted in a shift in the structure of employment out of the agricultural sector. This structural change increased the proportion of wage-earning workers, who used to be self-employed. This phenomenon is known to exist during transitional periods in many developing countries. The transition is due to a substantial increase in wage earnings in the manufacturing sector over the periods of economic development. Hence, a large number of workers from the agricultural sector decided work in manufacturing sectors where wages and salaries were higher. As a result, we observe that the labor share and the UIE share move in opposite directions, particularly in the boom period 1986-1996. In addition, the employment shares of workers in the agricultural sector declined from 0.708 in 1980 to 0.410 in 2002 while the shares of workers in the non-agricultural sectors rose. However, the raw labor share appears to be stable over time, indicating that the financial crisis did not substantially harm the employees' aggregate earnings.

As mentioned previously, the raw labor share could be underestimated since some specific unmeasured incomes are not included in labor compensation. As a general rule of thumb, labor's share of income is assumed to be about two-thirds that of the national income—although the exact figure is sensitive to specific data used to calculate the ratio. We apply the methodology of "two" adjustments (Adjustment 1 and Adjustment 2) proposed by Gollin (2000) and then compute the

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average outcomes on both adjustments. [10] Differing from the raw labor share shown in Figure 1, the adjusted labor share shown in Figure 2 displays a decreasing trend before the crisis. The adjusted labor share has a mean value of 0.726, maximum value of 0.828, and minimum value of 0.624. The adjusted labor share grew positively during the crisis period, with the average adjusted labor share being 0.62 percentage points per annum. The data clearly indicate that the financial crisis seems not to have caused any adverse shocks for the labor share. Even though the nominal output sharply dropped during the crisis, the total wage bill was relatively stable during the period considered.

Since the national account identity is identified as the total wage bill plus total profits, the share of capital (denoted as the share of total profits to the value added in real terms) can then be computed. In general, the trend of the adjusted capital share is inversely related to that of the adjusted labor share. [11] During the period 1980-2003, the adjusted capital share had a mean of 0.274, maximum value of 0.376, and minimum value of 0.172. Similar to data from other emerging economies, our data suggest that the majority of Thailand's national income is shared by labor. However, the long-run movement of labor's share seems to have displayed a decreasing trend in Thailand's economic evolution, especially during the boom period (sub-period II), which was characterized by export-led growth in the manufacturing sector. Thailand relied more on capital-intensive goods, which led the rapid growth of the economy.

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[10] Adjustment 1 is computed as the ratio of the sum of shares in GDP of the compensation of employees and the share of UIE to one minus the share in GDP of indirect taxes and subsidies, and provision for consumption of fixed capital. Since this adjustment counts the share of UIE as labor income, the labor share found in this adjustment has a mean of 0.800, declining from 0.898 to 0.691. Adjustment 2 is computed as the ratio of the share of compensation of employees in GDP to one minus the share of UIE and minus the share of indirect taxes, subsidies, and provision for consumption of fixed capital. Because UIE is treated as a composite of income and profit rates, the labor share in Adjustment 2 should be lower than that of Adjustment 1. We find that Adjustment 2 has a mean of 0.652, declining from 0.757 to 0.557.

[11] Krueger (1999) points out that the calculation of labor's shares might have some measurement problems. With a rise in employee stock ownership and pension funds and an increase in the compensation for top executives, labor and capital might not be divided neatly into mutually exclusive categories. This paper suggests that the increase in the number and variety of available wage sources should help to improve the measurement of labor-share and capital-share devising categories.

Figure 2:   Adjusted Labor Share and Adjusted Capital Share
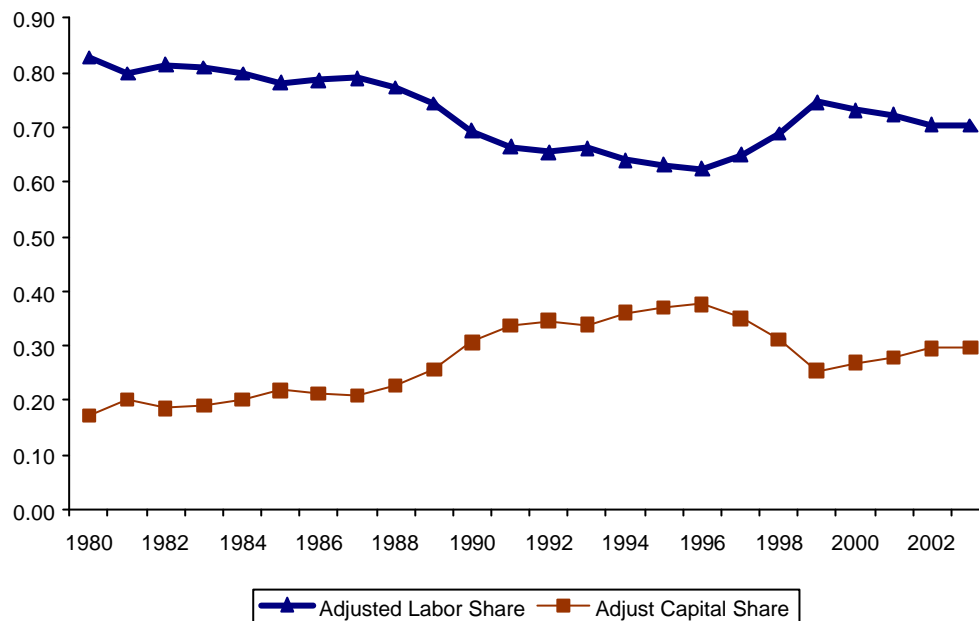
III.   The Evolution of Unit Labor Cost and Unit Capital Cost

Mainstream international trade theory posits that a country will have a comparative advantage if it produces goods and services based on what it possess in relative abundance. Having more of a given input implies that the price of such a factor will be low relative to other more scarce inputs. Goods produced with relatively cheaper inputs command lower prices and therefore are more competitive than the same goods produced elsewhere where such factors are more expensive. The term "competitiveness" in the case of Thailand refers to cheap labor. In practice, policies that improve the welfare of workers imply higher labor costs and lower price competitiveness. Since labor is usually the largest component of production costs, a sustained rise (decline) in unit labor costs will cause an upward (downward) shift in a firm's average and marginal cost curves, which in turn determines cost competitiveness.

In addition, in a world of high capital mobility, the level of cost-competitiveness may be viewed as a determinant of the magnitude of foreign direct investment flows. Footloose industries tend to locate where unit costs of non-tradable inputs, particularly labor, are low. Costs of tradable inputs such as raw materials and capital are then likely to be approximately equalized internationally. The most important non-tradable input is labor. Thus, the unit labor cost (i.e., labor cost per unit of output) could be a particularly useful indicator of cost competitiveness (Turner and Golub 1997).

This study discusses competitiveness in Thailand, measured by the unit labor costs (ulcs) over the long-run periods between 1980 and 2003.[12] Algebraically, ulcs are calculated as the ratio of the nominal wage rate (dollars per worker) to labor productivity, which is the quantity of output produced per worker. In aggregated terms, the quantity of output can be used as a proxy for the real value added. The unit labor costs rise when compensation and benefits rise faster than labor productivity. The lower is the ulcs' value, the more competitive is the country's manufacturing sector. The competitiveness of the manufacturing sector is often measured by (i) a low level of nominal wages and (ii) an increase in labor productivity. Since these two variables are given in nominal terms, the ulcs are adjusted using GDP or some price deflator to obtain ulcs in real terms (denoted ulc1).[13] With an upward trend, ulc1 increased from 0.600 in 1980 to 1.207 in 2003. Since the labor share declined, an upward trend of ulc1 must be due to an increase in the GDP deflator. The increases in the GDP deflator should therefore indicate a loss of Thailand's cost competitiveness during the period studied.

Nevertheless, the higher ulc1 may not imply a loss in competitiveness for Thailand when considering intercountry comparisons. By doing intercountry comparisons, the ulcs should be constructed considering not only the ratio of the nominal wage rate to labor productivity, but also the transformation of the local currency (Baht) to the numeraire currency (e.g., US dollar). The definition of ulcs can be further refined using a series of adjustments such as the price purchasing parity (PPP) exchange rate (the price-adjustment effect), which is the ratio of the nominal exchange rate (Baht/US dollar) in PPP terms. Thus, Thailand gained competitiveness in comparison with other countries not only because of low wages and high labor productivity, but also because of the depreciation of the Baht against the US dollar.[14]

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[12] The unit labor cost in the manufacturing sector is a key determinant of competitiveness in traded goods markets. By focusing on costs rather than prices, using the unit labor costs takes away some endogeneity of the CPI and export price measures. Golub and Ceglowski (2002) mention some limitations of the unit labor costs. First, data on labor productivity and labor compensation, which are needed to compute the unit labor costs, are not always reliable and available on a timely basis. Second, these measures are not widely available for service sectors, which constitute a growing component of international trade. Third, labor productivity may exhibit short-run counter-cyclical movements. Fourth, the unit labor costs ignore other costs of production (e.g., intermediate goods, non-labor taxes, and capital costs).

[13] $ulc1 = \dfrac{w_n}{\left(\dfrac{VA_n}{P}\right)\Big/L} = \left(\dfrac{w_n L}{VA_n}\right)P$, where P is the GDP deflator.

[14] To compare the computed unit labor costs among countries, the use of purchasing power parities (PPPs) is adopted. We then multiply the ulcs (after the PPP adjustment) by the current nominal exchange rate in order to convert the local-currency price (Baht) to a numeraire currency,

Ulc2 may be defined as pure ulc effects with price-adjustment. Ulc2 displays a downward trend, which indicates greater competitiveness of the Thai economy during the two decades concerned. Ulc2 has a mean of 0.281, maximum value of 0.388, and minimum value of 0.206. When considering different sub-periods, ulc2 dropped in sub-period I (1980-1985), stayed relatively stable during the boom decade of sub-period II, and then dropped again during sub-period III.

Why was ulc2 stable during the sub-period II? It is because of the downward trend of the labor share, which was offset by a higher price adjustment effect. As a result, the Thai economy did not gain much competitiveness during the boom period. Even though the export boom led to lower labor shares, an increase in export demand pressured the Baht to appreciate, reflecting a loss in the competitiveness of the Thai economy.

Why did the ulc2 drop during sub-period I and sub-period III, while ulc1 constantly increased during these sub-periods? Since the labor share decreased during sub-period I and slightly increased during sub-period III, the decreasing ulc2 was mainly determined by the price-adjustment effect owing to the devaluation of the Baht. During the crisis period, the Baht was effectively devalued by approximately 60 percent.[15]

Nevertheless, using unit labor cost as an indicator of competitiveness might not be applicable to many countries, which are focused on capital-intensive production. In addition, some sectors in Thailand are considered capital-intensive and play a major role in the Thai economy. Thus, similar to the analysis using ulcs, an indicator of competitiveness, "unit capital costs (ukcs)" might be considered as another competitiveness indicator; it is defined as the ratio of the cost of capital (or profit rate) to capital productivity. The interpretation of ukcs is straightforward. The lower is the level of ukcs, the more competitive is the Thai economy. Similar to Figure 3, Figure 4 shows two ukcs, one with a GDP deflator (ukc1) and one with price-adjustment (ukc2).[16] Ukc1 increased significantly owing to the increases in the GDP deflator, from 0.125 in 1980 to 0.511 in 2003. However, when adjusting the series with the ratio of PPP and exchange rates, ukc2 was relatively stable during sub-period I; it increased during the boom decade, and dropped significantly

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generally the US dollar). This is called the "price adjustment effect." So $ulc2 = \left(\dfrac{W_n L}{VA_n}\right)\left(\dfrac{ppp}{ER}\right)$,

where $\left(\dfrac{W_n L}{VA_n}\right)$ is the pure ulc effect and $\left(\dfrac{ppp}{ER}\right)$ is the price adjustment effect.

[15] Since the long-run trend of Thailand's purchasing power parity (PPP) was slightly upward during the periods, reduction of the price adjustment component was truly due to the devaluation of the Baht.

[16] $ukc1 = \dfrac{r_n}{(VA_n / P)/K} = \left(\dfrac{r_n K}{VA_n}\right)P$ and $ukc2 = \dfrac{\left(r_n / ER\right)}{(VA_n / PPP)/K} = \left(\dfrac{r_n K}{VA_n}\right)\left(\dfrac{PPP}{ER}\right)$

during the crisis period. A sharp drop of ukcs during sub-period III was due not only to the lower capital share, but also the sharp devaluation of the currency (Baht) itself. The series had a mean of 0.106, a minimum value of 0.074, and a maximum value of 0.173.

Figure 3:   Unit Labor Costs (ulcs)
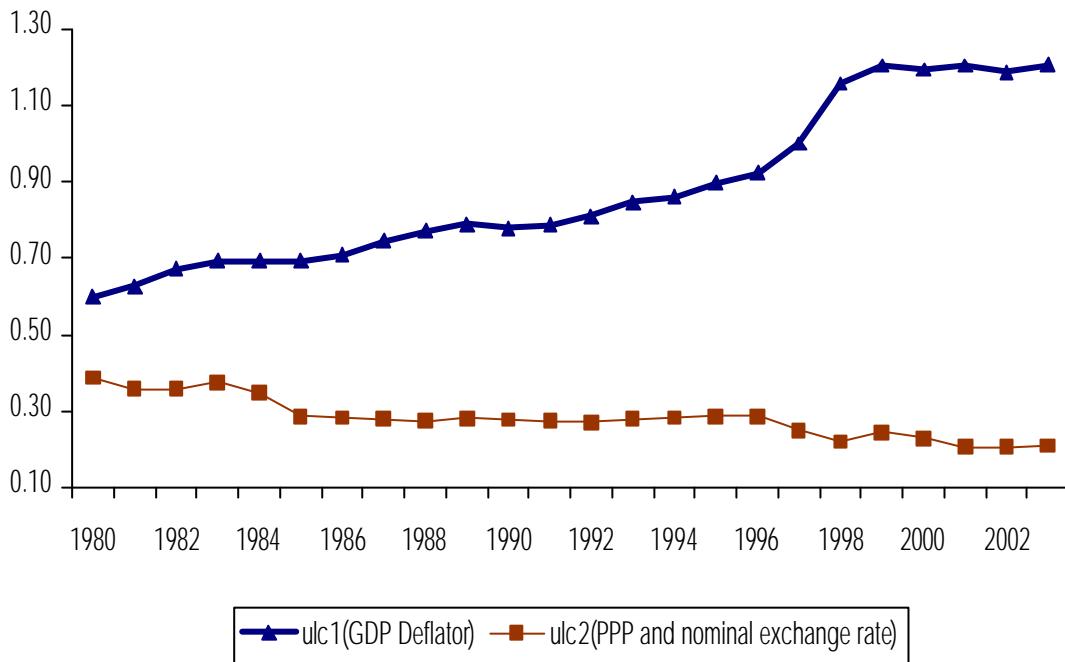
Figure 4:   Unit Capital Costs (ukcs)
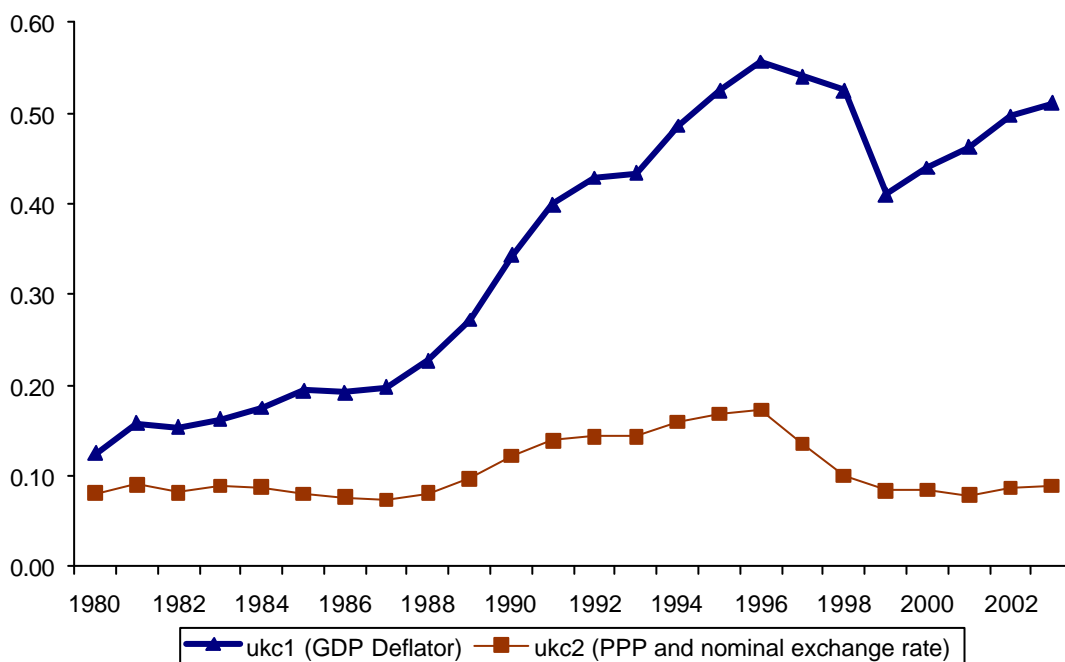
This section examines ulcs and ukcs as key determinants of long-run cost competitiveness. By intercountry comparison, both series (ulc2 and ukc2) indicate that the Thai economy did not gain competitiveness during the boom phase 1986-1996.[17] During the crisis period, the competitiveness of the Thai economy dropped sharply owing to price-adjustment effects (the devaluation of the Baht). Nevertheless, the concept of cost competitiveness should concern international prices (for both exports and imports), which in turn determine trade flows. If Thailand's competitiveness improves, foreign demand for Thai products should rise as the products become less expensive in international markets. Thailand's import demand would be expected to drop as imported goods become more expensive for Thai buyers. The declining trends of both ulcs and ukcs imply a good prospect for competitiveness in the global market.

IV. Determinants of Competitiveness and Long-run Growth

In the previous section, two indicators, ulcs and ukcs, were introduced to determine the country's long-run competitiveness. Recall that ulcs is a ratio of wages divided by labor productivity. While lower wages usually imply that a country is more competitive than many others, labor productivity becomes an important variable determining the long-term growth of developed economies. This section analyzes other relationships between ulcs and ukcs and long-run economic growth by examining each component of the two indicators in detail. Using account identity, the variables examined in this section are wage rates, profit rates, labor productivity, capital productivity, and capital-labor ratio. The interrelationships among these variables help to increase understanding of the performance of the Thai economy in the past two decades.

4.1. Employment and Wages

It may be recalled that unit labor cost is the measure of worker compensation to labor productivity. If labor productivity increases and worker compensation remains unchanged, the unit labor costs will decline. On the other hand, if labor productivity remains unchanged but worker compensation and benefits rise, then unit labor costs will rise. Thus, changes in unit labor costs reflect the net effect of changes in worker compensation and changes in worker productivity. Recalling that the ulcs have shown a decreasing trend over the two decades studied, this section attempts to assess how wage earnings are identified and how they moved during the period.

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[17] From now on, the unit labor costs (ulcs) and the unit capital costs (ukcs) explained in this paper are referred to as ulcs and ukcs with PPP and exchange rate adjustment (price-adjustment effect), or ulc2 and ukc2.

Identifying the wage earnings of Thai workers faces a major problem since the wages and salaries reported by Thailand's Labor Force Survey are collected only from wage-earning workers. The Survey provides data on employment by classification of workers as follows: (1) wage and salaried workers, (2) own-account workers, and (3) unpaid family workers. The first group is defined as those who work in formal sectors, such as those who work as government employees, state-enterprise employees, and private employees, or employees in non-agricultural sectors. Since these workers are protected by the Labor Protection Act, they are covered by various kinds of social insurance. The formal sector, nevertheless, involves entry barriers (e.g., a high level of education, the ability to access some job-related information, and good networking). Figure 5 shows that the share of Thai workers in the formal sectors (or wage and salaried workers) has been increasing substantially from around 22.3 percent of total employment in 1980 to around 41.7 percent in 2003.

Similar to the labor markets in many other developing countries, the Thai labor market consists of a large proportion of workers who are non-wage employees and work in the informal sector. In 2003, non-wage workers are classified as (1) own-account workers and (2) unpaid family workers, which accounted, respectively, for about 32.7 percent and 25.5 percent of total employment. The summation of those two, around 58.2 percent, is the ratio of workers in the informal sector to total employment. These workers might be considered by the Labor Force Survey as non-wage workers; this includes workers who work in an enterprise that typically operates on a small scale with a low level of organization.

Figure 5: The Share of Wage and Salaried Workers (Workers in Formal Sector) to Total Employment
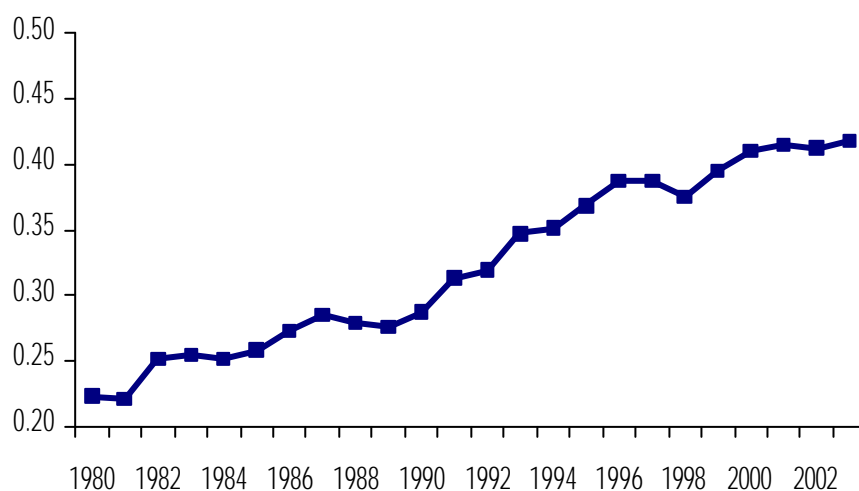
During the period studied, shares of workers in the informal sector dropped significantly from 77.8 percent in 1980 to 58.2 percent in 2003. The share of own-account workers was found to be quite constant, about 32 percent, during the period studied, while the share of unpaid family workers has been dropping substantially from 46.7 percent in 1980 to 25.5 percent in 2003. Therefore, this pattern determines that the declining share of unpaid-family workers is causing a decrease in the share of informal workers.

Why did the share of unpaid-family workers decline? This is because the majority of unpaid-family workers in Thailand are in the agricultural sector. Over time, a large number of these workers moved to formal sectors, especially to small and medium-sized enterprises.[18] The seasonal pattern of the number of workers in the formal sector is caused mainly by the seasonal mobility of laborers in private enterprises. Nevertheless, the seasonal movement of workers between the formal sector and the informal sector is also appearing, especially in the agricultural sector.[19]

Figure 6: **The Share of Own-Account Workers, the Share of Family-Own Workers, and the Share of Workers in Informal Sector to Total Employment**
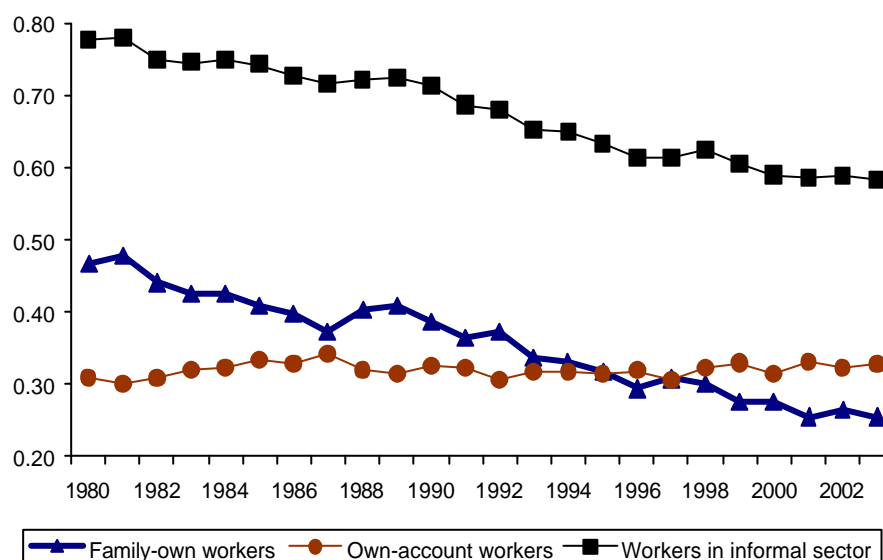
By applying this percentage share of labor to the total employment series, with the national account, the real wage rate of workers can be calculated using the definition of labor share, corresponding to two categories of workers: those in the

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[18] Approximately 85 percent of unpaid-family workers are in the agricultural sector, followed by those employed in the commerce sector and in the service sector.

[19] Regarding the Labor Force Survey, the majority of unskilled workers move from the formal sectors to the informal sector, especially during the curvature period in the agricultural sector (i.e., the third quarter of the year). Approximately 68.8 percent of unpaid family workers are female; they were found to have more seasonal (by quarter) movement compared with male workers.

formal sector and those in the informal sector. The real wage rate of workers in the formal sector (wage and salaried workers) is calculated as the product of the raw labor share times the nominal GDP at factor cost divided by the number of workers in the formal sector (wage and salaried workers), then adjusting the wages to 1998 prices.[20] The most significant feature of this series is its substantial increase during the boom decade, i.e., from 47,928 baht in 1986 to the maximum of 75,483 baht in 1996, and its slight drop during the crisis period to 73,328 baht in 2003. Consistent with the rapid growth of the Thai economy, the real wage rate of salaried workers increased substantially during the boom decade. The current wage rate in 2003 is about 57 percent higher than what it was in 1980.

Figure 7 also illustrates the real wage rate of workers in the informal sector. Similar to what we computed for wage and salaried workers, the real wage rate of informal workers is calculated as the difference of the adjusted labor share and raw labor share, times the real GDP at factor cost (in 1998 prices), divided by the number of workers employed in the informal sector (own-account workers plus unpaid family workers). Unlike those in the formal sectors, the computed wages of workers in the informal sector slightly increased during the boom decade from 26,169 baht in 1987 to 28,874 baht in 1998. However, it significantly increased to 40,092 baht in 2003. This indicates that workers in the informal sector did not gain much during the boom decade and would not be able to maintain the purchasing power of their wages. On average, the real wages of salaried employees or workers in the formal sector are about 2.2 times higher than those of workers in the informal sector. The gap between these two wages became larger when the boom decade started. In 1987, the real wages of workers in the formal sector were about 1.8 times higher than those of workers in the informal sector. In 1996, real wages of workers in the formal sector were about 2.6 times higher than those of workers in the informal sector. It sounds intuitive to say that the wage rates of salaried workers are higher than those of informal workers. Since the majority of informal workers are unpaid family workers, and about 85 percent of such workers are employed in the agricultural sector, the wages of those workers are much lower than those of the workers in the manufacturing sector.[21]

Further, why did the wage gap between workers in the formal and informal sectors become wider during the boom period? Again, since the majority of

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[20] The Labor Force Survey also provides the monthly wages of those workers in the formal sector. Nevertheless, computing real wages from the account identity also introduces another approximation. Comparing the series to the minimum wages in each period, wages computed from the national account seem to be reliable, since those computed wages are slightly higher than the minimum wages.

[21] Even though some own-account workers, such as doctors and lawyers, might have higher earning than salaried employees, the share of those own-account workers is still low and relatively stable at approximately 30 percent of total employment throughout the periods studied.

informal workers are in the agricultural sector, the wages of informal workers are determined by agricultural outputs, whereas the wages of formal workers are mainly from non-agricultural outputs. The gains from the boom were not equally shared among the sectors. Thailand's successful development strategy has been built mainly on the export of labor-intensive manufactures. The agricultural sector captured only a tiny gain from the investment boom. Wages offered in this most labor-intensive sector were not as competitive as those offered in other sectors. As a result, while industrial employment grew significantly during the export-led boom period, the share of workers in the agricultural sector declined. [22]

Figure 7:   Real Wage rates: Salaried Workers, Workers in Informal Sector, and Average (Unit: baht per year)

Finally, Figure 7 shows the average real wage rate of the Thai economy, computed as adjusted labor share times the ratio of GDP at factor cost and employment. The series pronounced an increasing trend from 27,135 baht in 1980 to 53,967 baht in 2003, or an increase of approximately 3.1 percentage points per annum during the period 1980-2003. During sub-period I (1980-1985), real average rates grew around 1.8 percentage points per annum, increasing to 4.3 percentage points per annum during the boom decade (1986-1996). Until the crisis, real average wages dropped by 0.7 percent in 1997 and 2.9 percent in 1998. The real wage rate of the Thai economy today is about 98.9 percent higher than what it was

[22] The most important are changes in domestic terms of trade from a decline in relative agricultural prices (known as Stoper-Samuelson effects), and unequal rates of factor endowment growth, which cause factors to migrate to sectors where their relative productivity is higher (Rybczinski effects). Both of these intersectoral effects have been observed to be important features of explanations for the relative decline of Thai agriculture over the boom period.

in 1980. This means that, like other emerging countries, Thailand is considered a wage-growth country, as during the period growth was driven by wages from salaried workers. Increased real wages of salaried workers should therefore indicate higher labor productivity among those groups of workers over the periods studied.

4.2. Profit Rate

Capital accumulation has clearly been an important driving indictor of Thailand's economic growth. Capital stock grew very quickly during the two previously mentioned decades, especially in manufacturing.[23] Rapid growth of foreign investment inflows to Thailand was the main source of the economic growth during the boom period. One of determinants of investment decisions is the profit rate. A higher profit rate is a signal for more future investment. The dynamic movement of profits relative to recent investment has an influence on planned investment growth. Theoretically, there are relationships between unit labor costs and profit rates. A sustained change in unit labor costs may cause a shift in a firm's average and marginal cost curves. Rising production costs, with higher unit labor cost, should thereafter reduce profits. Moreover, if these effects spread across the economy, the result should be a decrease in the overall profit rates of the economy. Therefore, higher ulcs imply that less cost competitiveness should have an adverse effect on profit rates.[24]

Figure 8 shows the average profit rate and the incremental profit rate of Thailand. The profit rate is calculated by using the real GDP at factor cost minus the total wage bill in real terms, divided by capital stock.[25] The incremental profit rate is computed as the ratio of the change in total profits between two consecutive periods to investment lagged one period. The movement of the incremental profit rate indicates the movement of the average profit rate, which leads to an expectation future of investment growth. Figure 8 illustrates the average real profit rate and the incremental profit rate of the Thai economy. The most noticeable feature of the average profit rate is that it is relatively constant during the period studied. The average profit rate for the period is about 0.083 (8.3 percent). In fact, the series increased from 0.065 (6.5 percent) in 1980 to 0.074 (7.4 percent) in 1985.

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[23] Capital stocks are measured as the weighted average of gross capital stock (75 percent) and net capital stock (25 percent), as provided by NESDB,.

[24] Burger (1973) explains that the relationship between wages and profit rates are generally influenced by two main factors: (1) cost factors such as wage rates or material costs, and (2) adjustment factors by firms, such as employment, man-hours, and capacity utilization. The profit-wage ratio generally moves cyclically along with the economic cycle.

[25] Net capital stock is computed from the formula $K_t = I_t + (1-d) K_{t-1}$, in which the initial period of K_0 (real capital stock in the year 1980) was 1,958,342 million baht and the initial period of I_0 (real investment in the year 1980) was 269,627 million baht. The depreciation rate (δ) is assumed to be 0.06, or 6 percent. All data have been provided by NESDB.

During the boom decade, 1986-1996, the profit rate increased slightly from 0.071 (7.1 in 1986) to 0.102 (10.2 percent) in 1996. The 1997 crisis caused the profit rate to drop by about 4.3 percentage points and reach its lowest level of 0.059 (5.9 percent) in 1999.

Figure 8:   Profit Rate and Incremental Profit Rate
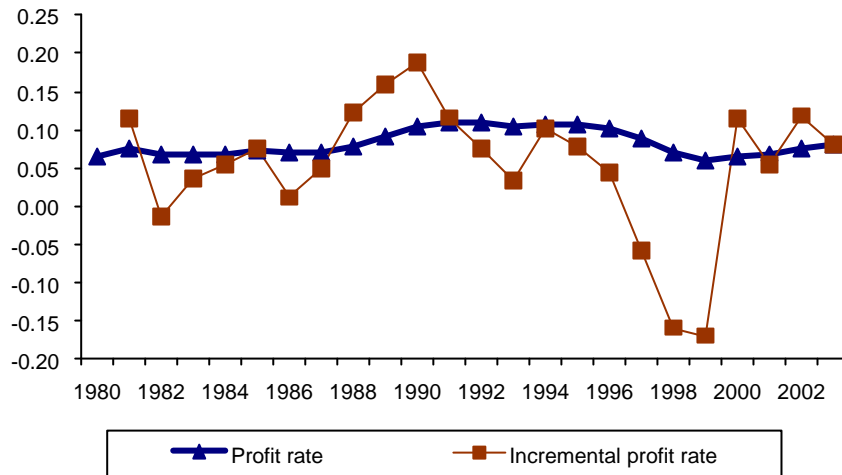
However, by considering the incremental profit rate, the positive value of the series indicates the good prospects for the Thai economy, especially during the boom decade. During the period 1986-1996 the average incremental profit rate was as high as 0.089. The negative value of the series (indicating the existence of a poorer investment climate) appeared during the three consecutive years, 1997-1999, which was the period most severely affected by the crisis (-0.058 in 1997, -0.159 in 1998, and -0.170 in 1999). Thus, the series shows that the investment climate in Thailand actually reached its nadir in the year 1999.

Nevertheless, the growth potential of the Thai economy was fully utilized, since the growth rate of capital stock exceeded the profit rate. Explained by the "Cambridge Equation," the more capital growth exceeds the profit rate, the greater is excess demand, which accelerates the degree of inflation in an economy. Figure 9 shows the growth rate of capital stock, the growth rate of output, and the profit rate. It can be seen that, prior to the crisis, the growth of capital stock was approximately 5.1 percentage points above the growth in the profit rate during sub-period I (1980-1985) and it was 7.4 percentage points above the growth in the profit rate during the boom period (1986-1996). This indicates therefore that the stimulation of the Thai economy prior to the crisis had generated high inflationary pressures. This might be a consideration for Thai policy makers who lack the ability to control the degree of inflation, especially during the periods of rapid growth. However, since the capital stock dropped significantly after the crisis, the growth in the profit rate thereafter exceeded the growth rate of capital stock. This evidence implies that the Thai government had some room to stimulate demand and extract this country from the crisis without increasing inflationary pressures.

Figure 9: Profit Rate, Growth Rate of Capital Stock, and Growth of Output
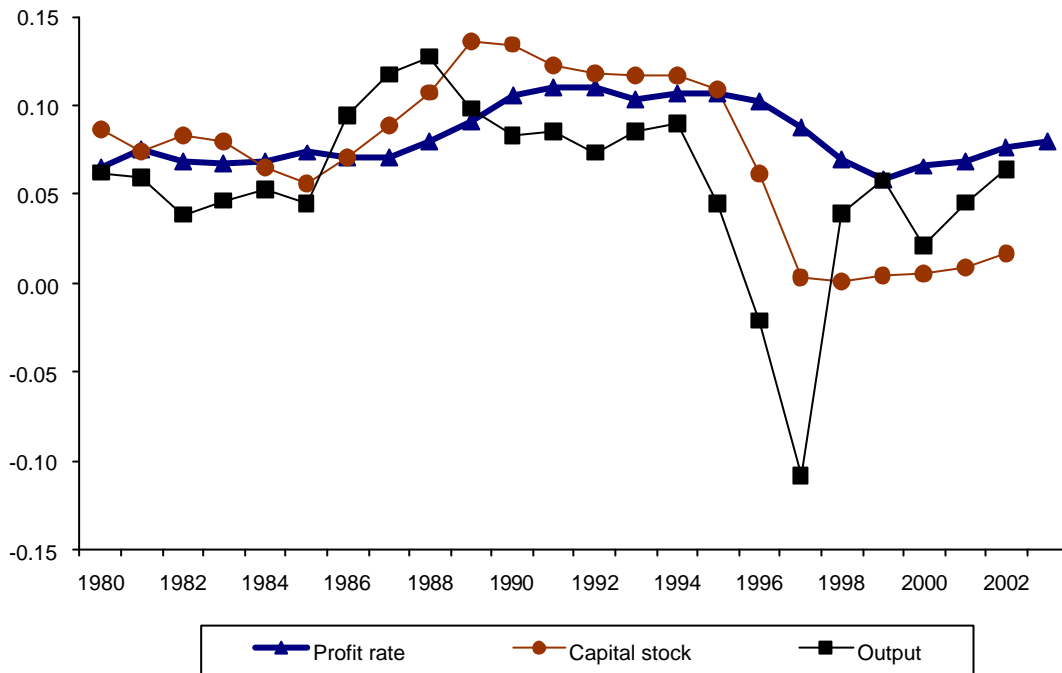
Based on the Cambridge Equation, this result supports the argument that the extensive economic stimulation during the boom period was a strong cause of inflationary pressures. This situation led to speculation in asset prices and more unproductive investments in various sectors. In this regard, the inflationary pressures and unproductive investments were found to be the major causes of the 1997 crisis. Figure 10 shows the share of real investment to real output at factor cost. In support of the above argument, the investment share was quite stable at about 0.362 (36.2 percent) during the period 1980-1985. Until the boom decade (1986-1996), the ratio increased substantially from 0.331 (33.1 percent) in 1986 to a maximum of 0.56 (56 percent) in 1996; many believe that this was a period of over-investment. Thereafter, the investment share significantly collapsed from 0.56 (56 percent) in 1996 to 0.284 (28.4 percent) in 1998, and then reached the minimum point of 0.261 (26.1 percent) in 2001. After the crisis, it oscillated around 0.26-0.27 (26-27 percent).[26]

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[26] This resulted from a deceleration of investment in real estate, especially in the construction of residential buildings, commercial buildings, condominiums and factory buildings. Purchases of machinery and equipment for the production of goods and services also slowed in accordance with the reduction of capital utilization in the manufacturing sector in the crisis period.

Figure 10: Investment Share
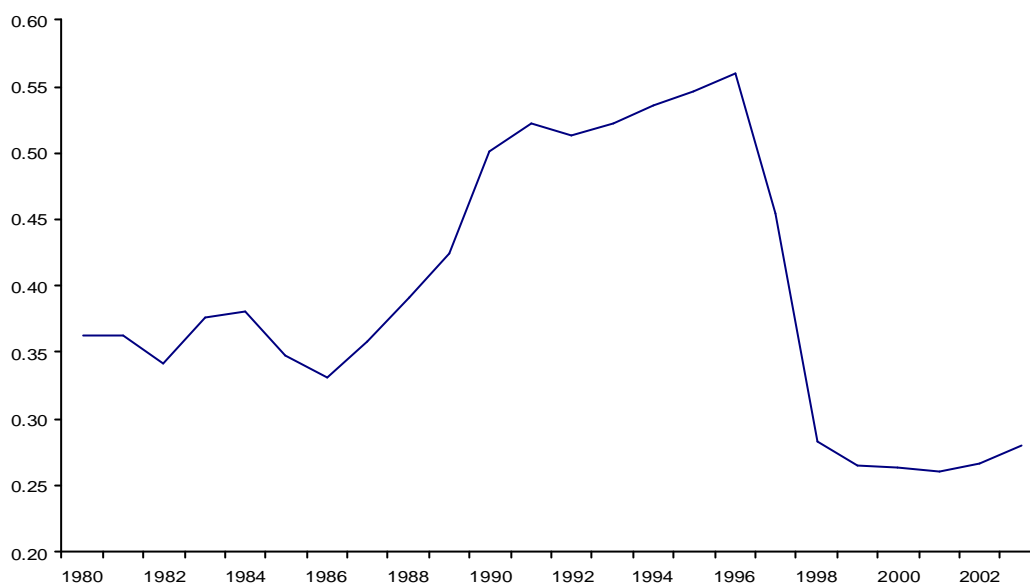
4.3. Capital-Output Ratio, Capital-Labor Ratio, Labor Productivity

The capital-output ratio of the Thai economy showed an increasing trend from the minimum point of 2.631 in 1980 to the maximum point of 4.099 in 2000.[27] Generally, a higher capital-output ratio might determine the deterioration of the quality of investment through the negative effects of capital productivity. Since the inverse ratio of capital per output represents capital productivity, the ratio of output to total capital stock displayed a slight decrease from 0.380 in 1980 to the minimum point of 0.223 in 1998, thereafter increasing to 0.269 in 2003. Both series moved in the opposite direction; a higher capital-output ratio implies lower capital productivity, and vice-versa.

From the profit rate that can be written as the product of the capital share times the inverse of the capital-labor ratio times labor productivity, Figure 11 depicts the capital share (calculated as one minus the adjusted labor share) and capital productivity (the inverse of the capital-output ratio). As shown in Figure 11, capital shares display an increasing trend, except for a sharp drop during the period 1997-1999; the capital-labor ratio also increased from 86,271 baht in 1980 to a maximum of 297,979 baht in 1999, thereafter slightly decreasing to 285,569 baht in 2003. Labor productivity increased significantly from 32,786 baht in 1980 to the maximum value of 76,812 baht in 2003. Owing to negative growth in real output in the crisis period, the series declined from 75,519 baht in 1996 to 66,089 baht in 1998.

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[27] NESDB regularly creates the incremental capital-output ratio (ICOR), the ratio between the change in capital stock and the change in gross domestic product at constant market prices.

Labor productivity is one of the most important indicators of a country's economic well-being. Productivity growth boosts employment to the extent that the employers' demand for labor increases when workers become more productive. Greater labor productivity enables firms to produce a given amount of goods or services with a smaller number of laborers employed. Higher labor productivity implies the production of a given amount of goods or services in a smaller number of working hours. However, labor productivity is not a perfect measure of the overall level of technology in an economy. For example, increases in capital will raise output per hour of work and hence increase labor productivity, but we are in fact using more inputs rather than making better use of inputs.[28] With regard to this combination, increased capital share, increased capital-labor ratio, and increased labor productivity explain the increase in the profit rate during the period prior to the crisis. Regarding this combination, a sharp decrease of capital share during the period 1996-1999, a drop in labor productivity during the same period, and a stable capital-labor ratio imply a sharp drop in the profit rate from 0.102 (10.2 percent) in 1996 to the minimum point of 0.059 (5.9 percent) in 1999.

**Figure 11: Capital Productivity and Capital Share**
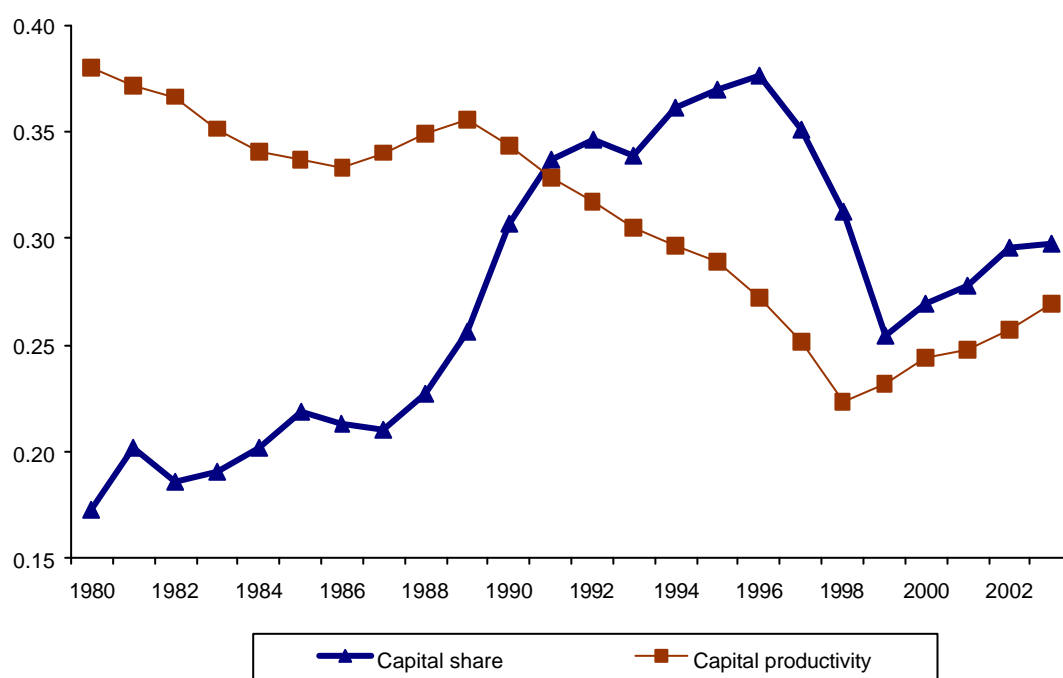
[28] Moreover, since payroll costs are related to the number of laborers/hours a firm uses, higher productivity can sometimes lead to higher unemployment as firms are able to produce more with their existing workers instead of hiring new workers.

Figure 12: Capital-Labor Ratio (Unit: Baht)
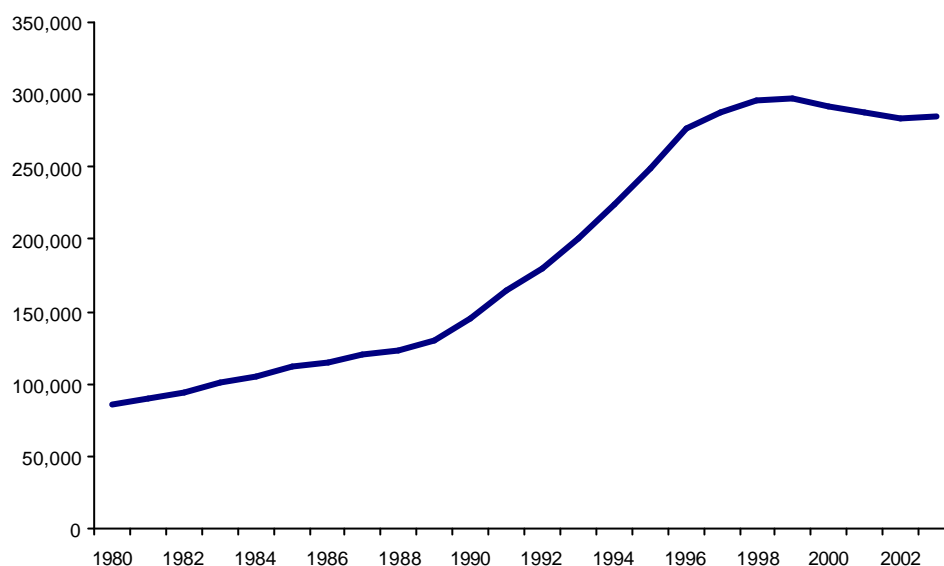
Figure 13: Labor Productivity (Unit: Baht)
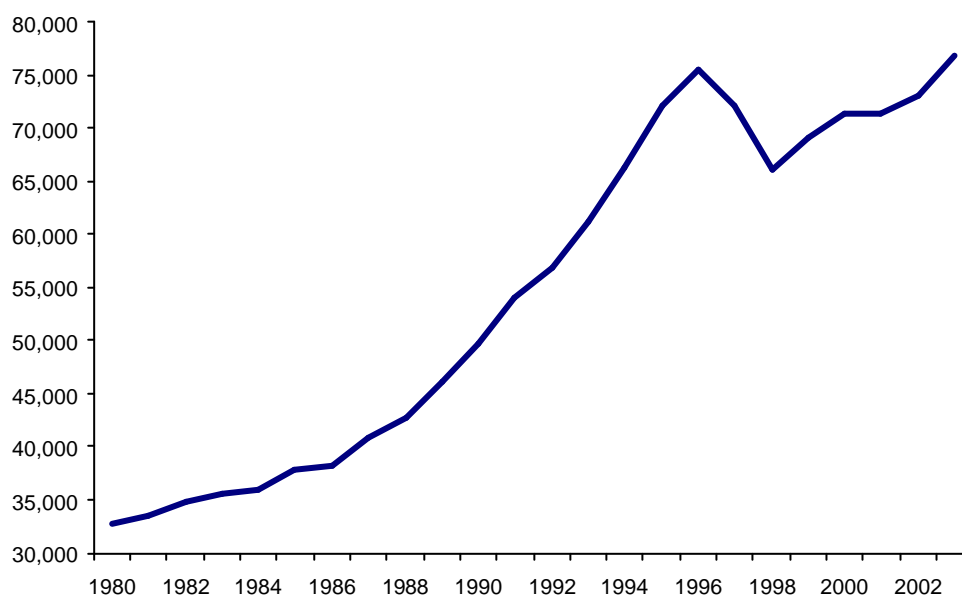
## V. The Dynamics of Income Distribution

Since the growth rate of ulcs (ulc2) is the sum of the growth rate of the labor share plus the growth rate of the ratio of PPP to the exchange rate, the dynamic pattern of ulcs depends on how both of these components move. Nonetheless,

relatively small changes in labor share might cause changes in ulcs and movement of the exchange rate, especially during extraordinary periods such as when the Baht was sharply devalued. Therefore, this should be the main source of changes in ulcs. Figure 14 displays the growth rate of ulcs, the growth rate of labor share, and the growth rate of the ratio of PPP to the exchange rate. It can be observed that sharp drops of ulcs in 1984 and in 1997 were due to the growth in the ratio of PPP to the exchange rate (or the sharp devaluation of the Baht). The correlation between the growth rates of ulcs and the growth rates of the exchange rate ratio was as high as 0.883, while the correlation of the growth rates of ulcs and the growth rates of the labor share is only 0.092. Since the pure ulcs effect is the ratio of wages to labor productivity, an upward trend in the average wage that coincides with an upward trend in labor productivity indicates small changes in the pure ulcs effect. These findings indicate that the movement of the price-adjustment factor (movement of the Baht) determines Thailand's cost competitiveness.

Figure 14: Growth Rates of ULC, Labor Share, and Ratio of PPP to Exchange Rates
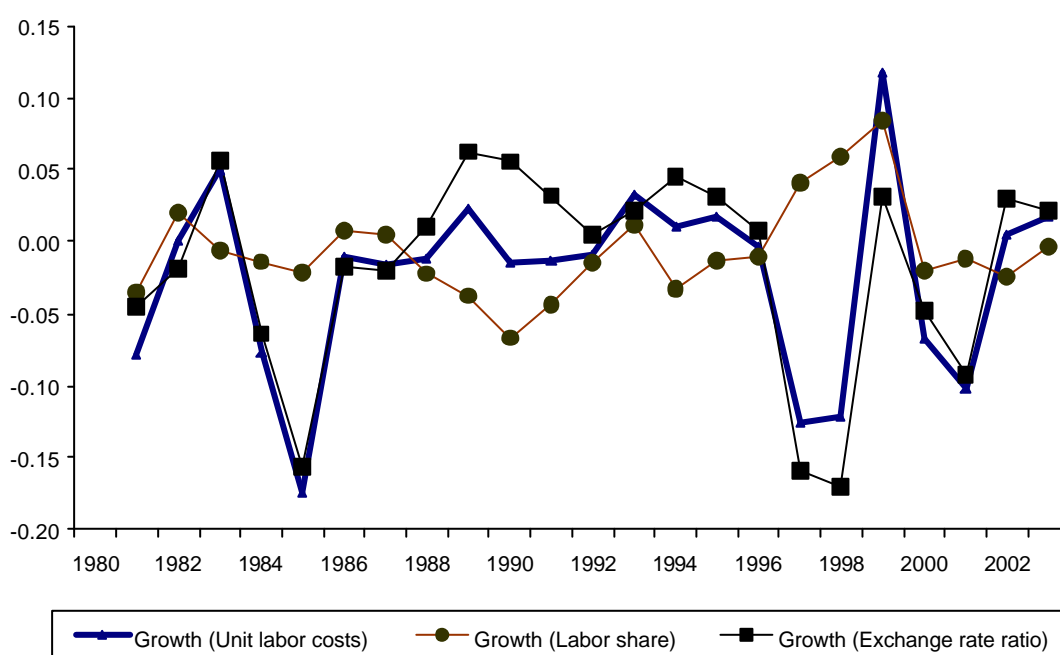
However, the growth rates of ukcs can be used as another indicator of the level of competitiveness. As displayed in Figure 15, the correlation between the growth rates of ukcs and the growth rates of the exchange rate ratio is about 0.747, and the correlation between the growth rates of ukcs and the growth rates of capital share is about 0.840. Therefore, unlike ulcs which are mainly determined from the exchange rate ratio, ukcs are determined from both the capital share and the exchange rate ratio, in which the impact of the exchange rate ratio was found to be somewhat stronger.

Figure 15: Growth Rates of UKC, Capital Share, and Ratio of PPP to Exchange Rates
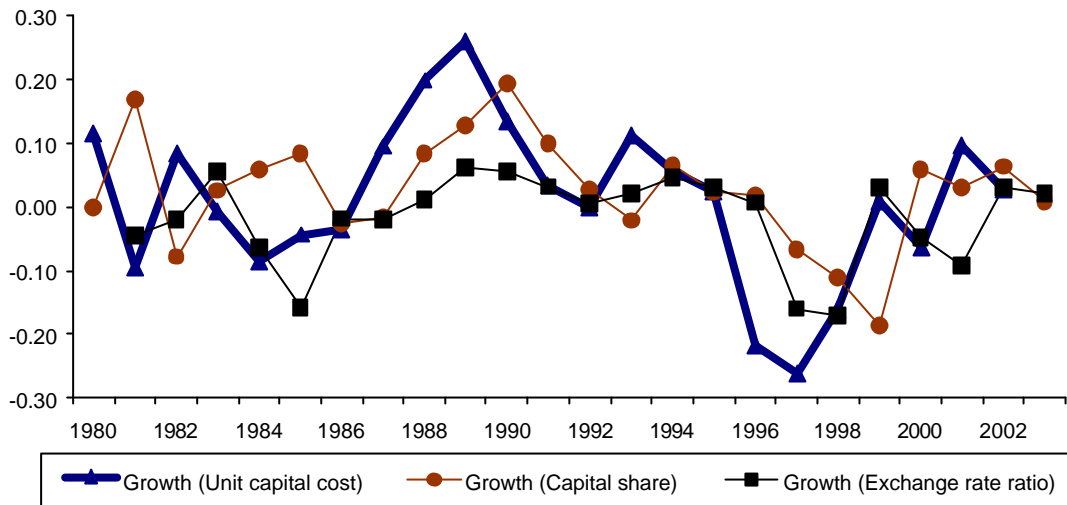

Figure 16 shows the dynamics of functional income distribution by comparing the difference between the growth rates of the real wage minus the growth rates of labor productivity, implying a return to labor, and the growth rates of the real profit rate, implying a return to capital. Functional income distribution shows how equally income was allocated to the two production factors. Before the crisis, the profit rate exceeded the rates of return to labor, implying greater gains to capital than to labor. This is because the growth process during the economic boom was generally a result of the accumulated investment of large enterprises and conglomerates, which in turn produced higher profit rates. Nonetheless, the period 1996-1999 marked the first time that factor gains switched to labor since there was a negative drop in the profit rate.

The growth of the real wage rate, minus the labor productivity and profit rates moved in opposite directions (with the correlation being -0.882). This implies that gains in real wages, equal to or above the level of labor productivity, can come only at the expense of reductions in the real profit rate, and vice-versa. In other words, if the real wage rate increases faster than labor productivity while the capital-output ratio rises, the profit rate should decline.

Figure 16: Growth Rates of Real Wages, Labor Productivity, and Profit Rate
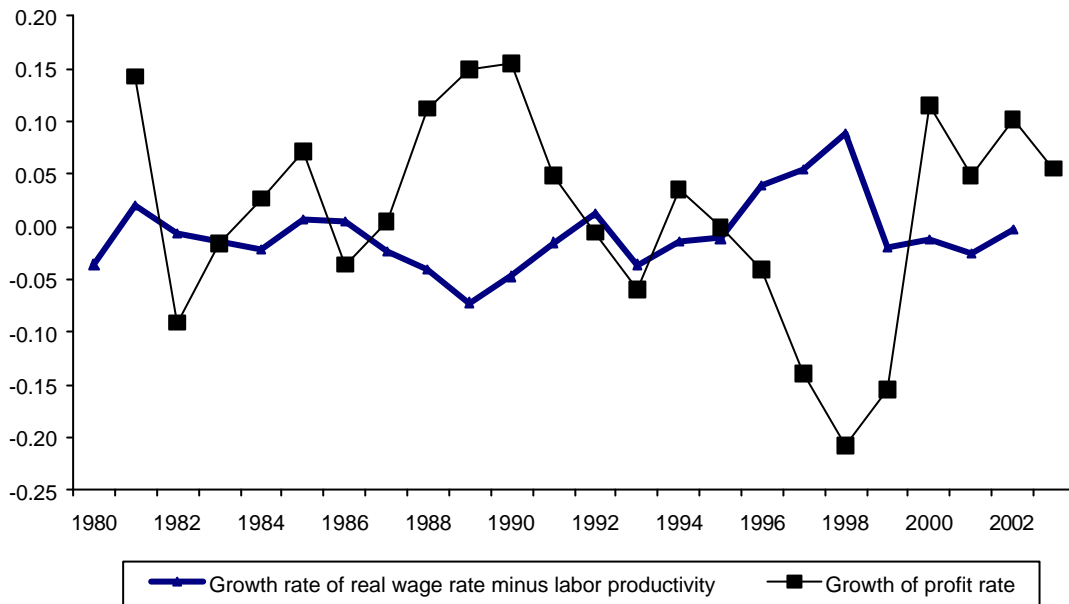

VI. The Degree of Monopoly

A high degree of monopoly is often associated with higher mark-up prices (and higher share of profits to value added). Kalecki's degree of monopoly interprets a firm's capacity to enforce a claim on profits against laborers. This measure identifies the firm's ability to markup prices over costs.[29] Kalecki's degree of monopoly for the Thai economy showed an increasing trend, from a value of 0.208 (20.8 percent over cost) in 1980 to a maximum of 0.602 (60.2 percent over cost) in 1996. Then, it decreased sharply to 0.341 (61.1 percent over cost) in 1999. Decreased capital shares and the drop in profit rates during the crisis caused firms to lose their market power and thus monopoly power during the crisis period. In the period 2000-2003, the degree of mark-up started to increase, i.e., 42.3 percent over cost in 2003. The average degree of markup during the period studied was about 0.378 (38.7 percent over cost).

Generally, a higher degree of monopoly can be the result of one of two causes: (i) a firm is more efficient in its production owing to new technology and enhanced managerial techniques, or (ii) a firm is able to exert market power as it plays a dominant role in the market. In the case of Thai businesses, both causes can be observed. First, Thailand had higher labor productivity in the overall economy, which indicated how efficient the firms were. Second, business well-being in

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[29] $P = (1 + m)ulc = (1 + m)\dfrac{w_n}{VA/L}$, in which the degree of monopoly $= m = \dfrac{s^K}{1 - s^K} = \dfrac{s^K}{s^L}$

Thailand in the past was created mainly from large conglomerates and multinational corporations.[30] As in many emerging economies, large conglomerates dominated Thailand's domestic business growth. Many foreign investors were persuaded to convert their operations into joint ventures with Thai firms because joint ventures are believed to further enhance firms' monopoly power.[31]

Figure 17: Markup (Degree of Monopoly)
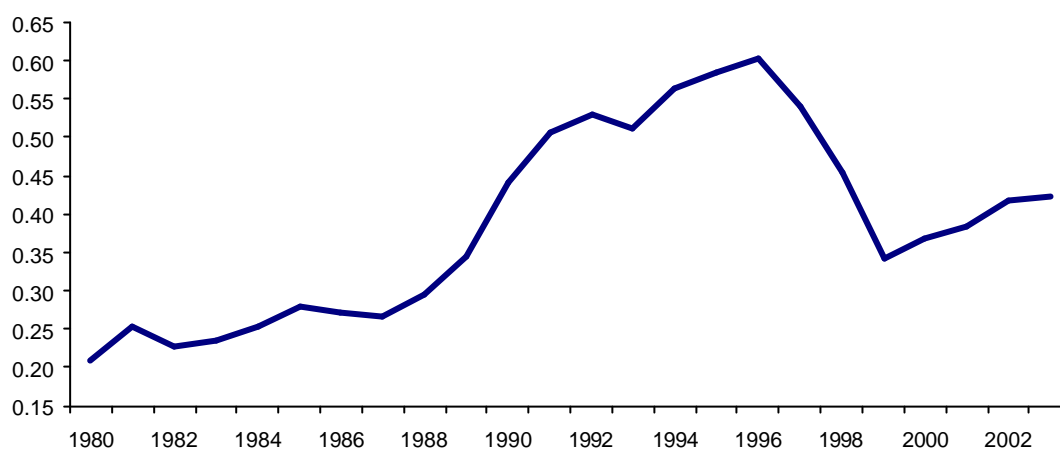
In addition, prior to the crisis, an upward trend in the degree of markup in the Thai economy might be created when major conglomerates were receiving protection from the government.[32] Further, Thailand's Board of Investment (BOI) also established scaled conditions for obtaining promotional privileges for investment; however, the BOI rejected projects proposed by new and smaller firms (Phongpaichit and Baker, 1996), which characterizes Thailand as a country still having a low degree of competition. This was especially so during the boom period. Most major businesses are operated by conglomerates and foreign enterprises, which receive a tremendous degree of protection.

The relationships among labor productivity, wages, and markups are important aspects of dynamic income distribution. The growth rate of the nominal

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[30] The early stages of the post-1985 boom were driven by the relocation of manufacturers, mainly from Japan, Hong Kong, and Taiwan. However, this relocation was part of a larger process. Capital, technology, information, and skills now flowed more freely into Thailand and across the world.

[31] Pholphirul (2003) found that, among different channels of direct foreign investment, joint-venture firms (involving foreign and local investors) generate the highest degree of monopoly power compared with other channels of multinationals, such as subsidiaries, and international divisions.

[32] For instance, established firms producing steel and glass got a privilege to withdraw new competitors on the grounds that these sectors were already saturated. In the automotive industry, the government was persuaded to follow import-substitution policies and did not allow any new entrants, any increase in capacity, or any imports. In the sugar industry, major firms induced the government to help them to form a cartel to fix prices, allocate export quotas, and exclude competition.

wage rate minus labor productivity, which has a mean of 0.032, measures the possibility that wage charges might be passed on to consumers through higher prices. This in turn might generate higher monopoly power, and implies that the nominal wage rate in Thailand grew somewhat more slowly than labor productivity. Figure 18 displays the relationships among labor productivity, wages, and markups. The growth rate of markups and the growth rate of the nominal wage rate minus labor productivity are negatively correlated, with the correlation being as high as -0.686. This indicates that the higher profit rate from markups has shifted capital. Especially during the crisis, when there were a negative growth rates in markups during the period 1997-1999 (-0.039 in 1997, -0.056 in 1998, and –0.078 in 1999), this implies that profits shifted to labor, in which cause the growth rate of the nominal wage rate minus labor productivity was around 0.059 during the period 1997-1999.

Figure 18: Growth Rates of Nominal Wages, Labor Productivity, and Markup
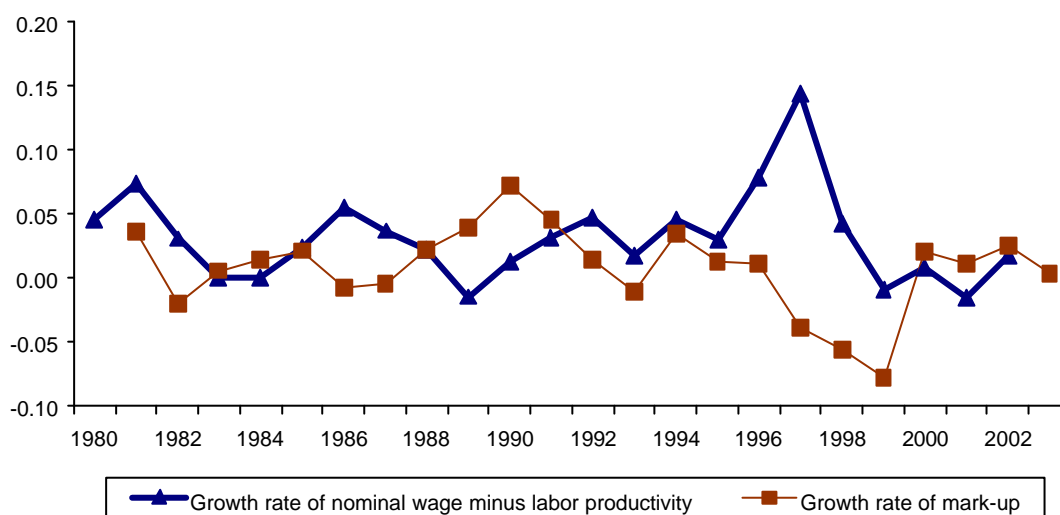
VII.   Labor Decomposition

Thailand experienced constant growth of GDP per capita along with the evolution of its economy, which undoubtedly raised the living standard of the population. Figure 19 shows the per capita GDP. The ratio of real GDP to the total population grew at the rate of about 3.5 percent per annum during sub-period I (1980-1985), and about 7.0 percent per annum during sub-period II. During the crisis period, Thailand experienced a drop in per capita GDP: 3 percent in 1997 and a severe drop of 12 percent in 1998. Overall, real GDP per capita increased from 15,740 baht in 1980 to 40,258 baht in 2003.

Figure 19: Real GDP per Capita
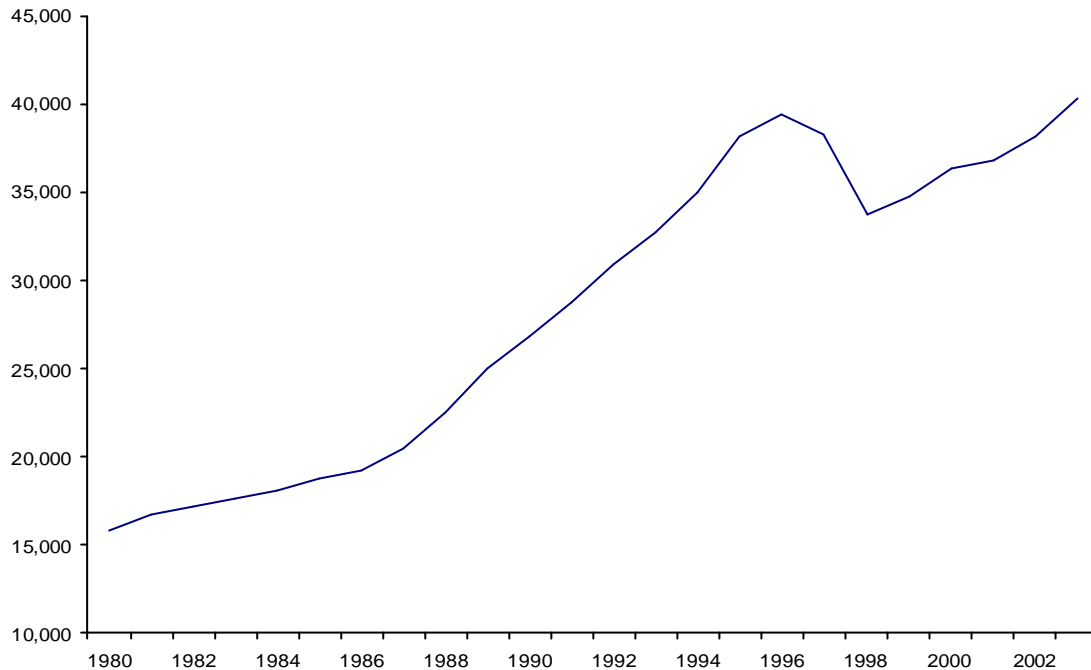
This section investigates income per capita by using a range of labor market indicators. Algebraically, GDP per capita is obtained from labor productivity, labor force participation (ratio of the labor force to the total population), and employment rate (ratio of employment to the labor force). In other words, the growth of output per capita can be decomposed into the sum of the growth of those three variables. This simple decomposition indicates major sources for improving the long-run living standard. As shown in Figure 20 (using 1980 as the base year=1), Thailand's per capita income was determined mainly by labor productivity. Income per capita in Thailand in 2003 was 255.8 percent higher than that in 1980, while labor productivity in 2003 was 234.3 percent higher than that in 1980. Since the formal sector grew at a slightly faster rate throughout the period studied, the contributions of the growth in the employment rate and in labor force participation to per capita income are quite small. During the entire period, the employment rate was quite constant at around 95.0 percent throughout the period. Labor force participation increased from around 48.1 percent in 1980 to around 54.5 percent in 2003, indicating that the labor force grew slightly faster than the population. This implies that the country's dependency ratio was decreasing. As with other emerging countries where modern forms of contraception have been widely accepted, females are educated, and family size has declined dramatically, the number of Thai women who have moved into professional, technical and administrative positions has increased substantially in recent decades.

Figure 20: Labor Productivity, Labor Force Participation, and Employment Rates
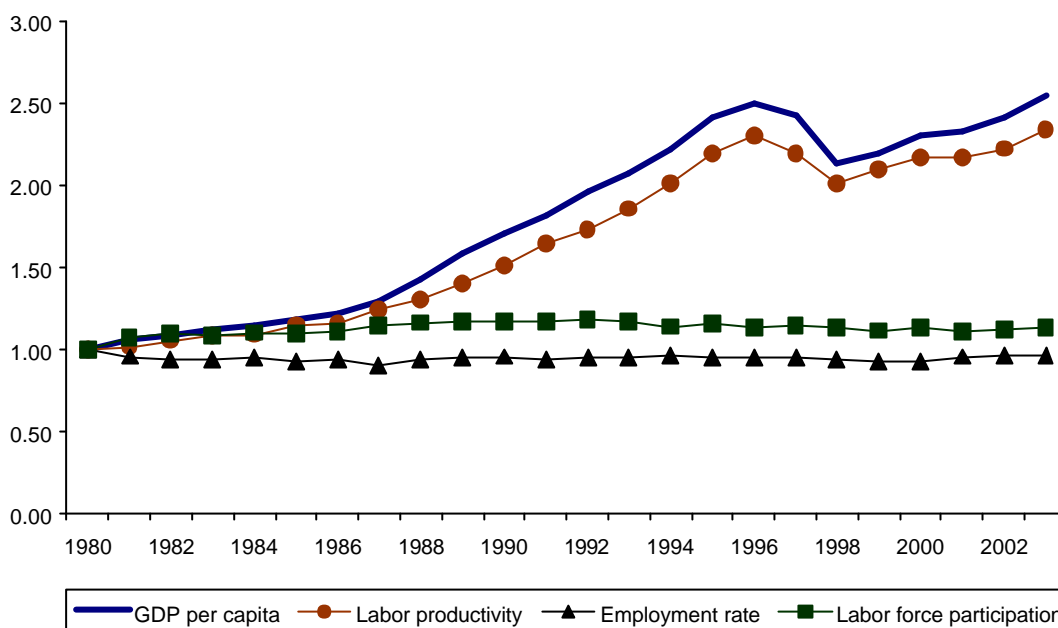
According to Ark and McGuckin (1999), this result follows analysis to determine how many people need to be fed, which can be determined by what they have produced. [33] Since Thailand's labor force participation and employment rate were relatively constant during the periods studied, labor productivity was the only factor that determined the long-run living standards of the country. Nevertheless, Thailand's relatively higher wage costs may have induced rapid substitution from labor to capital, resulting in higher observed labor productivity when decomposing GDP.

Unemployment has never been a serious problem in Thailand since it has remained quite constant at about 3-4 percent per annum throughout the periods studied. Nevertheless, the unemployment rates are likely to underestimate Thailand's labor utilization problems, especially during the dry, or non-farming, season. Based on the results of the Labor Force Survey, the labor force participation rate and the number of persons who reported themselves as unemployed vary significantly between the dry and wet seasons, especially among women. If workers waiting to be employed in the farming season or those who are seasonally

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[33] Ark and McGuckin (1999) observed the relationship between labor productivity and GDP per capita among different countries. Their study implies that, owing to the smaller number of workers employed and the lower labor force participation rate, the productivity advantage of the country's GDP per capita might be eroded.

economically inactive are added to the number jobless, the unemployment rate would reach 15-16 percent during the dry season.[34]

One way to improve GDP is to increase labor force participation, especially the participation of skilled labor. In addition, since labor force participation is the ratio of labor to population, Thailand's strategy could be to increase the number of laborers employed and to promote job creation. Currently, Thailand allows foreign workers to enter the domestic labor market for some specific types of jobs. Foreign workers in Thailand can be classified roughly as legal or illegal workers. Legal workers come into the country mainly through international companies. Such persons are largely high-level administrators, managers, and technicians, plus some semi-skilled workers. Illegal workers are mostly unskilled laborers from neighboring countries. They are likely to work in wood cutting, on rubber plantations, or in fisheries. These are industries in which native laborers have become unwilling to work. Increasing the number of foreign workers in domestic production helps to improve GDP. Therefore, a challenge for the Thai government is to find out how to solve existing problems related to migrant labor, especially by managing and systematizing existing illegal migrant workers.

VIII. The Sources of Growth and Total Factor Productivity

Many factors determine the growth of a country's output, and changes in these factors cause the output to change. Many previous productivity studies in Thailand relied on some specific form of production function, which is used to derive the total factor productivity index. However, there is also another approach in which the growth output can be explained without any assumed form of production function. This approach is known as growth-accounting analysis. This section investigates Thailand's TFP calculated from the national account identity. In this sense, TFP is the "weighted average of the growth rates of the wage rate and the profit rate."[35] Specifically, this paper investigates the contribution of wage rate growth and profit growth to outputs in the Thai economy. Figure 21 displays the contribution of wage rate growth and profit rate growth on output growth. The series indicates that the profit rate contributed relatively more to the output growth of Thailand than the wage rate throughout the period studied. It also explains that

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[34] Underutilization of less-educated agricultural workers during the dry season, however, is by no means the only cause of the labor supply and demand gap. Owing to a policy that emphasizes more value-added types of production, there is now rapid growth in the excess demand for skilled and semi-skilled labor.

[35] From $\hat{y}_t \equiv s_t^L \hat{w}_t + s_t^L \hat{l}_t + s_t^k \hat{k}_t + s_t^k \hat{r}_t$, then TFP = $\hat{y}_t - s_t^L \hat{l}_t - s_t^K \hat{k}_t = s_t^L \hat{w}_t + s_t^k \hat{r}_t$

the negative growth of output during the crisis was also due to the sharp drop of the profit rate.[36]

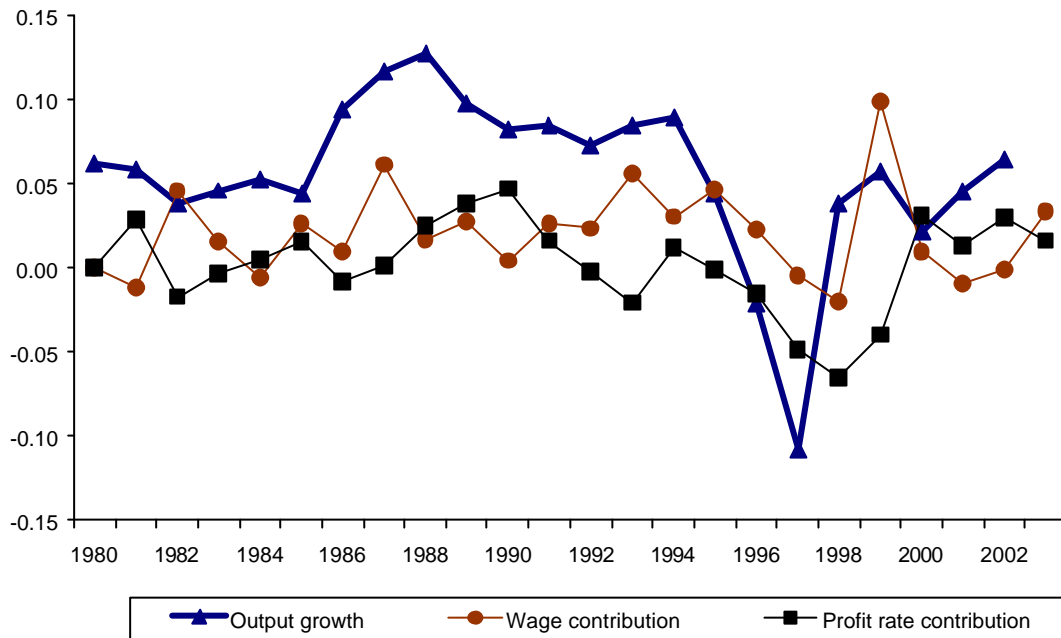**Figure 21: Growth of Output, Contribution of Wage Rate, and Contribution of Profit Rate**

Figure 22 shows the contribution of input factors to output growth. Before the crisis, both factors, capital and labor, seemed to contribute equally to the positive growth in output. However, labor contributed relatively more to the negative output growth rate during the crisis.[37] Figure 23 shows TFP growth and its components, wage rate growth weighted by its share and the profit rate growth weighted by its share (TFP = $s_t^L \hat{w}_t + s_t^k \hat{r}_t$). Before the crisis, in the period 1980-1996, wage rate growth contributed relatively more to TFP growth. During the crisis, in the period of 1997-2003, both factor prices seemed to have equally contribution to TFP growth. Before the crisis, the correlation between TFP growth and wage rate growth was 0.535, while the correlation between TFP growth and profit rate growth was 0.483. After the crisis, the correlation between TFP growth and wage rate growth was 680, while the correlation between TFP growth and profit rate growth was 0.683.

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[36] The correlation between output growth and wage contribution was 0.263 during the period 1980-1996 and it was 0.484 during the period 1997-2003. The correlation between output growth and profit rate contribution was 0.480 during the period 1980-1996 and it was 0.801 during the period 1997-2003.

[37] The correlation between output growth and labor contribution was 0.304 during the period 1980-1996 and it was 0.587 during the period 1997-2003. The correlation between output growth and profit rate contribution was 0.669 during the period 1980-1996 and it was -0.180 during the period 1997-2003.

Figure 22: Growth of Output, Contribution of Labor, and Contribution of Capital
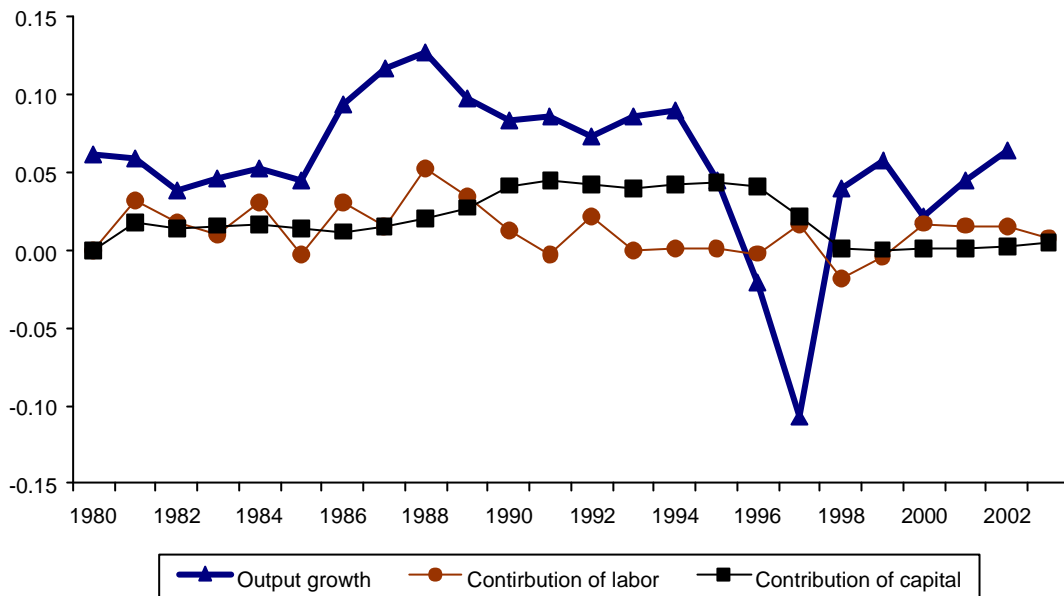
Figure 23: Implied Total Factor Productivity Growth and Components
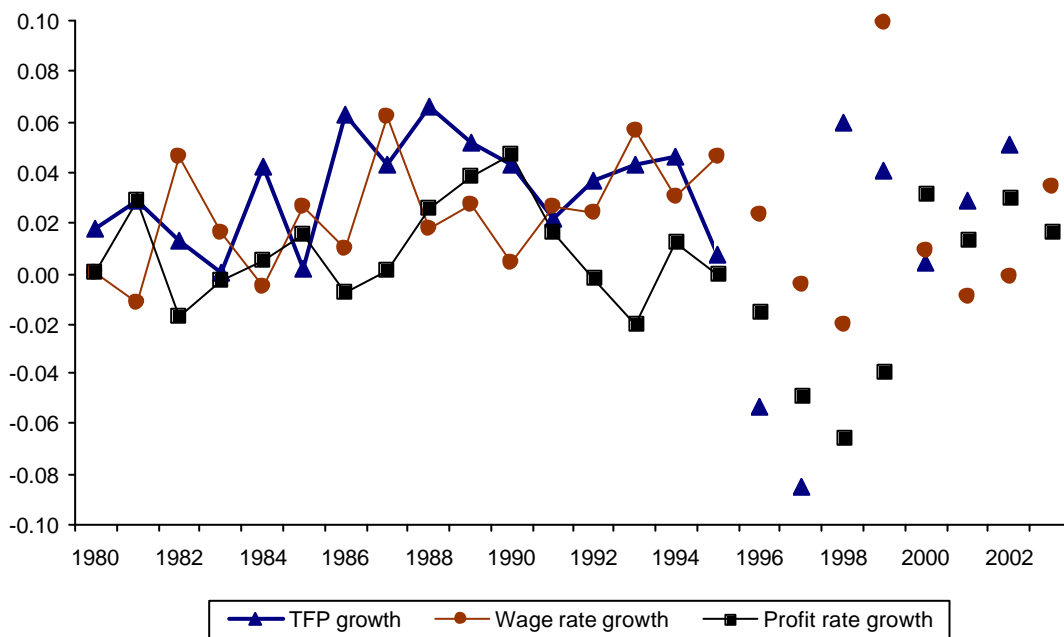
It should be kept in mind, however, that, during the whole period studied, the contribution of capital to output growth was small relative to the contribution from the profit rate, while the contribution of labor to output growth was higher relative to the contribution from the wage rate. This leads us to some general conclusions. First, capital accumulation seems not to be the major contributor to Thailand's long-run economic growth, but labor has been. Second, the long-run positive growth (including negative growth during the crisis) of the Thai economy

has mainly been driven by the profit rate. Third, the variable that was driving the movement of TFP growth during the pre-crisis period was mainly wage growth weighted by its share, whereas after the crisis, both profit growth and wage growth seem to make equal contributions.

IX.   Estimating Medium-term Growth Potential

The economic development process usually involves social, political, administrative, and external factors. Giving a full account of the contribution of those factors to growth outcome is impossible.   The National Economic Development Plan launched by NESDB in 1961 can be taken as a milestone in Thailand's modern economic development.   Subsequent plans were issued regularly thereafter.[38] The Ninth Plan (2002-2006) was the most recently formulated Plan to take into consideration the economic downturn caused by the 1997 crisis. Since that Plan was adopted, a series of economic indicators have pointed out the good potential for growth of the Thai economy. NESDB (2004) reported for the medium-term an average of 5.7 percent output growth per annum, which, to be attained, would need, on average, an annual growth rate of 11.5 percent in investment during the period 2005-2009. To achieve this, the Thai government aims to consolidate economic fundamentals as well as encourage stability instead of targeting rapid growth in output.

In this section, we calculate a simple framework to explain the potential growth rate that Thailand would achieve during the medium-term plan. The key to achieve this growth rate of 5.7 percent in output per annum is to attain a growth rate in capital stock of about 7.5 percent, which is higher than what it was in 2003 (1.6 percent). This means that the contribution of capital growth weighted by its share to the growth output is $s_k \hat{k}$ = 0.38 x 7.5 = 2.85 percent.

However, to understand the role of capital in increasing the growth potential projected by NESDB, the growth rate of capital stock can be written as the product of investment shares in output and capital productivity subtracted by the depreciation of capital stock, which is assumed to be 6 percent.[39] In order to increase the growth rate of capital, consideration must be given to increase either investment share or capital productivity, or both.

Table 1 shows the NESDB targets for investment to grow on average, by 10.2 percentage points per annum during the period 2004-2009. We can calculate the targeted real investment, which must increase from 720,219 million baht in 2003 to

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[38]   Except for the First Plan which covered a six-year period, each Plan covers a five-year period.

[39] $\hat{K}_t = \dfrac{\Delta K_t}{K_{t-1}} = \dfrac{I_t - dK_{t-1}}{K_{t-1}} = \dfrac{I_t}{K_{t-1}} - d = \left[\underbrace{I_t \Big/ Y_t}_{Investment\,Share} \quad x \quad \underbrace{Y_t \Big/ K_{t-1}}_{Capital\,\Pr oductivity} \right] - d$

1,408,307 million baht in 2009. This also implies an increase in investment share (I/VA) from 28 percent in 2003 to 39 percent in 2009, or about 11 percentage points between now and 2009. Within this Plan period, net capital stock needs to grow from 9,579,882 million baht in 2003 to 12,507,497 million baht in 2009, or approximately 4.6 percentage points per annum.[40] It may be recalled from the period studied, 1980-2003, net capital stock grew by approximately 7.5 percent per annum to achieve output growth of 5.7 percent.[41] This planned investment, from 2004-2009, seems unlikely to generate enough growth in capital stock. Alternatively, if the growth rate of capital stock is 4.6 percent per annum, the contribution of the growth rate of capital weighted by its share to output growth would be approximately as follows: (0.38 x 4.6) = 1.75 percent.[42]

Nevertheless, another way to increase the growth rate of capital stock, from 4.6 percent to 7.5 percent between now and 2009, is to improve capital productivity (Y/K). Achieving a growth rate in capital stock of 7.5 percent, given an increase in investment share (I/VA) of 11 percentage points (from 28 percent to 39 percent), would require that capital productivity increase as follows: [(0.075 + 0.06)/0.39] = 0.35. This implies that capital productivity should improve from 0.27 in 2003 to 0.35, or approximately 30 percent, within six years. This might lead to the question: How should Thailand accomplish that? This would seem to be a challenging task for the Thai government: how to increase the "quality of investment" to achieve the potential output together with an increase in investment volume.

If, on the other hand, Thailand fails to improve the productivity of its capital to achieve 7.5 percent growth in capital stock, the investment share (I/Y) would have to increase as follows: [(0.075 + 0.06)/0.27] = 0.50. However, since, in the post-crisis period, investment share was still oscillating around the level of 0.26-0.27 during the period 1997-2003, increasing investment share by (0.5-0.27) = 0.23 within six years would likely be a difficult and challenging task for the Thai government.

In sum, even though labor productivity through education and on-the-job training might be a key factor to enhance capacity-building as well as economic growth, it might be impossible to achieve without physical capital investments in infrastructure, factories, transportation equipment, ICT systems and residential housing. Another challenging job for Thailand in attempting to realize the goals of the NESDB medium-term plan is to determine how to improve capital productivity and increase the capital stock within five years. Thailand faces capacity constraints not only in many producing sectors, but also in basic infrastructure, plant and equipment, and housing facilities.

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[40] With planned investment during the period 2004-2009, we can calculate the growth rate of capital based on the formula $K_t = I_t + (1-\delta) K_{t-1}$. (The depreciation rate is assumed to be $\delta = 0.06$)

[41] Incidentally, the average annual growth rate of real GDP during the period 1985-2003 was 5.7 percent, while the average planned GDP growth during the period 2004-2009 is also 5.7 percent.

[42] 0.38 is the average value of the adjusted capital share during the period 1980-2003.

Table 1:   Planned Output, Planned Investment, and Growth Rate of Capital Stock: 2004-2009

Year	Planned output growth (%)[a]	Planned investment growth (%)[a]	Planned output (million baht)[b]	Investment (million baht)[b]	Investment share (%)[b]	Capital stock (million baht)[b]	Growth rate of capital stock (%)
2004	6.0	13.8	2,731,389	819,609.2	0.300	9,824,699	0.026
2005	6.0	14.5	2,895,272	938,452.6	0.324	10,173,669	0.036
2006	6.0	13.8	3,068,989	1,067,959	0.348	10,631,208	0.045
2007	5.5	11.4	3,237,783	1,189,706	0.367	11,183,042	0.052
2008	5.5	8.9	3,415,861	1,295,590	0.379	11,807,650	0.056
2009	5.3	8.7	3,596,902	1,408,307	0.392	12,507,497	0.059
Average (2004-2009)	5.7	10.2	3,157,699	1,119,937	0.352	11,021,294	0.046

Source: [a] NESDB (2004),   [b] Author's calculation.

X. Conclusion

This paper analyzes the long-run performance of the Thai economy in three major areas: (i) growth and productivity, (ii) competitiveness, and (iii) income distribution.

First, this paper classifies stages of economic development during the period 1980-2003 into three sub-periods. Then the unit labor cost (ulc), the product of labor share and price adjustment factors, is computed as a competitiveness indicator. Stable ulcs using price adjustments (ulc2) and higher ulcs using a GDP deflator (ulc1) suggest that the Thai economy did not gain competitiveness during the boom phase (1986-1996). The paper finds that non-decreasing ulcs during this period does not imply less competitiveness in the Thai economy. Since the share of the wage bill has been increasing, Thailand might be considered a wage-led growth economy. An increase in labor share, which was the result of higher demand for labor, might have led to higher economic growth. Wage rates are found to increase substantially during the boom period. In addition, this paper also constructs a new competitiveness indicator, unit capital cost (ukc), which is the product of capital share and price adjustment factors. Similarly, as with ulcs, the ukcs series emphasizes that the Thai economy did not gain competitiveness during the boom decade, 1986-1996, since there was a slight increase in the profit rate. During the crisis period, the competitiveness of the Thai economy dropped sharply owing mainly to the depreciation of the Baht.

Second, this paper observes that the long-run economy of Thailand has had (i) an increasing average wage rate, except for a slight drop during the crisis, (ii) increasing profit rates during the boom decade and about a 4 percent drop during the crisis, (iii) a substantial increase in the capital-labor ratio, (iv) decreasing capital productivity and an increasing capital-output ratio, (v) increasing labor productivity, and (vi) increasing markups owing to the large conglomerates and multinational corporations that possess market power in the Thai economy.

Third, analysis of the dynamics of functional income distribution indicates that, if the profit rate exceeded the rates of return to labor, this finding would imply more gain to capital than to labor. This is also consistent with the observation that wage charges might be passed through to consumers in the form of higher prices and higher monopoly power. In the long run of the Thai economy, the rate of return to labor (growth of real wage rates minus growth of labor productivity) exceeded the growth of profit rates. This implies that labor gains more than capital, especially during the crisis when there was a sharp drop in the profit rate and labor started to gain more.

Fourth, Kalecki's markup, the ratio of capital share to labor share, is computed to determine the degree of monopoly. It had an increasing trend, from a value of 0.208 (20.8 percent over cost) in 1980 to a maximum of 0.602 (60.2 percent over cost) in 1996. Then, it decreased sharply to 0.341 in 1999. Decreased capital shares and the drop in profit rates during the crisis caused firms to lose their market power and thus monopoly power during that period.

Fifth, the paper decomposes the growth of GDP per capita into growth of labor productivity, growth of the employment rate, and growth of the labor force participation rate. Since Thailand's labor force participation and employment rates were relatively constant during the period studied, labor productivity was the main factor boosting long-run GDP per capita. Given that unemployment has never been a serious problem in Thailand, this finding suggests that increasing labor force participation might help to improve per capita income. Challenging tasks for the Thai government are, then, to increase the number of employed workers and to promote job creation.

Sixth, total factor productivity (TFP) growth in Thailand is calculated from the national account identity, which is the weighted average of the growth rates of the wage rate and the profit rate. The series indicates that the profit rate contributed relatively more to output growth during the boom period than the wage rate. During the crisis, negative growth in output was also due to a sharp drop in the profit rate. The variable driving the movement of TFP growth during the pre-crisis period was mainly wage growth weighted by its share, while, after the crisis, profit rate growth seems to have contributed more to TFP.

Seventh, taking into account the medium-term plan announced by NESDB, what should be the concern of the Thai government in attempting to improve capital productivity and increase the capital stock to make sure that targeted investments can be achieved? Owing to capacity constraints, Thailand needs not only to invest in many producing sectors, but also to build more in terms of basic infrastructure.

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