

THE NON-FARM RATE OF PROFIT AND THE THAI ECONOMIC DEVELOPMENT: 1970–2010

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Abstract: The article measures the non-farm profit rate in Thailand from 1970 to 2010. The shape of the profit rate suggests that the Thai economy can be differentiated into four phases. The decomposition analysis reveals that the organic composition of capital has greatly contributed to fluctuations of the profit rate, while the rate of capacity utilization and the capacity–capital ratio have positive impacts in three out of four phases. Meanwhile, the profit share and the rate of surplus value have just slight impacts on the profit rate. Furthermore, the article discusses that the capitalist class has always been a dominant class who could benefit from economic development, and the profit rate determines the growth rate of capital stock in Thailand.

Key words: Thai economic history; profit rate; capital accumulation

1. Introduction

The year 1971 could be marked as the year of Thailand's first step to the process of industrialization, since it was the year in which the third five-year National Economic and Social Development plan encouraging diversifications of domestic production was officially issued. One of the early apparent consequences of the plan was that the Thai economy, which used to be an agrarian economy, had intensive diversifications of domestic production, and so the industrial sector led by labor-intensive industries, such as textile and garment industries, was rapidly developed (Doner 2009, 102). Due to increasing demand for labor, self-employed farmers migrated from villages to become workers in the city. In the middle of the 1980s,

after the devaluation of Thai baht, which raised Thai industries' competitiveness of exports, the export-oriented strategy was fully implemented and exports became a main engine of economic growth (Akarasanee, Dapice, and Flatters 1991). The Thai economy then grew rapidly, and Thailand became the fifth Asian Tiger as a consequence of its economic miracle (Muscat 1994). Shortly after that, abrupt outflows of foreign capital, preceded by a loss of export competitiveness, turned the prosperity into a slump. Massive outflows of foreign capital led to a run on the foreign reserves of the Bank of Thailand due to its attempt to fix the value of the Thai baht to the US dollar. The decision to switch from the fixed to the flexible exchange rate system caused a collapse of the baht's value, and a severe balance of payments crisis erupted. The worst economic crisis hit the country in July of 1997, leading to the -11% economic growth rate in 1998. In spite of suffering from the crisis due to economic openness, the country has never shunted away from economic liberalism, but, instead, economic policies under the guideline of neoliberalism were installed with a higher degree of openness (Hewison 2003). For this, the restructuring process, as intended by the International Monetary Fund (IMF), the World Bank, and the Thai government, was to enhance intense economic competition via free markets in global capitalism (Hewison 2001). However, economic growth has never reached its peak rate prior to the crisis. In fact, the global crisis in 2009, leading to a negative economic growth rate, signaled that Thailand, as being more exposed to the world economy, still has to struggle in the fragile world of capitalism.

For all studies of the Thai economic development, besides the real growth rate of gross domestic product (GDP), it is rare to see other alternative indicators evaluating economic performances of Thailand. In Marxian economics, the rate of profit is a key variable determining the health of an economy, technological changes, pace of capital accumulation, and income distribution (Dumenil and Levy 1993). Since industrialization has been an engine for modernization and economic prosperity in Thailand after 1970 and the proportion of farm profits out of total profits have been quite small (see section 3 for detailed discussion), the non-farm rate of profit is an appropriate variable to understand the different phases of economic development in Thailand. This article, hence, aims at measuring the non-farm rate of profit in Thailand from 1970 to 2010 and emphasizing the role of the non-farm rate of profit on the Thai economic development.

Heretofore, Glassman (2001; 2004, 174-88) is the only author who has ever measured the rate of profit in Thailand; his goal is to tell an alternative story of the crisis in 1997 by using the rate of profit and its determinants. However, perhaps due to the unavailability of the data for the net fixed capital stock, Glassman had to estimate his series of net fixed capital stock. In this article, I can take advantage from the current availability of the data of the net fixed capital stock provided

by the National Economic and Social Development Board (NESDB) in order to obtain a better estimate of the non-farm profit rate in Thailand from 1970 to 2010.

Besides this introduction, this article is composed of four other sections. Section 2 is the analytical framework where all of the variables necessary for the decomposition analysis are defined. Section 3 is the empirical measurement of the non-farm rate of profit in Thailand from 1970 to 2010. In addition, I will present the decompositions of the non-farm rate of profit in order to see the determinants that influence the fluctuations of the non-farm rate of profit through time. Section 4 uses the results of the decomposition analysis to understand the development of the Thai economy. Section 5 contains some concluding remarks.

2. Analytical Framework

In Marxian theory, the necessary condition for the existence of the capitalist economy is its ability to reproduce and expand via the process of capital accumulation. According to Marx's reproduction schema developed in *Capital*, volume 2, capital accumulation can occur when an amount of surplus value, left from capitalist consumption, is recycled to generate a larger amount of capital in the next production process. The size of this recurrent process, hence, depends on the amount of the surplus value compared to that of the capital used to generate it. In this sense, the rate of profit, generally defined as "the indicator of the profitability of capital" (Dumenil and Levy 2004, 22–23), can inform the ability of the system to accumulate. On this ground, a high rate of profit means that a large available amount of surplus value that can be plowed back to the accumulation process generating fast economic growth, while a low rate of profit implies a limited amount of surplus value and slow accumulation. That is, the rate of profit is an important variable for fluctuations in the capitalist economy.

2.1. The First Decomposition

Following Weisskopf (1979), I can define the rate of profit (r) as

$$r = \frac{\Pi}{K} \quad (1)$$

where Π is total profit, and K is net capital stock. Since total output (Y) is a sum of total profits (Π) and total wages (W), I can express an identity

$$Y = \Pi + W \quad (2)$$

Meanwhile, given that Z is the potential output, the profit share (π), the rate of capacity utilization (u), and the capacity–capital ratio (σ) are respectively defined as follows.

$$\pi = \frac{\Pi}{Y} \quad (3)$$

$$u = \frac{Y}{Z} \quad (4)$$

$$\sigma = \frac{Z}{K} \quad (5)$$

Hence

$$r = \frac{\Pi}{Y} \cdot \frac{Y}{Z} \cdot \frac{Z}{K} = \pi \cdot u \cdot \sigma \quad (6)$$

The decomposition shows that the rate of profit is a product of the profit share, the rate of capacity utilization, and the capacity–capital ratio.

2.1.1. The Profit Share

The profit share can be transformed to express a struggle between real wages and labor productivity as follows. Substituting Equation (2) into Equation (1) yields

$$\pi = \frac{Y - W}{Y} = 1 - \frac{W}{Y} = 1 - \theta \quad (7)$$

where θ is wage share. Applying appropriate price indices to W and Y yields

$$\theta = \frac{P_w W^*}{P_y Y^*} = \frac{P_w}{P_y} \cdot \frac{w \cdot L}{l \cdot L} = \frac{P_w}{P_y} \cdot \frac{w}{l} = P_{wy} \cdot \theta^* \quad (8)$$

where P_w is the price index for wage goods, P_y is the price index for output, w is real wages, l is labor productivity, P_{wy} is the ratio of the price index for wage goods to that for output, and θ^* is a real strength of labor. A change of θ^* is theoretically related to an economic condition. Rapid economic growth, leading to increasing labor demand and a decreasing size of the reserve army of labor, allows workers to have greater bargaining power to ask for higher real wages above an increasing productivity of labor, so θ^* tends to increase. Substituting Equation (8) into Equation (7) yields

$$\pi = 1 - P_{vy} \cdot \theta^* \quad (9)$$

Equation (9) shows that θ^* has a negative impact on π and hence on r . In other words, an increasing θ^* implies that real wages increase faster than labor productivity does. This reduces the profit share and the rate of profit.

2.1.2. The Rate of Capacity Utilization

In Marxian literature, the rate of capacity utilization (u) implies the demand for commodities. The hypothesis is that capitalists, instead of changing an amount of capital stock, adjust their utilization level of their capital to meet fluctuating demand, and this hence alters u . That is, u is likely to decrease in the case of dropping demand for products, while it is likely to increase in the case of higher demand.

2.1.3. The Capacity–Capital Ratio

I can separate the real and price components of the capacity–capital ratio as follows.

$$\sigma = \frac{P_Y Z^*}{P_K K^*} = \frac{P_Y}{P_K} \cdot \sigma^* = P_{yk} \cdot \sigma^* \quad (10)$$

where Z^* is the real potential output, K^* is the real net capital stock, P_K is the price index for capital goods, P_{yk} is the ratio of the price index for output to that for capital goods, and σ^* is the real capacity–capital ratio.

σ^* describes the ability of each unit of fixed capital to generate output; that is, it implies a productivity of capital. Furthermore, not only does a falling σ^* imply a declining productivity of capital, but a continuously falling σ^* also means that a tendency for a technical change has a bias toward a labor-saving productive force. This implies that, when more capital is used in the production process, labor becomes more productive.

2.2. The Second Decomposition

The profit rate can alternatively be decomposed as a product of the rate of surplus value (s) and the inverse of the organic composition of capital (occ) where

$$s = \frac{\Pi}{W} \quad (11)$$

$$occ = \frac{K}{W} \quad (12)$$

Hence,

$$r = \frac{\Pi}{W} \cdot \frac{W}{K} = \frac{s}{occ} \quad (13)$$

2.2.1. The Rate of Surplus Value

The rate of surplus (s) value suggests profits to capitalists as returns for one unit spent as wages. This rate is also known as the rate of exploitation because it is values of production in excess of necessary labor time, implying the ability of capitalists to exploit workers by appropriating a part of total production values, which is generated by workers. In this sense, s can also represent powers of workers to bargain for their wages and those of capitalists to appropriate surplus value from a total value of production.

2.2.2. The Organic Composition of Capital

According to Weisskopf (1979), the organic composition of capital has two components: the technical composition of capital and the relative price ratio. A rising organic composition of capital may be caused by a rising technical composition of capital or a rising price of fixed capital in comparison to a price of wage goods. Therefore, Equation (12) can be decomposed as follows.

$$occ = \frac{K}{W} = \frac{P_K K^*}{P_W W^*} = P_{kw} \cdot tcc \quad (14)$$

where tcc is the technical composition of capital, and P_{kw} is the ratio of the price index for capital goods to that for wage goods.

In Marx, as time passes, capitalists tend to replace variable capital with constant capital, so occ as well as tcc tend to increase together with development of capitalism. Still, Marx ([1894] 1991, 342–43) realizes that P_k has a tendency to be relatively cheaper, leading to a lower P_{kw} . Therefore, the cheaper capital can prevent the fall of the occ and it can act as a counteracting factor of the falling profit rate.

2.3. The Rate of Profit and Capital Accumulation

According to Dumenil and Levy (1993, 285–94; 2004, 25–28), the rate of profit plays a significant role in determining capital accumulation, because surplus value can be reinvested to reproduce and expand capital stock. To show how the rate of

profit determines the rate of capital accumulation, I can extend from Dumenil and Levy (1993, 287), begin with

$$K_t - K_{t-1} = \infty_{t-1} \Pi_{t-1} + \infty_{t-2} \Pi_{t-2} + \infty_{t-3} \Pi_{t-3} + \dots + \infty_{t-n} \Pi_{t-n} \quad (15)$$

Equation (15) expresses that an annual change of net capital stock comes from profits in previous years. The parameters ∞ s imply the main assumption of the equation; that is, a constant proportion of profits in previous years is accumulated and hence leads to a change of net capital stock in these years ($K_t - K_{t-1}$), while n is the number of previous years whose profits are still used to create capital stock in the current year. Plus, it is expectable that profits in successive years play smaller roles in current-year capital accumulation. Therefore, the parameters ∞ s are expected to be smaller in each successive.

The left-hand side of Equation (9) can be understood as the rate of change of capital stock after K_{t-1} is divided through. Hence,

$$\frac{K_t - K_{t-1}}{K_{t-1}} = \frac{\infty_1 \Pi_{t-1} + \infty_2 \Pi_{t-2} + \infty_3 \Pi_{t-3} + \dots + \infty_n \Pi_{t-n}}{K_{t-1}}$$

$$k_t = \infty_1 r_{t-1} + \frac{\infty_2 K_{t-2}}{K_{t-1}} r_{t-2} + \frac{\infty_3 K_{t-3}}{K_{t-1}} r_{t-3} + \dots + \frac{\infty_n K_{t-n}}{K_{t-1}} r_{t-n} \quad (16)$$

where k_t is the growth rate of net capital stock in the current year.

Equation (16) expresses that the profit rates in previous years determine the growth rate of net capital stock. Since capital accumulation is the natural process in a capitalist economy, capital stock has a tendency to increase through time. Therefore, the rates of profit in earlier past years are expected to have smaller impacts on the current growth rate of capital stocks.

3. The Non-Farm Sector and the Empirical Measurements of All Variables

The common difficulty of measuring the rate of profit is mainly how to properly define all of the variables, given a context of an economy. In Thailand, since the 1970s, the economic structure has continually transformed from an agricultural economy to an industrial economy. According to Phongpaichit and Baker (2002, 200–201), since the 1960s, there have been transfers of workers from a traditional farm sector toward a modern industrial sector. The farm sector has acted as the provider of labor power to meet labor demand in other sectors. This implies that working as wage-workers in the other sectors yields greater incomes than working as self-employed farmers does. In addition, using the 2003 labor force survey, Bryant and Gray (2005) found that most farmers are self-employed, while

the proportion of capitalist farmers is low in the total agricultural workforce. Therefore, the farm sector can be reasonably assumed as the sector where profits are slightly generated. Therefore, in order to measure the rate of profit in Thailand since 1970, the focus is on the non-farm sector where most profits are presumably generated.

Since the focus is on the non-farm sector, all of the variables, except the price ones, are specifically non-farm. The sources and the compilation of these data can be seen in detail in Appendix 1. The data for potential output are limited in Thailand, so I, following Shaikh and Moudud (2004), use time-series econometrics to estimate potential output from 1970 to 2010.¹ Details are provided in Appendix 2. It must be noted that, in this article, since the focus is on the non-farm sector and all of the variables are measured from the non-farm data, the prefix “non-farm” for all of these variables will be dropped to encourage flow of the article.

After obtaining all of the variables, the rate of profit and its components can be presented as in Figures 1–12.

From Figure 1, I can divide the whole series of the rate of profit, according to its shape, into four phases: the first phase is from 1970 to 1979 when it sharply rises, the second phase is from 1980 to 1989 when it still increases, but with a slower pace, the third phase is from 1990 to 1998 when it sharply drops, and the fourth phase is from 1999 to 2010 when it slightly increases. To define the impacts of each component on the rate of profit, I can present growth accounting of Equation (6) as follows.

$$\dot{r} = \dot{\pi} + \dot{u} + \dot{\sigma} \tag{17}$$

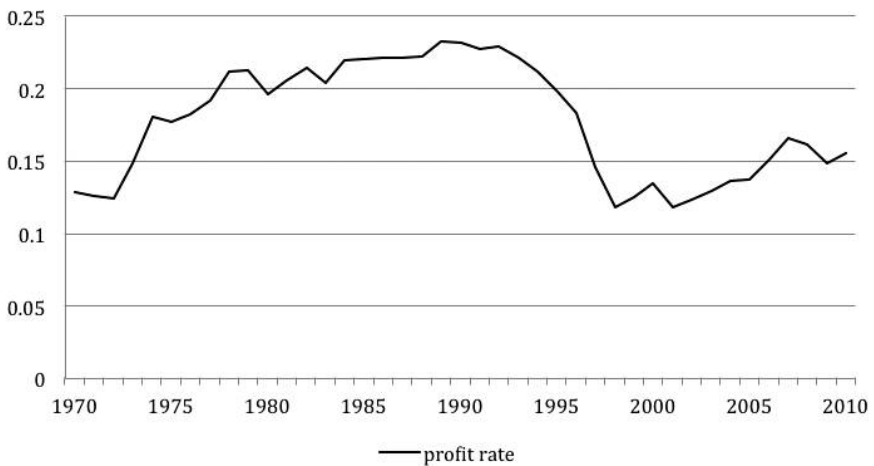


Figure 1 Non-Farm Profit Rate (*r*) in Thailand from 1970 to 2010

Source: See Appendix 1.

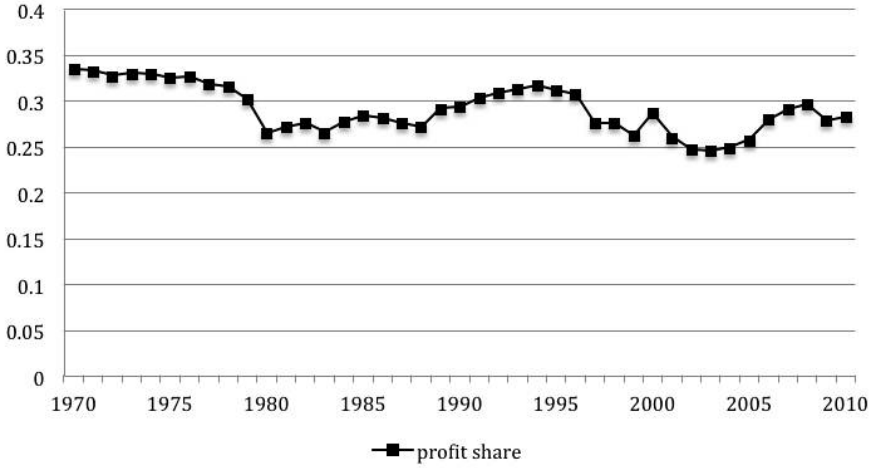


Figure 2 Non-Farm Profit Share (π) in Thailand from 1970 to 2010

Source: See Appendix 1.

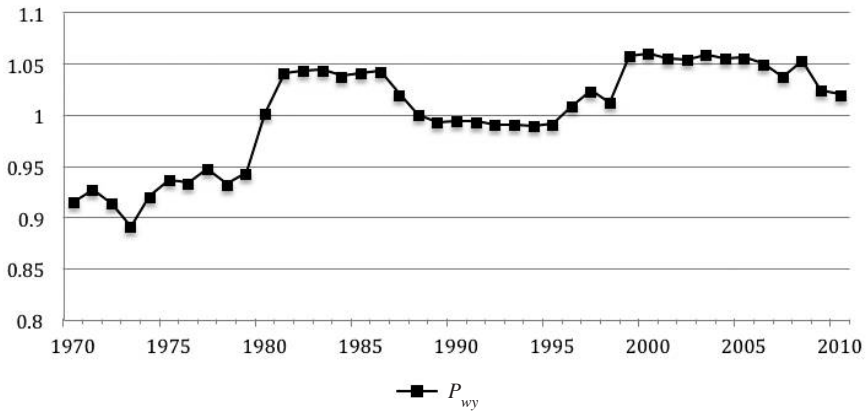


Figure 3 The Ratio of the Price Index for Wage Goods to That for Output (P_{wy}) in Thailand from 1970 to 2010

Source: See Appendix 1.



Figure 4 The Real Strength of Labor (θ^*) in Thailand from 1970 to 2010

Source: See Appendix 1.

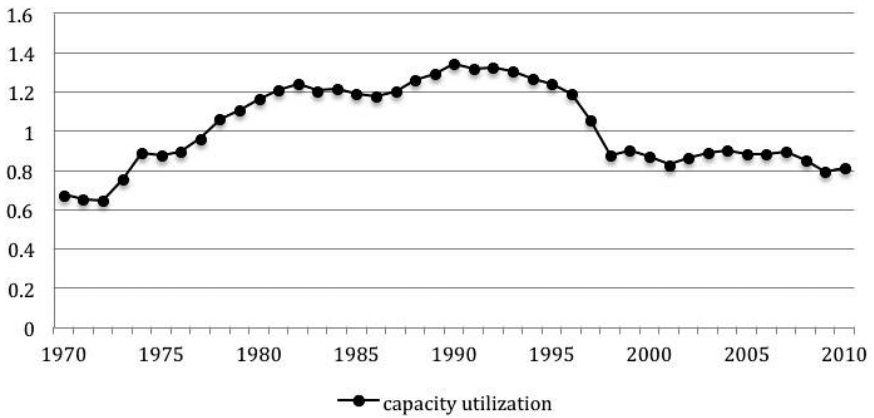


Figure 5 The Non-Farm Capacity Utilization (u) in Thailand from 1970 to 2010

Source: See Appendix 2.

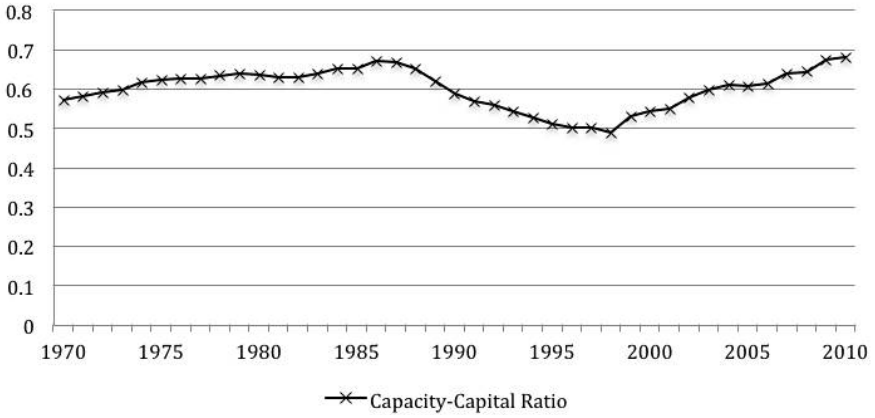


Figure 6 The Non-Farm Capacity–Capital Ratio (σ) in Thailand from 1970 to 2010

Source: See Appendices 1 and 2.

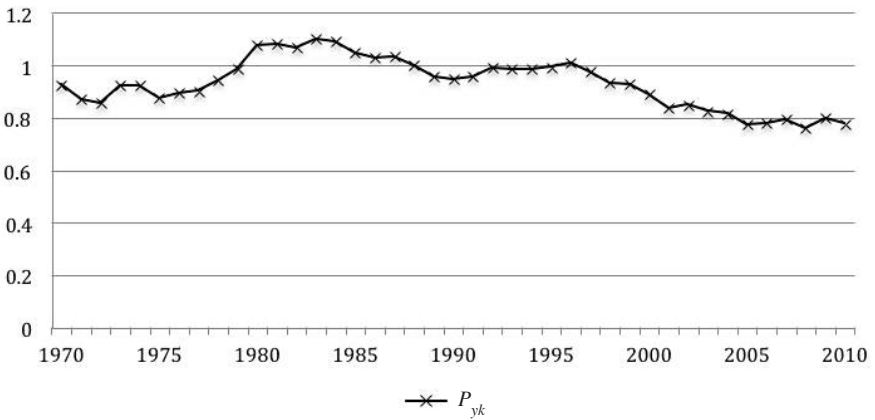


Figure 7 The Ratio of the Price Index for Output to That for Capital Goods (P_{yk}) in Thailand from 1970 to 2010

Source: See Appendix 1.

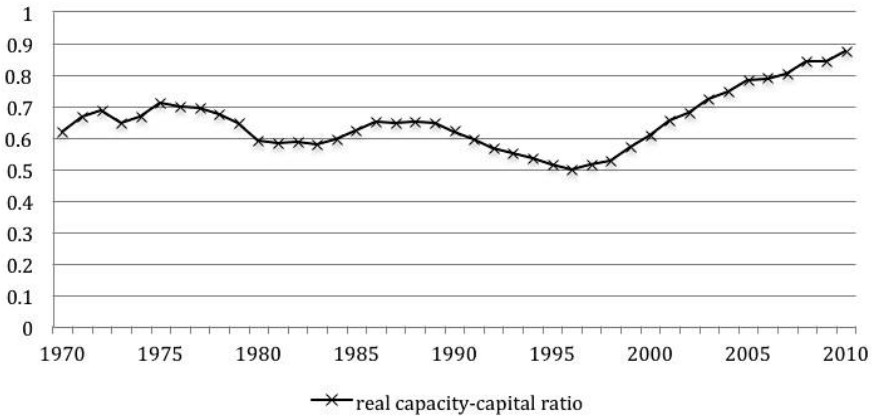


Figure 8 The Non-Farm Real Capacity–Capital Ratio (σ^*) in Thailand from 1970 to 2010

Source: See Appendices 1 and 2.

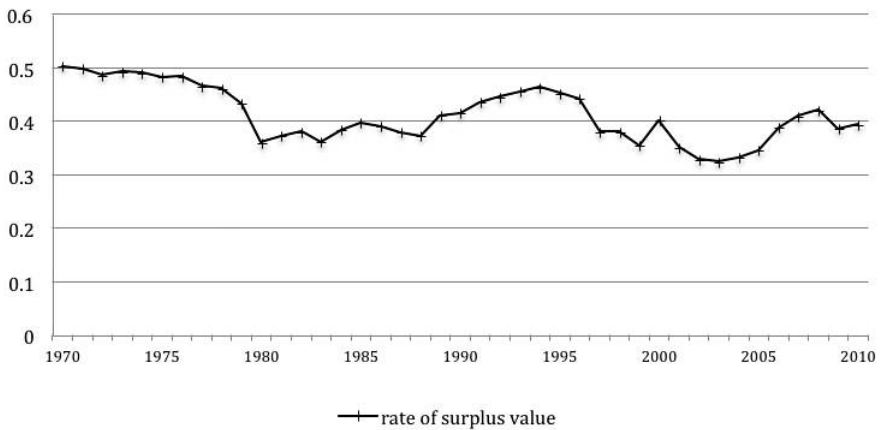


Figure 9 The Non-Farm Rate of Surplus Value (s) in Thailand from 1970 to 2010

Source: See Appendix 1.

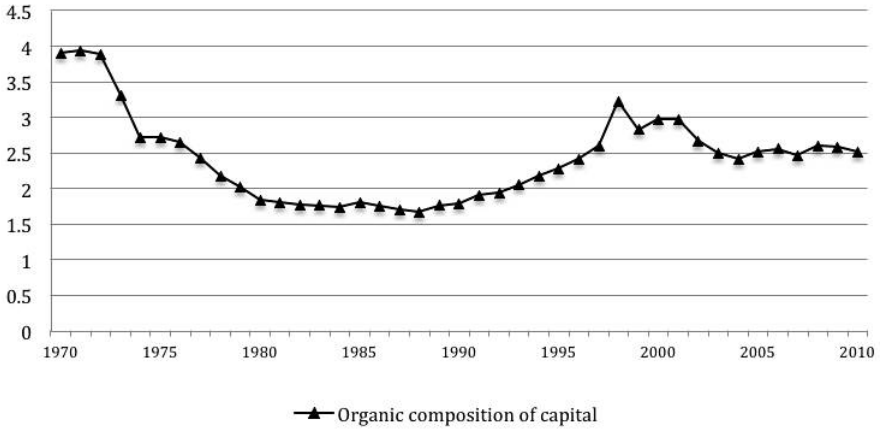


Figure 10 The Non-Farm Organic Composition of Capital (occ) in Thailand from 1970 to 2010

Source: See Appendix 1.

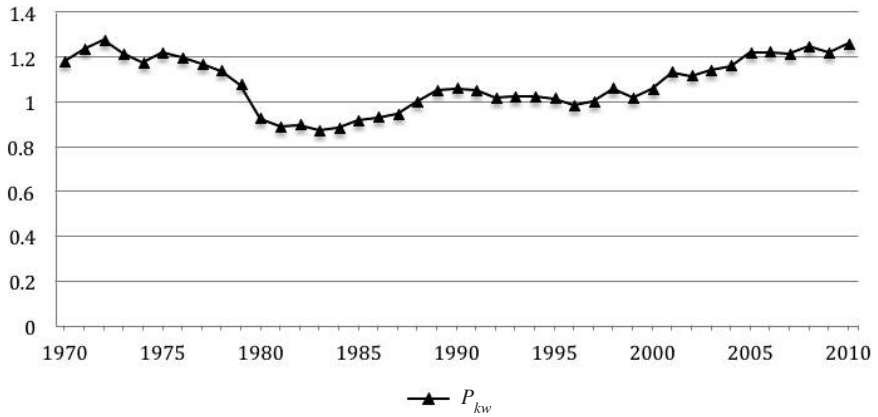


Figure 11 The Ratio of the Price Index for Capital Goods to That for Wage Goods (P_{kw}) in Thailand from 1970 to 2010

Source: See Appendix 1.

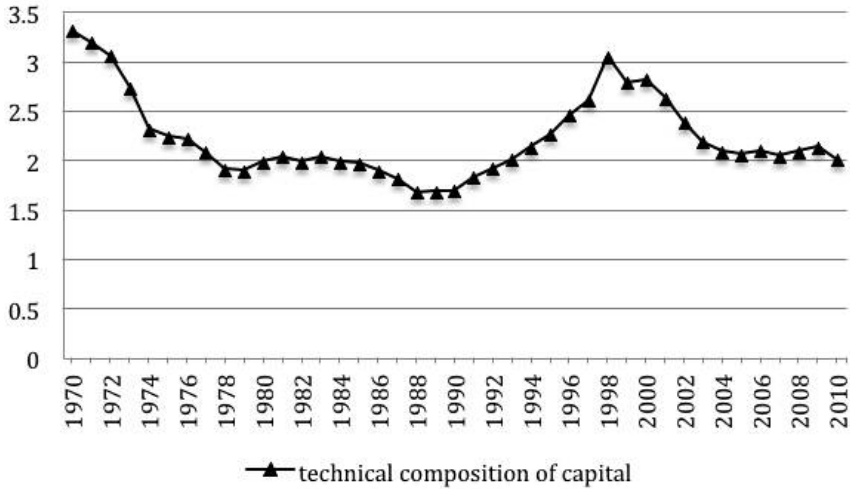


Figure 12 The Non-Farm Technical Composition of Capital (tcc) in Thailand from 1970 to 2010

Source: See Appendix 1.

Finding growth accountings of Equations (8)² and (10) and substituting them into Equation (17) yields

$$\dot{r} = -\frac{W}{\Pi}(\dot{P}_{wy} + \theta^*) + \dot{u} + \dot{P}_{YK} + \theta^* \tag{18}$$

Meanwhile, in the second decomposition, growth accounting of Equation (13) is

$$\dot{r} = \dot{s} + o\dot{c}c \tag{19}$$

Substituting growth accounting of Equation (14) into Equation (19) yields

$$\dot{r} = \dot{s} - \dot{P}_{kw} - t\dot{c}c \tag{20}$$

The growth rates of all variables and their impacts in each phase of the profit rate are presented in Table 1.³

In the first decomposition, the profit share moves in the opposite ways compared to that of the rate of profit for the first two phases, while, in the last two phases, it moves in the same direction but its impact on the profit rate is only 8.5% in

Table 1 Annual Average Growth Rates of the Rate of Profit and Its Determinants

Unit: (% Δ)

Year	1970–79		1980–89		1990–98		1999–2010	
	<i>g</i>	<i>i</i>	<i>g</i>	<i>i</i>	<i>g</i>	<i>i</i>	<i>g</i>	<i>i</i>
<i>r</i>	5.74		0.91		-7.29		2.37	
<i>First decomposition</i>								
1. π	-1.12	-19.61	-0.36	-39.43	-0.62	8.52	0.21	9.02
1.1. P_{wy}	0.34	-13.56	0.52	-139.11	0.21	7.45	0.07	-7.31
1.2. θ^*	0.19	-7.72	-0.37	98.05	0.04	1.44	-0.15	16.15
2. <i>u</i>	5.64	98.32	1.57	172.99	-4.24	58.21	-0.62	-26.14
3. σ	1.23	21.44	-0.29	-32.55	-2.58	35.34	2.78	117.65
3.1. P_{yk}	0.69	12.06	-0.28	-30.97	-0.30	4.09	-1.50	-63.34
3.2. σ^*	0.53	9.31	-0.01	-1.58	-2.29	31.35	4.35	183.74
<i>Second decomposition</i>								
4. <i>s</i>	-1.65	-28.68	-0.51	-56.04	-0.87	11.88	0.30	12.53
5. <i>occ</i>	-6.98	121.70	-1.40	154.64	6.93	95.06	-2.02	85.45
5.1. P_{kw}	-1.02	17.79	-0.24	26.07	0.09	1.26	1.45	-61.38
5.2. <i>tcc</i>	-6.02	104.98	-1.17	128.88	6.83	93.71	-3.42	144.73

Source: Author's measurement.

the third phase and 9.0% in the fourth phase. The real strength of labor has the largest impact on the profit rate in phase two, but its impact is counterbalanced by the larger but negative impact from the ratio of the price index for wage goods to that for output. Meanwhile, the rate of capacity utilization moves together with the rate of profit in the first three phases in which its impact is very large. Indeed, compared to other variables in the first decomposition, the shape of the rate of capacity utilization (Figure 5) is most similar to that of the rate of profit (Figure 1). However, it moves against the rate of profit in the fourth phase in which the negative impact of the rate of capacity utilization is offset by the positive impact of the capacity–capital ratio. The capacity–capital ratio positively contributes to the fluctuations of the profit rate for almost all the time except in the second phase. Still, interestingly, the dropping capacity–capital ratio in the second phase is greatly due to the dropping ratio of the price index for output to that for capital, while the real capacity–capital ratio, constantly growing in the early period of the phase before dropping later, has a very small impact on the rate of profit.

For the second decomposition, the rate of surplus value, similar to the profit share, moves against the rate of profit in the first two phases. For the last two

phases, though having positive impact, the rate of surplus value contributes only 11.9% in the third phase and 12.5% in the fourth phase. Meanwhile, the organic composition of capital's impact on the growth rate of the rate of profit offsets the negative impact of the rate of surplus value in the first two phases. Yet, in spite of the partial contribution of the growth rate of the rate of profit in the last two phases, the organic composition of capital still contributes 95.1% and 85.5% in the third and fourth phase, respectively. In further details, the main determinant behind the fluctuations of the organic composition and the rate of profit is the technical composition of capital, whose impact is over 90% in all phases, while the ratio of the price index for capital goods to that for wage goods has relatively much smaller impact.

4. The Rate of Profit and the Thai Economic Development

4.1. The Four Phases of the Thai Economic Development

As the Thai economy can be divided into four phases according to the shape of the rate of profit, the decomposition analysis presented in Table 1 suggests that the economic development in each phase has its unique characteristics.

The first phase during 1970–79 is the early period of the industrialization process in which the labor-intensive manufacturing activities emerged as an important engine for the Thai economy. The sharp drop of the organic composition of capital implies that a large number of workers were employed to work with capitals. According to Doner (2009, 186–87), the Thai textile industry started being developed by Japanese textile investment since the first half of the 1960s, and, by 1972, Thailand became self-sufficient for the industry as all raw materials could be acquired domestically. Not only did it account for 6% of total exports, the textile industry employed 54,000 workers by 1979 (Phongpaichit and Baker 2002, 140). Together with the growth of the textile industry, agribusiness and consumer good assembly, which were also labor-intensive, also rapidly expanded. According to Phongpaichit and Baker (2002, 202), three to four millions of workers in the farm sector came to Bangkok to meet increasing labor demand in the manufacturing sector in the form of off-seasonal employment; that is, the process of proletarianization began.

This huge wave of labor migration to work with new and existing capitals then led to the fast-increasing rate of capacity utilization, and this resulted in the increasing rate of profit. These employments were opportunities to increase their incomes, so the workers were willing to accept the jobs in spite of getting flimsily paid. Hence, despite large demand for labor, the real strength of labor did not perform an upward trend. This phenomenon arose because of a surplus of reserve

army of labor in the country, so workers did not have strong bargaining power to raise their wages. The proletarianization process without serious class conflicts was, hence, beneficial to capitalists to obtain profits from the rising rate of capacity utilization and rising capital productivity.

The second phase during 1980–89 is characterized as the period of the slow-increasing rate of profit. The first decomposition suggests that it was the rising rate of capacity utilization that contributed to the increasing rate of profit, while the profit share and the capacity–capital ratio had negative impacts. Meanwhile, the second decomposition shows that the organic composition of capital slightly dropped and this influenced the slowly increasing rate of profit, offsetting an impact of the stable rate of surplus value. The continual falling organic composition of capital signified that employment in the non-farm sector, continuing from the previous phase, kept increasing. According to Phongpaichit and Baker (2002, 213–14), manufacturing employment increased from 2.18 million in 1979 to 3.85 million in 1991, and the 1980s was the first decade in which annual addition to the employed labor force in the non-farm sector exceeded that in the farm sector. Still due to an abundant reserve army of labor, the profit share and the rate of surplus value did not drop in spite of the continual recruitment of workers. However, a slow drop of the organic composition of capital suggested that uses of capital, together with rapid labor recruitment, also increased and some leading industries became more capital intensive. Foreign firms producing electronics and semiconductors moved their bases to Thailand, and speedily grew during the 1980s (Phongpaichit and Baker 2002, 163). As an economy turned more capital intensive, the real capacity–capital–ratio, different from the previous phase, became quite stable. However, diversifications in the manufacturing sector played a very important role to drive export boom, leading to the fast economic growth in the late 1980s (Simon 1996, 88–91). Certainly, as a response to the rising demand for export, the capacity utilization increased quickly, resulting in the increasing rate of profit.

The third phase during 1990–98 is the crisis phase for the Thai economy. A huge wave of foreign capitals came in to generate investments in Thailand, while the country started encountering a problem of labor shortage. In response to this problem, the manufacturing sector was pushed forward to more labor-saving technology. In this phase, the Thai economy merged to Marx's prediction of the falling rate of profit in which the rising organic composition of capital plays a leading role. To further understand, in the first decomposition, the real capacity–capital ratio dropped, implying that the productivity of capital was lower and contributed to the lower rate of profit. In this sense, as long as the economy develops and more capital are used in production process, the falling rate of profit can be understood as a result of lower productivity of capital. This is what Dumenil and Levy (2004, 35) called a “trajectory à la Marx”. In addition, the first

decomposition also suggests that the declining rate of capacity utilization also contributed to the falling profit rate. According to Phongpaichit and Baker (1998, 95–98), the rises of other emerging countries, the falling value of the Japanese yen, and the lack of improvement in export industries led to the falling trend of Thai export growth rate since 1988 to 1996. The rate of capacity utilization, hence, dropped in response to lower demand for exports.

In the fourth phase, 1999–2010, the organic composition of capital dropped, and this contributed to the bouncing-back rate of profit. This was mainly due to the rise of a labor-intensive sector, that is, the service sector. After the crisis, the Thai service sector has acted as an absorber for laid-off employees. The Amazing Thailand in 1998–99 was the very first tourism campaign launched by the Thai government to use the service sector as a booster for the economy. In 1998–2002, employment in the service sector had accounted for only 41.51% of total employment, but its share became 46.65% in 2009 (Koonnathamdee 2013). Since the service sector was labor-intensive, labor productivity in the sector was quite low. This implies that labor productivity in the whole economy was lower, while capital productivity increased. As a result, the capacity–capital ratio increased after the crisis. Meanwhile, from Table 1, this phase was the only time period when the rate of capacity utilization moves against the profit rate. However, looking at Figure 5 carefully, I can argue that rate of capacity utilization had been around 87%–89% from 1999 to 2007, and it dropped relatively quickly after 2007. After the crisis, export growth rate was never as high as that in the pre-crisis era,⁴ so this stable export demand led to the stable rate of capacity utilization from 1999 to 2007. Meanwhile, there were two main factors behind the drop of the rate of capacity utilization in 2007: the global financial crisis and the Thai political turmoil (Sussangkarn and Nikomborirak 2012). First, the global financial crisis since 2007 and the Eurozone crisis afterward tremendously shrunk the global demand, which unavoidably led to falling demand for Thai exports. Second, the political turmoil since 2006 could significantly obstruct the growth of domestic demand, because it led to problems of transportation, lack of confidence, and shrinking of domestic demand.

4.2. The Weakening Real Strength of Labor in Thailand

Even though the real strength of labor has performed frequent fluctuations, the trend line (dashed line) in Figure 4 shows that the real strength of labor in Thailand has continually dropped. This implies that, after the beginning of the Thai industrialization, the bargaining power of workers has been weaker. Two main reasons can explain the weakening real strength of labor in Thailand. One is the sizeable reserve army of labor and the other one is the role of the government to undermine the bargaining power of workers.

1. *The sizeable reserve army of labor.* Thailand has a large size of the reserve army of labor. Therefore, an abundant supply of labor has the ability to meet labor demand in the non-farm sector, so a sharp reduction of the reserve army of labor that would allow workers to have higher bargaining power has been hardly observed in Thailand. As discussed above, the process of industrialization led to high demand for labor since the beginning of 1970s. This demand was met by an abundant supply of labor in the farm sector. The large reserve army of labor in Thailand during the early period of industrialization is compatible with Marx's ([1894] 1991) explanation on how "the relative surplus population" can act as a counteracting factor of a falling profit rate (pp. 343–44). Although the labor market tightened due to fast-increasing labor demand during the economic boom (Phongpaichit and Baker 1998, 135–36), low-skilled migrant workers, mainly from neighbor countries, came to Thailand to meet the increasing labor demand during the post-crisis years. According to Martin (2007), a number of migrant workers increased more than one million during 1995 to 2005, and the proportion of migrant workers out of total labor force increased from 2.2% in 1995 to around 5% in 2005. These migrant workers played a crucial part to enlarge the size of the reserve army of labor in Thailand.

2. *The role of the government.* According to Hewison and Brown (1993), the characteristics of the Thai government played a role on the strength of labor unions; that is, more liberal-democratic governments tended to yield more benefits toward the working class. However, Brown (2004, 89–91) added that, in spite of several attempts to increase the bargaining power of the working class and to strengthen labor unions, the "conservative" governments were in power for most of the time from the late 1970s to the mid-1990s. Therefore, the working class never gained a winning momentum in wage-profit struggles, because the governments employed several tactics to disarray strengths of labor organizations. One of the obvious examples is perhaps the attempt by the National Peacekeeping Council's Announcement 54 to abolish the 1975 Labor Relation Act.⁵

4.3. The Non-Farm Rate of Profit and the Growth Rate of Capital Stock

Since capital accumulation is a necessary condition for the existence of a capitalist economy, the growth rate of net capital stock and economic fluctuation are highly related. Figure 13 presents the growth rate of net capital stock⁶ in Thailand from 1971 to 2010. When the country started building its economic strength from the early 1970s to the mid 1980s, the growth rate of net capital stock shows an increasing tendency. The growth rate of net capital stock surged at relatively fast rates during the economic boom from the mid 1980s to the mid 1990s. When the economic crisis emerged in 1997, the growth rate of net capital stock dropped sharply to negative numbers before it shows an upward trend again after 2002.

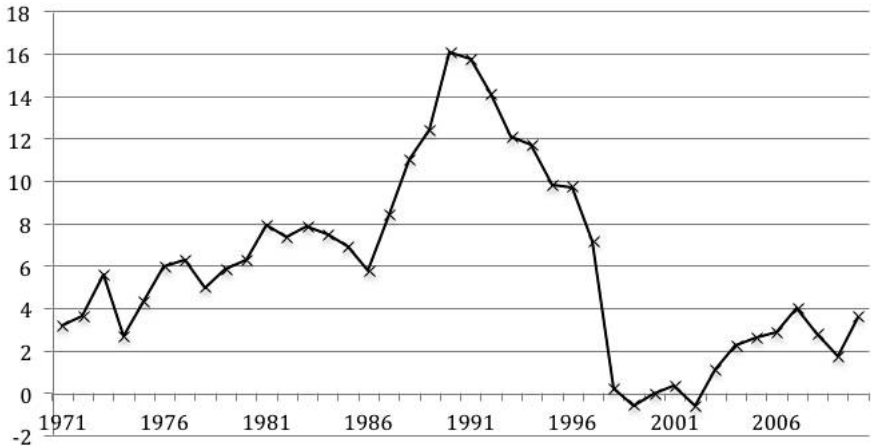


Figure 13 The Growth Rate of Private Net Capital Stock from 1971 to 2010

Source: NESDB data—see Appendix 2 for the measurement.

A rough comparison of Figures 1 and 13 suggests that the growth rate of net capital stock and the rate of profit move in quite similar patterns. They both showed clear rising tendencies during the first 20 years, and then sharply fell during the 1990s. Both rates started increasing again in the early 2000s, but they could never be as high as what they had been during the late 1980s to the early 1990s. During the boom, the peak of the rate of profit was in 1989 when it was 0.23%, while the peak of the growth rate of net capital stock was in 1990 when it was 16.10%. During the crisis, the bottom of the rate of profit was in 1998 when it was 0.12%, while the bottom of the growth rate of net capital stock was in 1999 when it was -0.55% . Prior to the recovery period, the rate of profit fell once again to 0.12% in 2001, while the growth rate of net capital stock reached its bottom, -0.58% , in 2002. Comparing the peaks and the bottoms of the two series, the rate of profit usually 1 year preceded the growth rate of net capital stock.

Using a more advanced tool, I also present the cross-correlogram in Figure 14 to see the relation between the lags of the profit rate and the growth rate of net capital stock.

The cross-correlogram shows positive correlation, so the rate of profit and the growth rate of capital stock are positively cross-correlated. The peak of the cross-correlogram is at lag 1. This peak suggests that the growth rate of capital stock lags the rate of profit by one period. That is, the rate of profit in the year $t - 1$ has the greatest impact, while its successive lags have dwindling impact on the growth rate of capital stock.

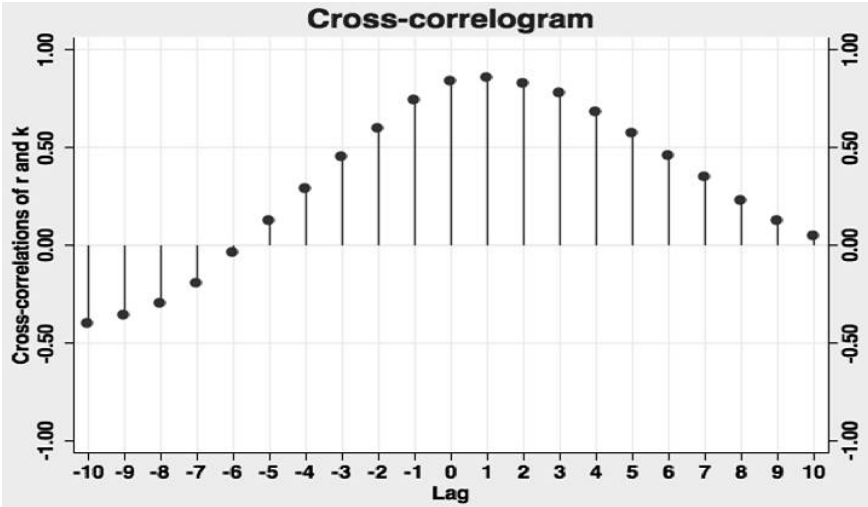


Figure 14 Cross-Correlogram of r and k

Source: Graphic from STATA 12.

To obtain deeper knowledge of the relation between the two variables, I employ the time-series econometrics to determine whether or not Equation (16) holds in the case of the Thai economy. See Appendix 3 for the details on the econometric work. Even though Equation (16) is a distributed lag model containing finite number of past profit rates, I found that, for the case of Thailand, only the rate of profit in the latest year (year $t - 1$) has an impact on the growth rate of net capital stock. The estimated equation from the data can be presented as follows.

$$k_t = 36.79r_{t-1} \quad \text{Adjusted } R^2 = 0.81 \tag{21}$$

The t -statistic is 12.75 which yields a significant coefficient. Equation (21) suggests that the rate of profit in the past determines the growth rate of net capital stock; that is, a unit change of the rate of profit in the latest year (year $t - 1$) leads to 36.79% change in the growth rate of net capital stock.

5. Concluding Remarks

Since the process of industrialization in the 1970s, the Thai economy has experienced both the phenomenal economic prosperity and the dreadful economic crisis. This article attempts to emphasize the role of the rate of profit on the Thai economic development. One of the benefits from studying the behavior of the

rate of profit is to know the different phases of economic development of the Thai economy. The shape of the rate of profit suggests that the Thai economy can be differentiated into four phases: 1970–79 when the rate of profit surged, 1980–89 when the rate of profit slowly increased, 1990–98 when the rate of profit sharply dropped, and 1999–2010 when the rate of profit bounced back from its bottom. The decomposition analysis suggests that different behaviors of the profit share, the rate of capacity utilization, the capacity–capital ratio, the rate of surplus value, and the organic composition of capital, have reflected the different characteristics of the Thai economy in each phase.

The decomposition analysis further reveals that the organic composition of capital has greatly contributed to fluctuations of the rate of profit, while the rate of capacity utilization and the capacity–capital ratio has had positive impacts in three out of four phases. Meanwhile, the profit share and the rate of surplus value have determined the rate of profit only after 1990 and their impacts have been slight. This implies that the rate of profit has been characterized by the relation between capital and labor, while class conflicts, determining the profit share and the rate of surplus value, have barely been potent. That is, since the 1970s, the capitalist class has always been a dominant class who could expand and earn benefits from economic development, while the working class has been subordinate (Hewison 2001). This article also discusses that the reasons behind the weakening real strength of labor are twofold. The first one is regarding the characteristics of the Thai labor market, in which the reserve army of labor was, for most of the time, large enough to meet demand for labor. As a result, the labor market has not been sufficiently tight to raise the bargaining power of the working class. Meanwhile, the second one is regarding the role of the government, whose conservative policies have suppressed the working class.

The last point revealed in this article is to underline the role of the rate of profit on capital accumulation in Thailand. In particular, according to the econometric result, the rate of profit has significantly determined the growth rate of net capital stock in the Thai economy. Since capital accumulation is a necessary condition for the existence of a capitalist economy, a good understanding on the past and future rate of profit in Thailand is very important to really understand the Thai economy.

Appendix 1: The Measurement of the Non-Farm Rate of Profit

Sources of Data

Data for the profit rate measurement are taken from the following sources.

1. The main source of data is National Income of Thailand from the National Economic and Social Development Board (NESDB). To obtain the series of national income from 1970 to 2010, I had to collect the data from the following sources from both the NESDB's website and the NESDB's reports:

- 1.1 National Income of Thailand: New Series 1970–87;
- 1.2 The file National Income of Thailand: 1980–2001 edition;
- 1.3 The file National Accounts of Thailand: New Series (Chain Volume Measures 1990–2010).

There is an overlap of the data from 1980 to 1987 from source 1.1 and source 1.2, and another overlap from 1990 to 2001 from source 1.2 and source 1.3. The NESDB has yearly revised the National Income Account, so data during the overlapped years are different in different sources. As suggested by the NESDB's staff, the data for the overlapped years presented in the later reports are more accurate. Therefore, I use the data of 1970–79 from source 1.1, that of 1980–89 from source 1.2, and that of 1990–2010 from source 1.3.

2. Another source of data is the historical data of gross domestic product (GDP) from 1951 to 1996. The data are available on the NESDB's website. This table was published after *National Income of Thailand: New Series 1970–87*, and hence, it is expected to inform more accurate GDP than source 1.1.
3. Another source of data is *Capital Stock of Thailand: 1970–2011*, which contains the data on private net capital stock.
4. The last source of data is the World Bank's Databank, from which I obtain the data for price indices.

Explanations of the Variables and the Compilation of Data

1. Non-farm net domestic product (Y) = net domestic product – farm net domestic product

Net domestic product = GDP – provision for consumption of fixed capital

GDP at market prices from 1970 to 1979 is obtained from source 2, and GDP from 1980 to 1989 is obtained from source 1.2. Meanwhile, provision for consumption of fixed capital is obtained from source 1.1 and 1.2. Net domestic product from 1990 to 2010 is from source 1.3. Since the agricultural sector takes a big share of total production in Thailand, total GDP can be divided into two types: farm GDP and non-farm GDP. In all sources, the sum of farm GDP and non-farm GDP is always equal to total GDP.

Farm net domestic product = farm GDP – estimated provision for consumption of fixed capital in the farm sector

The data of farm GDP are obtained from the same sources as explained in the case of GDP. However, one difficulty is that the NESDB revised the definition of farm GDP. The data from 1970 to 1989 include the entry “Simple Agricultural Processing Products” in the agricultural sector, but the data from 1990 to 2010 consider this entry as a part of manufacturing production. In order to have a consistent definition of data, as suggested by the NESDB’s staff, “Simple Agricultural Processing Products” is subtracted from farm GDP from 1970 to 1989. Meanwhile, estimated provision for consumption of fixed capital is reported in an aggregate level, so the exact data of this depreciation in a farm sector are unknown. To estimate this value, I collect the data of net capital stock from source 3, where total net capital stock is divided into net capital stock in a farm sector and that in a non-farm sector. Hence, I assume that the ratio of depreciation in the farm sector to the total depreciation should be equal to the ratio of net capital stock in the farm sector to total net capital stock. That is, my estimated provision for consumption of fixed capital in the farm sector is equal to the ratio of net capital stock in the farm sector to total net capital stock times total provision for consumption of fixed capital.

2. Non-farm profit (Π) = total profit – farm profit

Total profit = saving of private corporations + property income + direct taxes on corporations + corporate transfer payments + unincorporated profit – interests on consumers’ debt – imputed rent

Profit, by definition, is composed of four categories: corporate profits, non-corporate profits, interests, and rents. All data are available in sources 1.1, 1.2, and 1.3. However, some modifications of the data in order to get proper profits must be noted as follows.

First, interests on consumers’ debt are subtracted from property income, because they are not derived from the production process.

Second, imputed rent is subtracted from total profits, because the imputed rent is the sum of estimated returns of self-owned properties. In the case of Thailand, self-owned properties are mostly self-owned farms and residential properties which do not generate profits.

Third, in the farm sector, all unincorporated income is considered as wage-equivalents to self-employed farmers, because it is proper to assume that most farmers are self-employed and they do not earn profits.

Fourth, for non-farm unincorporated income, following other profit rate literatures (e.g., Wolff [2001], and Izyumov and Alterman [2005]), I simply assume that a half of non-farm unincorporated income is profits, while another half is wages of being self-employed.

Farm profit = farm net domestic product – total farm wage

As already mentioned, there have been continual transformations of workers from being self-employed farmers in the farm sector to being wage-workers in the non-farm sector. Therefore, not only are wages paid to farm workers considered as wages in the farm sector, but incomes to self-employed farmers are also considered as wage-equivalents in the farm sector. The first part of total wages in the farm sector is compensation of employees in the farm sector, and the second part is, as stated above, all unincorporated income in the farm sector. All of these variables are available in sources 1.1, 1.2, and 1.3. In addition, since “Simple Agricultural Processing Products” is a part of the agricultural sector from 1970 to 1989, wages paid in “Simple Agricultural Processing Products” are included in total wages in the farm sector only from 1970 to 1989, but not from 1990 to 2010. Following how farm net national domestic product is previously defined, these wages should be subtracted from total wages from 1970 to 1989. However, data on wages paid in “Simple Agricultural Processing Products” are not available, so I have to estimate them. I then find the proportion of “Simple Agricultural Processing Products” in the total farm GDP, and I assume that it is equal to the proportion of wage paid in “Simple Agricultural Processing Products” in the total farm wages.

3. Non-farm wage (W) = non-farm net domestic product (Y) – non-farm profit (Π)

4. Non-farm private net capital stock (K) = non-agriculture private net capital stock – net private capital stock of real estate, renting, and business activities

Net residential fixed capital stocks are subtracted from net non-farm fixed capital stocks to get K , because, in general, most of these capital stocks are residential, which do not generate profits. All of these data are obtained from source 3.

5. Wage goods price index (P_w)

Following Weisskopf (1979), I consider that the price index for wage goods is the consumer price index. The data are from source 4.

6. Output price index (P_y)

I consider that the price index for output is GDP deflator. The data are from source 4.

7. Capital goods price index (P_k)

The price index for capital goods is not instantly available. However, source 3 reports the data of capital stock both at constant prices and at current replacement cost. I can easily use this data to measure a series of P_k .

Appendix 2: The Estimation of the Potential Output (Z)

Theoretical Framework

Shaikh and Moudud (2004) developed a general methodology to estimate the potential outputs and the rates of capacity utilization of the Organisation for Economic Co-operation and Development (OECD) countries by considering that “capacity is the aspect of output that co-varies with the capital stock over the long-run.” They start at the identity

$$Y = \frac{Y}{Z} \cdot \frac{Z}{K} \cdot K \quad (22)$$

Then,

$$\log Y(t) = \log u + \log \sigma + \log K \quad (23)$$

The first behavioral equation is based on the idea that the actual rate of capacity utilization fluctuates around a normal rate ($u^* = 1$), so

$$\log u(t) = e_u(t) \quad (24)$$

where $e_u(t)$ is a random error term.

The second behavioral equation is regarding the capacity–capital ratio (σ). Given that the growth rate of σ depends on autonomous technical change (parameter β_1) and the growth rate of capital stock (parameter β_2), this can be stated in a log function as

$$\log \sigma(t) = \beta_0 + \beta_1 \cdot t + \beta_2 \cdot \log K + e_v(t) \quad (25)$$

where e_v is the random error term. Substituting Equations (24) and (25) into Equation (23) yields

$$\log Y(t) = \beta_0 + \beta_1 \cdot t + \gamma_2 \cdot \log K + e(t) \tag{26}$$

where $\gamma_2 = 1 + \beta_1$ and $e(t) = e_u(t) + e_v(t)$. Equation (26) implies that Y and K are cointegrated, while the estimated value of Y is capacity output (Z).

Econometric Method

Because the data are time series, I shall start at doing unit root tests for both Y and K (Table 2).

The results show that $\log K$ is certainly stationary at $I(1)$. However, for $\log Y$, the test of the model without trend finds that $\log Y$ is $I(0)$ but the model with trend finds that $\log Y$ is $I(1)$. Since the result seems more clear at $I(1)$, I would conclude that $\log Y$ is more likely $I(1)$. Since both variables are $I(1)$, I then apply the Johansen-Juselius cointegration test in order to find cointegration between the variables. The results can be presented as in Table 3.

Table 2 The Unit Root Tests for the Regression of Equation (26)

Variables	Augmented Dickey–Fuller		Phillips–Perron	
	Without trend	Trend	Without trend	Trend
$\log Y$	-3.52**	-0.49	-2.90*	-0.73
$d.\log Y$	-3.18*	-4.05**	-3.20*	-4.01**
$\log K$	-0.89	-0.27	-0.70	-1.06
$d.\log K$	-3.51**	-3.55*	-3.56**	-3.58*

Notes: **significant at the 99% confidence level, *significant at the 95% confidence level.

Table 3 The Johansen-Juselius Cointegration Test for the Regression of Equation (26)

Rank	Eigenvalue statistics	Critical Eigenvalue	Trace statistics	Critical trace
0	105.65	14.07	105.66	15.41
1	0.01	3.76	0.01	3.76

From Table 3, I can reject the null hypothesis of Rank = 0, but I cannot reject the null hypothesis of Rank = 1. Therefore, cointegration between $\log Y$ and $\log K$ is detected. Then, running a regression of Equation (26) yields

$$\log Y(t) = -97.73 + 0.05 \cdot t + 0.52 \cdot \log K \tag{27}$$

The adjusted R^2 of Equation (27) is 0.97, and all of the coefficients are significant. Therefore, I can use Equation (27) to further calculate non-farm potential output (Z).

Appendix 3: The Econometric Estimation of the Relation between the Growth Rate of Net Capital Stock and the Non-Farm Rate of Profit

Variables

1. Net capital stock (K) in this section is different from the net capital stock in Section 3. Theoretically, when discussing the process of capital accumulation where surplus value is reinvested to generate more capital stock, Marx does not mention the impact of foreign capital inflows which are surplus value generated at other regions. Therefore, I subtract the real value of the net flows of external debt from the real value of the non-farm net capital stock by being based on the assumption that all external debts come to Thailand to generate the process of capital accumulation only in the non-farm sector. The data of net flow of external debts in Thailand from 1971 to 2010 can be acquired from the World Bank's databank.

2. The non-farm rate of profit is the same variable as in the section *The Non-Farm Sector and the Empirical Measurements of All Variables*.

Econometric Method

Instead of beginning with testing a unit root problem, I begin my regression with finding an appropriate lag number for Equation (16) and follow by using the Johansen-Juselius Cointegration test to find whether or not variables are cointegrated. In the regression, I set the maximum number of lag at 4 to allow a certain degree of freedom. That is, I, therefore, start with the regression of $k_t = f(r_{t=1}, r_{t=2}, r_{t=3}, r_{t=4})$, and then delete insignificant variables to obtain the optimal lag length. I eventually find that Equation (21), where only $r_{t=1}$ is significant, is the best model.

In order to affirm that this regression is not a spurious one, I need to prove two points. The first point is that both the growth rate of capital stock and the rate of profit are integrated at the same level. The second point is that the variables used in the regression k_t and $r_{t=1}$ are cointegrated. For the first point, I use the model with trend and the model without trend of the Augmented Dickey–Fuller test and the Phillips–Perron test to check stationarity of each variable. The results are as follows (Table 4).

Table 4 The Unit Root Tests for the Regression of Equation (16)

Variables	Augmented Dickey–Fuller		Phillips–Perron	
	Without trend	Trend	Without Trend	Trend
<i>K</i>	-1.335	-1.586	-1.636	-1.815
<i>d.k</i>	-4.623**	-4.587**	-4.621**	-4.582**
<i>r</i>	-1.426	-2.287	-1.649	-2.282
<i>d.r</i>	-4.224**	-4.421**	-4.197**	-4.430**

Notes: **significant at the 99% confidence level, *significant at the 95% confidence level.

The Augmented Dickey–Fuller test and the Phillips–Perron test suggest that all of the variables are integrated at order one ($I(1)$) in both the model with trend and that without trend. Hence, the first point is proved. For the second point, the Johansen–Juselius Cointegration test is applied, and the result can be presented in Table 5.

Table 5 The Johansen–Juselius Cointegration Test for the Regression of Equation (16)

Rank	Eigenvalue statistics	Critical Eigenvalue	Trace statistics	Critical trace
0	15.523	14.07	16.033	15.41
1	0.510	3.76	0.510	3.76

According to the results, I cannot reject the second null hypothesis of Rank = 1 as the trace statistics (0.510) is lower than the critical trace (3.76). This means that cointegration between k_t and r_{t-1} is detected. This yields the conclusion that Equation (21) is not a spurious regression, and the non-farm rate of profit determines the growth rate of capital stock.

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Notes

1. The data of the rate of “industrial” capacity utilization, which could be used to estimate “non-farm” potential output, from the Bank of Thailand is available from 1978 to 2010. There are two reasons that require me to estimate potential output and the rate of capacity utilization for this article. First, the Bank of Thailand does not have the data from 1970 to 1977, but the decomposition analysis, presented in this article, needs the data from 1970 to 2010. Second, the Bank of Thailand measures the rate of “industrial” capacity utilization, not the “non-farm” one. Hence, I would argue that my

estimated “non-farm” potential output and rate of “non-farm” capacity utilization is more complete (since it is a measure of the data from 1970 to 2010) and more suitable for this article (since it is non-farm, not just industrial).

- Following Weisskopf (1979), I can transform $\dot{\pi}$ into a function of $\dot{\theta}$ by setting

$$\begin{aligned} \dot{\pi} &= \left(1 - \theta \right) = \frac{d(1-\theta) / dt}{(1-\theta)} \\ &= \frac{-d\theta / dt}{\pi} = -\frac{\theta}{\pi} \cdot \dot{\theta} \\ &= -\frac{W / Y}{\Pi / Y} \cdot \dot{\theta} \\ &= -\frac{W}{\Pi} \cdot \dot{\theta} \end{aligned}$$

Since $\dot{\theta} = \dot{P}_{wy} + \dot{\theta}^*$

$$\dot{\pi} = -\frac{W}{\Pi} (\dot{P}_{wy} + \dot{\theta}^*)$$

- Then, since all series move through time, annual-average geometric growth rates of all series are computed to see the impacts of each component on the rate of profit in each phase. The columns *g* of the table present annual-average geometric growth rates in each phase. The columns *i* of the table are calculated by having the values in column *g* in each phase divided by the annual-average geometric growth rates of the rate of profit, and then have them multiplied by 100 to get numbers in a form of percentage. The percentages in columns *i* can be rough indicators estimating the contribution of each determinant on the growth rate of the rate of profit in each phase. It is necessary to note that, from Equation (13), the organic composition of capital has a negative relationship with the rate of profit. Therefore, to properly present the impact of *occ*, P_{kw} , and *tcc* a negative one is multiplied.
- After the crisis, neoliberalism has become a main track of development for the Thai economy. The apparent neoliberal policy to enhance export demand was the attempt to encourage international free trade agreements; the Thaksin administration was “aligning aggressively with bilateral FTAs” (Chirathivat and Mallikamas 2004). Even though this policy could not bring back miraculous export growth rate, it can be argued that this policy played a part to maintain a fair export performance.
- The National Peacekeeping Council was a military clique overthrowing the elected government of Chatichai Choonhavan in February 23, 1991. The coup was known as an antidemocratic action from the Thai conservatives. The attempt to weaken the Labor Relation Act, created during the rise of democracy in 1975 to strengthen labor organization, was one practice that the government tried to abolish heritages of left-wing movements.
- Net capital stock here is defined differently from that used to measure the non-farm rate of profit. See Appendix 2 for more details.

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