PROFIT RATE, BALANCE OF PAYMENTS, AND ECONOMIC GROWTH: THREE ESSAYS ON THE THAI ECONOMY FROM 1970 TO 2010

by

Naphon Phumma

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STATEMENT OF DISSERTATION APPROVAL

The dissertation of **Naphon Phumma**

has been approved by the following supervisory committee members:

Minqi Li	, Chair	**22/04/2013** Date Approved
Stephen Reynolds	, Member	**22/04/2013** Date Approved
Rudi von Arnim	, Member	**22/04/2013** Date Approved
Al Campbell	, Member	**22/04/2013** Date Approved
Pichit Likitkijsomboon	, Member	**22/04/2013** Date Approved

and by **Thomas Maloney** , Chair of the Department of **Economics**

and by Donna M. White, Interim Dean of The Graduate School.

ABSTRACT

This dissertation is aimed at explaining the development of the Thai economy from 1970 to 2010 from the Marxian and post-Keynesian perspectives: in particular, how the nonfarm rate of profit in Thailand interacts with its balance-of-payments constraint. The theoretical core of this dissertation, constructed in Chapter 2, is developed from the extended Thirlwall's law, in which capital flows, determined by the rate of profit, play a role to drive economic growth via balance-of-payments expansion, and from changes of the rate of profit due to changes in the organic composition of capital, determined by flows of foreign capitals. The model suggests that the dynamic interaction between the rate of profit and level of GDP generated from capitals flows most likely results in cyclical movements of these two variables.

The rest of the dissertation consists of empirical works on the Thai economy. The nonfarm rate of profit in Thailand from 1970 to 2010 is measured in Chapter 3, and the decomposition analysis reveals the factors behind its fluctuations. The results show that the organic composition of capital and the output-capital ratio are the factors determining the nonfarm rate of profit.

The model in Chapter 2, in order to explain cycles of an economy, requires two preliminary assumptions. First, the balance-of-payments-constrained growth models can explain its economic growth, and, second, the rate of profit determines the growth rate of capital flows. Chapter 4 proves these two assumptions by using the Thai data. To prove the first assumption, the full course of Thirlwall's law test is done, and it is found that the

extended Thirlwall's law is better than the original Thirlwall's law in order to predict the Thai economic growth rates. For the second assumption, the ARDL bound testing in Chapter 3 determines the growth rate of capital flows.

Chapter 5 puts together the nonfarm rate of profit and the GDP level generated from the extended Thirlwall's law. The empirical diagram behaves quite similarly to the theoretical diagram presented in Chapter 2, so the theoretical core of this dissertation can explain the Thai economic growth.

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CHAPTER 1

INTRODUCTION

1971 could be marked as the year of Thailand's first step towards the process of industrialization, since it was the year in which the third five-year National Economic and Social Development plan encouraging multifarious domestic productions was officially issued. One of the early apparent results of the plan was that the Thai economy, which used to be a pure agrarian economy, had intensive diversifications of domestic production, so industrial sectors were rapidly developed (Doner 2009: 102). After that, the country fully entered the world capitalist system in which foreign-related economic activities have yielded both positive and negative impact. In the mid-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, et al. 1991). Foreign capital in forms of external debts via the banking system, portfolio investments via the stock market, and foreign direct investments tremendously flew into the country to finance investments in industrial and service sectors and thus fueled rapid economic growth. Interestingly, between the late 1980s to the early 1990s, the Thai economy was the fastest-growing economy in the world (Warr and Nidhiprabha 1996: 2), and it was considered as the fifth Asian Tiger[1] (Muscat 1994).

[1] The original four Asian Tigers refer to Hong Kong, Singapore, South Korea, and Taiwan, whose economies grew exceptionally fast between the 1960s and the 1990s.

Shortly after that, in 1997, immediate outflows of foreign capital, preceded by a loss of export competitiveness, turned prosperity into 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. A severe balance-of-payments crisis erupted and then spread to other countries in the region, namely, Indonesia, Malaysia, the Philippines, and Korea. A loan package from the IMF was given to the country, and some restricted policy conditions designated by the IMF were also applied to limit prospective flawed policies. Nevertheless, the effectiveness of the IMF's policies and the exact time of recovery from the crisis were still unclear (Sussangkarn 1999). After the crisis, exports have remained a dominant engine for the Thai economy, while foreign capital has been considered as an important factor of job creation and technological development. In spite of suffering from the crisis due to economic openness in the late 1990s, the country has never shunted away from economic liberalism, but, instead, economic policies under the guideline of neoliberalism were installed at a higher degree (Hewison 2003). However, economic growth has never reached its peak rate occurring prior to the crisis. In fact, being more exposed to the world economy, Thailand could be more vulnerable to suffer from the current global crises (Cheewatrakoolpong and Manprasert 2010). The tale of the fifth Tiger has ended, and the country has had to struggle in the fragile world of capitalism.

The development of the Thai economy has attracted interests from many scholars. Some notable works on the historical development of the Thai economy since the period of industrialization in the 1970s can be referred to as follows. Some grand books can be

reviewed as follows. The work of Warr and Nidhiprabha (1996) and that of Muscat (1994) were two grand pieces emphasizing the roles of macroeconomic policies on the Thai economic boom. Similarly concluding that national economic policies were very important to economic prosperity in the late 1980s to the early 1990s, these two books, nevertheless, have different methodologies to approach the same end. The former observed several fields of macroeconomics policies, e.g., fiscal policy, monetary policy, and exchange rate policy, and use some advanced tools in economic analysis to appraise the impacts of the policies on economic growth. Meanwhile, the latter emphasizes the historical development of economic and political struggles that led to the advents of the successful policy setting. Studies of economic history by Phongpaichit and Baker (1998, 2002) provided some alternative views to explain the boom and bust of the Thai economy. Beside influences from policies; cultural structures, such as the Chinese cultures on doing business; the trend of the upland labor force to migrate to the city; and political structures, such as the relations between business groups and military leaders, are considered as significant factors causing fluctuations of the economy. Written in the middle of the crisis, Dixon's (1999) work argued that the prosperous Thai economy was built upon several problems which paved the way to the crisis in the late 1990s. Surrounded by many minor problems, underdevelopment in the agricultural sector, uneven income distribution, and uneven development between rural and urban areas are major problems of the Thai economy prior to the crisis. Observing several sectors of production, Doner (2009) argued that the Thai economy has been able to diversify their production but unable to upgrade productiveness of these economic activities, so Thailand has been stuck in the middle-income trap. This half-way economic transition from a low-income country to a

high-income country is a result of unstable politics which unevenly facilitates development of some sectors and neglected that of other sectors.

Even though these great works cover many aspects to explain the Thai economy, there have still been a relatively limited number of literature using the Marxian or Post-Keynesian approach to understand the Thai economy. In addition, existing works on these alternative approaches do not only emphasize the period of industrialization. Among many of his articles, Hewison's book (1989) observed the Thai economy from the middle of the nineteenth century to the early 1980s, and finds that the economy rapidly developed in a capitalist fashion. In his analysis, he sees the Thai economy as composed of four principal fractions – agrarian, commercial, industrial, and banking – whose relationships drove the development of the Thai economy. In particular, he sees that the banking fraction was the most dominant fraction which could smoothly link its interests to the state, and led the economy to grow with a high degree of economic and social prejudices. Glassman (2004) was the latest author employing a Marxian method to understand the Thai economy after the period of industrialization. In his work, the Thai economy was developed under the hegemonic power of the US cold-war regime and the quasi-hegemony of the Japanese businesses. In spite of fast economic growth, the prosperity was paid for by the toil of the working class. In addition, the Thai rate of profit is measured and used to explain the economic crisis of 1997-98.

This dissertation is aimed at complementing these previous works by providing alternative views to explain the development of the Thai economy. For all studies of the Thai economic development, beside the real growth rate of GDP, there is no other alternative indicator that tells the health of the Thai economy. In Marxian economics, the

rate of profit is one of the key variables not only telling the health of an economy but also playing a role as an incentive for capitalist accumulation. Thereby, the Thai rate of profit can stand as a distinguished alternative indicator to understand the health of the Thai economy. In addition, a clear knowledge of the Thai rate of profit can certainly lead to a deeper understanding of the economic development of Thailand. Because industrialization has been a key to economic fluctuations since the 1970s while the role of the traditional farming sector has faded, the nonfarm rate of profit from 1970 can be considered as an appropriate variable for the Thai economy.

Meanwhile, in Post-Keynesian literature, the balance-of-payments-constrained growth model (the original Thirlwall's law) (Thirlwall 1979) is a prominent demand-led growth model which emphasizes the importance of exports and a country's balance of payments. Shortly after the advent of the original model, Thirlwall and Hussain (1982) developed the extended version of the balance-of-payments-constrained growth model (the extended Thirlwall's law) by adding the role of the capital account on the balance of payments; in particular, they took into account the ability of capital flows to relax the balance of payments that could constrain economic growth. As stated above, because the Thai economy has relied on exports and capital inflows and its crisis was due to declines of exports and outflows of foreign capital, economic development of the country has likely been constrained by the balance of payments. Hence, the extended Thirlwall's law is going to be a main tool to understand the Thai economy from the Post-Keynesian perspective.

In the extended Thirlwall's law, economic growth is a function of the growth rate of capital inflows. On the other hand, Marxian economists believe that capital can move

between sectors and regions in in order to seek higher profit rates, i.e., capital tends to move from sectors or regions with lower profit rates to those with higher profit rates. This dissertation may be considered as a hybrid version of Post-Keynesian and Marxian approaches to understand the Thai economic development via the model constructed in Chapter 2.

Throughout the history of economic thought, economists have debated whether or not the balance of payments has impact on a country's economic growth, but how the rate of profit plays a role in the balance of payments has been barely studied. The first essay (Chapter 2) is aimed at filling this gap and emphasizing the importance of the rate of profit on the balance of payments by presenting the model of economic development in which the rate of profit and the extended Thirlwall's law interact. The chapter, at the beginning, shows that the economic growth rate defined by the original Thirlwall's law is the equilibrium growth rate acting as a center of gravity around which the actual growth rate circulates, while the extended Thirlwall's law allows relaxation of some important assumptions, especially the assumption of current account balance. The fundamental idea on which the model is based is that, in Marxian economics, the rate of profit is the most important determinant of capital accumulation, so capital has a tendency to move from a country with a lower rate of profit to that with a higher rate of profit. Therefore, a country that can run chronic current account deficits and use foreign capital to relax the balance-of-payments constraint is likely to have a higher rate of profit than the average global rate of profit. However, increasing concentration of capital in the country leads to the increasing organic composition of capital that is the main reason of falling rate of profit in Marx's original argument. As a consequence, the country's rate of profit falls and

tends to converge to the global rate of profit, so the country becomes less attractive to foreign capital. That is, foreign capital plays a smaller role in relaxing the balance of payments and hence, they have a smaller impact on economic growth.

Additionally, since the model in Chapter 2 can tell the dynamic interaction between the balance-of-payments growth rate and the rate of profit, it is possible that a country's rate of profit drops lower than the global profit rate. A massive amount of foreign capital can flow away from a country and trigger a balance-of-payments crisis. That is, the model can incorporate Marx's argument of the falling rate of profit to explain a balance of payment crisis.

In the next steps, the dissertation is developed to empirically apply the model in Chapter 2 to explain the Thai economy. The second essay (Chapter 3) is aimed to measure the nonfarm rate of profit in Thailand from 1970 to 2010 by carefully looking at the *National Income of Thailand* issued by the National Economic and Social Board (NESDB). The result shows that the nonfarm profit rate continually fluctuates. Following the methodology presented by Dumenil and Levy (2004a: 22-23), the chapter decomposes the nonfarm profit rate to see its determinants – the nonfarm profit share (π), the nonfarm output-capital ratio (u), the nonfarm rate of surplus value (s), and the nonfarm organic composition of capital (c). The results show that the output-capital ratio and the organic composition of capital have been the main factors determining the trends of the nonfarm profit rate in Thailand, while profit share and the rate of surplus value have had smaller influences. The understanding of the nonfarm profit rate and its determinants reveal some details that leads to a better understanding of the development of the Thai economy.

The third essay (Chapter 4) employs a time-series analysis to provide empirical support for the model in Chapter 2. The chapter is divided into two parts. For the first part, in order to test whether Thirlwall's law and the extended Thirlwall's law can predict the growth rate of the Thai economy or not, the chapter starts with the measurement of the income elasticity of imports, and this elasticity is later used to calculate the predicted growth rates. The results suggest that both the original and the extended Thirlwall's law can explain the growth of the Thai economy from 1980 to 2010. However, in deeper details, the extended model is better than the original model, as it can predict growth rates more accurately. The second part of this chapter attempts to show that, for the case of Thailand, growth rate of capital flows is determined by the nonfarm profit rate. The chapter uses an autoregressive distributed lag (ARDL) bound testing approach to find short-run and long-run impact of the nonfarm rate of profit on growth rate of capital flows. The results present that the nonfarm rate of profit has impact on growth rate of capital flows in the long run, but growth rate of capital flows do not have long-run impact on itself. In the short run, the results are reversed. Lags of growth rates of capital flows have significant impact on itself, while the nonfarm profit rate has no impact. This finding is compatible with the nature of the extended Thirlwall's law and it supports the hypothesis that profit rate determines mobility of capital.

Lastly, Chapter 5 is not only the conclusion of the dissertation but it also provides empirical supports to ensure that the theoretical mode in Chapter 2 can explain the development of the Thai economy. The nonfarm rate of profit in Thailand and estimated GDP level generated from the extended Thirlwall's law are put together in the same

diagram to see whether or not the interactions between the two variables are the same as proposed in the theoretical model.

CHAPTER 2

THE RATE OF PROFIT AND BALANCE-OF-PAYMENTS-CONSTRAINED ECONOMIC GROWTH: THE DYNAMIC MODEL

2.1 Introduction

Marxists consider that the rate of profit to be one of the most important concepts in the study of economics, because it acts as a determinant of the health of the economy, a criterion of technical changes, a factor of accumulation and growth, and a basis of distribution (Dumenil and Levy 1993). On the other hand, throughout the history of economic thought, economists have debated whether or not the balance of payments has impact on a country's economic growth. However, there have been few studies on how the rate of profit interacts with the balance of payments to determine economic growth. For example, Szymanski (1974) took the idea of Marx and classical Marxists, such as Lenin and Luxembourg, in which the rate of profit is the main determinant of international capital mobility, and analyzed impact of US capital outflows on the US balance-of-payments crisis. This analysis is applicable to merely the case of a developed country, while the case of a developing country is not mentioned. In the case of a developing country, Shaikh[2] (1980) argued at the beginning of his article that the rate of

[2] In his analysis, foreign investments create both positive and negative impacts on a country's balance of payments. On the positive side, foreign investments can create large-scale modern

profit attracts foreign investments, and capital flows from developed countries where profit rate is lower to developing countries where profit rate is greater. These two Marxian works, though providing insightful arguments on foreign capital on the balance of payments and considering the rate of profit as a main determinant of capital mobility, did not directly address impact of the rate of profit on the balance of payments.

The main purpose of this chapter is to fill this gap by attempting to find direct impact of the rate of profit in the balance of payments. This chapter adopts the balance-of-payments-constrained growth model (the original and the extended Thirlwall's law) in which relaxation of the balance-of-payments constraint leads to higher economic growth, and argues that capital flows, which are one of the main factors governing the balance-of-payments constraint, are determined by the rate of profit. In turn, changes of economic growth resulting from capital flows also have impact on the rate of profit. That is, in particular, this chapter develops a dynamic model showing the interaction between the rate of profit and the level of GDP. To a further extent, this chapter can expand the Marxian crisis theory by arguing that the falling rate of profit can cause the balance-of-payments crisis. Moreover, it can also show some conditions of the original Thirlwall's law to be able to yield the economic growth rule for a country constrained by its balance of payments.

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industries. Meanwhile, they also eliminate weak firms in backward industries, so all firms in backward industries that can survive from the wave of foreign capital must be very competitive in the world market. These dual-track developments can strengthen a developing country's export sector, and improve its balance of payments. On the other hand, on the negative side, these foreign investments may act as a "powerful blocking mechanism" which obstructs development of "indigenous forces of production." This effect lowers prices of indigenous commodities, and hence lowers a developing country's term of trade which jeopardizes a country's balance of payments. However, when he reaches the point where foreign direct investments can affect the balance of payments, the role of the rate of profit disappears.

2.2 The Original and the Extended Thirlwall's Law

The original Thirlwall's balance-of-payments-constrained growth model is successfully created in his 1979 paper. The law is created by assuming that a country has current accounts in balance, so

$$PX = P_f M \tag{2.1}$$

where X is the real value of exports and M is the real value of imports, P is the domestic price of exports, and P_f is the foreign price of imports in domestic currency. The general multiplicative function of exports and that of imports which are used to derive the law are

$$X = \left(\frac{P}{P_f}\right)^{\theta} Z^{\varphi} \tag{2.2}$$

$$M = \left(\frac{P_f}{P}\right)^{\phi} Y^{\eta} \tag{2.3}$$

where Y is domestic income, Z is global income, θ is the price elasticity of demand for exports, φ is the income elasticity of demand for imports, ϕ is the price elasticity of demand for imports, and η is the income elasticity of demand for imports.

Taking the rate of change of equation (2.2) and that of equation (2.3) and substituting them into the rate of change of equation (2.1) simply yields the original Thirlwall's law. The parsimonious form of the law is as simple as

$$y_B = \frac{\varphi z}{\eta} \tag{2.4}$$

By definition, the product of the income elasticity of demand for imports and the real growth rate of world income (z) should be equal to the real growth rate of exports (x), so $\varphi z = x$. Hence,

$$y_B = \frac{x}{\eta} \tag{2.5}$$

where y_B is an estimated economic growth rate. In order to derive this law, some requirements, especially the assumption of current account balance (equation (2.1)), are indispensable, so y_B is generally considered as the equilibrium growth rate of an economy (Setterfield 2011). Following Abu-Ismail (2006), I can show that equation (2.5) yields the equilibrium growth rate by looking at the identity

$$(I - S) + (G - T) + (X - M) = 0 \tag{2.6}$$

where I is private investment, S is private saving, G is government spending, and T is tax revenues; all variables are in real values. Assuming that

$$(I - S) + (G - T) = 0 \tag{2.7}$$

Due to the assumption in equation (2.7), it can be derived that

$$X = M \tag{2.8}$$

Taking the rate of change of equation (2.8) yields

$$x = m \tag{2.9}$$

where m is the growth rate of real imports. Without considering the price effects, the value of real imports (M) can be expressed as a function of real domestic income (Y)

$$M = Y^{\eta} \tag{2.10}$$

Taking the rates of change of (2.10) and substituting into (2.9) yields

$$x = \eta y \tag{2.11}$$

Hence, equation (2.11) can be expressed exactly the same as equation (2.5).

From the above exercise, in order for the original Thirlwall's law (equation (2.5)) to exactly tell actual economic growth rate, some other requirements must be satisfied. The first one is from equation (2.7) in which domestic spending from investments and government spending (I and G) must be internally financed by domestic tax revenues and domestic saving (T and S). To state it in another way, positive (negative) net government saving $(T - G)$ must be offset by negative (positive) net private saving $(S - I)$. To further simplify the model, Thirlwall (1979) explicitly assumed two price-related conditions. The first one is that the sum of the price elasticity of demand for imports and the price elasticity of demand for exports must be equal to 1, so any change in exchange rate does not change the current account balance. The second price-related condition regards the constant term of trade so that relative prices in a common currency must stay constant. Since relative prices are constant, equation (2.1) can be simplified to equation (2.8).

Since these requirements are not likely to be simultaneously met in the real world, the actual rate of economic growth is likely to deviate from the equilibrium growth rate.

In the empirical part of his article (1979) where the original Thirlwall's law was initiated, Thirlwall explained that actual growth rate generally deviates from the equilibrium rate, because most countries always have imbalances of current accounts.

The requirement of current account balance yields another property of the original Thirlwall's law; the expansion of national income due to export growth must be offset by increasing imports in order to maintain the external balance. A country can grow not because of its ability to generate trade surplus but because of growing trade values via export demands. That is, growing exports allow higher income which must be used to increase imports and keep current accounts in balance. Therefore, according to equation (2.4), the equilibrium growth rate of one country is a result of the growth rate of the global income, and all countries can have economic growth simultaneously without having a problem of fallacy of composition (McCombie and Roberts 2002: 106-108, Setterfield 2011). Thirlwall (1986) argued that the fundamental idea that exports depend on world income, which is a demand side idea, differentiates the balance-of-payments-constrained growth model from a neoclassical model, where exports are considered as a matter of increasing productivity and other domestic supply constraints.

Because the original Thirlwall's law argues that economic growth rate is driven by global demand for exports, it has been questioned that supply constraints in a country may not be able to fully adjust to meet the global demand. That is, it is possible that the growth rate from the demand side, which is derived from the original Thirlwall's law, may not be equivalent to the growth rate of potential output, which is a function of labor force growth and productivity. The deficient capacity, if the growth rate from the demand side is greater, or the excess capacity, if the growth rate from the supply side is greater,

may lead to internal imbalances in a domestic level, thereby ruining the ability to explain economic growth of the original Thirlwall's law. As shown by Palley (2002: 120), the condition that the original Thirlwall's law can be the equilibrium by being equal to the potential output growth rate can be derived from the following additional equations.

$$\lambda = d_0 + d_1 y_B \tag{2.12}$$

λ is the growth rate of labor productivity. Equation (2.12) is the expression of Verdoorn's law that increasing output growth from the demand side – y_B – leads to increasing labor productivity.

$$y_p = \lambda + n \tag{2.13}$$

y_p is the growth rate of potential output, which is the natural growth rate defined from the supply side and acts as the supply constraint of an economy. Equation (2.13), by definition, says that the growth rate of potential output (y_p) is the sum of the growth rate of labor productivity (λ) and the growth rate of labor force (n). Substituting equation (2.12) into equation (2.13) yields

$$y_p = d_0 + d_1 y_B + n \tag{2.14}$$

At the equilibrium where economic growth from the demand side is equal to that from the supply side, $y_p = y_B$. Hence, equation (2.14) can be rearranged as

$$y_B = \frac{d_0 + n}{1 - d_1} \tag{2.15}$$

Substituting equation (2.5) into equation (2.14) becomes

$$x = \left(\frac{d_0+n}{1-d_1}\right)\eta \tag{2.16}$$

Equation (2.16) is the condition that the balance-of-payments-constrained growth rate is equal to the natural growth rate. However, this condition seems to take place very rarely. That is, if $x > \left(\frac{d_0+n}{1-d_1}\right)\eta$, there will be excess demand and overuse of capacity. Meanwhile, if $x < \left(\frac{d_0+n}{1-d_1}\right)\eta$, there will be excess supply and underuse of capacity.

There are several solutions for this problem. Palley (2002: 121-123) suggested that the income elasticity of imports (η) could be expressed as a function of the rate of employment. When excess demand keeps growing, bottlenecks of domestic production emerge, so people demand more products from abroad. As a result, η increases until the condition in equation (2.13) is met. Setterfield (2006, 2011) argued that Palley's solution was "semi supply-determined growth" where the balance-of-payments-constrained growth rate adjusts to meet the supply constraints. He, instead, suggested that it is d_1, the Verdoorn's law coefficient, that is going to change in response to excess demand, and adjust the supply constraints to meet the condition in equation (2.16). Differently, Pugno (1998) created his "open Goodwin model," where conflicts between classes affect inflation which further affect competitiveness to export and hence income. His finding is that, in the long run, the labor supply constraint never exists because the mobility of labor, e.g. migrations of workers, can adjust growth rate of labor force growth to meet the excess demand. That is, Pugno suggested that it is n that adjusts, so equation (2.16) is satisfied. Regardless of their approaches, all authors believed that the external equilibrium (current accounts in balance) and the internal equilibrium ($y_p = y_B$) can be

reached simultaneously. Therefore, the demand for exports via the original Thirlwall's law determines the supply constraints in a country.

Shortly after the advent of the original law, Thirlwall and Hussain (1982) observed that some developing countries encountered a foreign exchange bottleneck due to slow export growth, but they could grow rapidly while having current account deficits. This was because a massive amount of foreign capital flows into those countries to relax their balance of payments. From this fact, they extend the original Thirlwall's law by allowing current account imbalances and taking into account the effects of foreign capital on the balance of payments. The new model (the extended Thirlwall's law) is

$$y_B' = \frac{\omega(x)+(1-\omega)(c)}{\eta} \tag{2.17}$$

where y_B' is an estimated economic growth rate, and c is a real growth rate of foreign capital inflows. Total receipts of foreign currency (R) are equal to the sum of export volume (E) and the volume of net capital flows (C). Hence, $\omega = \frac{E}{R}$ is the share of nominal exports in total receipts and $1 - \omega = \frac{C}{R}$ is the share of nominal capital flows in total receipts. The major difference of the extended model is that it relaxes the constraint of external balance and allows the system to initially start at the 'disequilibrium' of the current account. Meanwhile, two price-related conditions, applied in the derivation of the original Thirlwall's law, still hold in order to simplify the model.

The origin of the model is hence from

$$PX + C = P_f M$$

where C, if positive (negative), is the net volume of capital inflows (outflows). The price-related conditions still hold, so P and P_f can be considered identical. Therefore, the equation can be simplified as

$$X + C = M \tag{2.18}$$

Since, according to equation (2.3), M is a positive function of income (Y), I can now distinguish between Y_B, the real value of domestic income that satisfies equation (2.8), and Y_B', the real value of domestic income that satisfies equation (2.18). In this regard, assume that X is equal in both equation (2.8) and equation (2.18); hence, $Y_B' > Y_B$ if a country has a current account deficit, while $Y_B' < Y_B$ if a country has a current account surplus.

Since one major requirement – the current account in balance – is relaxed, y_B', expected by Thirlwall and Hussain (1982), should be closer to the actual growth rate than y_B. However, McCombie and Roberts (2002: 93 – 96) quantitatively showed that the difference between y_B' and y_B should be very small, and the effect of foreign capital inflows, though important in the short or medium run, is negligible in the long run. That is, y_B and the original Thirlwall's law act as a better estimator for the long-run equilibrium growth rate. Setterfield (2011) later proved the "durability" of the original Thirlwall's law by assuming the "scarcely plausible" case that capital flows becomes more and more important until all foreign exchange comes from foreign capital inflows.

According to Thirlwall (2011), "one of the weaknesses of the above model, however, is that it places no limit on the level of current account deficits financed by capital inflows and therefore on a country's level of indebtedness relative to GDP."

Coming out before Thirlwall's statement, Moreno-Brid (1998) took this problem into consideration and derived a new specification of the law with the main assumption that the ratio of current account deficit to GDP must be stable in the long run. His finding was that whether or not the balance of payments can constrain economic growth depends on the initial export to total receipts ratio (ω) and the level of income elasticity of imports. Barbosa-Filho (2002) criticized Moreno-Brid's article by arguing that the initial export-import ratio is a function of economic growth, so the assumption of the long-run stable export-import ratio may be jeopardized. To solve this problem, Barbosa-Filho used phase diagrams to find the conditions of having a stable export-import ratio, and then mathematically showed that the only way to have the stable export-import ratio is to have an income elasticity of demand for imports that is equal to one. To remove this restriction, Barbosa-Filho included price changes and used an export-GDP ratio and import-GDP ratio as new unbalanced-trade constraints. Therefore, both price elasticity of demands for imports and income elasticity of demand for imports determine the conditions of constant current account deficits to GDP ratio. Both derivations are fundamentally based on Moreno-Brid's observation that the ability to attract inflows of foreign capital depend on the current account deficits to GDP ratio and the foreign debt to GDP ratio. The higher the two ratios, the lower the inflows of foreign capital. Still, this argument is somewhat incomplete, as both authors ignore the reasons of why the ratios approach their certain limitations. In fact, there must be a determinant of capital inflows and the existences of these limitations are subject to these determinants. Both Moreno-Brid and Barbosa-Filho assumed that increasing economic growth leads to higher imports and hence higher trade deficits, and these deficits are automatically financed by capital inflows. This assumption

is more or less in conflict with the premise of the balance-of-payments-constrained growth model which requires capital to relax the balance-of-payments constraint and allow a country to stay in deficit. This reasoning, if correct, further enhances the importance of understanding the determinant of foreign capital inflows. From the Marxian perspective, this determinant is likely to be the rate of profit. Accordingly, Moreno-Brid's and Barbosa-Filho's specifications can be improved by considering capital flows as a function of the profit rate.

In a Marxian tradition, the rate of profit is the main determinant of capital accumulation and investments. In a country, capital has a tendency to move from branches of production with lower profit rates to those with higher profit rates. The higher concentration of capital in a branch where capital moves into then leads to the higher organic composition of capital and the lower rate of profit. Due to the nature of capital to seek for a higher rate of profit, profit rates among sectors tend to converge to the general rate of profit. Marx (1991: 242) intentionally omitted a discussion on the different national levels of profit rates, but maintained that the concept of intersectoral variations of profit rates among domestic sectors in a country can be applied to explain international variations of profit rates among countries as well. Therefore, capital tends to move from a country with a lower profit rate to that with a higher profit rate, and, according to Szymanski (1974), this is the principle that the classical Marxists – namely, Lenin and Luxembourg – adopted and used in their further analyses. This argument further implies that a country's rate of profit tends to converge to the global rate of profit, and, as soon as the domestic profit rate is equal to the global rate, *ceteris paribus*, capital

neither flows in nor flows out of the country.[3] In this chapter, this idea is fundamental; the rate of profit is the main determinant of capital inflows, while, in the meantime, the inflows of capital tend to increase the organic composition of capital which reduces the rate of profit. That is, there is a dynamic interaction between the profit rate and capital inflows, and, as observed by Thirlwall and Hussain (1982), these inflows of capital determine economic growth of a country by relaxing the balance-of-payments constraint. Meanwhile, the falling rate of profit can cause outflows of capital, and hence cause a balance-of-payments crisis.

2.3 The Model

Because the rate of profit determines capital flows and capital flows also cause changes in the rate of profit, the purpose of this section is to create a model describing the dynamic interaction between Y_B' and r. That is, changes of Y_B' and those of r are determined by the level of both Y_B' and r. The model is derived from two fundamental ideas. The first one is the extended Thirlwall's law (equation (2.14)). The second is regarding the rate of profit that can be decomposed to be a function of the rate of surplus value and the organic composition of capital. The model is hence composed of two differential equations of $\dot{Y}_B'$ and $\dot{r}$, and it can be constructed as follows.

[3] The contemporary phenomenon may be contradictory to what Marxists argue. If, presumably, profit rate differentials among the rich countries are small while the rate of profit in the poor regions are larger than the global rate of profit, the majority of capital should flow from the rich to the poor regions. However, the fact is just opposite. The majority of international capital flows among countries occur among developed countries or some outstanding rising economies. Meanwhile, capital flows between rich countries and some less developed countries, such as poor parts of Africa and Asia, have been very small. According to Alfaro et. al. (2005), institutional quality, measuring the quality of informal and formal rules in an economy, and government policies on capital mobility are determinants of capital flows. These factors are significant but they are absent in the classical Marxian analysis on the relationship between international capital mobility and the rate of profit.

2.3.1. $\dot{Y}'_B$

From equation (2.17), capital flows influence the balance of payments and determines y'_B, which hence changes the value of Y'_B. Theoretically, the profit rate differential between a country's profit rate and the global rate determines the direction of capital flows. The big gap between these rates cause flows of capital from a region whose profit rate is low to another region whose profit rate is high, while the equality of these two rates implies no mobility of capital. Therefore, if the domestic rate of profit is greater than the global rate of profit, leading to a positive gap between the two rates, capital must flow in to relax the balance of payments and yield a positive effect on Y'_B. In contrast, if the gap is negative, capital must flow out and cause a negative effect on Y'_B. In the context of equation (2.17), this implies that it is the profit rate differential that determines c and hence y'_B.

Another factor that affects Y'_B is a country's position of the current account; that is, the differential between Y'_B and Y_B.[4] To be complementary with the arguments by Moreno-Brid (1998-99) and Barbosa-Filho (2002) who considered the case of a deficit country and observed that the ratio of debt to GDP approaches a certain rate, I can extend the arguments by saying that the ratio of capital flows (for both inflows and outflows) to

[4] In general, it is argued that the country cannot have current account imbalance forever, and the current account has a tendency to converge to its balance due to the following reasons. If earning from exports is lower than spending for imports, economic growth tends to slow down in order to reduce imports. In contrast, if a country has a current account surplus, economic growth tends to accelerate generating more imports so the current account surplus tends to be eliminated. That is, there is an automatic mechanism for the current account to adjust to its equilibrium. This argument is contradictory with the fundamental argument of this paper, arguing that the rate of profit determines flows of capitals and hence determines the balance of payments. That is whether or not the current account can be in deficit depends on the level of the rate of profit. Therefore, current account disequilibrium does not have a mechanism to adjust to the equilibrium.

GDP should approach a certain level set by the rate of profit. In order to approach this ratio, export growth rate and import growth rate can be different, so y_B' may alter in order for the ratio of capital flows to GDP to approach that level. This argument implies that the growth rate of GDP is equal to that of capital flows. Assuming that the balance-of-payments-constrained growth rate is equal to the actual growth rate:

$$c = y = y_B' = \frac{\omega(x)+(1-\omega)(c)}{\eta}$$

So, $$c = y = \frac{\omega(x)}{\omega-1+\eta} \quad (2.19)$$

Equation (2.19) is a simplified form of Moreno-Brid's revised balance-of-payments-constrained growth model in which the condition of the constant ratio of capital flows to GDP is satisfied. The important condition that this revised model can be rational is that the denominator, $\omega - 1 + \eta$, must be greater than zero, in order to tell that an increasing growth rate of export leads to increasing economic growth. In addition, finding the rate of change of equation (2.10) and substituting into equation (2.19) give

$$m = \frac{\omega\eta(x)}{\omega-1+\eta} \quad (2.20)$$

Equation (2.20) describes the relationship between real growth rate of imports and that of export that can keep the ratio of capital flows to GDP constant. From equation (2.20), if $\frac{\omega\eta}{\omega-1+\eta}$ is greater than 1, x must be lower than m in order to satisfy the condition $c = y$. In contrast, if $\frac{\omega\eta}{\omega-1+\eta}$ is smaller than 1, x must be greater than m in order to satisfy the same condition. Lastly, if $\frac{\omega\eta}{\omega-1+\eta}$ is equal to 1, x must be equal to m. The

value of $\frac{\omega\eta}{\omega-1+\eta}$ depends on ω and η. Since the value of ω tells whether the current account is in balance ($\omega = 1$), deficit ($\omega < 1$), or surplus ($\omega > 1$), the variable that really determines the value of $\frac{\omega\eta}{\omega-1+\eta}$ is η. $\eta = 1$ is critical as it always makes $\frac{\omega\eta}{\omega-1+\eta}$ equal to 1, so x and m are always equal. The values of $\frac{\omega\eta}{\omega-1+\eta}$ depend on whether η is inelastic or elastic ($\eta < 1$ or $\eta > 1$) and also depend on whether the current account is in deficit or surplus ($\omega < 1$ or $\omega > 1$). The results can be comprehended in Table 2.1.

Y_B' tends to converge to Y_B when $\eta > 1$, so x is greater than m in a deficit period and x is lower than m in a surplus period. In other words, the current account has a tendency to return to the equilibrium. Y_B' has its negative-own feedback to adjust to Y_B if η is elastic. Meanwhile, if $\eta = 1$, Y_B' and Y_B stay parallel; that is, the disequilibrium of the current account does not have impact to adjust to its equilibrium. Lastly, if $\eta < 1$, x is lower than m during a deficit period and x is greater than m during a surplus period. In other words, the current account tends to move away from its balance, and Y_B' tends to diverge away from Y_B.

Table 2.1 The Values of $\frac{\omega\eta}{\omega-1+\eta}$ in the Different Cases of an Income Elasticity of Demand for Imports and the Different Positions of the Current Account

	$\omega = 1$ (balance)	$\omega > 1$ (surplus)	$\omega < 1$ (deficit)
$\eta = 1$ (unitarily elastic)	= 1	= 1	= 1
$\eta > 1$ (elastic)	= 1	> 1	< 1
$\eta < 1$ (inelastic)	= 1	< 1	> 1

Based on this theoretical discussion, I propose a simple differential equation of Y_B'. In the specification, Y_B' changes according to two factors. The first factor is the gap between Y_B', in which the disequilibrium of the current account exists, and Y_B, in which the current account is in balance. The second factor is the gap between the domestic rate of profit and the global profit rate. The equation is as follows.

$$\dot{Y_B'} = \propto_1 (Y_B' - Y_B) + \propto_2 (r - r^*) \tag{2.21}$$

where $\propto_1$ is a coefficient whose sign depends on whether η is elastic or inelastic. If η is elastic $(\eta > 1)$, $\propto_1$ is negative. If η is inelastic $(\eta < 1)$, $\propto_1$ is positive. And, if η is unitarily elastic $(\eta = 1)$, $\propto_1$ is equal to zero. Meanwhile, $\propto_2$ is a positive coefficient describing impact of the gap between the national rate of profit and the global rate of profit. High profit rate differential can attract foreign capital inflows that relax the balance of payments and hence generate higher growth. Since Y_B is determined purely by growth rate of exports which is generally understood as a function of world income, it is assumed exogenous and held constant in this analysis. Similarly, r^* is the global rate of profit whose value cannot be altered by changes of a country's profit rate, so it is also assumed to be exogenous.

2.3.2 ṙ

Meanwhile, Y_B' and r can lead to changes in the rate of profit as well. In order to understand how capital flows and current account disequilibrium can alter the rate of profit, I may start with a general decomposition of the rate of profit. In a wide range of literature on the decomposition analysis of the rate of profit (e.g. Weisskopf 1979,

Dumenil and Levy 2004), the way to see the components of the rate of profit is to decompose it as follows.

$$r = \left(\frac{\Pi}{W}\right) \cdot \left(\frac{W}{K}\right) \tag{2.22}$$

where Π is net profit, W is wage bills, and K is net fixed capital stock.

The term $\left(\frac{\Pi}{W}\right)$ is similar to Marx's definition of the rate of surplus value, which is a ratio of surplus value to total value of variable capital. It is generally argued that the change of this ratio depends on how tight the labor market is. That is, at the beginning of a growing period in which employment is still low, bargaining power of workers is deficient and real wage cannot increase as fast as labor productivity, so the rate of surplus value tends to increase. However, at one point in which the labor market turns tight and the number of workers in the reserve army of labor becomes low, workers have more power to bargain for higher wages in the labor market and real wage increases faster than labor productivity, so the rate of surplus value drops. Accordingly, there can be the equilibrium rate of surplus value which is determined by the capacity growth rate, and the economy can grow without departing from the equilibrium rate if the economic growth rate is exactly the same as the capacity growth rate.

As it is already argued in the previous section (equation (2.12) – (2.16)), Post-Keynesian economists believe that export demand determines capacity growth; that is y_B determines y_p. This means that $y_B$is the growth rate that sets the equilibrium rate of surplus value. Not only does the differential of Y_B' and Y_B describe that the current account is not in balance, it also implies that economic growth does not stay on the track of the natural growth rate. That is, if Y_B' is greater than Y_B and the current account is in

deficit, domestic production encounters bottlenecks of available resources and internal production capacity is unable to support the growing economy. This, thus, tightens the labor market and raises the bargaining power of workers. As a result, the rate of surplus value drops. In contrast, if Y_B' is smaller than Y_B and the current account is in surplus, looseness of the labor market allows capitalists to have higher bargaining power to take more profit from total production. This leads to the increasing rate of surplus value. From these two opposite cases, since Y_B is considered exogenous and assumed to be constant, Y_B' can be argued to have a negative relationship with profit rate.

Meanwhile, The term $\left(\frac{W}{K}\right)$ describes the ratio of total wages to capital stocks in the economy. This is similar to the inverse of Marx's organic composition of capital which means the ratio of dead labors (machineries and raw materials) to living labors (wage-workers). In Marx, the organic composition of capital plays a very crucial role in the development of capitalism in which capitalists tend to replace living labors with dead labors, and this increasing organic composition of capital is the key factor of a tendency for the rate of profit to fall. For a country where foreign capital are influential to impact its domestic investment, large inflows of foreign capital tremendously increase domestic capital stock and hence its organic composition of capital. In the other way around, capital outflows reduce the amount of domestic capital stock and lower the organic composition of capital. Since a direction of capital flows is determined by a differential between the national rate of profit and the global rate of profit, positive differential has a power to attract capital inflows and lower the rate of profit, while negative differential causes capital flights and has a positive effect on profit rate.

Based on this theoretical discussion on profit rate decomposition, I can have a simple differential equation for the rate of profit which is a function of the gap between the output generated from the extended Thirlwall's law (Y_B') and the equilibrium output generated from the original Thirlwall's law (Y_B) and that of the differential between the domestic rate of profit (r) and the global rate of profit (r^*). The specification can be presented as follows.

$$\dot{r} = -\propto_3 (Y_B' - Y_B) - \propto_4 (r - r^*) \quad (2.23)$$

where $-\propto_3$ is a negative coefficient describing negative impact of tightness of a labor market on the rate of profit via changes in the profit share. As argued above, if Y_B' is greater than Y_B, increasing tightness of the labor market leads to the lower rate of surplus value and the lower rate of profit. However, if Y_B' is smaller than Y_B, the rate of surplus value tends to increase and the rate of profit is higher. Meanwhile, $-\propto_4$ is a negative coefficient telling the speed of adjustment of the national level of profit rate towards the global rate of profit due to international mobility of capital that greatly impact a country's organic composition of capital.

2.3.3 The Systems of Y_B' and r

Two differential equations – equation (2.21) and (2.23) – are the core of the model because they yield a system of dynamic interaction between Y_B' and r. The two differential equations yield two isoclines separating the phase plane into four isosectors. The point where the two isoclines intersect, which is the equilibrium of the system, is where the current account is in balance, $Y_B' = Y_B$, and the domestic rate of profit is equal

to the global rate of profit, $r = r^*$. The Jacobian matrix of the system can be presented in its general form as follows.

$$J \equiv \begin{bmatrix} \frac{\partial \dot{Y_B'}}{\partial Y_B'} & \frac{\partial \dot{Y_B'}}{\partial r} \\ \frac{\partial \dot{r}}{\partial Y_B'} & \frac{\partial \dot{r}}{\partial r} \end{bmatrix} = \begin{bmatrix} \propto_1 & +\propto_2 \\ -\propto_3 & -\propto_4 \end{bmatrix}$$

The sign of the trace and that of the determinant of the Jacobian matrix are still unknown due to an ambiguous sign of $\propto_1$. Since, as shown above, it is the value of η that determines the sign and magnitude of $\propto_1$, which further defines the characteristics of the system. Hence, all of the possible cases according to the value of η can be presented as follows.

1. *Case 1*: η is elastic ($\eta > 1$)

Since $\eta > 1$, it can be derived that $\propto_1 < 0$. In this case, the different signs of the off-diagonal parameters show a property of a clock-wisely cyclical adjustment. The isocline of $\dot{Y_B'}$ is upward-sloping, while that of $\dot{r}$ is downward-sloping. The system definitely yields a positive determinant and a negative trace of the Jacobian matrix. Hence, the system is stable and it shows the spiral cycle clock-wisely converging to the steady state which is where $Y_B' = Y_B$ and $r = r^*$. The phase diagram can be presented in Figure 2.1.

2. *Case 2*: η is unitarily elastic ($\eta = 1$)

A percentage change of income from inflows of capital leads to a higher percentage change of demand for import, so $\propto_1 = 0$ and the disequilibrium of the current

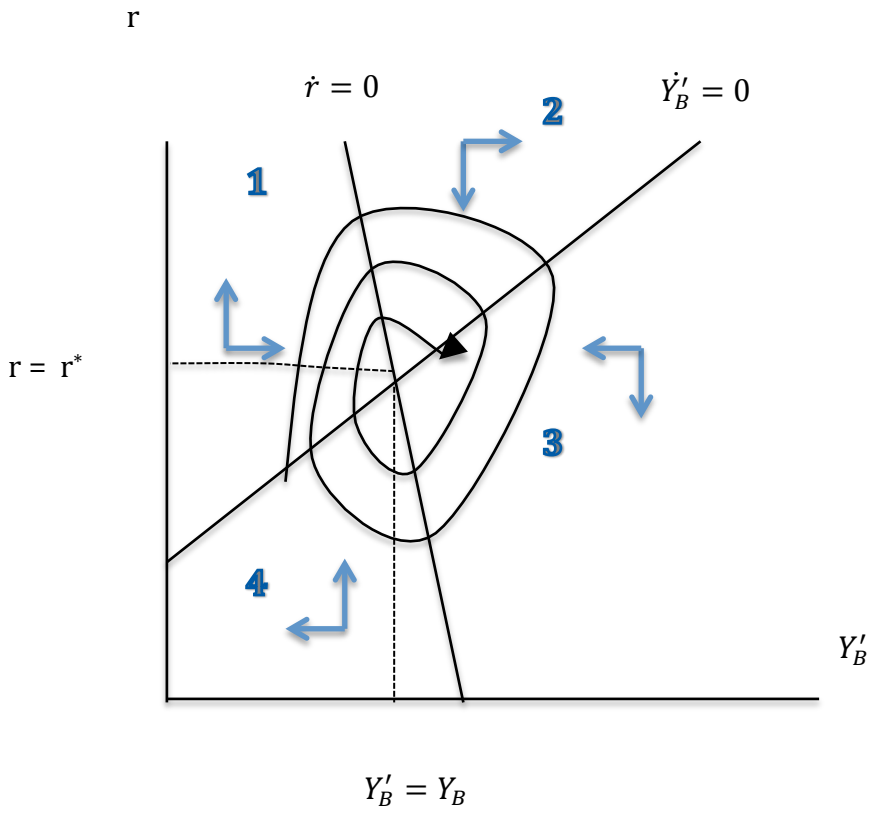

Figure 2.2: The Dynamic Interaction between Y'_B and r for the Case of $\eta > 1$

account does not have impact on Y'_B. As a result, the isocline of $\dot{Y}'_B = 0$ is a horizontal line while that of $\dot{r}$ is still downward-sloping. A negative trace and a positive determinant mean that the system is stable and it features convergence. Similar to *Case 1*, the system still moves in the form of a clock-wise spiral. The system of *Case 2* can be presented in Figure 2.2.

3. *Case 3*: η is inelastic ($\eta < 1$)

An inelastic η leads to a positive $\propto_1$, because a percentage change of capital flows, leading to economic growth in a country, is followed by a lower percentage change of

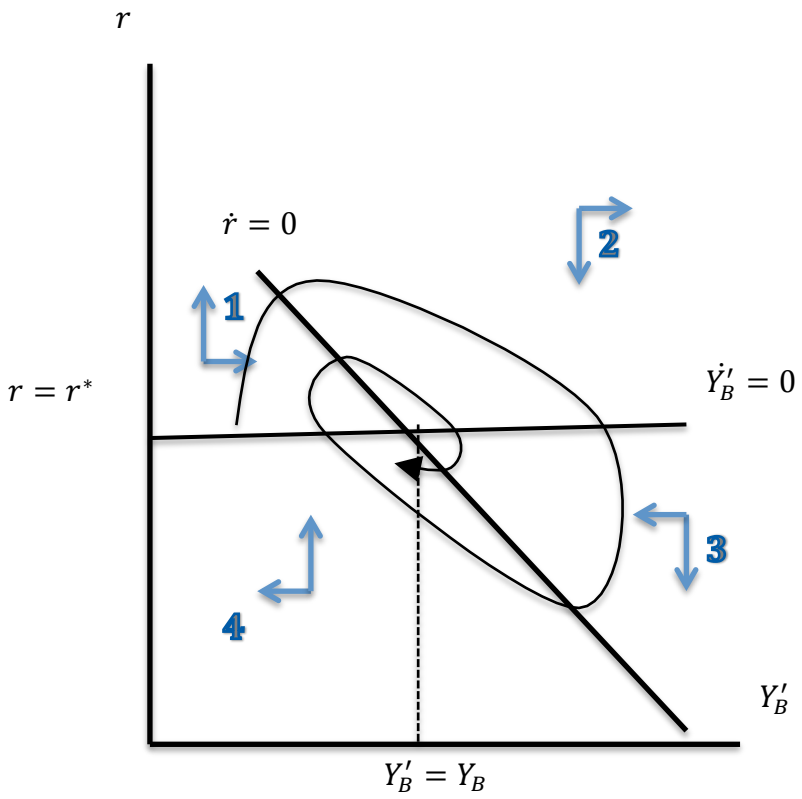

Figure 2.2: The Dynamic Interaction between Y'_B and r for the Case of $\eta = 1$

imports. Therefore, the gap between Y'_B and Y_B becomes wider. As a result, the isocline of $\dot{Y}'_B = 0$ has a negative slope. The trace and the determinant of the Jacobian matrix, whose value depends on the magnitude of $\propto_1$, can be falling in one of three following cases.

a) *Case 3.1*: the trace is negative and determinant is positive

In this case, η is not far below one, so $\propto_1$ is close to zero. That is, the current account disequilibrium does not play a big role to reduce the gap between Y'_B and Y_B. The phase diagram shows that the system still features a clock-wise cyclical movement. A negative trace and a positive determinant guarantee that the model is stable at its steady

state. In addition, a negative trace also means that the absolute value of the positive $\propto_1$ is smaller than that of the negative $\propto_4$. In other words, the mechanism of the current account to meet the constant ratio of capital flows to GDP has smaller impact compared to the impact from the rate of profit to set the position of the current account. As stated earlier, because $\propto_1$, in general, is expected to be quite low, Figure 2.3 is the case that is most likely to happen to economies whose income elasticities of demand for imports are inelastic.

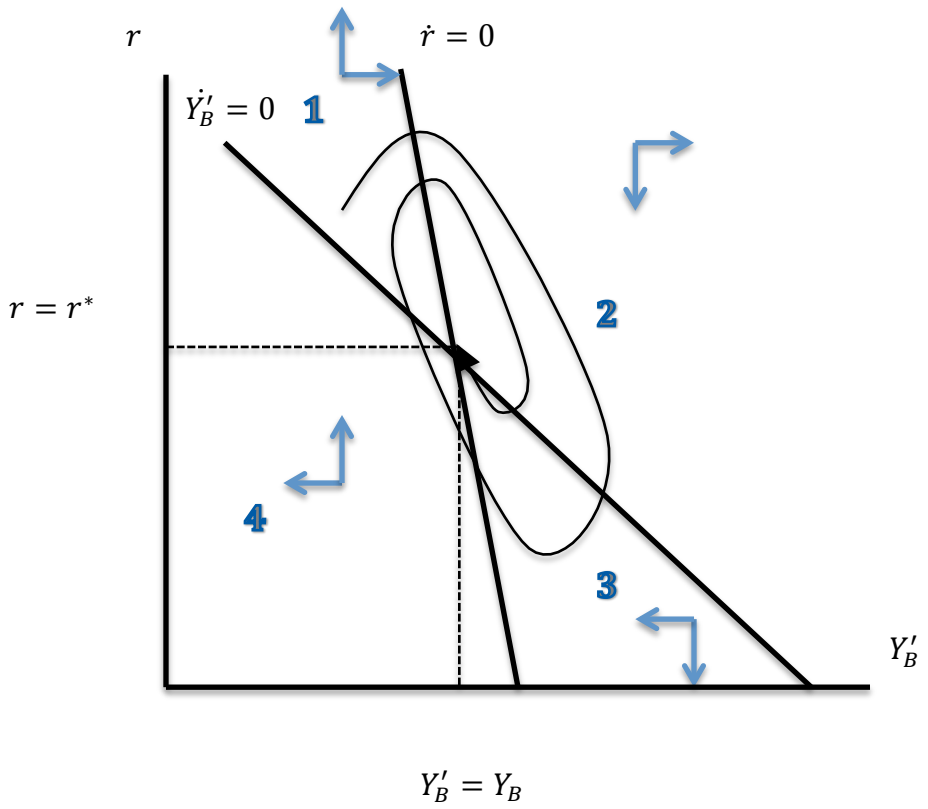

Figure 2.3: The Dynamic Interaction between Y'_B and r for the Case of $\eta < 1$, Resulting in the Negative Trace and the Positive Determinant

b) *Case 3.2*: the trace and determinant are positive

A low η leads to a higher value of $\propto_1$, so the trace becomes positive while, similar to the previous cases, the determinant is still positive. The system, hence, still features a clock-wise cycle, but it is divergent. Due to a positive trace, it means that the value of the positive $\propto_1$ is greater than the absolute value of the negative $\propto_4$. That is, the mechanism of the current account to meet the constant ratio of capital flows to GDP has great impact on $\dot{Y}'_B$, while capital flows do not have significantly big impact to increase the organic composition of capital and then reduce the rate of profit to the global rate. Hence, although the rate of profit has a tendency to converge to the global rate, it is actually the tendency to move away from the current account balance that drives the system to diverge away from the steady state. The graphical system of this case can be presented in Figure 2.4.

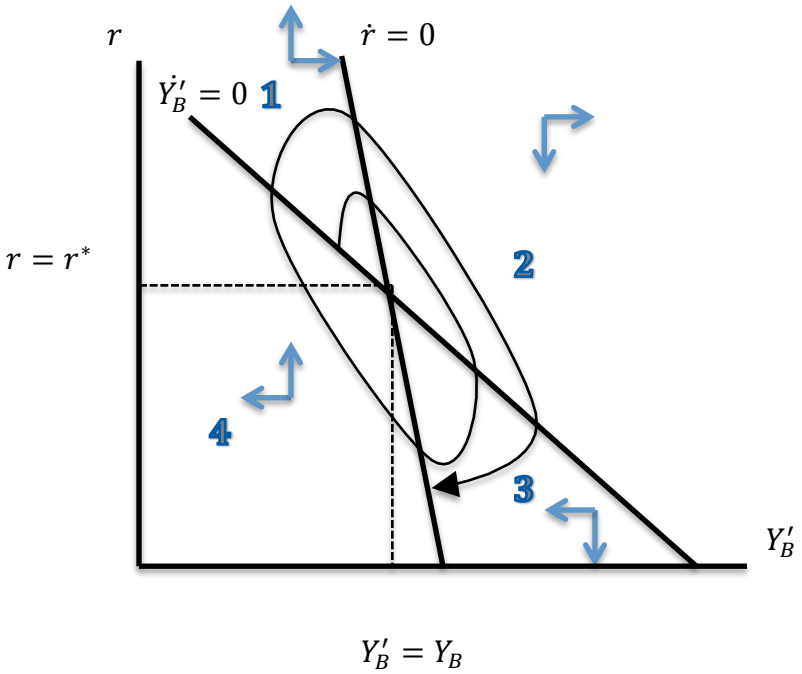

Figure 2.4: The Dynamic Interaction between Y'_B and r for the Case of $\eta < 1$, Resulting in the Positive Trace and the Positive Determinant

This is likely to be the case of a newly open country whose organic composition of capital changes very slowly due to its abundant labor force and its focus on labor-intensive industries. As a result, its rate of profit barely changes in spite of massive flows of foreign capital, contributing to a near-zero $\propto_4$.

c) *Case 3.3*: the determinant is negative

A negative determinant emerges when the absolute value of the product of $\propto_1$ and $\propto_4$ is greater than that of $\propto_2$ and $\propto_3$. That is, the negative isocline of $\dot{Y}_B' = 0$ is steeper than that of $\dot{r} = 0$. Dissimilar to all of the previous cases, the negative determinant means that the solution of the system, where $r = r^*$ and $Y_B' = Y_B$, is an unstable saddle point. As a result, the cycle no longer exists in this case. This is because the parameters of the off-diagonal variables, $\propto_2$ and $\propto_3$, do not have sufficient impact to drive the clock-wise cycle.

To explain this, for the case of a deficit (surplus) country, the current account deficit cannot sufficiently reduce (increase) the rate of profit to the level in which outflows (inflows) of foreign capital can sufficiently reduce (increase) $\dot{Y}_B'$. That is, the impact of the adjustment of the current account to reach the constant ratio of capital flows to GDP, which leads to a wider gap of $\dot{Y}_B'$ and Y_B outstrips the impact of profit rate adjustment to close the gap between $\dot{Y}_B'$ and Y_B. The steady state which is Y_B' and r^* is no longer the equilibrium around which the system circulates and it is a saddle point of the system. The system can be shown in Figure 2.5. This case is in conflict with the theoretical background of the model, because as, shown in phase 2 and phase 3 (phase 1 and phase 4) of the figure, that a country can run a chronic current account deficit (surplus) although its rate of profit is lower (higher) than the global rate of profit.

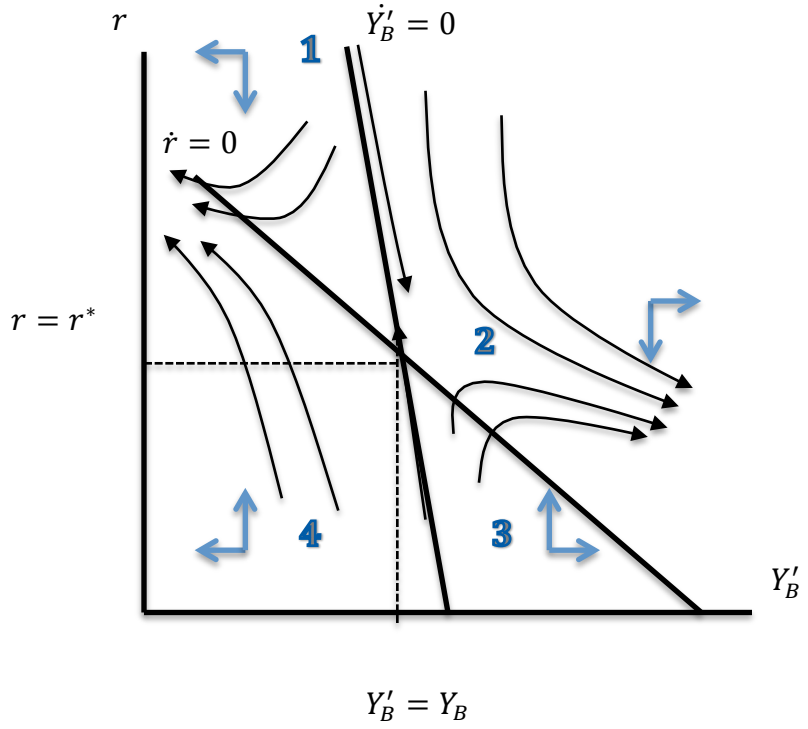

Figure 2.5: The Dynamic Interaction between Y'_B and r for the Case of $\eta < 1$, Resulting in the Positive Trace and the Negative Determinant

It is important to note that this model can explain an economy, if capital is allowed to flow in response to the rate of profit. That is, the economy should not have an intention to strictly control mobility of capital. To a further extent, it can be argued that a country employing foreign capital to expand its economy should have a high degree of interaction with the world economy, so its income elasticity of import is likely to be above one. In addition, due to the continuous expansion of international trades, all countries tend to have an elastic income elasticity of imports ($\eta > 1$). Consequently, among all cases, *Case 1* is the most possible case.[5]

[5] Empirical measurements of income elasticities of imports also show that most countries have an elastic income elasticity of imports. For example, Lopez and Thirlwall (2006) measured individual income elasticities of imports for sixteen Latin American countries, and found that fourteen out of sixteen countries have an elastic income elasticity of imports. In addiion, the two

Case 3.2 and *Case 3.3* could possibly happen only if η is significantly lower than one and hence $\propto_1$ is significantly high. It is important to note that equation (2.19) is another form of the balance-of-payments-constrained growth model, and this revised form requires the condition that the term $\omega - 1 + \eta$ must be positive. In other words, $\omega + \eta$ must be greater than one in order for equation (2.19) to explain economic growth of an economy. Therefore, *Case 3.2* and *Case 3.3* are not likely to occur at its initial state, because the two conditions $\eta < 1$ and $\omega + \eta > 1$ are contradictory to one another, especially during the deficit period when $\omega < 1$. In addition, because these two unstable cases cause a larger gap between Y_B' and Y_B, this implies that the fluctuations of ω are increasingly larger through time. Therefore, it is possible that at some point in time during the deficit period of the system, $\omega + \eta$ may drop below one and equation (2.19) does not hold to explain the economy. Empirically, $\eta < 1$ means that the ratio of imports to GDP of a countries should be falling through time, but this is irrelevant with the real world in which most countries have become more and more involved with international trade. Above all, as noted in the previous footnote, the current empirical research has revealed that most countries have elastic income elasticity of demand for imports. From this discussion, I can argue that *Case 3.2* and *Case 3.3* have low possibilities and they, though occurring, are not persistent because the dropping value of ω jeopardizes the condition $\omega + \eta > 1$, required in equation (2.19).

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inelastic income elasticities of imports of the two countries – Dominican Republic and Nicaragua – are not statistically significant. Bagnai (2010) measured income elasticities of imports of 22 OECD countries by taking into account impacts of structural breaks. His finding shows that only Iceland, when structural break is not considered, has the inelastic income elasticity of imports ($\eta > 0.9$). Yet, when taking into account the break year in 1989, the icelandic income elasticity of imports is elastic ($\eta = 1.35$) prior to the break year and became inelastic ($\eta = 0.8$) after the break year. Lastly, my finding in Chapter 4 shows that, for the case of Thailand, the income elasticity of imports from 1980 to 2010 is elastic as well ($\eta = 1.64$)

From the empirical and theoretical supports discussed above, only *Case 1*, *Case 2*, and *Case 3.1* seem to be valid in a long run and to be realistic in the real world. These three share the same characteristics; that is Y_B' and r converge to the equilibrium. This means that the extended Thirlwall's law cannot act as the long-run growth rule, and only the original Thirlwall's law is the ultimate balance-of-payments-constrained growth model that yields the long-run equilibrium growth rate.

2.3.4 Explaining the Cycles

The behaviors of the systems shown in their phase diagrams are very useful to understand how Y_B' and r can drive business cycles. Because $Case$ 3.2 and $Case$ 3.3 are not likely to happen in reality, I am going to just discuss the phase diagrams of $Case$ 1, $Case$ 2, and $Case$ 3.1 that are more likely to happen in the real world. The four phases in the phase diagrams of the interaction between Y_B' and r can be discussed in detail as follows.

Phase 1: This is the phase in which the rate of profit builds up. The increasing rate of profit attracts inflows of foreign capital to increase Y_B'. Meanwhile, since Y_B' is smaller than Y_B, the labor market is not yet tight, so profit share has a tendency to increase, leading to the increasing rate of profit. Hence, more workers are brought into the production process while not many fixed capital stocks are constructed. That is, variable capital takes a leading role in general production. As a result, the organic composition of capital tends to drop, and this leads to the fast-increasing rate of profit.

Phase 2: This is a boom phase where the rate of profit gradually drops but Y_B' increases enormously. This phase occurs after the rate of profit reaches its peak. A massive amount of foreign capital, which is attracted by very high profit rate, flows into

working as wage-workers in the nonfarm sector yielded them higher incomes than being self-employed in the farms. Therefore, it is reasonable to assume that all unincorporated income in the farming sector should be considered as wage equivalents to self-employed farmers. The next issue is how to deal with nonfarm unincorporated income. Since most unincorporated enterprises are small and directly run by their owners, the owners obtain a part of income as profits and another part as wages for being self-employed. Following the method used in other profit-rate literature (e.g. Wolff 2001) and Izyumov and Alterman (2005)), I simply assume that a half of this income is profits, while another half is wages of being self-employed. Unincorporated profit is hence equal to a half of nonfarm unincirporated income. Hence, it is equal to a half of *Others* of *Table 53 Income from Farms, Professions and Other* of source 1.1, *Others* of *Table 55 Income from Farms, Professions and Other Unincorporated Enterprises Received by Households* of source 1.2, and *Others* of *Table 47 Households and NPISHs Mixed Income Receivable* of source 1.3.

The sum of these four categories is defined as total profit collected from the Thai National Income Accounts. This total profit, to be compatible with other data, should be divided into farm profit and nonfarm profit too.

– Farm Profit (Π_f) = Y_f – total wages in the farming sector (W_f)

Even though most farmers are self-employed and their incomes are considered as wages, there are still some capitalist corporations in the farming sector. Therefore, it is necessary to estimate farm profit to be deducted from the total corporate profit. Unfortunately, the data on farm profit are not available, so I use the following method.

composition of capital keeps dropping. Therefore, the rate of profit slightly increases. However, this level of the domestic rate of profit is still lower than the global rate of profit and hence, it is not sufficient to attract foreign capital, so Y_B' still drops though the economy shows a sign of pickup via the increasing rate of profit.

The phase diagram also suggests that the rate of profit and Y_B' are most volatile during the first cycle. Then, the system gradually adjusts, so the rate of profit and Y_B' fluctuate less and less in the next cycles. This yields a marked insight that a country newly liberating its capital and money market in order to encourage foreign capital inflows to finance its economic growth may enjoy very fast economic growth only when the policy is newly launched. However, when the rate of profit drops below the global rate, rapid capital flights turn the economy into a slump due to the balance-of-payments crisis. Later, the economy may come back to growth, but the growth rate will never be as big as when the policy newly comes into use.

2.4 Conclusion

The intuitive idea behind this chapter's model is built from Marx's theory of profit rate equalization. In his idea, the nature of capital mobility is a pursuit of profits, so the rate of profit is the main determinant of capital flows and, hence, capital flows from a country with a lower rate of profit to that with a higher rate of profit. However, an increasing amount of foreign capital leads to the increasing organic composition of capital which directly lowers the rate of profit, so, in a host country, the rate of profit has a tendency to fall and converges to the equilibrium rate. The important point is that the mobility of capital has a large effect on a country's balance of payments, especially in the case of countries encouraging foreign capital to finance their investments, and, according

to the extended Thirlwall's law – equation (2.8) – growth rate of foreign capital flows determine the balance-of-payments-constrained growth rate. That is, the rate of profit has a dynamic interaction with the balance-of-payments-constrained growth rate.

From this intuitive idea, I can construct the dynamic model of profit rate and the level of GDP generated by the extended Thirlwall's law by using the idea of differential equations and phase diagram. The model presents that the parameters of both independent variables in the differential equations are important to determine the behaviors of the systems. However, it is likely that, in reality, the variables have a clock-wise cyclical relationship between one another, and the system converges to its steady state, where the national rate of profit is equal to the global rate of profit and Y_B' is equal to Y_B. The model contributes some theoretical insights to Marxian and Post-Keynesian literatures. First, different phases in the phase diagram imply that profit rate can determine business cycles, which is similar to the objectives of other Marxian works on the rate of profit and business cycles, such as, Hahnel and Sherman (1982) and Bakir and Campbell (2006, 2009), but this model suggests that the cycles are generated via fluctuations of the balance of payments. The model shows that a big boom is endogenously followed by a big slump. That is, business cycles in an economy, especially with free capital mobility, are endogenously embedded in the system due to the nature of foreign capital seeking for the high rate of profit. Second, a Marxian notion of the falling rate of profit resulting in an economic crisis is reaffirmed in the third phase of the model in which the rate of profit and Y_B' sharply fall together. The newly developed insight on economic crisis derived from model is that the crisis is via the balance-of-payments problem. Third, because this chapter argues that, due to empirical and

theoretical supplementary supports, only the cases containing a convergence property can exist in reality, the extended Thirlwall's law can only temporarily explain economic growth. That is, the original Thirlwall's law is the ultimate growth rule acting as a center of gravity of economic growth. This model, accompanying with other Post-Keynesian literatures (Pugno 1998, McCombie and Roberts 2002: 93 – 96, and Setterfield 2011), provide an alternative way to demonstrate the robustness of the original Thirlwall's law to describe the equilibrium growth rate of an economy.

CHAPTER 3

THE NONFARM RATE OF PROFIT IN THAILAND, 1970 – 2010

3.1 Introduction

Since the rate of profit is one of the most important concepts in Marxian economics, there is no way that economic development of an economy can be fully explained without understanding the historical performance of its rate of profit. For the case of Thailand, in spite of many works explaining its economic development, the study of the Thai rate of profit and its role in the Thai economy has been limited.[6] Since industrialization is an engine for modernization and economic prosperity in Thailand and industrial and service sectors are big absorbers for Thai workers, the nonfarm rate of profit in Thailand must yield a better understanding of the development of the Thai economy. This chapter is, hence, aimed to measure the nonfarm rate of profit in Thailand from 1970 to 2010. In addition, decompositions of the nonfarm rate of profit further yield valuable insights to understand some meaningful variables, such as the rate of surplus value and the organic composition of capital, that determine fluctuations of the nonfarm rate of profit.

To fulfill this task, this chapter is organized as follows. Section 3.2 is the review of literature on profit rate measurement in a Marxian tradition for the case of Thailand

[6] Glassman (2001 and 2004) is the only person who measures the rate of profit in Thailand. However, there are some shortcomings in both methodology and availability of data in his rate of profit rate measurement. More details on his measurement are discussed below in Section 3.2.3.

and that of other countries. Section 3.3 is my attempt to explain data collection and the methodologies to calculate the nonfarm rate of profit in Thailand. Section 3.4 shows the results and decomposes the nonfarm rate of profit to see its determinants. It also divides the nonfarm rate of profit into four phases, and calculates impact of each determinant on the nonfarm rate of profit in each phase. Section 3.5 shows how the nonfarm rate of profit and its determinants can reveal some hidden aspects of the Thai economy. Section 3.6 is the conclusion.

3.2 Literature Review

The idea of the rate of profit was invented by Karl Marx (1991) who argued that in a capitalist economy, there is a tendency for a falling rate of profit. After Marx's original work, the tendency for a falling rate of profit had been widely developed and criticized only in a theoretical level (Lenin 2008, Grossman 1992, Okishio 1961). However, empirical measurements of the rate of profit require a firm process of data collecting, so the first modern empirical work on the rate of profit came as late as the 1970s by Glyn and Sutcliffe (1972) in the case of the UK. After that, in the early time of the empirical measurement of the rate of profit, the US rate of profit received a wider range of attention from Marxists, so most literature attempted to create some techniques to measure the US profit rate. Hence, there is more literature on the US rate of profit than those on other single country. Therefore, this part will start by briefly reviewing literature on the US rate of profit and be followed by those on profit rates in other countries. This part will end with a detailed review of Glassman's works (2001, 2004), which are the only works measuring the rates of profit in Thailand.

3.2.1 The US Rates of Profit

The first empirical measurements of the US rates of profit came out in 1979. Wolff (1979) observed input-output tables, which at the time were available only for the years 1947, 1958, 1963, and 1967, and then he finds "the labor value" of all commodities and uses this labor value to calculate the rate of profit in the USA from 1947 - 1967. The result is that the rate of profit tended to increase. However, he concludes that this increasing rate of profit, which is against Marx's tendency of the falling rate of profit, was because labor productivity increased faster than real wages. With a different methodology, Weisskopf (1979) decomposed the rate of profit to see that its components are "the share of profits in income," "the rate of capacity utilization," and "the capacity-capital ratio," and, in respective response to these three components, "a rising strength of labor," "a realization failure," and "a rising organic composition of capital" are the sources of changes in the rate of profit. He acquired the data from the US National Income and Product Accounts to find the before-tax rate of profit for the entire non-financial corporate business sector from 1949 to 1975 that could be divided into five cycles of the rate of profit. His finding was that the rate of profit tended to fall and the rising strength of labor was the main factor of the declining rate of profit, while the decline of capacity utilization also contributed to the falling rate, however at a lower degree. This article by Weisskopf is a milestone work on profit rate measurement, as it sets a standard methodology to measure the rate of profit for many following works, such as Hahnel and Sherman (1982) who found the relation between the rate of profit and the US business cycles, Michl (1988) who used a regression analysis to take into account the trend structure, and Hanley (1987) who found that the profit squeeze in the late 1970s and

the early 1980s was due to higher wages received by nonproductive workers. In his 2001 and 2003 article, Wolff no longer employed the input-output matrix in order to measure the rate of profit, developed by himself in 1979. He, instead, used the data from the National Income and Product Account to calculate the US rate of profit. He found that the rising rate of profit since the early 1980s to 1997 was due to the rising profit share and the declining organic composition of capital.

The next breakthrough in profit rate literatures emerged when Moseley (1991) introduced a new way of measuring the rate of profit based on Marx's distinction between productive and unproductive labor. The main conclusion in all of his works on the rate of profit (Moseley 1990, 1991, 1997) was that the most important factor leading to the falling rate of profit in the USA has been the increasing proportion of unproductive labor. His further analysis argued that this way of measuring the rate of profit is more consistent with the trend of the rate of profit than two types of profit squeeze presented by Weisskopf (1979) and Wolff (1986).

Later literature on the US rate of profit has become more advanced in terms of both methodology and data collecting. Dumenil and Levy's *Capital Resurgent* (2004a) is a comprehensive book using several techniques to measure the rates of profit in the USA and France to explain the roots of the neoliberal revolution. Dumenil and Levy (2004b) invented a major breakthrough in the development of the literature on the rate of profit by seeing impact of the financial sector on the rate of profit. In the article, the authors succeeded in finding the rate of profit in the nonfinancial-corporate sector, that in the nonfinancial-corporate sector with impact of financial relations, and that in the financial sector. What they discovered is that the rise of neoliberalism in the USA significantly has

led to the increasing rate of profit in the financial sector, while financial incomes and burden of real interest rates have also affected the rate of profit in the nonfinancial sector. Following Dumenil and Levy (2004b), Bakir (2006) calculated the 'augmented profit rate' which is the rate of profit that takes into account impact of financial relations of the nonfinancial corporate businesses. He then compared the augmented profit rate with the after-tax profit rate and found that the nonfinancial corporate businesses paid a higher proportion of interests and dividends out of their pockets, and their financial investments could not yield sufficient income to offset higher dividends and interests.

3.2.2 The Rates of Profit in Other Countries

Empirical measurements of profit rates in other countries are not as advanced as those in the USA. Usually, profit rate literature calculates the rate of profit in a particular country, evaluates whether it has a tendency to fall or rise in each time period, and reports the dominant determinants of its tendency. Some selected examples of this literature are as follows.

Henley (1989) calculated the rate of profit in the UK corporate sector from 1962 – 1985 and found the falling trend of the profit rate mainly due to the lower profit share and the lower capital productivity, while the lower capacity utilization also contributed to push down the profit rate but at a moderate degree. Further, the sign of pick-up in the 1980s was due to lower workers' bargaining powers for higher wages. However, due to the absence of increasing productivity of labor and capital, there was no signal that the rate of profit could go back to its 1960s level. Brown and Mohun (2011) attempted to measure the profit rate in the UK during the interwar period (1920 – 1938), and found that there was a sharp rise of the rate of profit. The determinants of this rise in the 1920s

were different from those in the 1930s. In the 1920s, the rate of profit increased due to the increasing rate of surplus value and the falling organic composition of capital. In the 1930s, a surge of labor productivity was the main reason behind the increasing rate of profit.

Reati (1986) measured the rate of profit in West Germany from 1960 -1981 in order to test the law of the falling rate of profit. The result is that the rate of profit had a clear tendency of falling in all sectors, especially in the first half of the 1970s. However, this falling was not a result of the increasing organic composition of capital as stated in Marx' original argument. Rather, it was the increasing wage share as demands for labor rapidly increased, so the smaller size of a reserve army of labor resulted in increasing real wages. In addition, Tutan and Campbell (2005) studied the rate of profit in West Germany from 1960 to the year of unification by dividing the economy into the manufacturing sector and a nonmanufacturing sector. They find that both rates fell from 1960 to 1981 and then increased after that. Fluctuations of profit share in each sector were explained as a main engine of profit rate fluctuations.

Lianos (1992) presented the rate of surplus value, the organic composition of capital, and the rate of profit in Greece's manufacturing sector from 1960 -1983. He found that there was an increasing trend of the organic composition of capital, while the rate of surplus value and the rate of profit fluctuated and no apparent trend could be observed. A related article in 1993 by Lianos and Droucopoulos presented profit rate differentials of several industries in the Greek manufacturing sector from 1963 – 1986 in order to see whether or not the profit rates tended to converge in the long run. The result is that there is a moderate tendency of profit rate convergence, and the differentials

seemed to be bigger during a recession. Izyumov and Alterman (2005) used national income data to measure the rate of profit in Russia from the transition period in 1994 to 2002. The rate of profit had two separate trends: the decrease from 1994 to 1997 and the increase from 1998 to 2002, where output – capital ratio contributed the most to this fluctuation while profit share remains stable. Izquierdo (2005) estimated the rate of profit in Spain from 1954 – 2001, and he found that the rate of profit had a downward trend in the long term while there were short-term cyclical movements along this trend. According to the decompositions, he saw that the rising organic composition of capital contributed to the downward trend, while the movements of the profit share determined the cyclical movements of the profit rate.

Webber and Rigby (1986) evaluated the rate of profit in the Canadian manufacturing sector from 1950 to 1981. The authors used the idea based on Marx's reproduction schema in order to construct their model of the rate of profit. It is found that there were endogenous forces that caused higher real wages and higher organic composition of capital. However, there were counteracting factors such as lower prices of production and an increasing rate of turnover of capital that had positive effects to the rate of profit. Still, empirical evidence revealed that the rate of profit kept falling throughout the time of observation. The paper concludes that the falling rate of profit is endogenous to capitalism. For further details, two pieces by Webber and Tonkin measured the rate of profit in the Canadian textile, knitting, and clothing industries (1988a), and that in the Canadian wood, furniture, and paper industries (1988b).

In Mexico, due to a limitation of the Mexican data, Etelberto (2005) presented the *profitability trend,* which is estimated by the difference of the rate of growth of net

income per worker and wage rate and determines the moving direction of the rate of profit in the Mexican economy from 1970 - 2000. Further, he then divided the economy into six sectors, and found sectoral profitability trends. Marquetti, Filho, and Lautert (2010) presented the rate of profit in Brazil from 1953 to 2003. The rate of profit apparently showed a tendency of falling. To observe in more details, the authors divide the rate of profit into three phases: a moderate decline from 1953 to 1973, a sharp fall from 1973 to 1989, and a slight increase from 1989 to 2003. The profit rate decompositions further informed that the main factor behind the falling rate of profit was the declining productivity of capital.

Some studies were conducted to see the profit rates in several countries. Li, Xiao, and Zhu (2007) studied the long-term fluctuations of the rate of profit in the UK, the USA, Japan, and the Euro-zone, and the authors successful found the long waves of the rates of profit. Further, not only did they find the national rates of profit, the authors also discover the 'world profit rates' and their long waves. This then allowed the authors to understand the behaviors of the global rate of profit during different stages of world capitalist development and different hegemonic powers. Zachariah (2009) calculated the rate of profit in the USA, Japan, the UK, France, Italy, Canada, Australia, and Sweden from the early 1960s to the late 1990s. He found that the profit rates in the USA, Japan, France, and Canada had a tendency of falling, while those of the rest did not fall. In addition, the author also introduced the concept of the equilibrium rate of profit, which depends on the growth rate of workforce, the average growth rate of productivity of labor, a fraction of the labor-value of the surplus product, and depreciation. This equilibrium rate acts as a long-run trend of the rate of profit in a particular country. Vaona (2010)

presented the rate of profit in Denmark, Finland, and Italy from the 1970s to 2007, and all of them did not show a falling trend. The author could draw insights from seeing common behaviors of determinants of the rate in each country; in the short run, fluctuations in the rate of profit were caused by, as Weisskopf (1979) found, a rising strength of labor and realization failures, while, in the long run, the trends of the rates were run by rising productivity of capital and a shift of employments to high-productivity sectors.

3.2.3 The Thai Rate of Profit

For the case of Thailand, two pieces by Glassman (2001 and 2004: 176 – 184) were the only works estimating the Thai rate of profit in a Marxian fashion. Both works calculated the rates of profit in a manufacturing sector and a nonmanufacturing sector from 1970, and used only the manufacturing profit rate in order to analyze the causes of the economic crisis in 1996 – 1997.[7] In order to find the rate of profit, Glassman estimated the rate of profit from Office of the National Economic and Social Development Board (NESDB)'s *National Accounts;* total profit in the manufacturing sector is equal to manufacturing value added minus compensation of manufacturing employees, while profit in the nonmanufacturing is hence equal to nonmanufacturing value added minus compensation of nonmanufacturing employees. Due to the lack of data at the time, the NESDB provided only the data for 'gross' fixed capital stock, but did

[7] Using a non-Marxian method, Reynolds et al. (1999, 2001) also take into account the role of profitability in the Thai economy. Reynolds et al. (1999) use microlevel data in order to calculate the ratio of short-term debts to net profit of nonfinancial firms in several countries including Thailand, and find that taking excessive risks in microlevel data led to the Asian crisis. In their latter work (Reynolds et al. 2001), they compare the ratio of short-term debts to net profit in Asian countries with those of Latin American countries, they find that, prior to the crisis, the Asian countries took risks much higher than the Latin American countries.

not have the 'net' fixed capital stock. Since the rate of profit tells the profitability of the total capital that is currently in use, net fixed capital stock is the proper variable to measure the rate of profit. Therefore, Glassman had to estimate net fixed capital stock from gross fixed capital stock by estimating the average life of fixed capital at 25 years, and hence, an annual depreciation is 1/25 of the total value of gross fixed capital. From this estimation, he could obtain the estimated net fixed capital stock from 1970 to 1997, by using gross fixed capital stock from 1946 onwards. Glassman, as a result, was successful to explain that it was not only a financial sector and asset bubbles that triggered the crisis in 1997, but profit squeeze, realization failures, and the fall of capital productivity in a manufacturing sector also contributed to the rise of the crisis.

However, there are some shortcomings in Glassman's works. First, his rates of profit ended in 1997, because he wanted to use the rate of profit to explain the crisis. To fully utilize the power of the profit rate to understand the economy, the rate of profit should have been extended further, so it could have yielded some knowledge on how and when Thailand recovered from the crisis. Further, it could also yield some insights on the Thai postcrisis economy. Second, his methodology of calculating profit did not take into account the distinction between profits and wages from the total amount of self-employed workers. Third, his estimation of net fixed capital stock could not be and was not exactly the same as the actual data that are available at this time.

In this chapter, I can fill all these gaps. First, I can use the most updated data to find the rate of profit and its determinants from 1970 to 2010. Second, I can come up with a rigorous methodology to estimate wages to self-employed workers to consider the characteristics of the Thai economy. Since a majority of the population are self-employed

farmers, taking these wages into account has great impact on the rate of profit and its components. And, third, I can take advantage of the current available data for net capital stock in the private sector provided by the NESDB in order to get the exact value of net capital stock and be able to accurately estimate the rate of profit in Thailand.

The main focus of this chapter is on the measurement of the nonfarm rate of profit in the private sector. I attempt to calculate the nonfarm rate of profit in private sectors due to two major reasons. First, as already mentioned in the introduction of this chapter, the nonfarm rate of profit is likely to be the best variable in Marxian economics, under the context of the recent Thai economic development in which private sectors and industrialization have been the main developmental tools. Second, there is a limitation in data acquisition. The data do not differentiate capitalist capital stocks from noncapitalist capital stocks in the farming sector. Therefore, it is more appropriate and more accurate to measure the rate of profit only in the nonfarm sector where all capital stocks can be reasonably assumed to belong to only the capitalist class.

3.3 Data and Construction of Variables

3.3.1 Variables

Y: Net Domestic Product

Y': Real Net Domestic Product

Y_f : Farm Net Domestic Product

Y_n: Nonfarm Net Domestic Product

Π: Profit

Π_f: Farm Profit

Π_n: Nonfarm Profit

W_f: Total Wages in The Farming Sector

K: Nonfarm Private Net Capital Stock

K': Real Net Capital Stock

r: Nonfarm Profit Rate

π: Nonfarm Profit Share

u: Nonfarm Output-Capital Ratio

s: Nonfarm Rate of Surplus Value

occ: The Nonfarm Organic Composition of Capital

ω: The Nonfarm Wage Share

p: GDP Deflator

p_K: Capital Good Price index

3.3.2. Sources of Data

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

1. The main source of data for most of the variables is National Income of Thailand compiled by Office of 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 both the NESDB's website and the NESDB's reports, which can be listed as follows.

1.1 The data from 1970 to 1979 are available in *National Income of Thailand: New Series 1970 – 1987*.

1.2 The data from 1980 to 1989 are available in the file *National Income of Thailand: 1980 – 2001 edition*.

1.3 The data from 1990 to 2010 are available in the file *National Accounts of Thailand: New Series (Chain Volume Measures 1990 – 2010),* which is the latest version of the national income account of Thailand by NESDB.

There is an overlap of available 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 is different in different reports. 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 to 1979 from source 1.1, that of 1980 to 1989 from source 1.2, and that of 1990 to 2010 from source 1.3.

2. Another source of data is historical data of 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 – 1987*, and hence, it is expected to inform more accurate GDP than source 1.1, according to what is suggested by the NESDB's staff as explained above. Therefore, the data of both nominal and real GDP from 1970 to 1979 are obtained from this source.

3. The last source of data is *Capital Stock of Thailand: 1970 – 2011*, which contains the data on private net capital stock.

3.3.3. Explanations of the Variables and the Compilation of Data

1. Net Domestic Product (Y) = GDP – provision for consumption of fixed capital = farm GDP + nonfarm GDP – provision for consumption of fixed capital

GDP at market prices from 1970 to 1979 is obtained from *Table 1: Gross Domestic Product at Current Market Prices by Industrial Origin* of source 2, and GDP

from 1980 to 1989 is obtained from *Account 1: Domestic Product* of source 1.2 Meanwhile, provision for consumption of fixed capital is obtained from *Account 1: Domestic Product* of source 1.1 and 1.2.

Net Domestic Product of 1990 to 2010 is instantly available in *Account 2: Generation of Income Account* of 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 nonfarm GDP. In all sources, the sum of farm GDP and nonfarm GDP is always equal to total GDP.

– Farm Net Domestic Product (Y_f) = Farm GDP – estimated provision for consumption of fixed capital in a farming sector

Since farm GDP is always reported in the same table as GDP, the data of farm GDP is obtained from the exact 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 farming sector are unknown. To estimate this value, I collect the data of net capital stock from *Table 7 Net Capital Stock of Thailand at Current Replacement Cost* of source 3 where total net capital stock is divided into net capital stock in a farming sector and that in a nonfarm sector. Hence, I assume that the ratio of depreciation in the farming sector to the total depreciation should

be equal to the ratio of net capital stock in the farming sector to total net capital stock. That is, my estimated provision for consumption of fixed capital in the farming sector is equal to the ratio of net capital stock in the farming sector to total net capital stock times total provision for consumption of fixed capital.

– Nonfarm Net Domestic Product (Y_n) = $Y - Y_f$

2. Profit (Π) = (Saving of Private Corporations + Property Income + Direct Taxes on Corporations + Corporate Transfer Payments + unincorporated profit – Interests on Consumers' Debt)

Profit, by definition, is composed of four categories: corporate profits, non-corporate profits, interests, and rents. Corporate profits comprise the following four sub-categories; saving of private corporations, direct taxes on corporations, corporate transfer payments, and dividends. The first three subcategories of corporate profits are given instantly in source 1.1, 1.2, and 1.3, but dividends are a part of total property income. The two other parts of property income are interests and rents. Interests on consumers' debt are subtracted from property income, because they are not derived from the production process.

Since the aim is to find aggregate profit in a nonfarm private sector, government profit should be ruled out. The data of saving of private corporations is obtained from *Savings of Corporations and Government Enterprises* of *Account 2 National Income* less *Savings of Public Corporations and Government Enterprises* of *Table 57 Savings of Corporations* of source 1.1, *Savings of Corporations and Government Enterprises* of *Account 2 National Income* less *Savings of Public Corporations and Government Enterprises* of *Table 56 Savings of Corporations* of source 1.2, and *Savings of*

Corporations of *Table 42 Distribution of the National Income at Current Market Prices* less *Saving of Public and Government Enterprises* of *Table 50 Saving of Corporations* of source 1.3.

Direct taxes of corporations, corporate transfer payments, and interests on consumers' debts are obtained from *Direct Taxes of Corporations, Corporate Transfer Payments, Interests on Consumers' Debt* of *Account 2 National Income* of source 1.1 and 1.2 and from *Corporate Current Taxes on Income* of *Table 42 Distribution of National Income at Current Market Prices* of source 1.3.

Property income is obtained from *Income from Property* of *Account 2 National Income* less *Imputed Rent* of *Table 54 Income from Property Received by Household and Private Non-Profit Institutions* of source 1.1 and 1.2, and *Households Property Income Receivable* of *Table 42 Distribution of the National Income at Current Market Prices* less *Imputed Rent* of *Table 48 Households and NPISHs Property Income Receivable*. It is important to deduct imputed rent from total property income. This is because imputed rent is estimated returns of owner-occupied property. In the case of Thailand, self-owned properties are mostly self-owned farms and residential properties which do not generate profits.

Unincorporated income in the National Accounts of Thailand is divided into farm and nonfarm unincorporated income as well. In the farming sector, Bryant and Gray (2005) using the 2003 Labor Force Survey found that most workers are self-employed, while the proportion of capitalist farmers is very low in the total agricultural work force. In addition, since the 1960s, the labor force was certainly transferred from the farming sector to in the nonfarm sector (Phongpaichit and Baker 2002: 200 – 201), because

working as wage-workers in the nonfarm sector yielded them higher incomes than being self-employed in the farms. Therefore, it is reasonable to assume that all unincorporated income in the farming sector should be considered as wage equivalents to self-employed farmers. The next issue is how to deal with nonfarm unincorporated income. Since most unincorporated enterprises are small and directly run by their owners, the owners obtain a part of income as profits and another part as wages for being self-employed. Following the method used in other profit-rate literature (e.g. Wolff 2001) and Izyumov and Alterman (2005)), I simply assume that a half of this income is profits, while another half is wages of being self-employed. Unincorporated profit is hence equal to a half of nonfarm unincirporated income. Hence, it is equal to a half of *Others* of *Table 53 Income from Farms, Professions and Other* of source 1.1, *Others* of *Table 55 Income from Farms, Professions and Other Unincorporated Enterprises Received by Households* of source 1.2, and *Others* of *Table 47 Households and NPISHs Mixed Income Receivable* of source 1.3.

The sum of these four categories is defined as total profit collected from the Thai National Income Accounts. This total profit, to be compatible with other data, should be divided into farm profit and nonfarm profit too.

– Farm Profit (Π_f) = Y_f – total wages in the farming sector (W_f)

Even though most farmers are self-employed and their incomes are considered as wages, there are still some capitalist corporations in the farming sector. Therefore, it is necessary to estimate farm profit to be deducted from the total corporate profit. Unfortunately, the data on farm profit are not available, so I use the following method.

The first part of total wages in the farming sector is compensation of employees in the farming sector, and the second part is, as stated above, all unincorporated income in the farming sector. Total wages in the farming sector are hence equal to; *Agriculture* of *Table 52 Compensation of Employees* pluses *Farm Income* of *Table 53 Income from Farms, Professions and Other* of source 1.1, *Agriculture* of *Table 53 Compensation of Employees* pluses *Farm Income* of *Table 55 Income from Farms, Professions and Other Unincorporated Enterprises Received by Households* of source 1.2, and *Agriculture* of *Table 46 Compensation of Employees* pluses *Farm Income* of *Table 47 Households and NPISHs Mixed Income Receivable* of source 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 farming sector only from 1970 to 1989, but not from 1990 to 2010. Following how Y_f 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. To estimate wages paid in "Simple Agricultural Processing Products," I find the proportion of "Simple Agricultural Processing Products" in the total farm GDP, and I simply assume that it is equal to the proportion of wages paid in this sector in total wages in the farming sector.

– Nonfarm Profit (Π_n) = Π - Π_f

3. Nonfarm Private Net Capital Stock (K) = Non-Agriculture Private Net Capital Stock – Net Private Capital Stock of Real Estate, Renting and Business Activities

All of these variables are obtained from *Table 9 Net Capital Stock of Private Sector* of source 3. The reason for subtracting net capital stock of the real estate sector is

because most of these capital stocks are residential, which do not generate profit. Therefore, they should not be used to measure the nonfarm rate of profit.

3.4 The Rate of Profit in Thailand and Its Decompositions

As defined by Dumenil and Levy (2004a: 22-23), "the rate of profit is the indicator of the profitability of capital." Since the purpose is to measure the nonfarm rate of profit in a private sector in Thailand, the nonfarm rate of profit, by definition, is:

$$r = \frac{\Pi_n}{K} \tag{3.1}$$

Furthermore, the rate of profit can be decomposed further as a product of the nonfarm profit share (π) and the nonfarm output-capital ratio (u), where

$$\pi = \frac{\Pi_n}{Y_n} \tag{3.2}$$

$$u = \frac{Y_n}{K} \tag{3.3}$$

where Y_n is the net domestic product in the nonfarm sector. Hence,

$$r = \frac{\Pi_n}{Y_n} \cdot \frac{Y_n}{K} = \pi \cdot u \tag{3.4}$$

Figure 3.1, 3.2, and 3.3 present r, π, and u in Thailand from 1970 to 2010, respectively.

According to Weisskopf (1979) and Wolff (2003), the nonfarm rate of profit can alternatively be considered as a product of the nonfarm rate of surplus value (s) and the inverse of the nonfarm organic composition of capital (occ). Following this method, I can decompose the Thai nonfarm rate of profit in the following way.

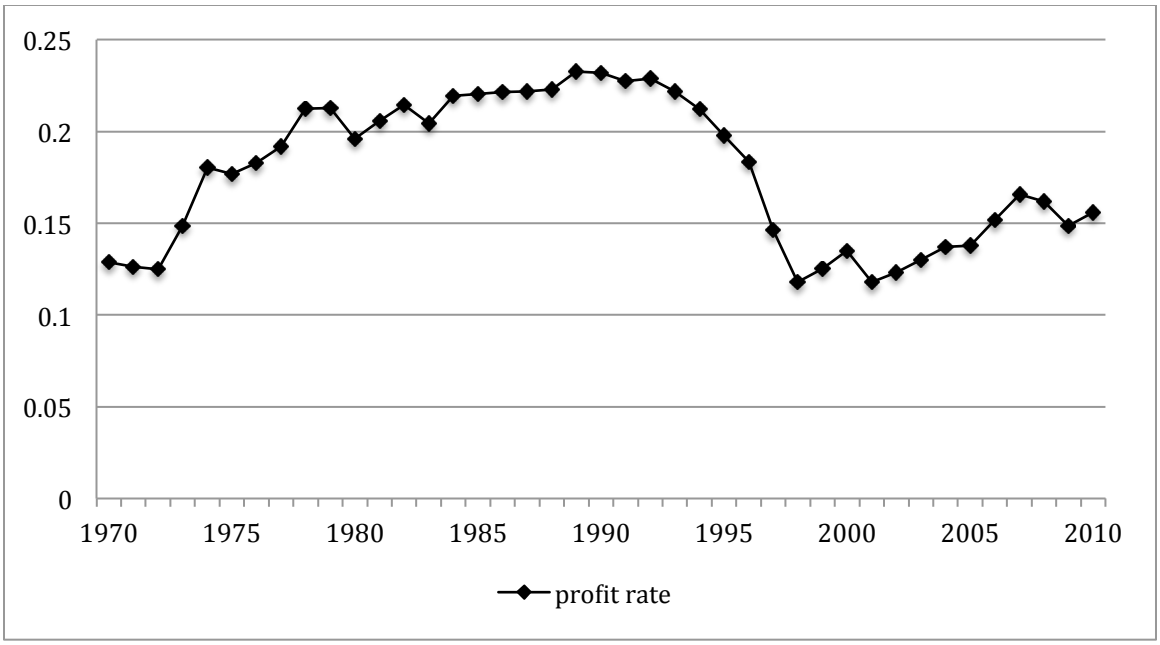


Figure 3.1 The Nonfarm Profit Rate (r) **in Thailand: 1970 – 2010**

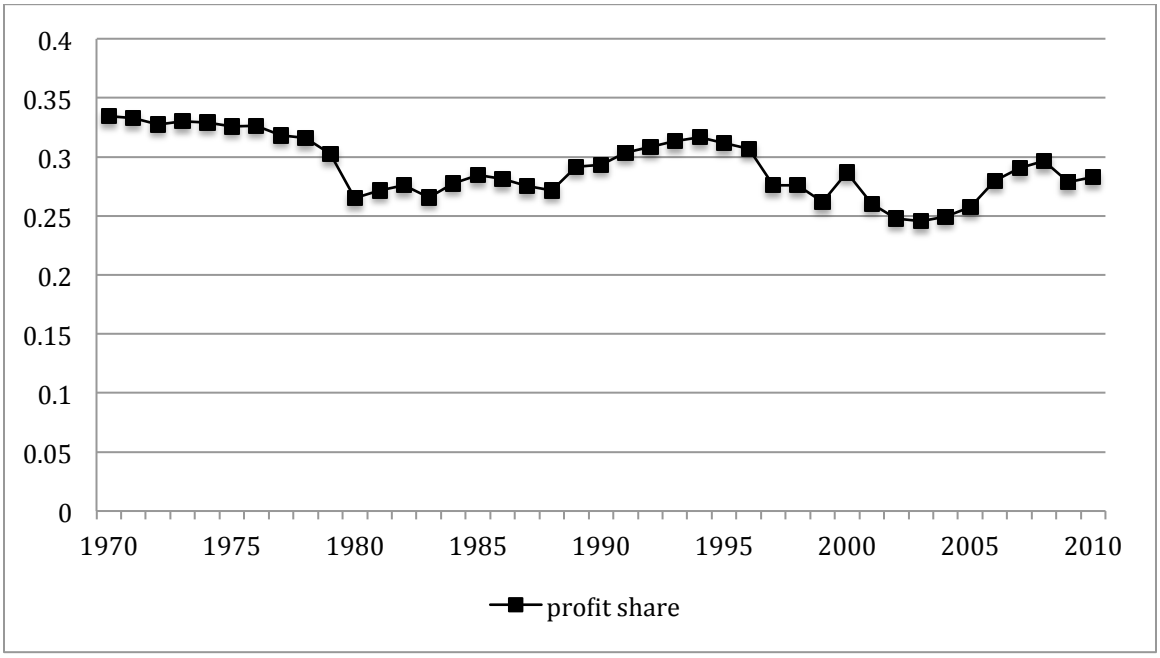


Figure 3.2 The Nonfarm Profit Share (π) in Thailand: 1970 – 2010

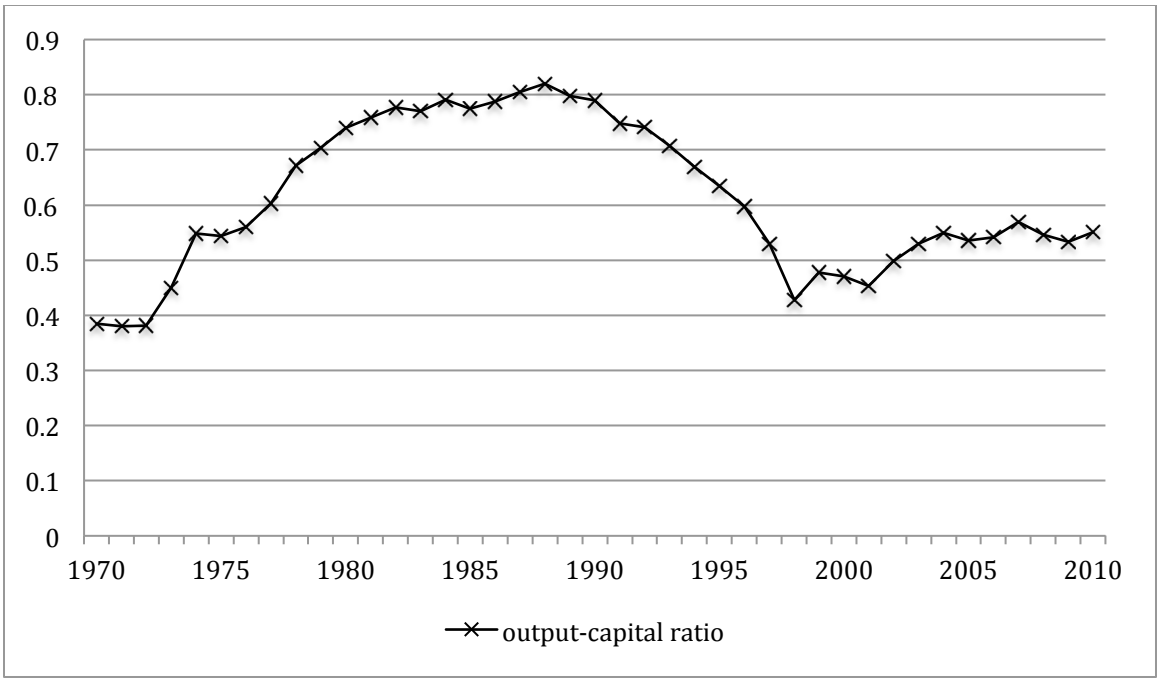


Figure 3.3 The Nonfarm Output – Capital Ratio (u_n) in Thailand: 1970 – 2010

$$s = \frac{\Pi_n}{W_n} \tag{3.5}$$

$$occ = \frac{K}{W_n} \tag{3.6}$$

Hence,

$$r = \frac{\Pi_n}{W_n} \cdot \frac{W_n}{K} = \frac{s}{occ} \tag{3.7}$$

Meanwhile, the rate of surplus value (equation (3.5)) represents profits to capitalists as a return for one unit spent as wages. This rate is also known as the rate of exploitation because it expresses 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 labor powers. In this sense, the rate can also

represents powers of workers to bargain for their wages and those of capitalists to appropriate surplus value from a total value of production.

The organic composition of capital (equation (3.6)) is the ratio of variable capital to fixed capital used in the economy. The rate itself tells the relationship between labor power and capital in a particular mode of production in an economy. Marx argues that, as capitalism develops, capitalists tend to replace variable capital (which means labor powers) with constant capital (which means fixed capital), so the organic composition of capital tends to increase. This phenomenon can be commonly seen as different stages of development in a newly rising economy; i.e., a country starts its development process with labor-intensive production processes and then moves forward to more capital-intensive production processes. The rising organic composition of capital is, in Marxian theory, very important, since it is considered as a key to a falling rate of profit and hence economic crisis in a capitalist economy.

From this alternative decomposition, Figure 3.4 and Figure 3.5, respectively, present the nonfarm rate of surplus value and the nonfarm organic composition of capital in Thailand from 1970 to 2010.

I consider that equation (3.4) is the first decomposition and equation (3.7) is the second decomposition. To evaluate impact of each determinant on the nonfarm rate of profit, finding the growth rate of equation (3.4) shows that growth rate of nonfarm profit rate is equal to the sum of the growth rate of profit share and that of output-capital ratio, and finding the growth rate of equation (3.7) shows that the growth rate of nonfarm profit rate is equal to the difference of the growth rate of the rate of surplus value and that of the organic composition of capital. Furthermore, I divide the whole series into four phases

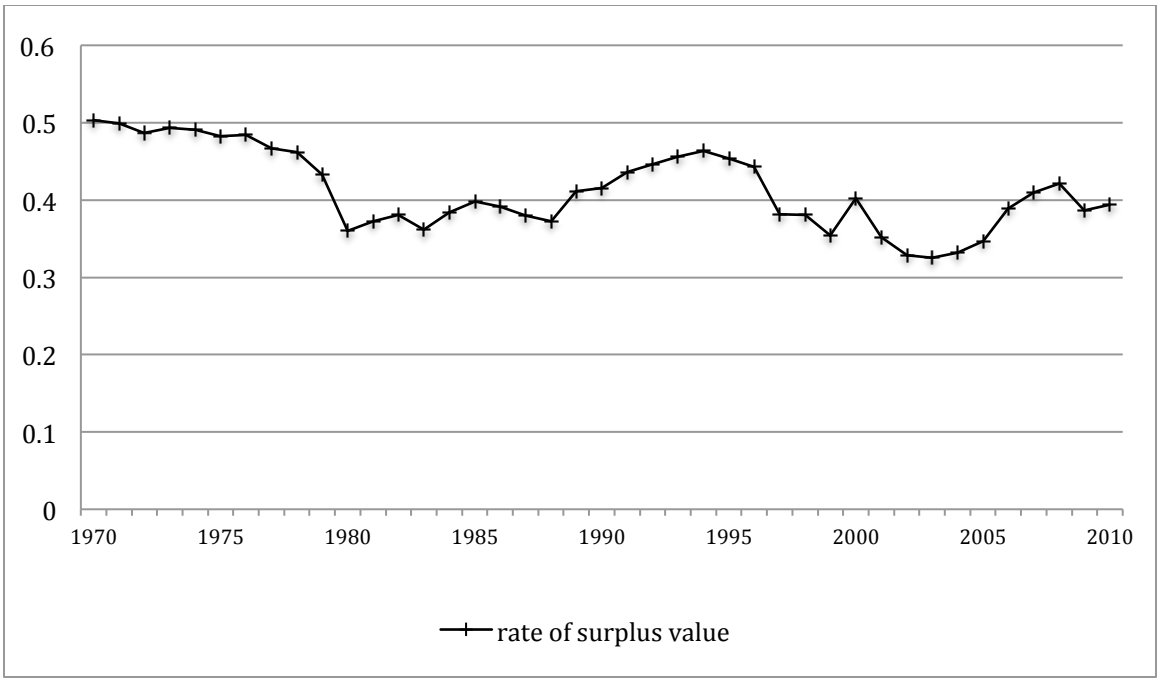


Figure 3.4 The Nonfarm Rate of Surplus Value (s) in Thailand: 1970 – 2010

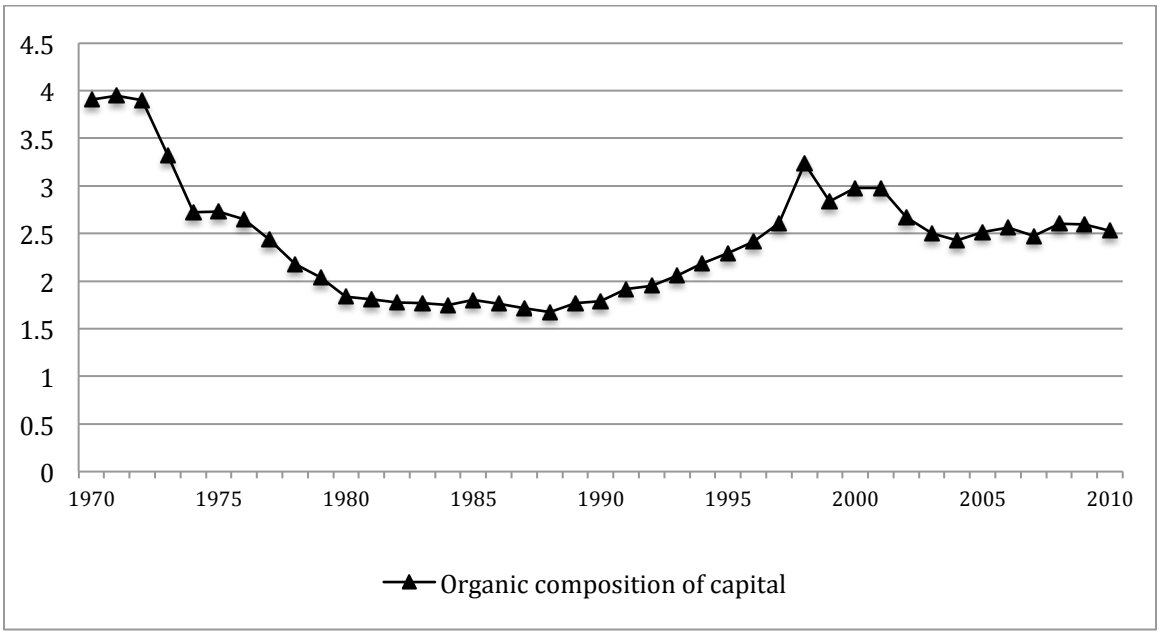


Figure 3.5 The Nonfarm Organic Composition of Capital (occ) in Thailand: 1970 – 2010

according to the shape of the nonfarm rate of profit: that is, 1970 – 1979 when it sharply increases, 1980 – 1989 when it has a tendency to increase, but with a slower rate, 1990 – 1998 when it sharply drops, and 1999 – 2010 when it slightly increases. Then, since all series move through time, I calculate annual-average geometric growth rates of all series in order to see how much each component contributes to the growth of the rate of profit in each phase. The results are presented in Table 3.1. The columns *g* of the table are annual-average geometric growth rates in each phase. The columns *i* of the table are simply calculated by having annual-average geometric growth rates of components' trends divided by those of profit rate's trends, and then have them multiplied by one hundred to get numbers in a form of percentage. The ratios can be a rough indicator estimating impact of each determinant contributing to the growth rate of the nonfarm rate of profit in each phase. It is necessary to note that, from equation (3.7), the nonfarm organic composition of capital has a negative relationship with the nonfarm rate of profit. Therefore, to properly measure impact of the nonfarm organic composition of capital on the nonfarm rate of profit in each phase, a negative one must be multiplied.

In the first decomposition, the nonfarm profit share moves in the opposite way compared to that of the nonfarm rate of profit for the first two phases, while, in the last two phases, it moves in the same way but its impact on the profit rate are only 8.5 percent in the third phase and 9.0 percent in the fourth phase. Meanwhile, the nonfarm output-capital ratio moves together with the nonfarm rate of profit in all phases. Indeed, its impact in the first two phases is very large, as it can offset impact of the inversely-related nonfarm profit share (its impact are over 100 percent in 1970-1979 and 1980-1989). In the last two phases, though the profit share partially contributes to the growth rate of the

Table 3.1 Annual Average Growth Rates of the Rate of Profit and Its Determinants

Unit: (%Δ)

Year	1970-1979		1980-89		1990-1998		1999-2010	
	g	i	g	i	g	i	g	i
Rate of profit	5.7		0.9		-7.3		2.4	
First Decomposition								
1. Profit Share	-1.1	-19.61	-0.4	-39.43	-0.6	8.5	0.2	9.0
2. Output-capital Ratio	6.9	120.97	1.3	139.93	-6.7	92.1	2.1	90.8
Second Decomposition								
3. Rate of Surplus Value	-1.7	-28.7	-0.5	-56.0	-0.9	11.9	0.3	12.5
4. OCC	-7.0	121.7	-1.4	154.6	6.9	95.1	-2.0	85.5

nonfarm rate of profit, impact of the nonfarm output-capital ratio on the movement of the nonfarm rate of profit are still much larger (92.1 percent in 1990-1998, and 90.8 percent in 1999-2000). Hence, in the case of Thailand from 1970 to 2010, the nonfarm output-capital ratio is the main factor determining fluctuations of the nonfarm rate of profit, while the nonfarm profit share played a much smaller role.

In the case of the second decomposition, the nonfarm rate of surplus value, moving very similarly to the nonfarm profit share, moves in an opposite direction compared to the nonfarm rate of profit in the first two phases. For the last two phases, similarly to the case of the nonfarm profit share, despite its impact in the last two phases, the nonfarm rate of surplus value contributes only 11.9 percent in the third phase and 12.5 percent in the fourth phase. Meanwhile, the nonfarm organic composition of capital's impact on the growth rate of the nonfarm rate of profit is great enough to offset

negative impact of the nonfarm rate of surplus value in the first two phases. In addition, in spite of the partial contribution of the growth rate of the nonfarm rate of profit in the last two phases, the nonfarm organic composition of capital still contributes 95.1 percent in the third phase and 85.5 percent in the fourth phase.

From these two decompositions, I can conclude that the nonfarm output-capital ratio and the organic composition of capital are the major determinant of the nonfarm rate of profit, while the profit share and the rate of surplus value have relatively smaller impacts on the nonfarm rate of profit in Thailand from 1970 to 2010.

3.5 The Rate of Profit in Thailand and the Thai Economy

3.5.1 The Labor Market

Because net domestic product is divided to be wages and profits, the nonfarm profit share can also tell the nonfarm wage share (ω) from the relation

$$\omega = \frac{W_n}{Y_n}$$

$$= \frac{Y_n - \Pi_n}{Y_n}$$

$$\omega = 1 - \pi \tag{3.8}$$

Equation (3.8) shows that the nonfarm profit share implies a ratio of wage share.

In a Marxian tradition, a change in wage share depends on the relationship between bargaining power of workers and that of capitalists, determined by labor demand to run an economy and a size of a reserve army of labor. In particular, rapid economic growth, leading to increasing labor demand and decreasing the size of the reserve army of labor, allows workers to have greater bargaining power to ask higher wages, so the

nonfarm profit share tends to drop, and vice versa. Since Thailand has encountered both fast economic growth and disastrous economic recession, it is very interesting to see that the nonfarm profit share barely determines the nonfarm rate of profit. In more details, it is even more striking to see that from 1970 to 1979 when the nonfarm rate of profit rose very rapidly, the nonfarm profit share moved even in the opposite way. As conflicts between classes determine nonfarm profit share, it can be argued that intense class conflicts that are significant to impact distribution of income has never occurred in Thailand. As a result, fluctuations of the profit share have never had significant impact on the nonfarm rate of profit.

The insignificance of the labor market to influence the nonfarm rate of profit may be a consequence of two reasons: the structure of the Thai labor market and the role of the government. In the case of the structure of the labor market, Thailand has had a very large size of the reserve army of labor in the traditional farming sector which has provided nearly unlimited supply of labor to meet labor demand in nonfarm sectors. In the 1970s, during the early process of industrialization, which is mainly run by labor-intensive industries such as textile and garment industries, 3-4 millions of workers in the farming sector came to Bangkok to meet increasing demands in the manufacturing sector for labors in a form of off-seasonal employment, so it can be said that the process of proletarianization began (Phongpaichit and Baker 2002: 202). This unique adjustment in the Thai labor market suggests that supply of labor has the ability to meet labor demand, so sharp reduction of the reserve army of labor that allows workers to have higher bargaining power has been barely observed in Thailand. One case in the history that, as argued by Phongpaichit and Baker (1999: 96), Thai manufacturers faced a shortage of

labor supply and real wage rates rose was during the first half of the 1990s, and this led to the loss of competitiveness in the export sector. In spite of the fact that real wage increased, the rising profit share and the rising rate of surplus value suggest that this increasing real wage was not as fast as increasing productivity in the nonfarm sector. Therefore, it was increasing labor productivity, not a shortage of labor supply nor greater bargaining power of workers, which led to higher real wage. In addition, the farming sector also acts as an absorber of nonfarming unemployed workers, so an increasing size of the reserve army of unemployed workers do not really allow capitalists to have greater bargaining power. The obvious example of this case is during the crisis in 1997-98. During this harshest economic crisis in the country's history, according to the World Bank's data, the growth rate of GDP per capital was as low as -12%, but unemployment rate had never been greater than 3% although many workers were laid off. The secret behind this low unemployment rate in the midst of the crisis was simply because laid-off workers returned to work in their family-owned farms. Therefore, as suggested by Figure 3.2 and Figure 3.4, the profit share and the rate of surplus value, in spite of a sharp drop of the nonfarm rate of profit, have a tendency to slightly drop until 2003. That is, the crisis did not completely destroy bargaining power of workers, and capitalists' income losses were bigger than workers' wage losses.[8]

[8] This, however, does not mean that capitalists suffer from the crisis more than workers. Ungpakorn (2001) argued that, as a consequence of the crisis, "restructuring offensive" – the tool, such as privatization of state-owned enterprises, delay of an unemployment benefit scheme, and repression of real wage, used by capitalists to transfer economic burdens from the crisis to workers – was implemented, so workers were those who really suffered from the crisis. This argument is correct if it is considered that workers' incomes were very close to the poverty line, so small drops of their income put them in poverty.

For the latter reason, Hewison and Brown (1993) also emphasized the role of politics on the strength of labor unions; that is, more liberal-democratic governments tended to yield more benefits towards the working class. In addition, 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 had been in power for most of the time from the late 1970s to the early 1990s. Therefore, the working class had never gained a winning momentum in wage-profit struggles, because the governments employed several tactics to disarray strengths of labor organizations. Among many examples given in his book to support the arguments, Brown's example (2004: 109) on the attempt by the National Peacekeeping Council's Announcement 54 to abolish the 1975 Labor Relation Act may be the most obvious intention by the government to destroy workers' bargaining power.[9]

It is important to emphasize that this section does not say that labor has not been important for the Thai economic development. However, it actually argues that a unique characteristics of the Thai labor market has prevented an emergence of intense class struggle, so the profit share and the rate of surplus value do not play a significant role to determine the nonfarm rate of profit in Thailand. Labor, interacting with capital, has played a very important role to the development of the Thai economy, as I can explain in the next section.

[9] The National Peacekeeping Council was a military clique overthrowing the elected government of Chatichai Choonhavan in February 23th, 1991. The coup was known as a response from the Thai conservatives. The attempt to weaken the Labor Relation Act was one practice with which the government tried to abolish the heritage of left-wing movements, because the Act had been created during the rise of democracy in 1975 to expand the space to create and strengthen labor organization

3.5.2 Capital-Labor Relation

The significance of the nonfarm output-capital ratio and the nonfarm organic composition of capital to determine the rate of profit suggests that the development of the Thai economy has been due to relations between capital and labor to generate outputs. A sharp drop of the organic composition of capital, which increases the nonfarm rate of profit during the 1970s, was obviously due to the process of proletarization in which self-employed farmers became both off-seasonal and permanent workers. At the time, a massive number of workers migrated to the city, while labor-intensive industries enjoyed low labor cost. Therefore, the textile industry became the spearhead of Thailand's export and economic growth. Not only did it account for 6% of total exports, the textile industry employed 54,000 workers by 1979 (Pasuk and Baker 2002: 140). As a result, wage bills for the whole economy increased rapidly, while the value of net capital stock increased at a relatively slower pace. This led to the lower nonfarm organic composition of capital and the higher nonfarm profit rate. This large reserve army of labor in Thailand during the early period of industrialization is compatible with Marx's explanation on how "the relative surplus population" can act as a counteracting factor of falling profit rate (1991: 343-344).

As the economy developed, the role of labor-intensive industries to drive the economy gradually faded down, while the manufacturing sector replaced the position of the leading sector of the economy. Some capital-intensive industries, such as automobiles and parts, electronics, and machineries, played a bigger role to boost the economy, so the values of GDP originating from machinery grew around 9 fold, 12 fold for electrical machineries and supply, and 5 fold for transport equipment during 1982-1992. Even

though many self-employed farmers continually moved to the city to be workers, uses of capital in production processes increased faster. As a result, the organic composition of capital dropped at a slower rate since 1980 and started increasing in 1989. From 1990 to 1998, the Thai economy merged to Marx's prediction of the falling rate of profit in which the rising organic composition of capital plays a main role. Investment as a percentage of GDP accounted for 28 percent in 1980, but this ratio kept increasing until reaching around 40 percent in 1990. After 1990 until the crisis hit in 1997, this ratio stayed at around 40 percent for the whole period. This greater share of investment in total GDP signals that the value of net fixed capital stock increased relatively fast compared to rising GDP. Because of this, the output-capital ratio also dropped and contributed to the lower nonfarm rate of profit. In this sense, as long as the economy develops and more capital is used in the 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 $\grave{a}$ la Marx."

3.5.3 The Effects of Changes in Prices

It is important to note that net domestic product (Y) and net fixed capital (K) are based on different prices: GDP deflator expresses price level of Y, while capital goods price index expresses price level of K. Since equation (3.3), explaining the components of the output-capital ratio, is in nominal values, it can be transformed to be a function of real values and their prices as follows.

$$u = \frac{p \cdot Y'}{p_k \cdot K'} \qquad (3.3^*)$$

where p is GDP deflator, p_K is capital good price index, Y' is the real value of net domestic product, and K' is the real value of net capital stock. The focus of this part is on these two price indexes. Taking the rate of change of equation (3.3*) yields that the growth rate of p, which is the inflation rate of GDP, and the growth rate of p_K, which is the inflation rate of capital goods, affect the growth rate of u. Since u is the determinant of the rate of profit, differences of these two inflation rates can have great impact on the rate of profit.

Since the nonfarm rate of profit in Thailand has been mainly determined by the nonfarm output-capital ratio, relative changes of these price indexes can, hence, lead to changes of the nonfarm rate of profit. Figure 3.6 presents annual inflation rates of GDP and annual inflation rates of capital goods from 1971 to 2010. The figure shows that these two inflation rates moved relatively similarly from 1981 to 2011, but they were different during the 1970s. Therefore, different changes of these two price indexes had impact on the nonfarm rate of profit only from the 1971 to 1980, while they became neutral from 1981 to 2011. During the 1970s, GDP deflator rose much faster than capital goods price index. As a result, price of capital became relatively cheaper, so investors tended to make more profit in nominal value from their fixed capital and hence the rate of profit increases. This is an obvious benefit to capitalists in Thailand who invested in textiles and other agricultural products to make higher profits out of their fixed capital. This "cheapening of the elements of constant capital" is one of the counteracting factors when Marx mentions the factors that could be against the tendency of the rate of profit to fall (Marx 1991 :342-343). This factor played a role on the fast-growing nonfarm rate of profit in Thailand only in the 1970s, before it became neutral after the 1980s.

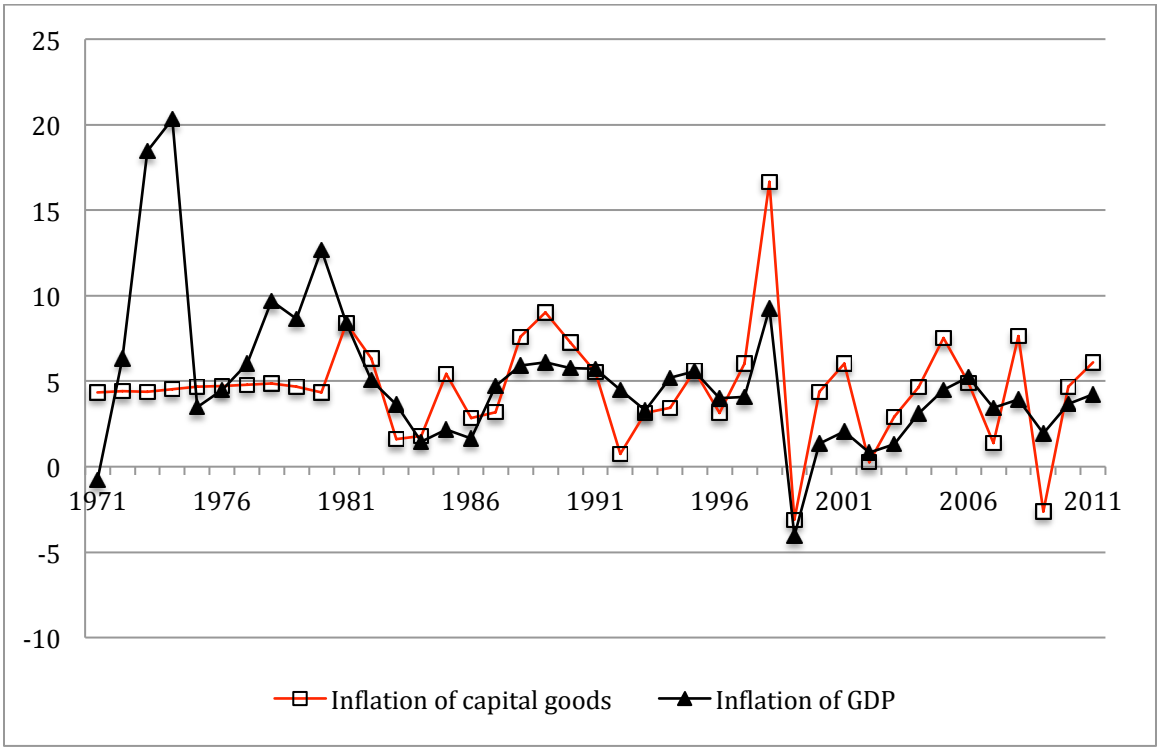


Figure 3.6 Inflation rate of GDP and Inflation rate of capital goods in Thailand: 1971 to 2010

3.6 Conclusion

The nonfarm rate of profit in Thailand can be divided into four phases: the sharp rise during the 1970s, the fluctuation with slightly increasing trend during the 1980s, the sharp drop during 1990 to 1998, and the slight increase from 1999 to present. The decompositions tell that the output-capital ratio and the organic composition of capital in the nonfarm sector are the main determinants of the nonfarm profit rate, while the profit share and the rate of surplus value did not have impact during the first two phases and had only slight impact in the last two phases.

In the first phase, workers were pulled from the countryside to work in labor-intensive manufacturing industries, so the proportion of capital in production processes

was still small and economic growth was built by labor-powers. The nonfarm profit rate hence increased, and this was a foundation for economic boom in the next decade. In the second phase, a few small crises in the early 1980s led to fluctuations of the nonfarm profit rate. The high profit rate attracted investments, and production process leaned to be more capital-intensive. However, shooting export growth since 1986 pushed up the country's economic growth, so the nonfarm profit rate kept rising in spite of the increasing uses of capital in production processes. During the late 1980s, a massive amount of foreign capital flew into the country to energize economic growth. In the third phase, uses of capital were excessive and a sign of economic crisis appeared, as the nonfarm rate of profit started dropping. The decreasing nonfarm rate of profit led to foreign investors' losses of confidence in the Thai economy, so foreign capital eventually flew away from the country and the crisis erupted. After the crisis, in the fourth phase, the rate of profit, in spite of its small increase in 1999 and 2000, never showed a clear trend of increase until 2002. Since the rate of profit theoretically signals the health of the economy, the nonfarm rate of profit evaluates that Thailand got stuck in a deep hole of the crisis in 1997-98 for around four years and it was as late as 2002 when Thailand could fully recovered from the crisis. After the crisis, the nonfarm rate of profit, even with its rising trend, cannot returns to its high rate prior to the crisis, so economic growth cannot get back to reach its prosperous rate. Chapter 5 will use the model presented in Chapter 2 to explain the reason for this phenomenon.

CHAPTER 4

PROFIT RATE AND THE BALANCE-OF-PAYMENTS-CONSTRAINED GROWTH RATE: THE EMPIRICS

4.1 Introduction

To be able to explain the interaction between the rate of profit and the balance of payments of a country, the dynamic model of the balance of payments and the rate of profit presented in Chapter 2 requires two preliminary assumptions. First, the original Thirlwall's law – equation (2.5) – can act as the equilibrium growth rule of an economy by being able to predict the actual growth rate, while the extended Thirlwal's law – equation (2.17) – should yield a better predicted rate of economic growth. Second, because the extended Thirlwall's law is a function of the growth rate of capital flows, in order to eligibly construct equation (2.21), it is necessary that the growth rate of capital flows must be determined by the rate of profit.

This chapter is aimed at providing some empirical support to argue that the model in Chapter 2 can explain the growth rate of the Thai economy by trying to prove that two preliminary assumptions hold. Hence, this chapter can be considered as being composed of two main parts, and each part is attempting to prove each assumption for the case of Thailand. The period of consideration in this chapter is from 1980 to 2010. I omit to test the data from 1970 to 1980, because of the following two reasons. The first one is a problem of data availability. The data on capital inflows of Thailand are not available

prior to 1975. Since I calculate a five-year moving average of some variables in order to eliminate some cyclical fluctuations, using empirical works prior to 1980 are not doable. The second reason is regarding the stage of economic development in Thailand. The 1980s was the period in which the country started employing the export-led strategy and encouraging foreign capital inflows to boost the economy, so the two preliminary assumptions and hence the model are likely to be valid to explain the Thai economy after the 1980s.

To test the first preliminary assumption, the first part of this section is going to test whether the original Thirlwall's law and the extended Thirlwall's law can predict the actual rate of economic growth. In spite of a wide range of literature on empirical tests of Thirlwall's law, there has been just one work by Ansari et al. (2000) trying to test whether the original Thirlwall's law holds in four Southeast Asian countries, including Thailand, from 1970 to 1996. The result is that the original Thirlwall's law does not hold in Thailand, because the predicted growth rate is, on average, lower than the actual growth rate. In spite of the existence of this work, there are three main reasons that I should retest whether or not Thailand has been constrained by the balance of payments. First, whether or not Thailand has been constrained by the balance of payments after 1996 is still unknown, as the work covers the data only from 1970 to 1996. Second, since the predicted growth rate obtained from the original Thirlwall's law is lower than the actual growth rate, according to Thirlwall and Hussain (1982), this might be because capital inflows that also affect the balance of payments are not considered. Third, Ansari et al. (2000) estimated that the income elasticity of import in Thailand from 1970 to 1996 is equal to 2.86. Compared with Sinha (1997) who estimated that the long-run income

elasticity of import in Thailand from 1953 to 1990 was merely 2.15, the estimated income elasticity of import by Ansari et. al. (2000) might be too high, so it might yield a too-low predicted growth rate.

The second section of this chapter relies heavily on the Marxian argument that the rate of profit is the main determinant of capital flows in order to find a positive relationship between the rate of profit and the growth rate of capital flows in order to confirm the validity of the second preliminary assumption for the case of Thailand. It is very interesting to see that even though Marxists consider that the rate of profit determines movements of capital between countries, no empirical work on this regard has been done before. This part could be considered as a pioneer work to empirically test this function of profit rate by using the case of Thailand since the 1980s. Since most foreign capital has been invested in nonfarm sectors of the Thai economy, profits and the rate of profit in the farming sector should not be involved in this matter. To be precise, it should be the nonfarm rate of profit in Thailand that has attracted foreign capital after the 1980s. Therefore, in this section, I am trying to empirically find the relationship between the nonfarm rate of profit and the growth rate of capital flows in Thailand from 1980 to 2010.

4.2 Empirical Tests of the Thirlwall's Laws

4.2.1 Theoretical Framework

As already mentioned in Chapter 2, the original Thirlwall's law created by Thirlwall (1979) is

$$y_B = \frac{x}{\eta} \tag{2.5}$$

This is obviously a demand-led growth model since economic growth of a country depends on export demands of its products, so any change in supply side such as increasing productivity or increasing capacity of production is a product of export demands and does not generate economic growth. As discussed in Chapter 2, the original Thirlwall's law requires some important assumptions of equilibriums, so it is the growth rule which yields equilibrium growth rate. Therefore, the original Thirlwall's law is a long-run growth model acting as a center of gravity for actual growth rate.

Then, to get closer to the reality in which some countries could have fast economic growth despite current account deficits, Thirlwall and Hussain (1982) showed that foreign capital inflows could relax a country's balance of payments and drift the growth rate from its the equilibrium rate predicted by equation (2.5), despite its chronic deficits. The extended model is derived and simplified to be as follows.

$$y_B' = \frac{\omega(x)+(1-\omega)(c)}{\eta} \tag{2.17}$$

This model implies that a debit side of a country's capital account can increase economic growth, because foreign capital can also relax the balance-of-payments constraint. At the same time, outflows of foreign capital may negatively contribute to a country's economic growth, and possibly lead to a balance-of-payments crisis as well. Since this model is derived from the abandonment of the assumption of current account balance, it is expected that its predicted growth rate obtained from equation (2.17) should be closer to the actual growth rate than that obtained from equation (2.5).

4.2.2 Methodology

Since 1979, there have been a massive number of empirical works testing the balance-of-payments-constrained growth models for countries and group of countries. Not only reviewing some articles up to 1997, McCombie (1997) also explained the evolution of empirical tests of balance-of-payments-constrained growth models. McCombie and Thirlwall (2004) reviewed the empirical tests of the models up to the year 2003. Then, Thirlwall (2011) reviewed empirical studies of the models from 2003 onwards. Regardless of their minor on econometrical techniques or data handling, most empirical studies follow the following stages of estimation. In the first stage, income elasticity of demand for import must be estimated. The general multiplicative demand function for import with constant elasticities usually assumed in literature on the balance-of-payments-constrained growth model is;

$$M = \left(\frac{P_f}{P}\right)^{\phi} Y^{\eta} \tag{2.3}$$

where M is the real value of imports, P is the domestic price of exports, P_f is the foreign price of imports in domestic currency, ϕ is the price elasticity of demand for imports, and η is the income elasticity of demand for imports. From the function, instead of understanding P_f and P separately, we can understand that $\left(\frac{P_f}{P}\right)$ is an inverse function of a country's term of trade. Following Thirlwall and Hussain (1982), the income elasticity of demand for imports can be estimated from the following equation.

$$ln\, M = ln\, A + \phi\, ln \left(\frac{P_f}{P}\right) + \eta\, ln\, (Y) \tag{4.2}$$

The coefficient η in front of the variable lnY_t in the regression of (3) means the value of the income elasticity of demand for imports. As a number of samples are required for each variable, η is hence a long-run income elasticity of demand for imports.

Because this is a time series regression, a general problem of time series data is the problem of nonstationary variables in which their mean, or variance, or both of them vary through time, because their current values are determined by previous values. Therefore, behaviors of these nonstationary variables can be understood only under the time of consideration, but the knowledge on these variables cannot be generalized to other time periods. This problem of nonstationarity is also generally known as a unit root problem. A regression of nonstationary variables can cause the phenomenon of spurious regression in which a result could present a relation of unrelated variables. In other words, coefficients of independent variables could be statistically significant and R^2 could be excessively high. To avoid this problem, the unit root test and cointegration test must be applied to check if any variable contains a unit root problem and to avoid spurious regression.

In the second stage, y_B and y_B' are estimated from equation (2.5) and equation (2.17), respectively.

In the third stage, annual growth rate of y_B and y_B' must be econometrically tested with actual growth rate (y) in order to tell whether or not y_B and y_B' are valid to explain y. In this chapter, I follow the econometric test of the balance-of-payments-constrained growth model designed by Bairam (1988) explaining by the following equations

$$y = \beta_1 y_B \tag{4.3}$$

and $y = \beta_2 y'_B$ (4.4)

The coefficients in front of y_B and y'_B are to tell validity of the original Thirlwall's law and the extended Thirlwall's law to explain a country's actual growth rate. That is, if β_1 is equal to one, the original Thirlwall's law is valid. Meanwhile, if β_2 is equal to one, the extended Thirlwall's law is valid. That is, the Wald tests by setting null hypotheses $\beta_1 = 1$ and $\beta_2 = 1$ must be tested by using F-value statistics. In order for the original Thirlwall's law and the extended Thirlwall's law to be valid to explain a country's economic growth, β_1 and β_2, respectively, must be significant and can be considered equal to one according to the Wald test of parameter.

In order to tell which predicted growth rate is better to explain actual growth rate, I can easily come up with the answer if one of equation of (4.3) and (4.4) is significant while the other one is not. However, if both are significant, the better predicted growth rate should be the one that deviates less from actual growth rate. In Thirlwall and Hussain (1982), the method used to tell whether the extended Thirlwall's law is better than the original Thirlwall's law is by calculating the average value of y_B and that of y'_B in a certain interval of time in order to find "average deviation," which is differences of these predicted growth rates and average actual growth rate. This method perhaps is too rough to tell the abilities of both models to predict the actual growth rate, because it ignores deviations of both predicted growth rates from the actual growth rate in each year. In other words, it is possible both growth rates may greatly fluctuate around the actual growth rate, but their averages are close to the average of the actual growth rate. To solve this problem, I, following a general formula of standard deviation, can have an alternative statistical reference to evaluate how much y_B and y'_B deviate from actual growth rate.

Analogous to the standard deviation, deviation of y_B and that of y'_B from actual growth rate (y) are formulated as follows.

$$d_B = \sqrt{\frac{1}{N}\sum_{i=1}^{N}(y_{Bi} - y_i)^2} \quad (4.5)$$

and $$d'_B = \sqrt{\frac{1}{N}\sum_{i=1}^{N}(y'_{Bi} - y_i)^2} \quad (4.6)$$

The lower the value of d_B and that of d'_B, the better y_B and y'_B, respectively, can explain actual growth rate, because they deviate less from y. Since it is expected that the extended Thirlwall's law is better than the original Thirlwall's law to explain actual growth due to its relaxation of the current account in balance, d'_B is expected to be lower than d_B to tell that y'_B deviates less from the actual growth rate.

4.2.3 Data and Explanations of the Variables

4.2.3.1 Variables

M = Real Value of Imports; obtained from the variable 'Imports of goods and services (constant 2000 US$)'

$\left(\frac{P_f}{P}\right)$ = Inverse of Terms of Trade: elaborated from finding an annual inverse of the variable 'Net barter terms of trade index (2000 = 100)'

Y = Real GDP; obtained from the variable 'GDP (constant 2000 US$)

x = Real Growth Rate of Value of Exports; elaborated from finding growth rate of five-years moving average of the variable 'Exports of goods and services (constant 2000 US$)'.

c = Real Growth rate of Total Private Capital Inflows = Nominal Growth rate of Total Private Capital Inflows (k); elaborated from finding growth rate of five-years moving average of the variable 'Private capital flows, total (BoP, current US$)' – Growth Rate of domestic price level; obtained from the variable 'Inflation, GDP deflator (annual %)'

ω = The ratio of export to total receipts of foreign currency; elaborated from finding five-years moving average of the variable 'Exports of goods and services (current US$)' divided by the sum of five-years moving average of the variable 'Exports of goods and services (current US$)' and of five-years moving average of the variable 'Private capital flows, total (BoP, current US$)'

4.2.3.2 Compilations of Data

Although foreign capital came to invest in Thailand and brought in some advanced technologies since the late 1960s (Doner 2009: 187), the amount had always been quite low. In fact, foreign capital started playing a significant role to determine economic growth as late as the late 1980s (Dixon 1999: 124-125). Since the model consists mainly of the rate of profit and foreign capital, it is more appropriate, in order to use the model to explain an economy, to consider the Thai economy during the era that foreign capital started being an important factor to determine the economy. Therefore, the analysis in this part tries to prove the validity of the original Thirlwall's law and the extended Thirlwall's law only from 1980 to 2010.

Another crucial point is regarding the nature of the balance-of-payments-constrained growth models. That is, both the original Thirlwall's law and the extended Thirlwall's law are long-run growth models. In order to really find empirical supports for the model, as done by Atesoglu (1993-94), cyclical movements of all variables used to

measure y_B and y'_B should be filtered away. As noted before, the methodology to calculate income elasticity of demand for imports already yields a long-run relationship between growth rate of import and that of GDP; that is, η is already a long-run variable, which can be fitted to the test of both Thirlwall's law. However, from equation (2.5) and (2.17), $x, c,$ and ω are annual growth rate which contain some cyclical fluctuations. In order to filter away some cyclical movements of these variables, I calculate the five-years moving average of the level of real and nominal values of export and nominal value of capital flows before calculating $x, c,$ and ω. All data can be retrieved from the database 'World Development Indicator (WDI) and Global Development Finance (GDF)' of the World Bank's World databank.

The data of the variables used to calculate the income elasticity of demand for imports are the annual data from 1980 to 2010. Meanwhile, the measurement of $x, c,$ and ω are filtered away some cyclical fluctuations by finding five-years moving average, so the data are the annual data from 1976 to 2010 in order to have $x, c,$ and ω from 1980 to 2010.

4.2.4 Empirical Results

4.2.4.1 Estimation of the Income Elasticity of Demand for Imports

As this is a time-series regression analysis, unit root test is a necessary first step to check stationarity of variables and to avoid a spurious regression. After M, $\left(\frac{P_f}{P}\right)$, and Y are transformed into their natural logarithm according to equation (4.2), I employ the models with and without trend of the Augmented Dickey-Fuller test and the Phillips-Perron test to check for stationarity of each variable. The results can be presented in Table 4.1.

Table 4.1 The Import Function: Unit Root Test

Variables	Augmented Dickey – Fuller		Phillips - Perron	
	Without Trend	Trend	Without Trend	Trend
lnM	-1.05	-1.38	-1.05	-1.54
d.lnM	-4.49***	-4.50***	-4.43***	-4.42***
lnY	-1.98	-0.78	-1.63	-1.14
d.lnY	-2.98**	-3.13*	2.96**	3.07
ln P_f/P	-2.24	-2.99	-2.22	-3.30*
d. ln P_f/P	-5.85***	-5.72***	-6.12***	-5.92***

*** rejection of the unit root hypothesis at 1% MacKinnon's critical value.
** rejection of the unit root hypothesis at 5% MacKinnon's critical value.
* rejection of the unit root hypothesis at 10% MacKinnon's critical value
The letter d. stands for the first difference of the variable.

From Table 4.1, the only variable that seems to be problematic is lnY whose first difference is not stationary when it is tested by the Phillips-Perron test with trend. However, when the Augmented Dickey-Fuller test with trend is applied to test the first difference of lnY, the null hypothesis of lnY to have a unit root problem can be rejected at 10% confidence interval. Hence, the test results are likely to suggest that all variables are stationary at their first differences (integrated of order 1, or I(1)).

Even though all variables are I(1), it is still possible to run a nonspurious regression if all variables are cointegrated and have long-run relationship. In order to find this information, lag length selection criteria and the Johansen-Juselius cointegration test must be conducted. Due to a small number of observations, when the test is applied, a maximum number of lag length is set at equal to 2 lags. The results can be seen in Table 4.2. Lag length selection suggests that one lag is optimal for the cointegration test. Given this optimal lag length, the results of the cointegration test are presented in Table 4.3.

Table 4.2 The Import Function: Lag Length Selection

Lag	FPE	AIC	HQIC	SBIC
0	**9.9e-06**	**-3.01**	**-2.97**	**-2.87**
1	**2.7e-08***	**-8.92**	**-8.74***	**-8.35***
2	**2.7e-08**	**-8.94***	**-8.63**	**-7.95**

*** indicates the lag length that yields a minimum number for each information criterion.**

FPE is the final prediction error, AIC is Akaike's information criterion, HQIC is the Hannan and Quinn information criterion, and SBIC is Schwarz's Bayesian information criterion.

Table 4.3 The Import Function: Johansen-Juselius Cointegration Test

Rank	Eigenvalue Statistic	Critical Eigenvalue	Trace Statistics	Critical Trace
		Model without Trend		
0	79.91	20.97	94.71	29.68
1	14.73	14.07	14.80*	15.41
2	0.07*	3.76	0.74	3.76
		Model with Trend		
0	29.63	23.78	40.48	34.55
1	10.80*	16.87	10.85*	18.17
2	0.05	3.74	0.05	3.74

*** indicates that the null hypothesis cannot be rejected**

According to the test result, the null hypothesis of no cointegration (Rank = 0) can be rejected at 95% confidence interval by both eigenvalue statistics and trace statistics in both the model with trend and that without trend. These results can be interpreted that all of the variables in the import demand function (equations (4.2)) are cointegrated, so they have long-run relationship. The test result generally suggests that I can proceed forward to find only one income elasticity of import of Thailand throughout the whole time period of 1980 to 2010.

However, merely the conclusion from the Johansen-Juselius cointegration test may not be sufficient. That is, it is still arguable that the Johansen-Juselius cointegration yields the results of cointegration among variables, because possible structural breaks are not taken into account. As stated earlier, the Thai economy from 1980 to 2010 kept fluctuating through time from the fastest-growing economic growth to the severe economic crisis, so it is possible that structural breaks occurred and income elasticity of imports changed due to the breaks. If structural breaks were detected, dividing an economy into a certain number of periods, it would be methodologically better to find an income elasticity of import of each period.

To take into account the possible impact of the structural breaks, the Gregor-Hansen test, discovered by Gregory and Hansen (1996), to find cointegration of data by taking into consideration of structural breaks should be applied. The main idea of the test is not only to detect a structural break in a series of a regression but also to test, if a break is detected, whether or not cointegration exists despite the existence of the structural break. The test covers four types of structural breaks: a break in the constant term (the C model), a break in the constant and the trend (the C-T model), the break in the constant and the slope (the C-S model), and the break in the constant, slope, and trend (the C-T-S model).[10] I test all types of the breaks to see whether or not cointegration can be detected and to affirm what is suggested in the Johansen-Juselius cointegration test. The results of the Gregory-Hansen test can be presented in Table 4.4.

[10] STATA is very handy, as it can run these four models instantly. It further uses some information criteria to find the best lag length for the calculation of the test statistics in each model.

Table 4.4 The Import Function: Gregory-Hansen Cointegration Test with Structural Breaks

Model	ADF		Z_a		Z_t	
	Statistics	Break Year	Statistics	Break Year	Statistics	Break Year
C	-4.43	1988	-4.33	1988	-22.89	1988
C-S	-5.30**	1999	-4.98	1999	-26.71	1999
C-T	-4.49	1987	-4.56	1987	-25.70	1987
C-T-S	-5.94*	1994	-5.94*	1994	-33.44	1994

**** rejects the null hypothesis of no cointegration at the 5% significance level.**
*** rejects the null hypothesis of no cointegration at the 10% significance level.**

According to the results, the Gregory-Hansen test with different models yields different break years. That is, the C model yields that 1988 is a break year, the C-S model yields that 1999 is a break year, the C-T model yields that 1987 is a break year, and the C-T-S model yields that 1994 is a break year. These different results lead to an ambiguity when the break year has be to decided in order to run the regression of equation (4.2). Furthermore, there are some possibilities that even though a structural break really existed, the break does not impact the estimation of equation (4.2) because all of the variables are cointegrated. These results can be noticed in the C-S model with 5% significant level of ADF test, and the C-T-S model with 10% significant level of ADF and Z_a test. From these results, the best way to calculate the income elasticity of import is by using the whole time period from 1980 to 2010.

Another important point is that, in order to avoid the problem of autocorrelation, I use Prais-Winsten regression to run equation (4.2). The results can be presented in Table 4.5.[11]

[11] Without using the Prais-Winsten estimation, the regression yields that the coefficient of the variable lnY is equal to 1.63, but the Durbin-Watson statistics signals a severe autocorrelation problem. The Prais-Winston estimation is a convenient procedure to solve this problem.

Table 4.5 The Import Function: Prais-Winsten Regression

	Coefficient	Standard Error	t	P
Constant	-14.28***	1.48	-9.63	0.00
Income Elasticity	1.64***	0.09	17.5	0.00
Price Elasticity	-0.60*	0.33	-1.85	0.08
Adjusted R^2	0.9963			
DW	1.73			

***** indicates that a coefficient is significant at the 1% significance level.**
*** indicates that a coefficient is significant at the 10% significance level.**

The main focus of this regression is on the income elasticity of demand for import, the coefficient of variable lnY, which is statistically significant at the 1% significant level, and its value is equal to 1.64. The income elasticity of import is elastic because Thailand is an open economy whose international trades are important for its economic growth. Therefore, a percentage change of GDP usually leads to a large change of other international transactions including imports. Furthermore, the Durbin-Watson statistic (DW=1.73) is at an appropriate level to say that the problem of autocorrelation may not present in this regression.

4.2.4.2 Estimations of y_B and y_B'

After obtaining η is equal to 1.64, I can proceed to calculate y_B and y_B' from equation (2.1) and (2.8), respectively. Comparisons of the actual growth rate (y), the estimated growth rate obtained from the original Thirlwall's law (y_B), and the estimated growth rate obtained from the extended Thirlwall's law (y_B') can graphically be presented in Figure 4.1.

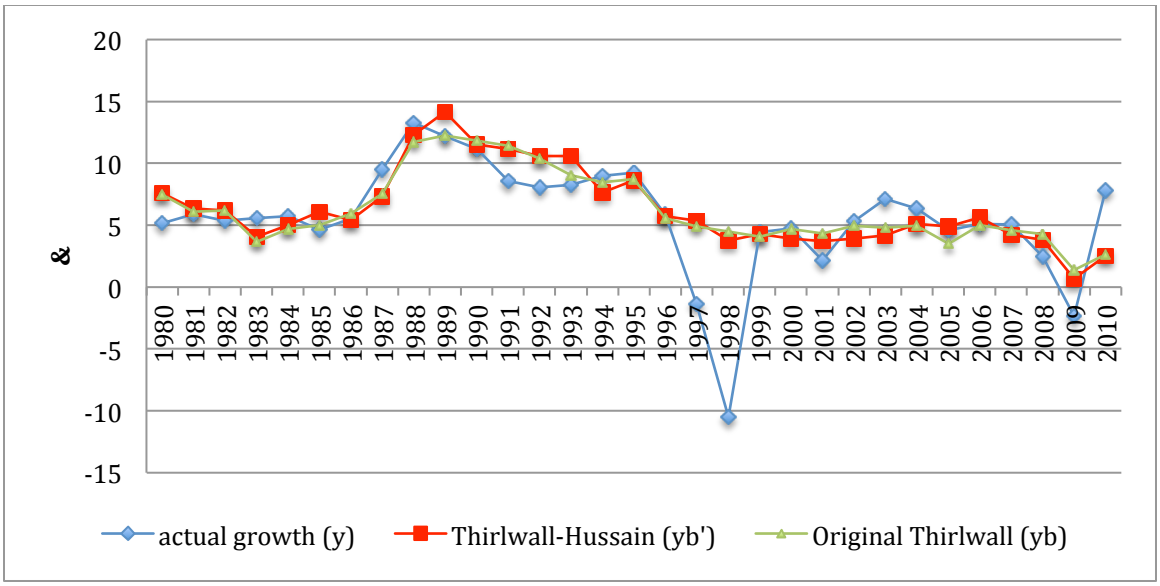


Figure 4.1 y, y_B, and y'_B: 1980 to 2010

4.2.4.3 The Validity of the Thirlwall's Laws

As already explained in the section on the methodology, the test of the validity of y_B and that of y'_B to explain the actual growth rate requires two stages. In the first stage, equation (4.3) and (4.4) must be run to get the coefficient β_1 and β_2 by using the whole set of data from 1980 to 2010. In the second stage, the coefficients must be tested whether they are equal to a unity, meaning whether or not they can be statistically considered as being equal to the actual growth rate.

To a further extent, I suspect that the economic crisis in 1997-98 caused a big change in the Thai economy. To test the ability to explain the Thai economy of y_B and y'_B, together with running the whole series of data from 1980 to 2010, I choose 1998 as a critical year, and run regressions of equation (4.3) and (4.4) with restricted time periods: 1980 to 1998 and 1999 to 2010. Table 4.6 presents the test for the validity of y_B and y'_B in the Thai economy.

Table 4.6 The Validity of the Original Thirlwall's Law and the Extended Thirlwall's Law

	1980 – 2010		1980 – 1998		1999 - 2010	
	Coefficients	F-statistics	Coefficients	F-statistics	Coefficients	F-statistics
y_B	0.92*** (10.37)	0.58	0.89*** (7.95)	1.66	1.09*** (7.10)	0.35
y'_B	0.90*** (10.63)	1.41	0.86*** (8.21)	1.05	1.13*** (7.44)	0.77

***** indicates that a coefficient is significant at the 1% significance level.**

The table presents that regressions of equation (4.3) to get the coefficients of y_B and those of (4.4) to get the coefficients of y'_B are set into three time periods: 1980-2010, 1980-1998, and 1999-2000. The columns 'coefficients' show estimated β_1 for y_B and β_2 for y'_B in the first stage of this test. The terms in the parentheses below the coefficients are the t-value statistics of all coefficients. The columns 'F-statistics' show the F-value statistics of the Wald test setting the null hypothesis: the coefficients are equal to one. All F-statistics are too low to reject the null hypothesis, so all estimated coefficients are statistically equal to one. As a result, in all cases, y_B and y'_B can explain the actual growth rate of Thailand.

4.2.4.4 y_B and y'_B: Which One is Better?

To tell whether y_B or y'_B is better to predict the actual growth rate, I calculate d_B and d'_B from equation (4.5) and (4.6) to tell deviation of y_B and y'_B from y. To be consistent with the above analysis, I still suspect that 1998 is the year that the structural break could occur since it was the worst year of economic downturn. The results can be presented in Table 4.7.

Table 4.7 Averages and Deviations of y, y_B, and y'_B

	1980 – 2010		1980 – 1998		1999 - 2010	
	Average	d_B,d'_B	**Average**	d_B,d'_B	**Average**	d_B,d'_B
Thirlwall – Hussain (y'_B)	6.33	3.34	7.86	3.91	3.92	2.15
Original Thirlwall (y_B)	6.28	3.38	7.65	3.96	4.10	2.19
Actual Growth (y)	5.61		6.38		4.41	

Theoretically, according to Thirlwall (1979), a country that has current account surplus means that its balance of payments grows faster than its national income, so estimated growth rates should be greater than its actual growth rate. Meanwhile, in the opposite case, estimated growth rates should be smaller than its actual growth rate for a country that suffers from its current account deficit. The results, however, are contradictory with the theory, because, during 1980 to 1998 when Thailand had current accounts deficits for most of the time, average values of y_B and y'_B are greater than that of y, while, from 1999 to present when Thailand have mostly had current account surplus, average values of y_B and y'_B are smaller than that of y. Following Thirlwall (1979), explanation of these contradictions could be because of effects from relative price movements. According to the data on net barter term of trade index[12], Thailand's term of trade index had a falling tendency from 1980 to 2001, while the tendency has increased after that. Assuming that the Marshall-Lerner condition has held throughout the period of consideration, the falling term of trade may contribute to too-high values of y_B and y'_B

[12] The data are available from the database 'World Development Indicator (WDI) and Global Development Finance (GDF)' of the World Bank's World databank.

before the crisis erupted, while the increasing term of trade may lead to a too-low value of y_B and y_B' after the crisis.

In addition, the results reflect something interesting. Since the average value of y_B' is greater than that of y_B prior to the crisis before it has been lower after the crisis, this finding suggests that capital flows were likely to favor the balance of payments from 1980 to 1998 while they have jeopardized it since then. This is well matched with the fact that Thailand was one of the major destinations for foreign capital among other emerging countries before the crisis, but its popularity became faded afterwards.

Even though the results show that the average value of y is closer to that of y_B than that of y_B' in all time periods, this does not mean that the original Thirlwall's law is better than the extended Thirlwall's law in terms of their abilities to predict y because, as explained in the section on methodology, the average deviations ignore deviations in each year. Since d_B' is smaller than d_B in all periods, this suggests that y_B', compared to y_B, deviates less from y. Therefore, in each year, the extended Thirlwall's law seems to yield a more accurate predicted growth rate in the case of the Thai economy.

In sum, the full course of econometric tests reveals that both the original Thirlwall's law and the extended Thirlwall's law are able to explain economic growth in Thailand. In addition, my calculations of d_B and d_B' suggest that the extended Thirlwall's law deviates less from the actual growth rate, so it is a better model to explain the Thai economy. As a result of these two findings, the first preliminary assumption of the model presented in Chapter 2 is proved true, so I can proceed to test the second preliminary assumption of the model in the next section.

4.3 Empirical Relationship between the Nonfarm Profit Rate and Capital Flows

4.3.1 Theoretical Framework

As discussed in Chapter 2, Marx did not really talk about the relationship between profit rate and international capital flows. In his original argument (Marx 1991: 242), differences of profit rates among sectors of production lead to movements of capital seeking for highest profits, so a sector with higher profit rate would encounter capital inflow while capital flows out from a sector with lower profit rate. Since his goal, in this part, is to propose equalization of profit rates among sector, he intentionally omitted discussion on profit rate and capital flows between different regions or countries.

Marxists who picked up this omitted point and consider the rate of profit as a determinant of foreign capital flows were those who applied Marxist theories to explain the stage of imperialism in the world capitalist economy. The classical debate between the revisionists, such as Kautsky, and Hilferding, and the revolutionaries, such as Luxembourg, Bukharin, and Lenin, was heavily related to imperialism. In spite of several disagreements on characteristics of imperialism, these classical Marxists shared the same understanding that imperialism was a form of capitalist expansion where capitalists in central countries were forced to expand their production to peripheral countries in order to take over cheap raw materials, find new markets, and enhance their capital accumulation. In addition, since Lenin's *Imperialism, the Highest Stage of Capitalism* was greatly influenced by Hilferding's *Finance Capital*, both revisionists and revolutionaries shared the same idea from the fact that the way of capitalist expansion to abroad shifted from exports of goods to exports of capital, especially finance capital, so

international capital flows became a very important tool for capitalists in some countries to avoid a problem of overproduction and crises in domestic economies by finding ways to earn more profit in other countries.

From this point, both sides shared the same basis; that is, a falling rate of profit in a country forces capitalists to export their capital to other countries whose rates of profit are higher. According to Szymanski (1974), these classical Marxists considered that capital has a tendency to flow from core countries to peripheral countries in order to transfer surplus value from the peripheries to the cores.

Later, after the influential works of Baran and Sweezy in the late 1940s to the early 1950s, Marxist theories of imperialism shifted from the perspectives of core countries to see how peripheral countries suffer from imperialism (Noonan 2010: 90-125). The works of neo-Marxists on dependency theory such as Frank and Amin take the view of peripheral countries and see that peripheral countries always have higher profit rate, compared to those of core countries. However, as foreign capital flows in, economic developments in the peripheral countries must slow down, because foreign capitalists repatriate surplus value to the core in forms of profits and interests (Chase-Dunn 1975). Therefore, looking in a longer run from this perspective, as argued by Szymanski (1974), dependency theorists believe that economic openness eventually leads to negative net flows of capital in peripheries due to the greater amount of return flows. This implies that foreign capital causes falling rates of profit in peripheral countries. From this view, the same logic is still applied; that is, foreign capital flows into peripheral countries in order to seek for profits, so the rate of profit attracts foreign capital.

4.3.2 Methodology

This part is going to prove the theoretical framework explained above by empirically testing the relationship between the rate of profit and the growth rate of capital flows for the case of Thailand from 1980 to present. Since foreign capital came to invest in Thailand in the nonfarm sector, it is going to be more appropriate to find whether or not the nonfarm rate of profit could significantly determine the growth rate of capital flows.

Because the second preliminary assumption concerns profit rate differential between the global rate of profit and a national rate of profit, these two profit rates should be measured. Thus far, according to literatures on profit rate measurement, only Li, Xiao, and Zhu (2007) have ever attempted to measure the global rate of profit, and the estimation has ended in 2005. Since the attempt of this dissertation is to use the model to explain the Thai economy until 2010, the estimation of the global rate of profit in the exact same methodology of Li, Xiao, and Zhu's work (ibid.) must be redone. This requires clear explanation of their methodology and full access to the most updated data. Alternatively, another way to get the global profit rate possibly is that I can define and measure the global profit rate in my own way. However, this way is going to be even more difficult, and it requires another project to be done. To solve the difficulty of obtaining the global profit rate, following the assumption in the model, I consider that the global rate of profit is an exogenous variable, and, for the case of Thailand, I attempt to just see the relationship between the nonfarm rate of profit and the growth rate of foreign capital flows. From this point, the simple model telling the relationship between these two variables can be stated as follows.

$$k = \alpha_0 + \alpha_1 r \tag{4.7}$$

where k is the growth rate of capital inflows while r is the nonfarm profit rate.

Since this part employs the time series analysis, the problem of nonstationary variables and spurious regression are the very first things to be concerned due to their regular appearances in time series regression. Similar to the previous part, the augmented Dickey-Fuller test and Phillips-Perron test are conducted to test unit roots of both k and r. After that, the autoregressive distributed lag (ARDL) bound testing approach, developed by Pesaran and Shin (1995, 1999) and Pesaran et al. (1996, 2001), is employed to find the relationship between k and r due to the following reasons. First, the ARDL bound testing approach is applicable, even though some variables are I(0) and some are I(1), without the problem of nonstationarity (Pesaran and Shin 1997: 21-24). Another advantage of using the ARDL approach is that the dynamic error correction model (ECM) can be derived from the ARDL, so the ARDL approach informs both long-run and short-run relationships between dependent and independent variables.

There are two phases in the ARDL bound testing approach. For the first phase, I have to find whether or not variables are cointegrated and have a long-run relationship. In order to fulfill this task, equation (4.7) must be transformed into the ARDL unrestricted error correction model (UECM).

$$\Delta k_t = \alpha_0 + \alpha_1 r_{t-1} + \alpha_2 k_{t-1} + \sum_{i=0}^{m} \beta_{1i} \Delta r_{t-i} + \sum_{j=1}^{m} \beta_{2i} \Delta k_{t-i} + e_t \tag{4.8}$$

where Δ presents the first differences of all variables. The first part of equation (4.8), seizing coefficients α_1 and α_2, tells the long-run relationship of two variables.

Meanwhile, the second part of the equation, seizing coefficients β_1 and β_2, tells the short-run relationship. The best lag length should be the model that yields the lowest value of the Akaike Information Criterion (AIC) and the Bayesian Information Criterion (BIC), and some diagnostic tests should be performed to test the performance of the UECM. As suggested by Pesaran and Shin (1999), the maximum number of lag length should be 2 for the annual series data. Then, F-test must be applied to test the null hypothesis of no cointegration

$$H_0: \alpha_1 = \alpha_2 = 0$$

$$H_1: \alpha_1 \neq \alpha_2 \neq 0$$

To test the hypothesis, two sources of critical bounds are referred by literatures on the ARDL bounds testing approach. The first source is Pesaran et al. (2001) which is appropriate for works with a large number of observations. Developed from the first source, the second source is in Narayan (2004) which is appropriate for works with a small number of observations, i.e., 30 to 80 observations. The critical bounds presented in both sources have the same structure. That is, two sets of critical values are presented, the lower bounds of the critical values are to test the case that the variables are I(0), while the upper bounds of the critical values are to test the case that the variables are I(1). If all variables are I(0), the test only refers to the lower critical bound. Meanwhile, if all variables are I(1), the test only refers to the upper critical bound. In the case of having both I(0) and I(1) variables in the regression, if the calculated F-statistics is over the upper critical bound, H_0 can be rejected and I can conclude that cointegration exists. Meanwhile, if the calculated F-statistics is below the lower critical bound, H_0 cannot be

rejected and I can conclude that cointegration does not exist. And, if the calculated F-statistics is in between lower and upper critical bound, the test is inconclusive.

In the second phase, after the long-run relationship among variables has been found, the optimal ARDL model with the optimal lag lengths of each variable (p,q) can be determined by using again the Akaike Information Criterion and the Bayesian Information Criterion. Given that the lag lengths of both variables are defined, equation (4.8) becomes

$$\Delta k_t = \alpha_0 + \alpha_1 r_{t-1} + \alpha_2 k_{t-1} + \sum_{i=0}^{q} \beta_{1i} \Delta r_{t-i} + \sum_{j=1}^{p} \beta_{2i} \Delta k_{t-i} + e_t \qquad (4.8^*)$$

where p is the optimal lag length of k and q is the optimal lag length of r. From the selected ARDL UECM, $-(\frac{\alpha_1}{\alpha_2})$ tells long-run impact of profit rate on growth rate of capital inflows. Meanwhile, in order to find coefficients of the short-run dynamics, the ARDL restricted ECM can be presented as

$$\Delta k_t = \alpha_0 + \gamma ecm_{t-1} + \sum_{i=0}^{q} \beta_{1i} \Delta r_{t-i} + \sum_{j=1}^{p} \beta_{2i} \Delta k_{t-i} + e_t \qquad (4.9)$$

where the term *ecm* stands for the ECM term based on ARDL (p,q) and γ is its coefficient. It is expected that γ is significant and has a negative value defining the speed of adjustment to the equilibrium, after an external shock occurs. Meanwhile, β_{1i} tells short-run impact of a change in the nonfarm profit rate on a change of the growth rate of capital inflow, and β_{2i} tells short-run impact of a change of the growth rate of capital inflow on itself.

4.3.3 Data and Empirical Results

The nonfarm rate of profit (r) has already been obtained from the profit rate measurement in Chapter 3, while the growth rate of capital flows (k) has already been obtained from the calculation of c in Section 4.2.3.

As stated in the section on methodology, one of the advantages of the ARDL bound testing approach is that it can be conducted without the problem of spurious regression even though some variables are stationary at their levels – I(0) – while some are stationary at their first differences – I(1). Therefore, in order to emphasize the reason of using the ARDL bound testing approach, unit root tests must be performed. The results of the unit root tests can be presented in Table 4.8.

The unit root tests discover that r is stationary at I(1), while k is stationary at I(0). Since r and k are integrated at different orders of integration, Johansen-Juselius cointegration test or the Engel-Granger two-steps method cannot be applied to test cointegration between these two variables. Given these problems, the ARDL bound testing approach, due to its advantage mentioned in the section on methodology, is the most appropriate and the most convenient econometric technique to deal with this problem, because it can be applied regardless of whether variables are I(0) or I(1).

In order to perform the ARDL bound testing approach, I can start the first phase by finding the optimal lag length of equation (4.8) by using information criteria. Since the suggested maximum lag length is 2 for annual data (Pesaran and Shin 1999), Table 4.9 presents the value of the Akaike Information Criterion (AIC) and the Bayesian Information Criterion (BIC) from running the equation (4.8) with different values of lag length (m = 1 and m = 2).

Table 4.8 Nonfarm Profit Rate and Capital Flows: Unit Root Tests

Variables	Augmented Dickey – Fuller		Phillips - Perron	
	Without Trend	Trend	Without Trend	Trend
r	-0.73	-1.44	-1.01	-1.80
d. r	-3.60***	-3.50**	-3.56***	-3.45**
k	-3.51***	-4.18***	-3.42**	-4.06***

**** the null hypotheses can be rejected at 5% significant level according to MacKinnon approximate p-value for Z(t)**
***** the null hypotheses can be rejected at 1% significant level according to MacKinnon approximate p-value for Z(t)**

Table 4.9 Nonfarm Profit Rate and Capital Flows: Lag Lengths Selection

Lags (m)	AIC	BIC	B-G	Adj R^2
1	259.69	267.89	3.96*	0.35
2	246.60	257.26	0.00	0.48

- AIC = Akaike Information Criterion, BIC = Bayesian Information Criterion, B-G = Breusch-Godfrey Autocorrelation test.
*** indicates that the regressions reject the null hypothesis of the test.**

The results show that the model with 2 lags yield the minimum value of AIC and BIC. In addition, from my further diagnostic tests, the model with 1 lag length (m=1) contains autocorrelation problem, so m=2 is the optimal lag lengths to test cointegration between k and r. After obtaining the optimal lag lengths, I can proceed to compare the computed F-statistics with the critical bounds. F-statistics is computed from the test of the null hypothesis, $H_0: \alpha_1 = \alpha_2 = 0$. Meanwhile, since the data in this chapter are from 1980 to 2010 with one regressor and this can considered as the case of small observations and equation 4.8 is a model with an intercept and no trend, the referred critical bounds with n = 31 and k = 1 presented in Narayan (2004) are more appropriate. The comparisons can be presented in Table 4.10.

Table 4.10 F-Statistics and the Critical Bounds.

Null Hypothesis (H_0)	F-Statistics	Significance Level	Critical Bounds	
			Lower Bounds	Upper Bounds
$\alpha_1 = \alpha_2 = 0$	11.62	1%	5.85	6.64
		5%	4.06	4.65
		10%	3.27	3.80

From Table 4.10, the F-statistics is greater than the critical upper bound of 1% level of significance. Hence, the null hypothesis of no cointegration can be rejected at 1% significance level, so k and r are cointegrated. This allows me to proceed forward to the second phase by determining the real ARDL equation.

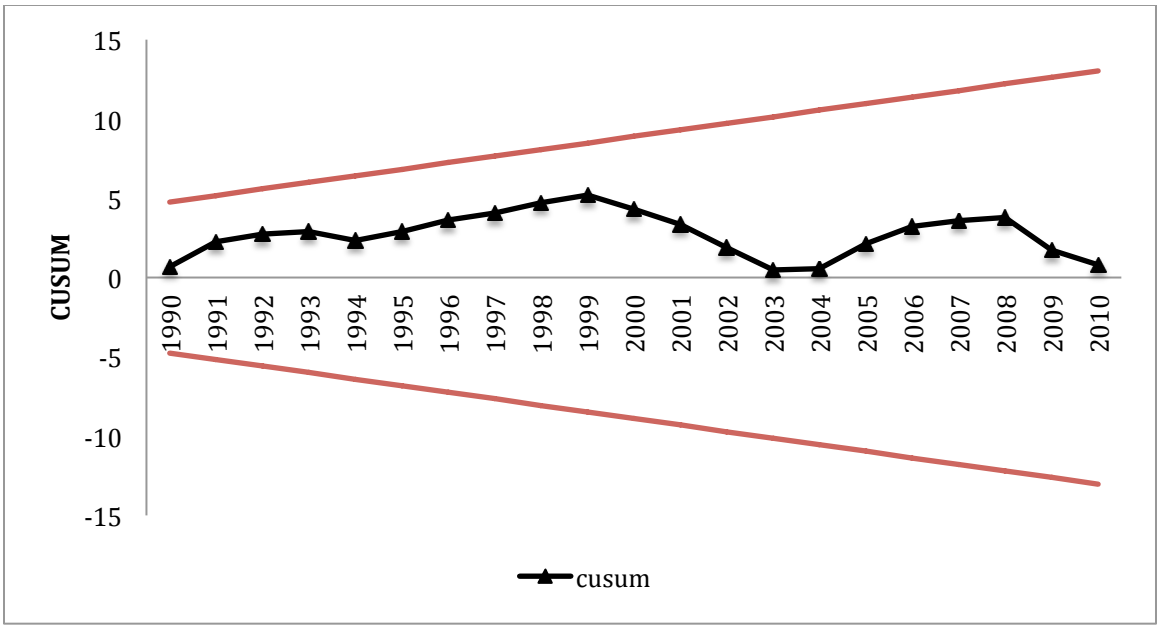
In the second phase, AIC and BIC is applied in order to find the optimal p and q of equation (4.8*). As a result, both information criteria suggest that the model with p=2 and q=0 (ARDL (2,0)) is the optimal ARDL UECM describing the relationship between k and r. Consequently, the restricted ECM can be derived to find the short-run dynamics of the model. In addition, some diagnostic tests are applied to tests the correct specification of the model. The tests suggest that the model does not have the problem of heteroskedasticity, since the Chi-squared statistics from the Breusch-Pagan test (χ^2_{BP}) is too low to reject the null hypothesis of no heteroskedasticity. Low Chi-squared statistics from the Breusch-Godfrey test (χ^2_{BG}) and the close-to-two Durbin-Watson's statistics reveal that the model does not contain a problem of autocorrelation. The Ramsey's RESET test yields a low Chi-squared statistics, so the null hypothesis of no omitted variables cannot be rejected. Lastly, the Jarque-Bera test yields Chi-squared statistics revealing that residuals are normally distributed. The long-run and short-run relationships, including the results of the diagnostic tests, can be presented in Table 4.11.

Table 4.11 The Long-Run and Short-Run Relationships between the Growth Rate of Capital Flows and the Nonfarm Rate of Profit

Period	Variables	Coefficients	t-statistics	Probability
Long Run	r	2.43	3.50	0.00
	Constant	-31.98	-2.91	0.00
Short Run	ECM	-1.68	-4.78	0.00
	Δr_t	3.52	1.26	0.22
	Δk_{t-1}	0.76	2.76	0.01
	Δk_{t-2}	0.49	2.29	0.03
$Diagnostics: \chi^2_{BP} = 0.04, \chi^2_{BG} = 0.26, DW - stat = 1.88,$ $\chi^2_{RESET} = 1.77, \chi^2_{JB} = 1.85, Adj\ R^2 = 0.48$				

As generally done in studies using the ARDL bound testing approach, The Cumulative Sum of Recursive Residuals (CUSUM) test and the Cumulative Sum of Square of Recursive Residuals (CUSUMSQ) test are conducted in order to test the null hypothesis of having the stability of coefficients at the 5 % critical bounds. The results are presented in Figure 4.2 in which the lines with marks fluctuates inside of the bound in both figures. The results suggest that the estimated coefficients in the restricted ECM are stable at 5% bound level of significance.

According to Table 4.11, the ARDL bound testing approach yields that 1% change in the nonfarm rate of profit results in 2.43 % change in the growth rate of capital flows in the same direction. This proves the hypothesis that the nonfarm rate of profit and the growth rate of capital flows have a positive relationship in the case of Thailand from



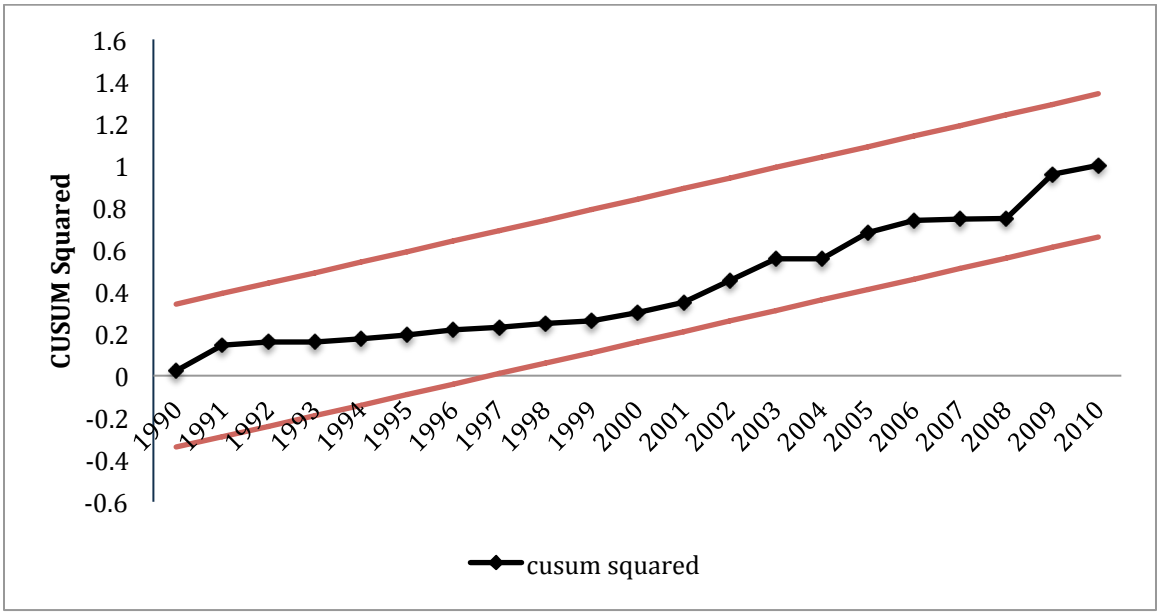


Figure 4.2 CUSUM and CUSUMSQ tests

1980 to 2010. Following what is expected, the coefficient -1.68 of the ECM term is negative, expressing the speed of adjustment to the long-run equilibrium when the system is disturbed by short-run shocks. In the short run, a change in nonfarm profit rate does not have statistically significant impact on the growth rate of capital flows. In contrast, only previous changes of the growth rates of capital flows (the first lag and the second lag) have impact on the growth rate of capital inflows in a current year.

4.4 Conclusion

This chapter empirically finds that two preliminary assumptions – the validity of the original and extended Thirlwall's law and the nonfarm rate of profit as a determinant of the growth rate of capital flows – hold for the case of Thailand from 1980-2010. The first part, attempting to prove the first preliminary assumption, shows that Thailand has been constrained by its balance of payments, since both the original and extended Thirlwall's law can explain the economy. Moreover, it shows that the extended Thirlwall's law is a better model, as it yields more accurate growth rates. The second part, attempting to prove the second preliminary assumption, uses the ARDL bound testing approach to show that the nonfarm rate of profit determines the grow rate of foreign capital flows in Thailand. This finding is complementary with many Marxian works which consider that the rate of profit is the important variable determining flows of capital not only among branches of production but also among countries.

CHAPTER 5

CONCLUSION

5.1 The Model and The Thai Economy

Since the period of industrialization in the 1970s, the Thai economy has leaned more and more toward the ideology of the self-regulating market by taking the path of economic liberalism. Diversification of domestic productions, which had been greatly supported by the government in the 1970s in order to serve the import-substitution strategy, was redirected to specialization of some industries to raise competitiveness in the world market and to increase export values in the early 1980s. Later, when more and more foreign capital considered Thailand as another spot for great deals of returns, the government responded by encouraging free mobilities of foreign capital. Similarly to other open economies, economic booms and busts have occurred at different time periods along the path of its economic development. An economic boom in the late 1980s to the mid-1990s was followed by the bust in the late 1990s. In spite of this economic swing, the IMF, after giving out the rescue package to help Thailand out from the crisis, forced the country to be more open to foreign capital and to liberalize the banking sector, while the government adopted a stronger dose of neoliberalism by privatizing state-owned enterprises and making free-trade agreements. Neoliberalism has occupied a position of a hegemonic ideology in Thai academics and policy creations. The ASEAN Economic

Community (AEC) that will lead to a unified and single market of all South East Asian countries by 2015 is a true product of the neoliberal ideology. Thailand Development Research Institute (TDRI), one of the most powerful think tanks in Thailand, recently suggested that Thailand will be more beneficial and successful in the AEC, if the Thai government can liberalize trades, services, and finances. The government should only establish efficient trade and investment facilities (TDRI 2012).

In this dissertation, I propose a fusion approach by blending a Post-Keynesian balance-of-payments-constrained growth model with Marxian profit rate to explain the development of the Thai economy. That is, the interactions between profit rate oscillation in Marxian economics and the role of foreign capital explained in the extended Thirlwall's law are used to explain the development of Thai economy. The theoretical core of this dissertation is located in Chapter 2 where profit rate and the balance of payments have impact on one another. The model proposes different cases of interactions between profit rate and GDP level generated from the extended Thirlwall's law as long as capital is allowed to move easily across borders to seek for greater profits. Nevertheless, it is highly possible that only the cases of stable clock-wise cycles can happen, because the income elasticity of demands for imports of an open country is unlikely to be low enough to cause bring the system to the unstable case. This insight tells that the rate of profit determines business cycles in a country via fluctuations in the balance of payments. In a further extent, a falling rate of profit can cause economic crisis via the balance-of-payments problem.

Empirically, this model can be valid to explain the development of the Thai economy only if two preliminary assumptions are true. The first assumption is that the

extended Thirlwall's law can explain economic growth of Thailand, and the second assumption is that the rate of profit really determines capital flows in Thailand. Chapter 4 of this dissertation attempts to test these two preliminary assumptions. However, before getting to the steps in Chapter 4 where profit rate is necessary to test the second assumption, the nonfarm rate of profit in Thailand from 1970 to 2010 is measured in Chapter 3. The main reason for finding the nonfarm rate of profit, instead of the national rate of profit, is two fold. First, foreign capital has flown to Thailand to invest and/or finance investments in nonfarm sectors, so the nonfarm rate of profit is likely to be a real determinant of foreign capital flows. That is, the nonfarm rate of profit seems to be the real variable to test the second preliminary assumption, according to the history of the Thai economic development. Second, because the interest of this dissertation is on the Thai economy after the process of industrialization in the 1970s, the nonfarm rate of profit seems to be better than the national rate of profit in order to explain how industrialization contributed to the Thai economic development.

The results show that the nonfarm rate of profit has fluctuated through time. The output-capital ratio and the organic composition of capital are the main variables determining the movements of the nonfarm rate of profit, while struggles between capitalists and workers to earn shares of national income, represented by the rate of surplus value and the profit share, do not have significant impact on the nonfarm rate of profit. The movements of the nonfarm rate of profit match well with characteristics of leading industries in each period. Labor intensive industries such as garments, textiles, and food processing products, which led the country's economy during the 1970s to the early 1980s, greatly lowered the organic composition of capital, so the nonfarm rate of

profit quickly surged. Meanwhile, the nonfarm rate of profit fell, in spite of fast economic growth, due to more intensive uses of capital in the newly leading industries such as electronics and machineries. Unavoidably, the government's policies to encourage inflows of foreign capital took an important role to find sufficient supplies of capital to meet demands for investments during the boom. Foreign capital came into the country in forms of foreign direct investments and loans to drive economic growth, especially after the nonfarm rate of profit reached its peak in 1986, before it started dropping for consecutive years. That is, the falling nonfarm rate of profit had shown a sign of a catastrophe before the crisis emerged in 1997. Contradictory to the precrisis case, free mobility of capital supported by the government allowed foreign capital to quickly flow away from the country when a sign of approaching crisis became apparent. The devaluation of Thai baht and rapid capital flights led to the balance-of-payments crisis. After the crisis, the nonfarm rate of profit showed a tendency of rising, but it did not seem to be as high as itself prior to the crisis.

The first part of Chapter 4 presents that the original and the extended Thirlwall's law are both valid to explain economic growth of Thailand, so the Thai economy has been constrained by the balance of payments. A further statistical reference tells that the extended Thirlwall's law is better than the original Thirlwall's law to explain the Thai economy. Therefore, the first preliminary assumption is also proved. The Thai economy from the export-led strategy in the 1980s to the current neoliberal regime has been clearly constrained by the balance of payments.

Employing the ARDL bound testing approach in the second part of Chapter 4, I find that the nonfarm rate of profit has a positive relationship with growth rate of foreign

capital flows in Thailand. Thereby, the second preliminary assumption is proved. The government's attempt to liberalize flows of foreign capital since the 1980s allowed foreign capital to flow in and out of the country to seek for highest returns. Foreign capital responded to the peak nonfarm rate of profit in the middle of the 1980s by tremendously flowing into the country, and led to high growth rate in Thailand. Meanwhile, capital flight that caused the crisis was attributed to the fast drop of the nonfarm rate of profit in the middle of the 1990s.

Since both of the preliminary assumptions have been empirically proved, the model in Chapter 2 is ready to explain the development of the Thai economy. In addition, not only does this empirical test in the first part of Chapter 4 approve the validity of Thirlwall's law in the case of the Thai economy, it also yields that the income elasticity of demand for imports in Thailand is elastic ($\eta = 1.64$). It is $Case\ 1$ of the model that explains the interaction between the nonfarm rate of profit and the level of GDP estimated from the extended Thirlwall's law. To empirically plot the relationship between the two variables, I can present Figure 5.1 describing the relationship between the rate of profit and the estimated level of GDP from the effect of capital flows (Y_B') from 1980 to 2010. Again, the reason of choosing 1980 as the starting year is because it is the year that the country started enhancing foreign capital inflows to generate economic growth. To calculate Y_B', I first use the latter part of equation (2.17), $\frac{(1-\omega)(c)}{\eta}$, and consider that this part is to express the growth rate of capital flows on the balance-of-payments-constrained growth rate. To get this growth rate, the data on 'Private Capital Flows' from World Bank's data are employed. After obtaining the growth rate from 1980 to 2010, I transform the real value of GDP in the year 1979 into its natural log value. Since it is

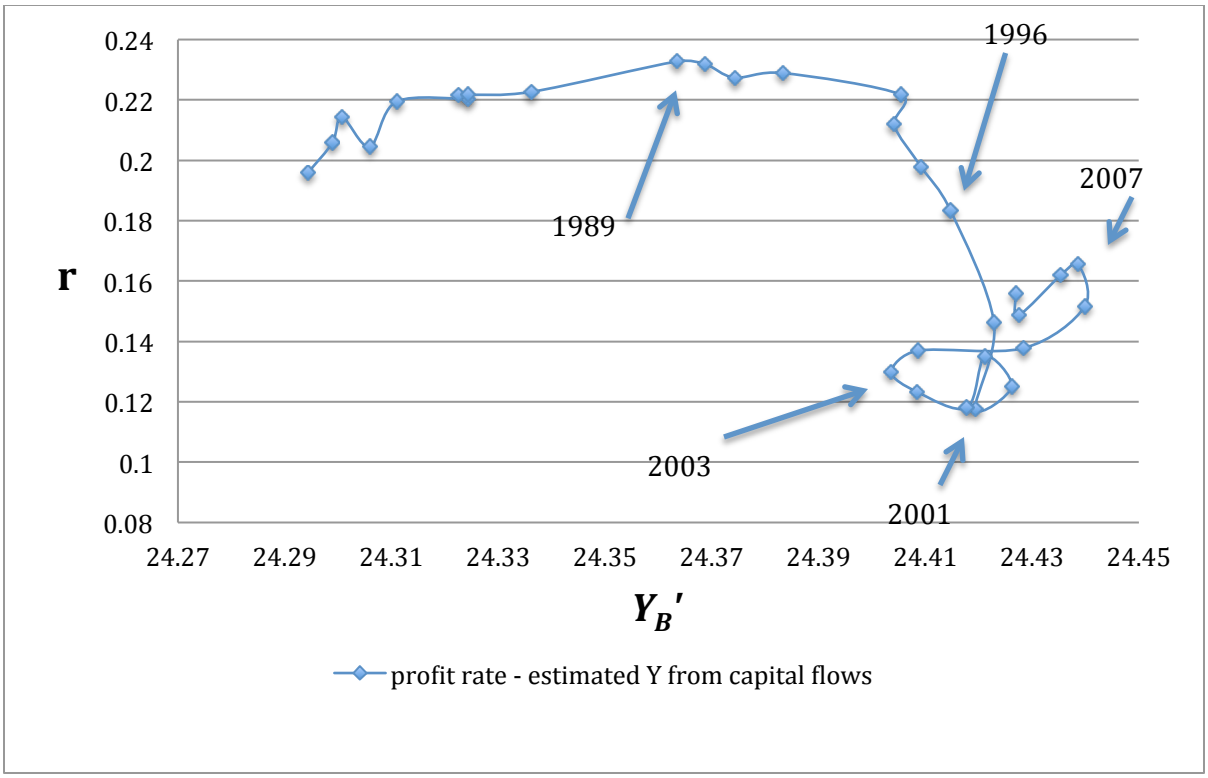


Figure 5.1 The Relationship between The Nonfarm Profit Rate (r) and the Estimated Level of Log GDP (Y_B') in Thailand: 1980 – 2010

generally known that a difference of a natural log value of current year's real GDP and that of last year's GDP multiplied by 100 tells real growth rate of the current year real GDP. I hence can add the growth rate of capital flows on the balance-of-payments-constrained growth rate to the natural log value of real GDP in 1979 to get the estimated GDP from capital inflows in 1980. Then, I add the growth rate of the current year to the estimated GDP from capital inflows of the previous year to get all estimated GDP from capital inflows from 1980 to 2010.

The empirics support the theoretical model. Figure 5.1 clearly shows 4 phases of the interaction between the nonfarm rate of profit and Y_B' in the case of the Thai economy. 1980 to 1989, when the nonfarm rate of profit and Y_B' increased together, was in Phase 1.

1990 to 1996 when the nonfarm rate of profit slightly dropped but Y_B' grew rapidly, was in Phase 2. 1997 to 2001, when Y_B' and the nonfarm rate of profit dropped together, was in Phase 3, which was a crisis phase. 2002 to 2003, when Y_B' still dropped but the nonfarm rate of profit started bouncing back from its bottom, was in Phase 4. The next cycle started in 2004, but it was quite difficult to define phases of this cycle. However, one precise thing is that this cycle is relatively small compared to the first cycle. This is more or less matched with what the phase diagram suggests that the economy in the later cycles should be less volatile, because the rate of profit moves closer to the global rate of profit so capital inflows play a less significant role to relax the balance of payments and hence to boost economic growth.

The empirics also support that the cycles, theoretically presented in Chapter 2, really occurred during the development of the Thai economy. The cycles of the rate of profits caused fluctuations of the balance of payments which contributed to the unstable economy. This is a result of the economy where capital is allowed to fully move in order to seek for high returns. According to Arrighi and Silver (1992: 32), the world economy has, since the 1970, entered the period of the declining US hegemonic power, so the global mode of production has entered the period of high-finance resurgence in which a massive amount of finance capital seek returns in financial markets throughout the world. From this statement, since Thailand has tried to advance forward to a capital-mobilization country, it is predictable that waves of massive foreign capital will come to take profits from the country and leave as soon as the profits are exhausted. Even though the move towards financial liberalization seems likely to bring in future economic booms, future economic crises are also unavoidable.

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