# CHAPTER 4

# OVERVIEW: EMPIRICAL EVIDENCES ON PRICE STICKINESS AND EXCHANGE RATE PASS-THROUGH

In this chapter, we would like to feature some current characteristics of price behaviors, inflation process and exchange pass-through for ensuring that Thai economy has an experience evidentially for appropriating adopted a New Keynesian perspective analytically.

Taking recent situations into account, Thai economy have affected tangibly from global environmental changes since the economic crisis, such as transition in the peg exchange rate regime to a managed float regime, the globally widespread low inflation by penetrating into inflation targeting regime and financial and trade liberalizations. Thereby, it can be argued that all of them are affecting the change in price adjustment and inflation process in Thailand. Therefore, to review of recent studies in these contexts is necessarily required.

It is well known that the key theoretical Keynesian proposition is nominal rigidity. In a point of view, price stickiness has an important implication on the length of monetary policy effects on real variables, for example in the short run monetary changes have mainly affected real economic variable rather than price. Therefore, the price processes in terms of both domestic and foreign goods (exchange rate) are the main economic variables to show the stickiness in this study.

In order to understand of the inflation process, it is crucial to review the adjustment of price and inflation in response to shocks in each sectoral level. One of literatures employed this issue is *Chantanahom. et al (2004)*[1]. They studied the nature of price adjustment involves analyzing distribution of the price adjustment frequency in the monthly consumer price index (CPI) basket changes by comparing them across

[1] Chantanahom, P., C. Poonpatpibul, and P. Vongsinsirikul, (2004) "Exploring Inflation in Thailand Through Sectoral Price Setting Behavior and Underlying Trend", Bank of Thailand Sympoisum, 2004.

time period and across sectors more than only testing by econometrics method. This work is more interested both of aggregate and disaggregates indices. That is the data used in the construction of the consumer and producer price indices based on sectoral data by comparing the frequency of price adjustment in the pre-crisis period and post-crisis period. Next subsection, we will arrange for literatures to cover all of these evidences.

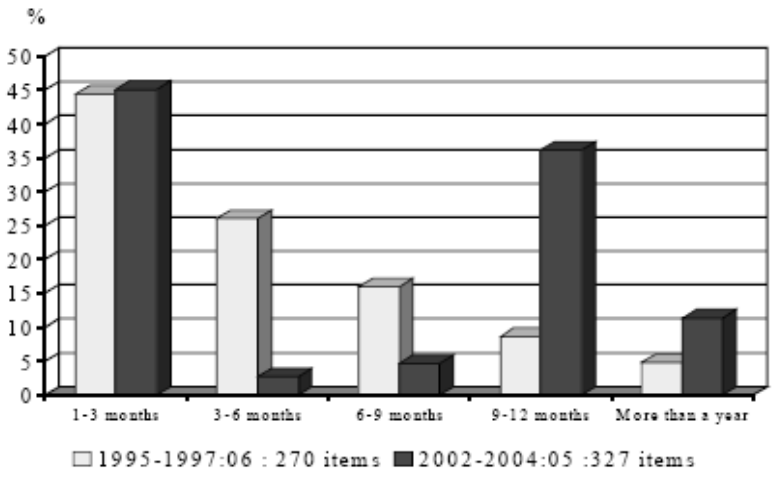
## 4.1 Empirical Evidence on Price Stickiness

### 4.1.1 Frequencies of Price Adjustment

It is apparent that prices adjustment frequency of Thailand is sticky supporting by Chantanahom, P. et al (2004). This work tried to address whether the frequency of price adjustment differ in the post-crisis period from the pre-crisis period in different cases of aggregated CPI, durable versus non-durable, goods and services traded versus non traded, food versus non-food, and aggregate PPI by using the monthly data of all goods and services in the CPI baskets of the January 1995-June 1997 period representing the pre-crisis period compared with the January 2001-April 2004 period representing the post-crisis period.

Figure 4.1

Frequencies of Price Adjustment from Total CPI

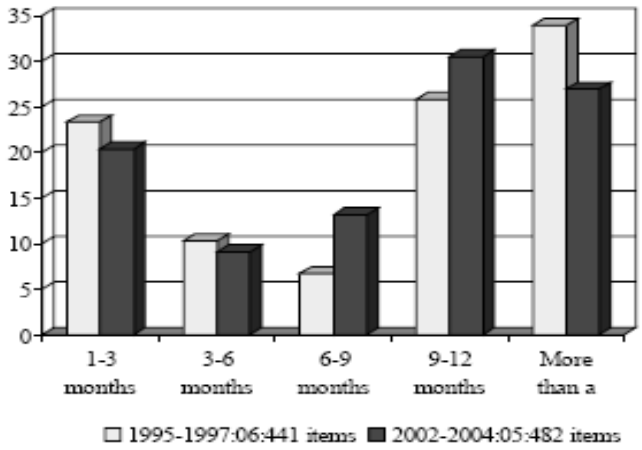



Source: Chantanahom, P. et al (2004) p.18

From the figure 4.1, it is shown that how frequencies of price adjustment of the total CPI comparing pre- and post- crisis in different monthly period are. It is clear that most of the prices of goods and services in the CPI basket changed very frequently for the pre-crisis period comparing to the post-crisis period. Because of the weight of goods and services in the CPI basket with average price adjustment frequency of every 1-3 months and 3-6 month together constituted 70.5 percent of all goods and services. However, for the post-crisis period, that of average price adjustment frequency of every 9-12 months rises sharply to 36 percent of the total CPI. It can conclude that on average prices changes less frequently in the post-crisis period.

Figure 4.2

Frequencies of Price Adjustment: PPI




Source: Chantanahom, P. et al (2005) p.22

Moreover, another indices investigating of Chantanahom, P. et al (2004) also include the producer price index (PPI) for analyzing the prices stickiness of goods and services as shown in figure 4.2. They found that in the pre crisis period prices of goods in the PPI basket were adjusted less frequently than prices of goods and services in the CPI basket. That is only 23 percent of the items by weight had price adjustments within 3 months compared with 45 percent for the case of items by weight in the CPI basket while in the post-crisis period the distribution of frequencies of producer price adjustment is similar to the pre-crisis period as the average frequencies of price adjustment as shown in the table 4.1

Table 4.1

Average Frequencies of Price Adjustment per Year

| Category | Pre-Crisis | Post-Crisis |
|---|---|---|
| Total CPI | 8.64 | 6.38 |
| Total PPI | 4.70 | 4.66 |
| Administered | 5.92 | 4.38 |
| Non-administered | 9.45 | 7.22 |
| Durable | 6.76 | 4.92 |
| Non-durable | 8.81 | 6.46 |
| Goods | 9.02 | 6.27 |
| Services | 7.66 | 6.60 |
| Traded | 7.94 | 6.75 |
| Non-traded | 9.03 | 6.19 |
| Food | 10.28 | 6.57 |
| Non-Food | 7.41 | 6.27 |

Source: Chantanahom, P. et al (2004) p.23

From table 4.1, it can conclude that for the post-crisis period, the overall and sectoral prices of consumer goods have been adjusted less frequently. Comparing to the frequencies of price adjustment between CPI and PPI, they have found crucially that the decline in frequencies of price adjustment observed in retail prices should not have been driven by the price setting behavior of producers.

Moreover, the paper also mentioned the main factors that have affected the inflation process development are i) increasing competition in both domestic and international trade, it may have reduced gradually firm's pricing power and led to stickier prices, ii) increasing productivity growth, Thai economy may be able to attain a higher GDP growth without facing inflationary pressure, iii) most of counties for monetary authorities has always been within low inflation target range for gaining credibility.

4.1.2 Stickiness in Price Adjustment Econometrics Approach

Most of econometrical tests of stickiness in price adjustment especially in the part are only the aggregate prices such as consumer price index (CPI) and producer price index (PPI). The argument of such indices representing only in the aggregate level is that it is not reflected the behavior of prices on the microeconomic level and may not be appropriated for monetary authority choosing optimal policy as motioned this issue by Chamchan (2002)[2]. His work mainly focused on test of stickiness in both of the aggregate and disaggregates levels and the study period of 1985 to 2000. At the aggregate level, the indices using to consider the price stickiness are Consumer Price Index (CPI), Producer Price Index (PPI) and Core (Consumer) Price index (COPI) while at the disaggregate level using Consumer Price Index of five product items consisting of Food and Beverage (Pfood), Housing and Furnishing (Phousing), Transportation and Communication (Ptrans), Recreation and Education (Precreation), Personal and Medical Care (Pmed) based on their sizes of percentage weight in the calculation of headline Consumer Price.

Chamchan had set up the model by following Devadoss (1996)[3] in terms of the gradual price adjustment within a basic equilibrium model of the partial information-localizes market framework of a rational expectation model using SUR estimated test. At the aggregate level, the model consisted of current growth rate of price indices (CPI, PPI and COPI) functioning of the unanticipated monetary policy shock, their own previous level which their coefficients indicate how the prices stickiness are, the current money supply growth (representing the demand side) and energy price growth (representing the supply side) as well as the disaggregate level. It is clear that flexible price adjustment should not depend on own lagged level but should adjust significantly in response to changes in current demand and production side.

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[2] Chamchan, Chalermpol (2002). “Stickiness and Asymmetry in Price Adjustment: Evidence of Thai Aggregate and Disaggregate Prices” Master’s Thesis, Faculty of Economics, Thammasat University.

[3] Devadoss, Stephen (1996). “Price Inertia: money supply and price changes.” Applied Economics, vol. 28, 1996, pp. 343-351.

The result is significantly discovered that Thailand has prices stickiness in both aggregate and disaggregate levels. For the result of stickiness in the aggregate price adjustment, it is found that Producer Price Index (PPI) and Consumer Price Index (CPI) adjust themselves in response to monetary policy shock with two months significantly while Core Price Index (COPI) taken a longer period about seventeen months responding to such a shock.

In additional, considering the degree of the adjustment (coefficient), Core Price Index (COPI) shown stickiness in its adjustment on their own historical level rather than Consumer Price Index and Producer Price Index (PPI) respectively.

For the result of stickiness on the disaggregate levels, it also found that adjustment of price in the food and beverage items is more flexible than the non-food and non-beverage items. Their result corresponds evidently to the finding Core Price Index (COPI) seems to be stickier than Consumer Price Index (CPI) because of excluding the products in food and energy items from the Consumer Price Index (CPI).

In a classical study of Seu-yam (1997)[4], the study tried to find the relationship between the changes in inflation level responding to the change in aggregate demand during 2518-2538 under the hypothesis that if price is flexible, the lag takes in respond to the change in aggregate demand should be very short. In contrast, if the lag of the change is so long, it may be implied that the existence of price stickiness in the Thai Economy.

By using OLS regression, the study is found that Thai inflation responded to the change in aggregate demand after five periods or there were five period lags in price responding to the change in aggregate demand, in the other words, the prices had inertia in the adjustment process for 5 quarters.

Attempting to establish the model theoretically, it has to firstly rely on the stylize facts that what characteristics of that economy are. In realizing these situations, the previous explanation have featured that the adjustment of prices in Thailand still be sticky or inert evidently corresponding to New Keynesian Frameworks.

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[4] Seu-yam, Phatthawut (1997). The Stickiness of Inflation Rate of Thailand, Master's Thesis of Economics, Thammasart Univeristy.

## 4.2 Empirical Evidence on Exchange Rate Pass-Through

As we discussed the important of exchange rate movement linked to terms of trade and overall inflation from the section of introduction, it is necessary to show that how the degree of exchange rate pass-through in Thailand is.

A study of the degree of exchange rate pass-through has been conducted by Buddhari and Chensavasdijai (2003)[5] by providing the evidence in Thailand.

Buddhari and Chensavasdijai (2003) evaluated the degree of exchange rate pass-through in Thailand based on data from the early 1990s to 2003Q1, with the use of the Bank of Thailand's macroeconomic model (BOTMM) and a non-structural vector autoregreesion (VAR) framework. They had found firstly that the degree of pass-through varied significantly depending on the price indices used as shown in table 4.2

Table 4.2

Exchange Rate Pass-Through Coefficients

| | Response Horizon (Quarters) | | |
|---|---|---|---|
| | 1 | 4 | 8 |
| Local Currency Import Price | 0.79 | 1.86 | 1.79 |
| Producer Price Index | 0.19 | 0.64 | 0.87 |
| Headline Consumer Price Index | 0.06 | 0.23 | 0.34 |
| Core Consumer Price Index | 0.04 | 0.15 | 0.26 |

Source: Buddhari and Chensavasdijai (2003) p. 26

Table 4.2, which summaries the results, shows that at the end of the first year (fourth Quarter), it is only 23 per cent and 15 per cent for headline and core CPI respectively while the pass-through elasticity for producer prices is relatively high at 64 per cent. After two years (eighth Quarter), the coefficient of estimated pass-through for headline and core CPI rises to 34 per cent and 26 per cent respectively. It

[5] Buddhari, A and V Chensavasdijai (2003) "Inflation Dymanics and Its Implications for Monetary Policy", Bank of Thailand Symposium.

is implying that more than half of the long run pass-through to consumer prices occurs within the first year. It is interesting to note that the pass-through elasticity declines at each stage along the pricing chain, so that shocks to the exchange rate have the biggest impact on import prices, followed by producer prices and consumer prices.

Table 4.3

Exchange Rate Pass-Through Across Countries

| Country | Response Horizon (Quarters) | | |
|---|---|---|---|
| | 1 | 4 | 8 |
| Philippines | 0.02 | 0.34 | 0.72 |
| Thailand | 0.06 | 0.23 | 0.34 |
| United Kingdom | 0.00 | 0.11 | 0.25 |
| Korea | 0.04 | 0.15 | 0.16 |
| Japan | -0.02 | -0.01 | 0.07 |
| Euro area | 0.01 | -0.02 | -0.15 |
| Singapore | -0.01 | -0.14 | -0.49 |
| Taiwan | -0.10 | -0.26 | -0.70 |

Source: Buddhari and Chensavasdijai (2003) p. 28

For comparison purposes, Table 4.3 places the degree of pass-through in Thailand in an international context. It is shown that the degree of pass-through in Thailand most resembles that of Korea and UK. Exceptional cases of the negative pass-through coefficients, they give the reasons that it is difficult to interpret and probably reflect the stability of exchange rate for Singapore and Taiwan including the EU where comprises a group of economies with wide structural differences and active intra-regional trade.

Moreover, the authors have found the reasons that plausible explanations for the modest pass-through are including competition, lower inflation expectation in the face of global disinflation and increased monetary policy emphasis on price stability after the adoption of inflation targeting framework, a shift in the housing market structure from rented accommodation to home ownership, and the non-trivial share of administered prices in the economy.

In conclusion, the main findings is that while import prices adjust rapidly and completely to variations in the exchange rate, domestic consumer prices do not respond fully even in long run. In other words, the degree of exchange rate pass-through in Thailand is low and diluted along the distribution chain from importers to producers, and finally to consumers and also tends to vary across sectors, reflecting differences in the share of import content.

Thereby, Thailand is also one of many countries which adopting the inflation targeting framework to be along with the low exchange rate and low inflation as suggesting by Campa and Goldberg (2002)[6]. From the empirical evidences on the low exchange rate pass through, incomplete pass-through, therefore, allow us to form the New Keynesian model.

[6] Campa and Goldberg (2002) contend that countries with low inflation and low exchange rate variability tend to have smaller pass-through elasticities.