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บทสรุป

ข้อคิดเห็นที่ปรากฏในบทความนี้เป็นความเห็นของผู้เขียน ซึ่งไม่จำเป็นต้องสอดคล้องกับความเห็นของธนาคารแห่งประเทศไทย

บทวิจัยนี้มุ่งศึกษาการปรับตัวของดุลบัญชีเดินสะพัดโดยครอบคลุมถึงการศึกษาเชิงเปรียบเทียบปัจจุบันกับช่วงวิกฤตเศรษฐกิจ เพื่อหาคำตอบของ 2 ประเด็นหลัก กล่าวคือ (1) ในภาวะที่เศรษฐกิจไทยขยายตัวต่อเนื่อง ดุลบัญชีเดินสะพัดจะมีโอกาสขาดดุลเมื่อใด และการขาดดุลจะสร้างปัญหาต่อเสถียรภาพต่างประเทศหรือไม่ (2) ระบบอัตราแลกเปลี่ยนที่ลอยตัวและเครื่องมือทางนโยบายมหภาคอื่นๆ จะช่วยแก้ปัญหาการขาดดุลบัญชีเดินสะพัดที่จะเกิดขึ้นในอนาคตได้หรือไม่ เพื่อตอบคำถามดังกล่าว บทวิจัยได้วิเคราะห์การตอบสนองของดุลบัญชีเดินสะพัดต่อการดำเนินนโยบายเศรษฐกิจมหภาค ทั้งในส่วนของนโยบายอัตราแลกเปลี่ยน นโยบายการเงิน และนโยบายการคลัง

จากการศึกษาพบว่าดุลบัญชีเดินสะพัดจะขาดดุลในอีก 3 – 5 ปีข้างหน้า และพบว่าอัตราแลกเปลี่ยนมีผลกระทบต่อการปรับตัวของดุลบัญชีเดินสะพัดน้อย ดังนั้น หากใช้อัตราแลกเปลี่ยนในการแก้ไขปัญหาดุลบัญชีเดินสะพัด การขาดดุลในระดับสูงจะทำให้อัตราแลกเปลี่ยนต้องปรับตัวมาก อันอาจก่อให้เกิดผลกระทบต่อภาคเศรษฐกิจและเป้าหมายทางนโยบายอื่นได้ จากการศึกษาพบว่านโยบายการเงินส่งผลต่อดุลบัญชีเดินสะพัดแต่ค่อนข้างล่าช้า ขณะที่นโยบายการคลังส่งผลกระทบอย่างรวดเร็วแต่เป็นเพียงระยะสั้นๆ ดังนั้น จึงมีความจำเป็นที่ต้องผสมผสานนโยบายมหภาคทั้งสามอย่างเหมาะสม เพื่อช่วยให้อัตราแลกเปลี่ยนไม่ต้องปรับตัวมากเพื่อรักษาเสถียรภาพของดุลบัญชีเดินสะพัด อย่างไรก็ตาม ในระยะยาวควรส่งเสริมนโยบายปรับโครงสร้างด้านอุปทานเพื่อส่งผลให้ดุลบัญชีเดินสะพัดมีเสถียรภาพที่ยั่งยืน

ผู้เขียนขอขอบคุณ ดร. อัจนา ไวความดี และผู้บริหารสายนโยบายการเงินทุกท่านที่ให้คำแนะนำ และขอขอบคุณ คุณกฤษณวร สุทธิรัตน์ ผู้วิเคราะห์ สายตลาดการเงิน สำหรับคำแนะนำและบทความในหัวข้อฐานะของดุลบัญชีเดินสะพัด ทีมพยากรณ์และเศรษฐมิติ สายนโยบายการเงิน ธปท. ในการอนุเคราะห์ผลการประมาณการจากแบบจำลองเศรษฐกิจมหภาค คุณจาตุรงค์ จันทรังษ์ สำหรับคำแนะนำในการวิเคราะห์ผลการประมาณการ รวมทั้งเพื่อนพนักงานทีมวิเคราะห์ดุลการชำระเงินและเพื่อนพนักงานทุกท่านในสายนโยบายการเงินที่ให้กำลังใจและการสนับสนุนอย่างดียิ่ง

บทสรุปผู้บริหาร

ภายหลังวิกฤตทางเศรษฐกิจ เสถียรภาพด้านต่างประเทศของไทย โดยเฉพาะอย่างยิ่งดุลบัญชีเดินสะพัดได้ปรับตัวดีขึ้นต่อเนื่อง อย่างไรก็ตาม ในช่วง 2 ปีที่ผ่านมา เศรษฐกิจไทยฟื้นตัวเข้มแข็งขึ้น ทำให้ฐานะดุลบัญชีเดินสะพัดเริ่มเกินดุลลดลงตามลำดับ รวมทั้งราคาน้ำมันในตลาดโลกได้ปรับตัวสูงขึ้นมาก และในอนาคตเมื่อการลงทุนโน้มเร่งตัวขึ้น ดุลบัญชีเดินสะพัดจะมีแนวโน้มเกินดุลลดลง และเปลี่ยนเป็นขาดดุลได้ในที่สุด ซึ่งจะส่งผลให้หนี้ต่างประเทศมีแนวโน้มเพิ่มสูงขึ้นอีกครั้ง จึงเป็นประเด็นที่น่าวิเคราะห์ว่า การขาดดุลบัญชีเดินสะพัดที่อาจจะเกิดขึ้นดังกล่าว จะสร้างปัญหาต่อเสถียรภาพเศรษฐกิจด้านต่างประเทศหรือไม่ และระบบอัตราแลกเปลี่ยนที่ลอยตัว (Managed Float) ตลอดจนเครื่องมือทางนโยบายอื่นนั้น จะสามารถช่วยแก้ปัญหาได้มากน้อยเพียงใด

เพื่อตอบคำถามดังกล่าวข้างต้น บทวิจัยนี้มุ่งศึกษาการปรับตัวของดุลบัญชีเดินสะพัด โดยครอบคลุมถึงการศึกษาเชิงเปรียบเทียบปัจจุบันกับอดีต โดยเฉพาะในช่วงวิกฤตเศรษฐกิจ ตลอดจนวิเคราะห์การตอบสนองของการปรับตัวของดุลบัญชีเดินสะพัด ต่อการดำเนินนโยบายเศรษฐกิจมหภาคทั้งในส่วนของนโยบายอัตราแลกเปลี่ยน นโยบายการเงิน และนโยบายการคลัง เพื่อที่จะเสนอแนวทางในการดำเนินนโยบายเศรษฐกิจมหภาค สำหรับการดูแลให้การขาดดุลบัญชีเดินสะพัดระยะต่อไปอยู่ในระดับที่เหมาะสม

จากการศึกษาโดยเครื่องมือทางเศรษฐมิติ พบว่า ปัจจัยที่สำคัญต่อการปรับตัวของดุลบัญชีเดินสะพัด ได้แก่ เศรษฐกิจประเทศคู่ค้า ระดับการผลิตในประเทศ อัตราแลกเปลี่ยนที่แท้จริง (Real Effective Exchange Rate) และอัตราการค้าระหว่างประเทศ (Terms of Trade) นอกจากนี้ จากการประมาณการโดยการใช้แบบจำลองดังกล่าวร่วมกับสมมติฐานที่เหมาะสม พบว่า หากเศรษฐกิจไทยมีอัตราการขยายตัวประมาณร้อยละ 6 –7 ดุลบัญชีเดินสะพัดจะเริ่มขาดดุลในปี 2550 เป็นต้นไป และหากเศรษฐกิจไทยเร่งตัวมากกว่าอัตราดังกล่าว คาดว่าดุลบัญชีเดินสะพัดจะเริ่มขาดดุลก่อนหน้านั้น

ในทางทฤษฎี ภายใต้ระบบอัตราแลกเปลี่ยนลอยตัว ดุลบัญชีเดินสะพัดจะปรับสู่สมดุลโดยพึ่งพาอัตราแลกเปลี่ยนในการเป็น Automatic Stabilizer อย่างไรก็ตาม ในกรณีของประเทศไทย การศึกษาเชิงพลวัต (Vector Autoregressive Model: VAR) พบว่า การปรับตัวของดุลบัญชีเดินสะพัดต่ออัตราแลกเปลี่ยนมีน้อย เมื่อเทียบกับตัวแปรทางเศรษฐกิจอื่น ๆ อาทิ เช่น เศรษฐกิจของประเทศคู่ค้าและการผลิตสินค้าในประเทศ การที่อัตราแลกเปลี่ยนส่งผลไม่มากในการปรับตัวของดุลบัญชีเดินสะพัดนั้น ส่วนหนึ่งเป็นผลจากดุลบริการที่มีการปรับตัวจากการเปลี่ยนแปลงของอัตราแลกเปลี่ยนน้อยมาก รวมทั้งสินค้าส่งออกของไทยมีอัตราการใช้วัตถุดิบนำเข้าค่อนข้างสูง นอกจากนี้ จากข้อมูลที่มียังไม่พบการปรับตัวของดุลบัญชีเดินสะพัดในลักษณะ J-Curve ที่เมื่ออัตราแลกเปลี่ยนที่แท้จริงอ่อนตัวลง จะทำให้ดุลบัญชีเดินสะพัดขาดดุลในระยะแรก แล้วจึงเริ่มเกินดุลภายหลัง เนื่องมาจากการนำเข้าสินค้าที่ปรับตัวได้ช้าเป็นสำคัญ

แม้ว่าการใช้นโยบายอัตราแลกเปลี่ยนแบบลอยตัวภายใต้การจัดการ (Managed Float) จะช่วยสร้างความยืดหยุ่นในการบริหารเศรษฐกิจมากขึ้น จากการเอื้ออำนวยให้อัตราแลกเปลี่ยนที่แท้จริงสามารถปรับตัวสอดคล้องกับปัจจัยพื้นฐานทางเศรษฐกิจตามกลไกตลาดได้ แต่เนื่องจากดุลบัญชีเดินสะพัดมีการปรับตัวไม่มากต่อการเคลื่อนไหวของอัตราแลกเปลี่ยน ดังนั้น การพึ่งพาเพียงเฉพาะนโยบายอัตราแลกเปลี่ยนในการรักษาเสถียรภาพของดุลบัญชีเดินสะพัด (โดยเฉพาะในภาวะที่เศรษฐกิจมีการขยายตัวในเกณฑ์สูง) โดยไม่มีนโยบายเศรษฐกิจอื่นมาช่วยสนับสนุน จะทำให้อัตราแลกเปลี่ยนต้องเปลี่ยนแปลงมาก ซึ่งจะก่อให้เกิดต้นทุนและผลกระทบต่อภาคเศรษฐกิจจริง ตลอดจนจะมีผลกระทบต่อเป้าหมายอื่นในการดำเนินนโยบายทางเศรษฐกิจ ดังนั้น การดูแลให้การขาดดุลบัญชีเดินสะพัดไม่สูงจนเกินควร จึงจำเป็นต้องอาศัยนโยบายทางเศรษฐกิจอื่น ๆ โดยเฉพาะนโยบายการเงิน และนโยบายการคลัง สนับสนุนควบคู่กันไป

จากการศึกษาพบว่านโยบายการเงินและนโยบายการคลังจะส่งผลต่อการปรับตัวของดุลบัญชีเดินสะพัดในลักษณะที่แตกต่างกัน กล่าวคือ การใช้**นโยบายการเงิน**ผ่านการปรับอัตราดอกเบี้ยระยะสั้นจะใช้เวลาประมาณ 1 ปี ในการส่งผ่านอย่างมีนัยสำคัญไปยังดุลบัญชีเดินสะพัด ในขณะที่**นโยบายการคลัง**ส่งผลกระทบในทันทีต่อดุลบัญชีเดินสะพัดเนื่องจากการลงทุนของภาครัฐส่งผลกระทบทางตรงต่อการลงทุนรวมของประเทศและดุลบัญชีเดินสะพัดอย่างรวดเร็ว แต่เป็นผลกระทบระยะสั้นเท่านั้น

ดังนั้น สรุปได้ว่าดุลบัญชีเดินสะพัดของไทยมีโอกาสสูงที่จะขาดดุลในช่วง 3-5 ปีข้างหน้า อย่างไรก็ดี สถานการณ์ทางเศรษฐกิจของประเทศได้ปรับตัวดีขึ้นมาก โดยหนี้ต่างประเทศอยู่ในระดับต่ำ ในขณะที่ฐานะเงินสำรองระหว่างประเทศมีความมั่นคงสูง รวมทั้งระบบอัตราแลกเปลี่ยนที่เป็นแบบลอยตัวภายใต้การจัดการ (Managed Float) จะสามารถรองรับการขาดดุลบัญชีเดินสะพัดที่อาจจะเกิดขึ้นในอนาคตได้ระดับหนึ่ง โดยที่ไม่ก่อให้เกิดแรงกดดันต่อเสถียรภาพเศรษฐกิจด้านต่างประเทศมากนัก อย่างไรก็ตาม ควรจะต้องมีการดูแลการขาดดุลบัญชีเดินสะพัดในระยะปานกลางให้อยู่ในระดับที่ไม่สูงจนเกินควร โดยจะต้องอาศัยการผสมผสานนโยบายเศรษฐกิจมหภาคที่เหมาะสมทั้งนโยบายการเงิน นโยบายอัตราแลกเปลี่ยน และ นโยบายการคลัง ร่วมกัน อีกทั้งจะต้องให้ความสำคัญต่อการแก้ไขปัญหาด้านโครงสร้างเศรษฐกิจ
เพื่อให้เกิดการปรับตัวที่ยั่งยืนของภาคต่างประเทศต่อไป

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I. Introduction

This paper studies the current account development for Thailand and its adjustment to the change in exchange rate, as well as other policy variables in the light of the policy recommendations to cope with possible excessive current account fluctuation. Current account is one of the key variables in determining the country's external imbalances. With the experience of the Asian Financial crisis in 1997, the awareness of external risk assessment has become increasingly crucial for the emerging economies. Many studies have found the essence of current account as the signaling variable to the financial crisis. Edwards (2002) finds that the currency crisis is usually associated with the current account reversal which refers to a sharp improvement of the current account while the treatment effect model (Edwards, 2004) finds that the current account is a significant crisis indicator.

With Thailand's economic recovery, the expansion of production and consumption sectors has posted some concerns for the country's trade balance and consequently, current account. To assess the time frame of the current account turning deficit, the paper first identifies current account determinants to obtain their coefficients in order to perform the forecast assuming appropriate assumptions for variables in the determinants. In estimating the current account determinants, various approaches for the specification could be employed. Knight and Scacciavillani (1998) uses Mundell-Flemming intertemporal approach asserting that current account imbalances are also an outcome of intertemporal consumption and investment choice in addition to the reflections of goods market. Ventura (2002) also finds that such approach works fairly well in the industrialized country's data.

However, Chin and Prasad (2000) employs a more simple and direct specification to determine the medium-term current account. Similarly, the single equation analysis performed here finds that real effective exchange rate, trading partner's economic performance, domestic production and terms of trade are the significant current account determinants. Moreover, the estimates suggest the overall effect of exchange rate on the current account is less than that of trading partner's economy and domestic production. Using the given coefficients from the estimation, together with a given assumption on the current account determinants,

the paper finds that Thailand's current account will eventually turn deficit in around 2007. However, the deficit could be more severe should Thailand grow faster than its normal path (at 6 – 7%). It is therefore interesting to determine whether the imminent crisis will post any threats to the external stability of the country. In this light, the paper considers the external vulnerability indicators and finds that the country's external position has substantially improved. Together with the floating exchange rate system in which exchange rate can adjust to partially absorb the economic shocks, the risk a crisis as severe as the previous one is modest.

With the risk assessment, the authorities possess possible economic tools to help smooth the sharp movement in current account, which may consequently delay or mitigate the effect of the imminent crisis. The paper investigates the effectiveness of these economic tools in the adjustment of the current account. The mechanism considered in the paper includes interest rate as a monetary policy tool, exchange rate that theoretically acts as an automatic stabilizer to the current account, and fiscal policies in gearing savings and investment toward the desired level.

In addressing the role of exchange rate and monetary policy in an adjustment process of the current account, the reduced form VAR analysis and the related time-series analysis is employed. Impulse responses suggest that, in the adjustment process of the current account, the exchange rate posts significant but little effect whereas monetary policy has lagged effect on the current account.

In the impulse response analysis, many studies have found evidence of the J-Curve response in the bilateral trade data rather than the current account data. Onafowara (2003) and Oskooee and Kantipong (2001) discover weak evidence of the J-curve in bilateral trade between Thailand and the US while Koray and McMillin (1998) find supports for the J-curve hypothesis for the US data. With small adjustment in the VAR system, the change in the government balance is discovered to transmit an immediate but short-lived effect on the current account. This findings support the evidence of Edwards (2004) that suggests a significant influence of the government budget balance on the current account. To crosscheck with the findings from impulse response functions, changes in these policy variables are fed through the macroeconomic model used by the Bank of Thailand. The

directions of current account adjustment in responses to these shocks confirm the findings from the VAR.

Regarding the small effect of exchange rate on the current account, a sizable exchange rate movement is essentially needed in order to stabilize a potentially large deficit. This large exchange rate fluctuation could possibly generate side effects on the other economic sectors as well as other policies' targets. Therefore, in the case of large and threatening deficit, exchange rate as a sole policy might not be appropriate. Given this, monetary and fiscal policies should be considered with discretion when used to provide assistance to the exchange rate.

The policy recommendations are therefore to apply the appropriate macroeconomic policy mix in the short run to mitigate the cyclical and short-term shocks. However, to ensure the external stability in the long run, policies regarding structural improvement, such as competitiveness enhancement, second stage import substitution and research and development, should be addressed.

The next section describes the data used in the analysis. Section III. reports the current account development including the process of finding the current account determinants which are used later to produce the forecasts. VAR and impulses responses are employed to analyze the effectiveness of the exchange rate on the current account adjustment in section IV. The next section investigates the influence of monetary and fiscal policies on the current account adjustment followed by the section addressing the policy implications. Section VII. describes drawbacks and possible extensions while the last section concludes the paper.

II. Data Description

The current account as well as capital account data including its component utilizes data from the Bank of Thailand website[1]. The annual data in US dollar term covers from 1970 – 2003 while the quarterly data starts from the first quarter of 1993 to the first quarter of 2004. However, due to the data limitation on the export and import price index, the least square regressions starts from 1995:Q1. On the analysis of service account, the figures used exclude interest income and transfer to eliminate the effect of the interest sensitive items.

In the regression analysis, logarithmic form is frequently imposed in order to adjust for scaling. However, the current account often registered a deficit in which the logarithmic operation cannot be performed. In attempts to avoid this complication, scaling the current account to a positive number or creating an index is not robust since the result varies depending on the scaling factors. Moreover, in the OLS specification, using the current account as an endogenous variable could produce the spurious regression results when any of the GDP components are used as exogenous variables. Therefore, the VAR and regression analysis employ the ratio of exports and imports to proxy for the current account movement. The X/M ratio has been widely used as current account proxy in many empirical investigations of the trade balance-exchange rate relationship (Onafowora 2003, Lal and Lowinger 2001, Bahmani-Oskooee and Brooks 1999, and Gupta-Kapoor and Ramakrishnan 1999). One reason for its use is that the ratio is not sensitive to the unit of measurement and can be interpreted as nominal or real CA (Bahmani-Oskooee, 1991). This paper utilizes all X/M ratios in terms of goods, services and the current account in the analysis.

The nominal exchange rate for the estimation is the quarterly average value of daily effective rate. In the econometric analysis, the real effective exchange rate, where the weight is calculated according the share of trade with the major trading partner, is also obtained to represent the country's competitiveness. The data are compiled by the Bank of Thailand. The index is trade weighted and comprises of 22

[1] www.bot.or.th

trading partner countries that account for more than 80 percent of the country's total trade. The formula in calculating the REER is as follows;

$$REER = \sum_{i=1}^{n} w_i \times \frac{FC_i}{HC} \times \frac{P}{P_i} \qquad \text{where } \sum_{i=1}^{n} w_i = 1$$

n = number of the major trading partners

w_i = weight of the currency of country i

P_i = Foreign price level

P = Domestic price level

$\frac{FC_i}{HC}$ = Units of foreign currency i per unit of domestic currency

During the Asian financial crisis, many economic variables were affected by the abrupt growth process and hence deviated from their equilibrium path. The fixed exchange rate regime was altered to a managed float and the Thai baht was devalued by more than 50%. This largely affects the value of the country's international trade and hence the current account data sharply adjusted during that period. To adjust for this irregularity in the data, the econometric analysis in this paper imposes dummy variable which takes the value of 1 from 1997:2 – 1998: 2 and 0 for the remainder of the series.

Private saving and investment from 1993:Q1 to 2004:Q1 are extracted from the National Economic and Social Development Board (NESDB) while the government expenditure and government budget balance are obtained from the Ministry of Finance. The import content data is also obtained from the NESDB's Input-Output Table of 1998.

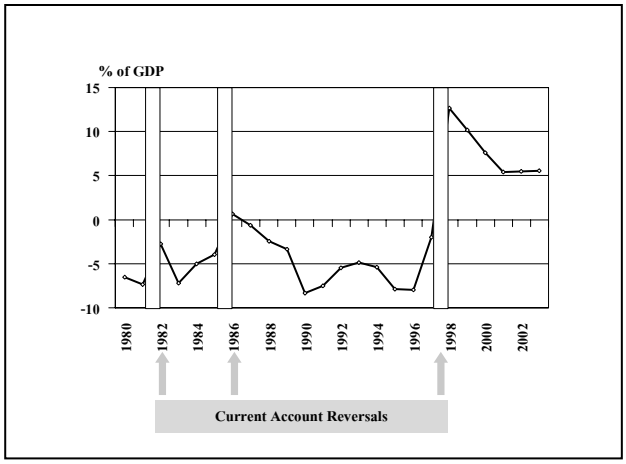
The manufacturing production index and the capital utilization index are compiled and published by the BOT. Trading partner's GDP is composed using the weighted average of major trading partner's GDP growth according to value of the country's export. Trading partners include 22 countries in which account for 80.3 percent of Thailand's total export bill in 2002. Sectoral regression employs export and import indices by sector in both price and quantity terms from 1995:1 – 2004:1. These sets of indices are also published on the Bank of Thailand website.

III. Thailand's Current Account Development

I. Overview: Development and theoretical aspects

Given the nature of developing countries, excessive requirements for factors of production during periods of economic expansion, especially through domestic investment, are typical. A large share of raw materials, oils and other production inputs may have to be imported from abroad to support the country's ongoing domestic production. Therefore, suggests that, developing countries' imports exceed exports, which consequently results in a deficit in the trade balance and the current account balance.

Figure 3.1 Thailand's Current Account (1980 – 2003)



Note: The figures are as a percentage of GDP and the shaded area represents the time when current account reversals happened.

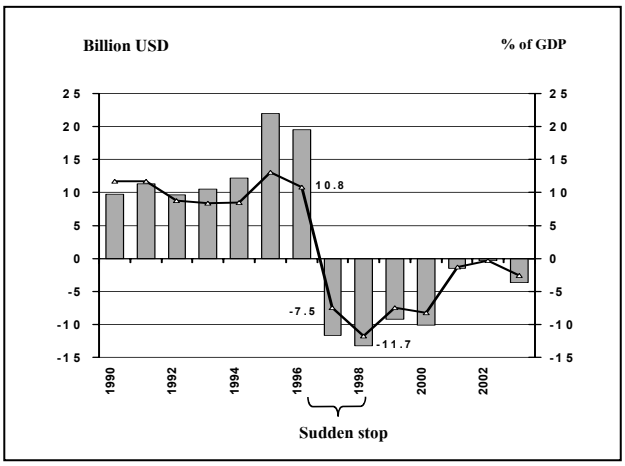
Thailand, as one of the developing countries, also exhibited a persistent current account deficit leading up to the financial crisis period in 1997. Figure 3.1 exhibits the development of Thailand's current account and indicates the accelerating deficit in the period before the crisis. The driving factor for the persistence of deficits in the current account is the rapid expansion of the economy from the beginning of the 1990's. Nevertheless, the situation sharply reversed to a current account surplus after the crisis year. This significant improvement in the

current account, in other words, the current account reversal[2], is partially a result of the exchange rate depreciation in tandem with the decline in investment spending from the economic recession. In addition, the cyclical recovery has been largely underpinned by strong exports and a rebound in global demand.

Throughout the sample period, three current account reversals has been reported for Thailand; in 1982, 1986 and the major one in 1997. The reversals in 1982 and 1997 were the effect of the country's exchange rate devaluations, which were consistent with the finding in Edwards (2004) that the current account reversals resulted from a sharp depreciation in the country's exchange rate.

Regarding the capital flow, prior to the crisis, Thailand experienced high levels of capital inflow, which theoretically acted as a source of financing for the country's persistent current account deficit. However, shortly before the crisis, investors' confidence and Thailand's creditability deteriorated significantly. This resulted in a substantial decline in capital flows as foreign funds were withdrawn from the country shown in Figure 3.2. This sharp declined of capital flows is regarded as the sudden stop in which the external financing of the current account deficit abruptly declined by more than 5 percent of the country's GDP in a year. (Edward, 2004)

Figure 3.2 Thailand's Capital Flow (1990 – 1992)



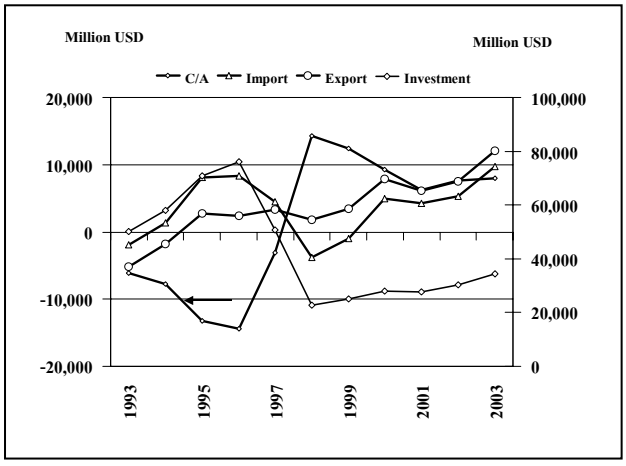
Note: The data in bar chart represent Thailand's capital flows excluding flows from the IMF. The line represents capital flows as a percentage of GDP.

[2] The current account reversals are defined as the improvement in the country's current account by more than 4 percent of its GDP in a year. (Edward, 2004)

II. Thailand's Current Account Prior to and After the Crisis

The accelerating investment and import of goods and service since the early 90's are the main factors contributing to the sharp deterioration of the current account prior to the crisis. Figure 3.3 reveals the remarkable increase in investment spending, which largely raised imports and led the trade balance and current account to large deficits. After the crisis, investment collapsed following the economic recession and hence lowered demand for import of goods and other raw materials. The current account status therefore improved notably and reached its peak in 1998 when Thailand recorded current account surplus of USD14.3 billions. Until recently, the current account continuously registered a surplus despite its gradual decline due to another up-cycle of the economy.

Figure 3.3 Current Account Environment During the Financial Crisis Period

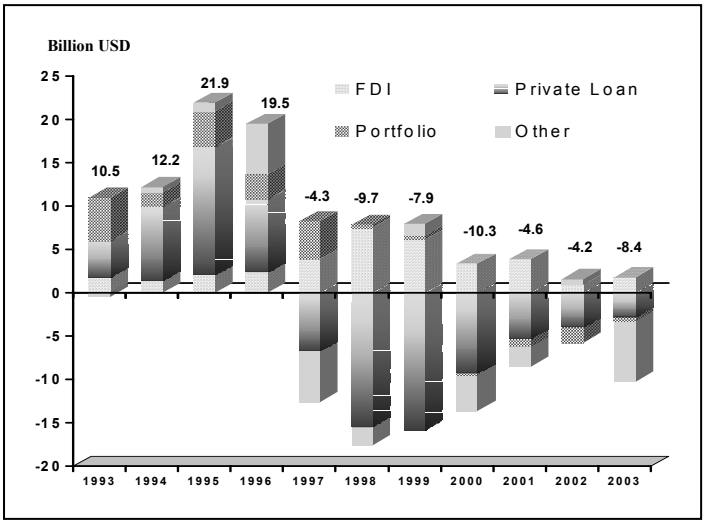


Note: Current account uses the left scale

In terms of the capital account, Thailand's current account deficit was largely financed by external borrowings, resulting in the substantial level of external debt and international accumulation. Figure 3.4 suggests that the share of private loans to total capital inflow substantially increased during 1993-1996. At the same time, the share of foreign direct investment, that is considered a more stable source of funding, was relatively stable. This pattern of capital flow leads Thailand to be vulnerable to the sudden stop of the capital account and, eventually, financial crisis.

The risk became more imminent when Thailand's credit rating was downgraded, and creditors rejected to further rollover existing debts and forced debt repayments.

Figure 3.4 Capital Flow Composition of Thailand



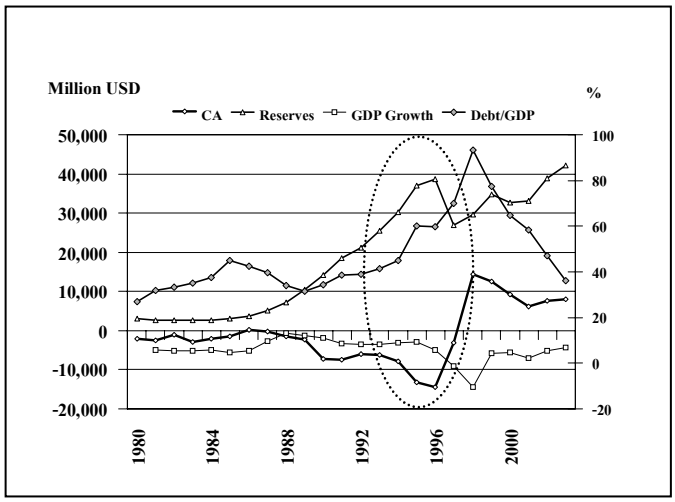
However, the situation reversed itself after the crisis as Thailand has attracted more foreign direct investment and the period of debt repayment has begun. FDI in Thailand increased significantly during 1997-1998 due to capital injection into the banking and non-banking sectors in response to operating and exchange losses. Moreover, Thailand's external debt outstanding has declined gradually from USD 105.1 billion at the end of 1998 to USD 52.3 billion at year end 2003 in line with debt repayments from both the private and the public sectors due mainly to the prolonged excess liquidity and improved corporate earnings. In short, the structure of capital inflow has moved toward a more prudent and sustained economic development.

Economic Indicators During the Crisis

In addition to the deteriorating condition of the current account, other external indicators expressed adverse signals that finally led the economy into crisis. Figure 3.5 presents the economic variables indicating the external stability of a country from 1980 to 2003. Despite a continuous increase in Thailand's international reserves, the major part of this foreign exchange accumulation was contributed by imports of foreign loans. As can be seen, with relatively stable GDP growth, the external debt to GDP rose substantially by the sharp increase in foreign

loans. At the same time, international reserves relative to the external debt decelerated shortly before the crisis.

Figure 3.5 Economic Stability During the Crisis

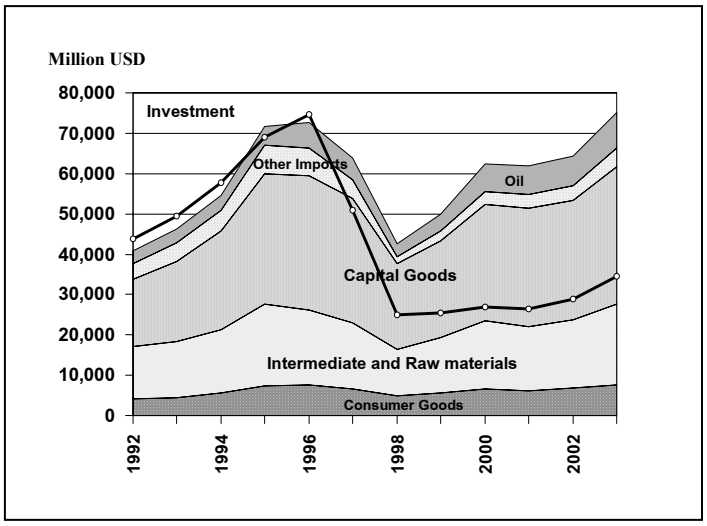


Sectoral Adjustment of the Current Account

The financial crisis did not post much of an adverse effect on the country's export of goods and services. With the baht depreciation and the stable growth of Thailand's trading partners, exports have risen gradually. Even though the relative competitiveness with respect to other countries in the region did not improve a great deal since other regional currencies also depreciated. Exports to other regions especially China, in both goods and services, was quite robust during the crisis.

As previously mentioned, the country's imports, on the other hand, were affected by the economic recession following the crisis. To investigate the break-down in import components, Figure 3.6 presents the by-sector import components from 1990 to 2003. The diagram suggests that the import of capital goods, which account for approximately 40 percent of the total import value, is highly sensitive to investment cycle, lagging by approximately one year. As the shares of other components of imports are relatively stable, that of capital goods accelerates during an investment up-cycle, and vice versa. The import of intermediate goods is also related to investment cycles, though the correlation is not as robust as that of capital goods.

Figure 3.6 Thailand's Import Components



The economic recession following the crisis in both real and financial sector caused investment to decline and lowered the country's imports, especially capital and intermediate goods. As shown, the share of capital goods has been relatively large and stable compared to the other import sectors throughout the sample period. This large share of capital goods imports suggests the country's dependency on foreign technology. The reduction in this dependency on capital imports would substantially relieve pressure on the country's current account.

III. Cyclicality of current account with other economic factors

In order to determine factors that drive Thailand's current account, the first step is to understand current account behavior and cyclicality of other major economic indicators, for example, Thailand's economic growth, trading partner's GDP and saving-investment cycles. Cycles represent the deviation from the variable's long -term trend, which is calculated by using the HP trend as a proxy. The major reason cycle analysis could give more useful information than the comparing levels is that some variables possibly have drifts, that create an upward or downward trend while others may fluctuates around a constant value. The direct comparison between the two series therefore cannot be easily performed, otherwise being converted into the cycle form.

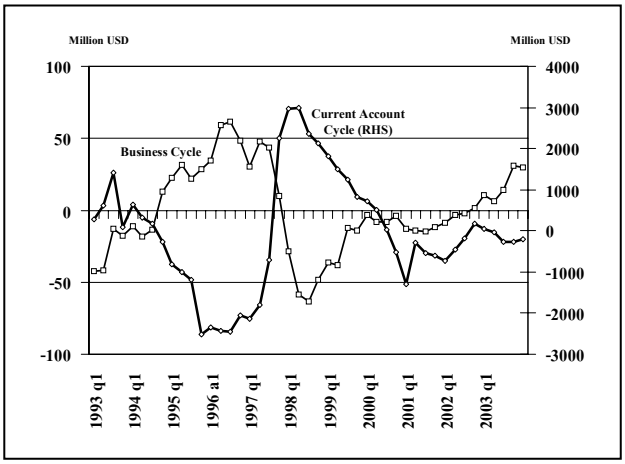
This cycle analysis could partially help identify the possible candidates for Thailand's current account determinants. To help quantify the relationship between

cycles, the correlation test for the cycles has been adopted. However, this technique is quite distant from identifying causality between the variables. From the correlation, only the synchronization among variables is suggested.

Current account cycle and business cycle

Figure 3.7 sheds some light on the synchronization of Thailand's current account and the country's business cycle. It is apparent that the current account moves in the opposite direction to the country's economic condition. An economic expansion leads to higher income and raises imports of goods and services. Therefore, the deterioration of the current account is expected. The correlation between the two cycles reported to be significantly negative.

Figure 3.7 Current Account and Business Cycles



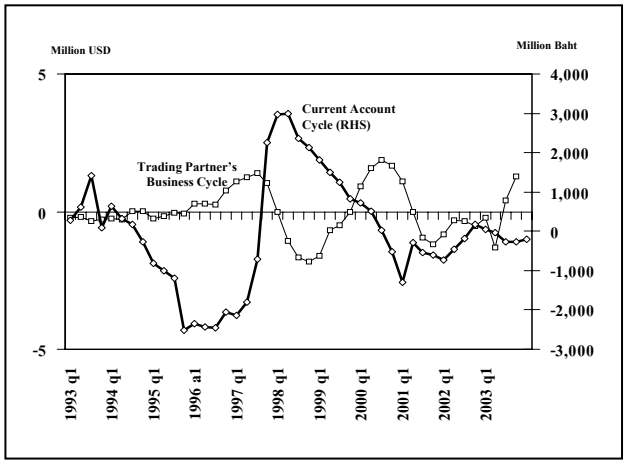
Note: Cycles are calculated by obtaining the deviation from the HP trend of the data.

However, from the diagram, the situation reversed after the year 2000. An economic expansion coincides with the improvement in the current account. This observation can be explained by the excess capacity utilization in the economy. The recession following the crisis caused the economy to produce less than its capacity, especially immediately following the expansion in investment prior to the crisis. With available capacity, the expansion did not require further investment or imports of capital, easing the downward pressure on the current account during that period. The correlation for the whole sample is – 0.89.

Current account cycle and trading partner's business cycle

Being the major export stimulus, one could expect trading partner's business cycle to be positively related to the current account cycle. As trading partner's income increases, demand for Thailand's goods and services are likely to increase, consequently, Thailand's current account improves. Figure 3.8 reveals the ambiguous co-movement between the two cycles. Before the year 2001, the cycles seem to move in the opposite direction, especially during the crisis period. The reason behind this observation is that the current account was dominantly driven by the currency depreciation and trading partner's movement became trivial. However, after the year 2000, both cycles have become positively synchronized. The correlation obtained for the full sample period is weakly negative, not positive as previously expected.

Figure 3.8 Current Account and Trading Partner's Business Cycles



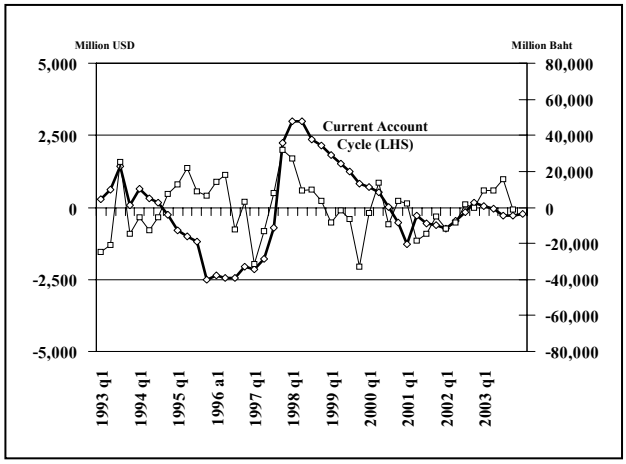
Note: Cycles are calculated by obtaining the deviation from the HP trend of the data.

Current account and saving - investment cycle

The traditional concept of saving - investment gap has often been used to explain current account fluctuation. For developing countries, investments are more likely to exceed national savings, as the investment opportunities are rather prevalent. The current account therefore registers a deficit by construction, whereas capital account is likely to record a net inflow. To investigate further the degree of contribution of savings and investment has on the movement in Thailand's current

account, without going into the complicated general equilibrium analysis, this section adopted the simple cycle analysis to savings and investment. Studies have found that in most developed countries, the fluctuation in the current account are largely co-move with the country's savings (Feldstein and Harioka , 1980). However, the result turns out to be opposite for Thailand.

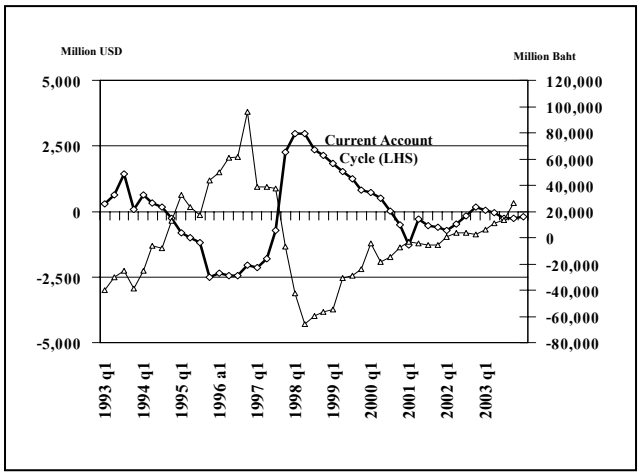
Figure 3.9 Current Account and Savings Cycles



Note: Cycles are calculated by obtaining the deviation from the HP trend of the data.

Figure 3.9 presents the cycles of Thailand's current account and national savings. With the fluctuation of the current account cycle, Thailand's saving cycle is moderately stable. This behavior of Thailand's savings has been known to be relatively consistent through time regardless of other economic conditions. Thailand's savings rate has been approximately 20 to 25 percent since the 1980's. Conversely, Figure 3.10 reveals the negative co-movement between the current account cycle and the investment cycle. The negative correlation between the two cycles is as high as 0.89 in absolute terms throughout the sample. This indicates investment spending as the major factor that relates to the current account.

Figure 3.10 Current Account and Investment Cycles



Note: Cycles are calculated by obtaining the deviation from the HP trend of the data.

The cycle analysis provides an overview of the co-movement between economic variables and current account. However, this statistical relationship is too vague in determining the current account's drivers. Therefore, a more in-depth analysis is needed. The next section applies statistical techniques to estimate the current account determinants and employs the estimates to perform the forecast given sensible assumptions.

IV. Current Account Determinants

The approach in seeking the current account determinants varies. A collection of literature provides the analysis on the current account as a mechanism for international consumption smoothing. The other related studies have concentrated on using fluctuation in investment and savings in the intertemporal approaches, for example, Feldstien and Harioka (1980), Knight and Scacciavillani (1998) and Ventura (2002). Their panel regression estimates reveal that savings are the main determinants of a country's current account. However, evidence from Thailand found earlier in the paper suggests that investment cycles, on the other hand, co-move quite strongly with the current account.

Rather than directly using savings and investment, the analysis takes on the current account determination using variables explaining net exports. In this light, Chinn and Prasad (2000) uses panel regression to find that government budget

balance and financial deepening are the important medium-term determinants. However, the analysis is aiming for the less structural determinants of the current account. With the traditional determinants of exports and imports, the simple reduced form equation explaining the current account can be obtained,

$$CA = f(TOT, REER, TPGDP, MPI, crisis\_dummy)$$

where CA = Ratio of export and import as the current account proxy

TOT = Terms of trade (Px/Pm)

$TPGDP$ = Major trading partners' economic performance

$REER$ = Real effective exchange rate

MPI = Manufacturing production index

$crisis\_dummy$ = The crisis time dummy (1996 - 1997)

Since the logarithm operation cannot be performed when the balance records a deficit, the ratio of export value over import value is used as a proxy for the current account. An interpretation of the coefficient read "a one percent change in any of the exogenous variables will cause export to rise by the percentage equals to that coefficient over the import".

The terms of trade represent the relative price of goods and services traded internationally, hence is expected to play an important role for the current account balance. Real effective exchange rate represents the competitiveness of the country relative to its trading partners. Manufacturing production index is used as a proxy for the country's supply-side economic performance for the convenience of interpretation and scaling of the coefficient. Trading partner's GDP, MPI, and the ratio of exports over imports are seasonally adjusted from the quarterly pattern.

Due to the persistence in the current account data, the lagged value of the current account is also used as one of the regressors. This technique helps in absorbing the possible autocorrelation in the error terms in the case of persistent endogenous variable. In addition, due to the possible causality reversal of exchange rate and the current account, the two stage least square such as the GMM estimation technique might be needed. However, the correlation between the error terms and

the regressed variable are quite low, hence the least square technique is the valid tool for the analysis.[3]

Table 3.1 Single Equation Results on Current Account Determinants

	Lagged Current Account	Trade Balance	Service Account
C	-1.779	-1.582	-9.153**
	(-1.272)	*(-1.281)*	*(-3.490)*
Lagged X/M	0.676**	0.707**	-0.372**
	(6.702)	*(8.353)*	*(-2.067)*
REER	-0.246**	-0.305**	0.058
	(-2.298)	*(-2.842)*	*(0.266)*
Trading Partner	0.662**	0.612**	2.477**
	(2.228)	*(2.331)*	*(5.184)*
MPI	-0.322**	-0.280**	-1.169**
	(-2.399)	*(-2.301)*	*(-4.706)*
Terms of Trade	0.330*	0.345**	0.874**
	(1.942)	*(2.232)*	*(3.074)*
Crisis Dummy	0.071**	0.076**	-0.021
	(3.193)	*(3.554)*	*(-0.493)*

1) The estimated equation for the current account is $\left(\frac{X}{M}\right)_t = \alpha + \beta\left(\frac{X}{M}\right)_{t-1} + \chi REER_t + \delta TPGDP_t + \phi MPI_t + \gamma TOT_t + \varepsilon_t$, using ordinary least square regression. All variables are in the logarithm form. Trading partners' GDP, current account proxy and manufacturing production index are corrected for seasonal factors.
2) When the regressions of trade and service accounts are performed, the ratios of X/M are export to import of goods, and export to import of services consecutively.
3) T-statistics are in parenthesis. ** and * represent 95 and 90 percent confidence levels respectively.

The estimates reveal the statistically significant but relatively small response of current account to the real exchange rate[4] compared to trading partners' GDP and domestic production. A one-percent increase in real effective exchange rate (appreciation) would deteriorate the ratio of export over import by an average of a quarter percent, in other words, cause imports to exceed exports by a quarter percent. This relatively slack adjustment of the current account to exchange rate movement will be discussed in detailed in later sections.

[3] In this case, the GMM technique is also experimented. Results are relatively similar.
[4] Substituting the real effective exchange rate with the bilateral exchange rate with the US yield similar results.

Thailand's major trading partner, on the other hand, is the major determinants of the current account. A trading partner's economic expansion helps improve the current account by more than twofold of the effect from the exchange rate through its demand for exports of goods and services. This relatively large coefficient of the trading partners' growth reveals a strong influence over the country's current account, reflecting the substantial dependency of Thailand's external trade on her partner's economic performance. The domestic expansion, proxied by the rise in manufacturing production index, on the other hand, stimulates the country's imports and consequently deteriorates the country's current account.

The relative price of the country's exports over imports, i.e. Terms of trade, exhibits a statistically weak influence on the current account. The positive coefficient, which is opposite from the findings of most literature, suggests a rise in the relative value of exports to imports due to an increase in the terms of trade. This finding implies that prices play a dominant role over quantities of trade. In depth, the value of the current account ratio can be written as

$$\frac{X}{M} = \frac{Px}{Pm} \times \frac{Qx}{Qm}$$

The regressions experimented by the balance of payment analysis team at the Bank of Thailand on export and import quantities reveals a stronger response of import quantity on its price relative to exports. As Px rises over Pm (a rise in terms of trade), Qx drops while Qm also drop is a sizable portion (Px and Pm mostly move together). As a result, the value of export (Px ×Qx) exceeds that of import (Pm × Qm) and X/M rises with the terms of trade.

To further investigate and understand what the major components are driving the country's current account, the single equation analysis is also performed on the trade and service account separately. The results on the determinants from the trade balance is similar to that of the current account while the service account, excluding the interest income and payment, yields somewhat different signs and magnitude of the coefficients. Whereas exchange rate fluctuation has no influence on the service account, table 3.1 suggests the quite substantial effect of trading partners' economies. An increase in trading partner's income induces more inbound tourism (the main item of the account), and hence improves the service account

substantially. With the dominance of the income effect, the dollar service income does not respond accordingly to exchange rate changes.

With the estimates obtained from the regression and probable forward looking assumptions, the next section will attempt to forecast the approximate time the current account will turn deficit and how severe it would be overtime.

V. Current Account Forecasts

This section utilizes the estimated current account equation specified in the previous section as the key instrument to forecast the movement of the current account in the future. However, it is to be noted that these coefficients obtained from the regression are based solely on the historical value of the variables and might not be able to capture an unexpected shock that could affect the economy in the near future. Together with the estimates from the equation above, the probable assumptions of the future value of all variables are needed to perform the forecast. The assumptions for the base line are listed in Table 3.2.

Table 3.2 Assumptions for the Current Account Forecasts from the Single Equation

Baseline	2004	2005	2006	2007
REER	82.11	81.50	81.50	81.50
TOT	77.02	76.35	76.11	75.30
TPGDP (%)	3.80	4.03	4.00	4.00
MPI (%)	6.56	6.26	6.72	6.73

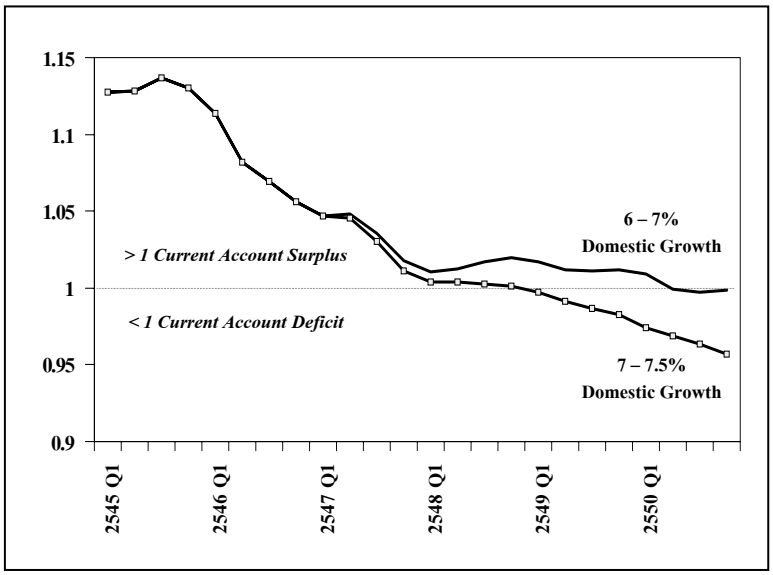
The number is annual average level or growth of the variables.

The REER is assumed to be constant in the medium term since the direction of exchange rate movement is basically the random walk. The country's terms of trade is expected to slightly deteriorate due to the high of the oil price which contribute a large portion to the country's import price and the manufacturing unit value. Despite the fact that the oil price situation is expected to subside towards the medium term, the commodity price that is used as a proxy for the country's export price are expected to gradually drop. The trading partner's growth is forecasted to face a slight decline in 2004 from the previous year and expected to stay at roughly

4 percent annual average after that. The manufacturing production index (proxy for the country's GDP growth with the correlation of more than 0.95) is expected to grow at a relatively stable rate around 6 –7 percent.

In addition, with the domestic economy being currently stimulated, it is rather probable that the acceleration of the economic growth could exceed the potential growth of 6 – 7 percent. Therefore, the other scenario is being created with the domestic production grows at a faster rate than the baseline scenario, say 7 – 7.5 percent, where all other variables resemble those in the baseline case. With the assumptions given in the two scenarios, the forecasts are performed and Figure 3.11 presents the current account forecasts accordingly.

Figure 3.11 Current Account Forecasts



The current account deficit from the forecasts is expected in the year 2007 for the baseline case. As can be seen from Figure 3.11, the ratio of X/M turns less than one, in other words, the value of imports exceeds the value of exports since the second quarter of 2007 and continues to remain in deficit throughout the sample. However, this deficit seems rather low and stable compared with the deficit incurred by the higher-growth domestic economy in the second scenario. In that case, not only the deficit is more severe, but also could be expected in the earlier period. This higher deficit is solely due to the import induced by the high economic expansion relative to the baseline.

With the current account deficit imminent, the question of interest is whether this would eventually lead Thailand to a financial crisis once more. To address this issue, the external and structural factors need to be considered. The financial crisis happens as the economy moves along financial stages, and is not necessarily caused by the chronic deficit of the current account. As mentioned in the previous section, the developing country with the economic expansion could normally possess a current account deficit as long as the borrowed funds are efficiently utilized and the financing strategy is well planned.

Table 3.3 External Vulnerability Indicators

	1995	1996	1997	1998	1999	2000	2001	2002	2003	Q1/2004
Reserves (Billion USD)	37.03	38.72	26.97	29.54	34.78	32.66	33.05	38.92	42.15	43.04
Liquidity Indicators										
Gross Reserve / ST Debt	0.7	0.8	0.7	1.0	1.8	2.2	2.5	3.3	3.9	3.8
Gross Reserves / Imports (mos.)	6.3	6.6	5.3	8.7	8.8	6.3	6.5	7.4	6.8	6.5
Solvency Indicators										
Current Account /GDP (%)	-7.9	-7.9	-2.0	12.7	10.2	7.6	5.4	5.5	5.6	5.3
External Debt / GDP (%)	69.1	65.9	64.8	69.9	72.9	66.7	56.1	48.8	40.3	38.8
External Debt / XGS (%)	169.4	160.4	149.0	146.5	132.8	106.8	86.6	73.2	60.7	58.5
Debt Service Ratio (%)	11.4	12.3	15.7	21.4	19.4	15.4	20.8	19.6	16.0	9.4

Source: Bank of Thailand

Currently, in terms of financing the deficit and financial stability, the country has accumulated international reserves that are well monitored at a sufficient level, especially relative to the country's debt obligation. Table 3.3 compares the external stability indicators before the crisis and the latest actual data. The external debt, despite the gradual increase as the economy expands, is at a level such that the external stability ratio is contained at a satisfactory level, far better relative to the case before the crisis in 1997.

In addition, unlike the pre-crisis era, the economy is now equipped with a floating exchange rate regime where the shock absorption is partially provided by

the fluctuation in exchange rate. Moreover, programs to promote high-value import substitutions also have been put in place to alter the structure of the country's import dependency.

Together with the relatively stronger external stability conditions, banking and financial institutions have gradually regained their strength and become a more cautious in their managing funds and resources. The cost of financial crisis is too high for those institutions to aggressively lend out their available funds. Finally, with the lessons learned from the crisis, public and private sectors are expected to be more cooperative in preventing the next crisis, or at least would prepare a stronger cushion in the case that the crisis could not be prevented.

In summary, the current economic stability that is more satisfactory relative to the pre-crisis era as well as the system of floating exchange rate should help reduce risks of a next financial crisis to happen, or could mitigate the effect of the crisis to be less severe than the last incidence.

IV. The Role of Exchange Rate on Current Account Adjustment

Exchange rate fluctuation and current account adjustment: assumptions for half-circle analysis

In the floating regime, exchange rate adjusts accordingly to market forces of supply and demand for local against foreign currencies. In the medium term to the long run, the imbalance of the country's external transactions, namely current account surpluses and deficits, theoretically contributes to these market forces in the adjustment process towards the balance of the country's inflow and outflow of foreign currencies.

On the other hand, the shorter run movement of exchange rate tends to be driven by the short-term market activities due to transactions including currency speculation, hedging as well as other trading and financing underlying transactions. The exchange rate adjustment, therefore, is not solely driven by the current account fluctuations. With various factors contributing to the fluctuations in exchange rate in the short run, rather than endeavor to analyze the entire circle of the relationship between exchange rate and current account, the paper emphasizes on how exchange rate plays the role on the current account adjustment. Therefore, the important assumption adopted in the analysis is that exchange rate adjusts appropriately in response to the market forces and follows the trends set by the current account fluctuation.

Role of exchange rate in current account adjustment

In the floating exchange rate regime, movement in the nominal exchange rate is expected to act as an automatic stabilizer to the current account in such a way that the balance of payment fluctuates in the neighborhood of zero in the long run. However, in the managed float system where nominal exchange rate is not as free to adjust as in the fully flexible scheme, the role of exchange rate in the current account adjustment could be dampened. This section attempts to test the effectiveness of the exchange rate movement on the current account adjustment and exploring the existence of the J-curve which are found in most literature. The J-curve is reported when an exchange rate depreciation leads to a deterioration, rather than an

improvement, in the current account. This phenomenon could be explained by the slow adjustment of the exporters and importers due to settled orders and decisions, which could not be readily altered.

The evidence from the current account determination in the previous section reveals the significant but small effect of the real effective exchange rate on the current account. However, the relationship from the regression only reflects the response of the current account on average, based on the historical movement. In this section, another statistical technique will be used to reveal the path of the current account response and how the current account develops over time in reaction to a shock of exchange rate.

VAR Methodology

The vector autoregressive model is employed in this section to test the responsiveness of the current account to economic variables in the system. The reduced form VAR is set up such that a variable linearly depends on its own lags and also on other variables and their lags. The system of the reduced form equation can be written as,

$$Y_t = \beta_0 + \sum_{s=1}^{L} \beta_s Y_{t-s} + \sum_{s=1}^{L} \gamma_s X_{t-s} + \chi D1997 + \varepsilon_t$$

Where $$Y_t = \begin{bmatrix} \log\left(\frac{1}{REER}\right) \\ \log(MPI) \\ \log(\frac{X}{M}) \\ RP14D \end{bmatrix}, X_t = [TPGDP]$$

β_0 = 4×1 Vector of Constant

β_s = 4×4 Vector of coefficients of lags

γ_s = 4×1 Vector of coefficients for trading partner's GDP of lags

χ = 4×1 Vector of coefficient for Dummy variables

and

MPI = Manufacturing production index

1/REER = The reciprocal of real effective exchange rate

X/M = The ratio of export to import of goods and services

RP14D = The 14-day repurchase rate

D1997 = Dummy variable of the crisis

TPGDP = Trading partner's GDP

In the VAR analysis, to capture the response of the current account, the real effective exchange rate is chosen over the bilateral exchange rate to reflect the response of the current account to composition of trading partners' currencies rather than a single currency. The reciprocal of real effective exchange rate alters its direct value only to simplify the analysis of the impulse responses. An increase in 1/REER implies an improvement on the country's competitiveness and a currency depreciation. The ratio of exports to imports, manufacturing production index and the trading partner's GDP are seasonally adjusted.

Table 4.1 Correlation Coefficients between Innovations

	$e_{\log(1/REER)}$	$e_{\log(MPI)}$	$e_{\log(XMS)}$	e_{RP14D}
$e_{\log(1/REER)}$	1.000	0.502*	0.396*	0.187
$e_{\log(MPI)}$		1.000	0.106	-0.035
$e_{\log(XMS)}$			1.000	0.034
e_{RP14D}				1.000

To further investigate the effects of shocks and trace out potential J-curve effects in the data, generalized impulse response functions from the VAR system as introduced by Pesaran and Shin (1998) are employed. The construction of an impulse response function and a variance decomposition requires an orthogonalization of the error terms by appropriately ordering the variables in the VAR model. The ranking of the endogenous variables is decided using the correlation coefficients of the error terms, the so-called the Choleski decomposition, which specifies the contemporaneous effect among the endogenous variables. Table 4.1 reports two significant correlation coefficients of the error terms at 5 percent

significant level[5]. From this result, the ordering of variables are log(1/REER), log(MPI), log(XMS) and lastly RP14D.

Lag Length Selection and the Block Exogeneity Test

In order to estimate the system, the optimal lag length is selected by using the Likelihood Ratio (LR) test, the Akaike Information Criterion (AIC), and the Swartz Baysian Criterion (SBC). The LR and the AIC suggest three lags whereas the SBC suggests only one lag. Hence, three lags will be applied since one lag may not fully capture the dynamics of the system. Next the block exogeneity test[6] is carried out to decide whether the exogenous variables should be included in the VAR system. The key issue is to determine whether each exogenous variable poses any impact on other variables in the system. The set of exogenous variables comprises the crisis-dummy and trading partners' GDP. The test suggests including D1997 and two lags of TPGDP.

Impulse Response Functions:

Current Account

The results on impulse responses for the current account system are presented in Figure 4.1. The diagrams exhibit responses of the current account (XMS), real exchange rate (1/REER), the repurchase rate (RP14D), and production index (MPI) to one standard innovation shock in real exchange rate (1/REER). The top left diagram indicates that the real effective exchange rate returns to the pre-shock value after a one standard deviation increase (0.94 in index term) within 2 quarters. At the same time, a shock in exchange rate causes the manufacturing production index to significantly rise and continues for over a year.

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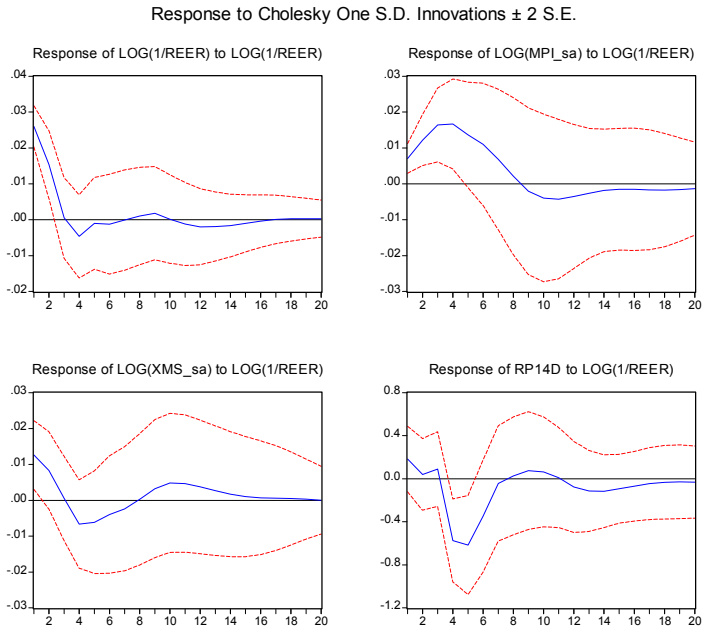
[5] To test the null hypothesis that the correlation coefficient is zero, we should compute the two standard deviation of r_{yz} which is equal to $2*(T-i)^{-1/2}$;where T is the number of usable observations and i is the sample cross-correlation coefficient. The null hypothesis can be rejected if the correlation coefficient exceeds 3.12.

[6] The Likelihood Ratio (LR) statistic tests the null hypothesis that omitted variable is sufficient. The test statistic is distributed as chi-square (χ^2), with degree of freedom to be the number of coefficients that are omitted from the restricted equation.

In response to an unexpected increase in 1/REER or real depreciation in baht, the bottom left panel reveals that the current account significantly rises in the first quarter.[7] In this quarter alone, one percent real exchange rate depreciation raises the country's current account by 0.2 percent of GDP. Nevertheless, the impact subsides and becomes unstable thereafter. In terms of the effect on the repurchase rate, the interest rate significantly drops in response to a real exchange rate depreciation in the 4th and 5th period.

Figure 4.1 CA System: Response to Cholesky One S.D. Innovation in Log(1/REER)

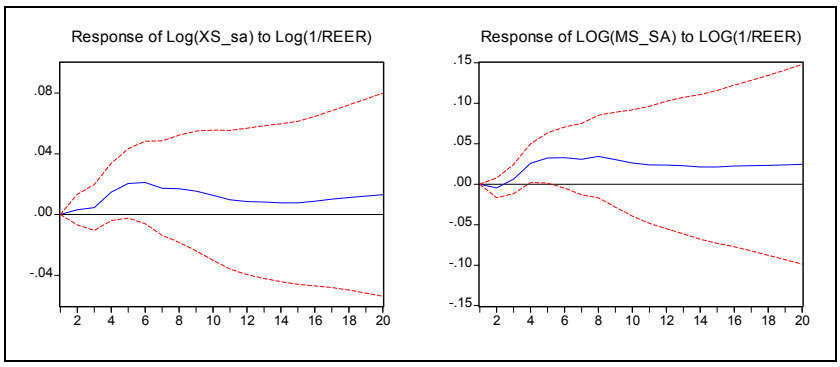


In the attempts to further explain the small impact of the exchange rate on the current account, the VAR analysis is performed on the decomposed system of exports and imports of goods and services. The impulse responses in Figure 4.2 reveal the similar dynamic path of imports and exports. An exchange rate depreciation weakly raises exports while imports slightly decline in the first two quarters before rebounding to be above the original level. Factors that drive these movements of exports and imports will be further scrutinized later in the section.

[7] In the first quarter, a one percent depreciation of the baht improves the current account by 4 percent.

Overall, the positive response of the two components, therefore, offset the movement in the current account.

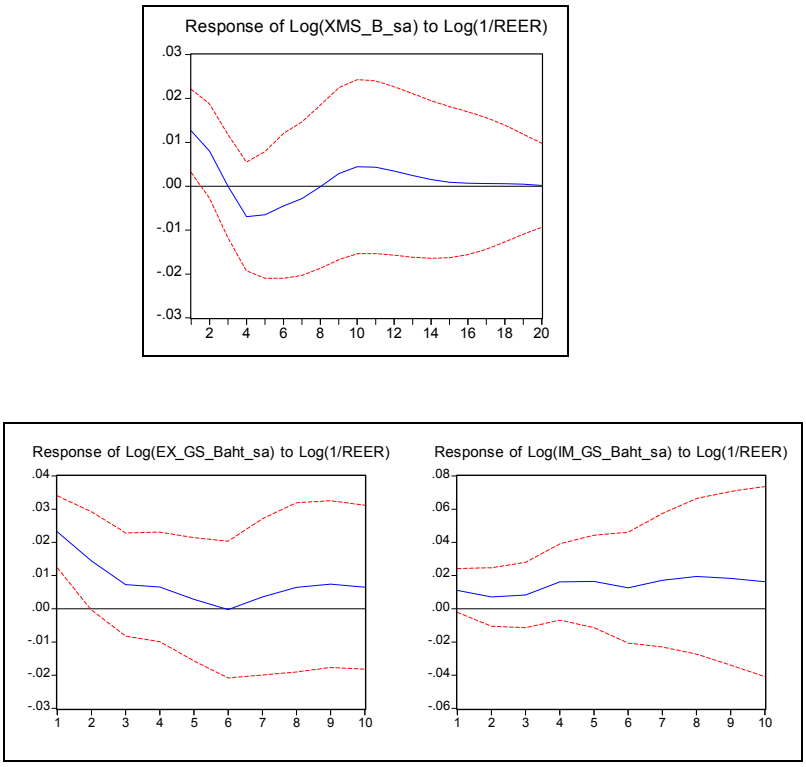
Figure 4.2 : Exports and Imports of Goods And Services
Response to Cholesky One S.D. Innovation in Log(1/REER)



In terms of the sluggish current account, the evidence of the J-curve is examined. The J-curve represents the adjustment of the current account at the time of currency depreciation. The devaluation immediately raises local currency price of imports. If the quantities of imports and exports do not adjust right away, the current account deficit grows in the short run. To pursue the issue, the VAR system alters the ratio of exports to imports in US dollar terms by those in the local currency terms. This is to observe the adjustment of trade quantity relative to price changes due to the depreciation.

Figure 4.3 presents the impulse response of the current account, exports and imports in terms of the local currency with respect to the shock in the real exchange rate. The impulse responses suggest no evidence of J-curves in the country's current account adjustment process. A local currency depreciation immediately results in an improvement within the first quarter after the exchange rate changes. The bottom panel of Figure 4.3 sheds some light on the improvement of current account. Exports rise in response to the depreciation while imports rises by a much smaller amount. This, therefore, increases the current account balance immediately within the first quarter and no J-curve is discovered in this analysis.

Figure 4.3 Response of Current Account in Baht Term to Cholesky One S.D. Innovation in Log(1/REER)



Comparison of VAR Results to the Macroeconometric Model

To verify the result from the VAR analysis, exchange rate shock is also imposed through the system of macroeconomic model. Chart 4.1 presents the flow mechanism and magnitude of the transmission of the exchange rate change towards the current account. One feature that the macroeconomic model differs from the VAR analysis is the exchange rate selection. The model employs the bilateral exchange rate while the impulse response analysis uses the composition of the exchange rate. The results from the model reveals that one percent depreciation in the exchange rate leads to a 0.47 percent improvement of current account to GDP ratio in the first quarter after the shock, compared to 0.2 from the impulse response analysis. In addition to the difference in exchange rate selections, the structure of the analyses and the dynamic responses could also explain for the difference in magnitude of the response.

However, the response suggested by the model in the later periods coincides with what is found in the VAR analysis. Imports accelerate within the following three quarters after the exchange rate change and hence deteriorate the current account.

VAR analysis on the Current Account Components

To support the results from the current account system as well as further analyze the movement in the current account, this section also attempts to investigate the impact of the exchange rate and interest rate shocks on the variation of the current account components, namely the trade and service accounts (excluding interest income and expenditure). Steps taken in the analysis are the same as in the current account system with the optimal lags of two suggested. The ratio of exports and import of goods and services to proxy the current account is replaced with exports and imports of goods (XM) for the trade account, and exports and imports of services (SXM) for the service account. The block exogeneity tests suggest including the dummy variable (D1997) and two lags of trading partners' GDP (TPGDP) in both systems. Next, the correlation coefficient between innovations is applied to find the appropriate ordering of variables when constructing the impulse response functions and the variance decomposition. The results suggest that the ordering in Trade system are log(1/REER), log(MPI, log(XM) and RP14D, which is the same order as in the current account system. At the same time, the ordering in service system are log(SXM), RP14d, log(1/REER) and log(MPI).

Trade Account

Figure 4.4 shows the response of the trade account to exchange rate shock. The crucial finding is the insignificant response of trade to the exchange rate shock. The reasons behind this are twofold. First, the responses of exports and imports of goods to the exchange rate shock are in the same direction, supporting the results from exports and imports of goods and services in the current account system. The further breakdown of analysis of VAR on exports and imports of goods are presented in Figure 4.5. The depreciation of baht raises both the export and import of goods with a higher magnitude in exports, resulting in a trade surplus. This

increase in imports at the time of currency depreciation might be controversial, but in the case of Thailand, this partly reflects the high import content in the country's export production.

Figure 4.4 Trade Balance System: Response to Cholesky One S.D. Innovation in log(1/REER)

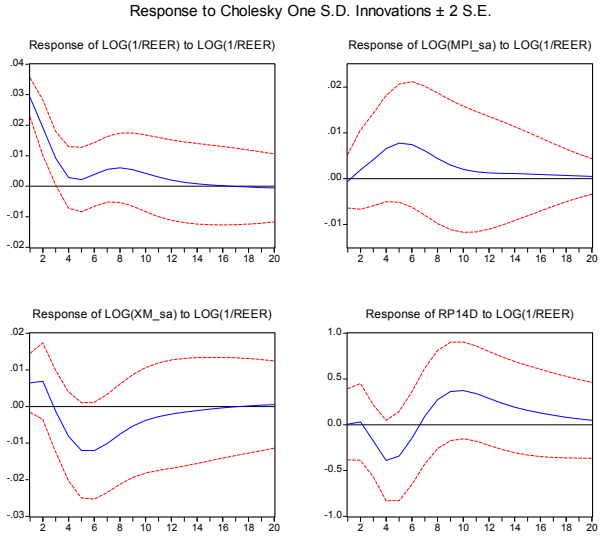
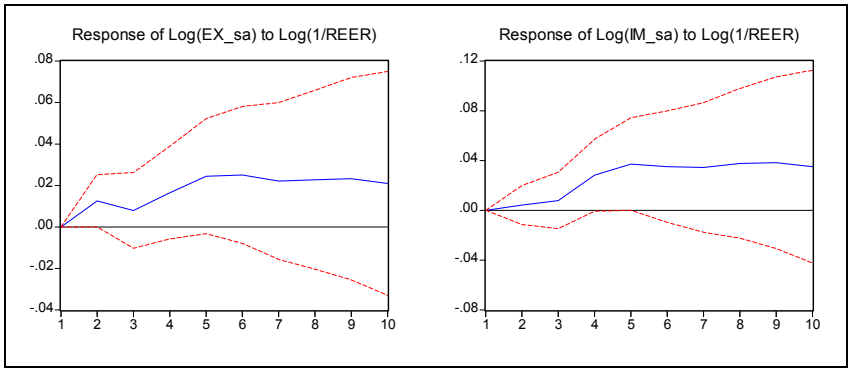


Figure 4.5 Trade Balance In/Out System: Response to Cholesky One S.D. Innovation in Log(1/REER)



Second, increase in international competition may have partly dampened the effect of exchange rate depreciation on Thailand's trade balance improvement due to competitive depreciation and aggressive pricing policies by its competitors, especially China and countries in Eastern Europe. The importers may ask for a price discount following a currency depreciation in exporting countries. This price

discount may be significant enough to dampen the effect of currency depreciation on the value of exports.

Service Account

Similar to the trade account, the response of the service account to an exchange rate shock shown in Figure 4.6 is insignificant. In other words, an exchange rate depreciation does not post a significant impact on the service account. To further reason this weak impact, the service account is decomposed into service receipt and service payment, and the impulse responses are shown in Figure 4.7.

Figure 4.6 Service Balance System: Response to Cholesky One S.D. Innovation in Log(1/REER)

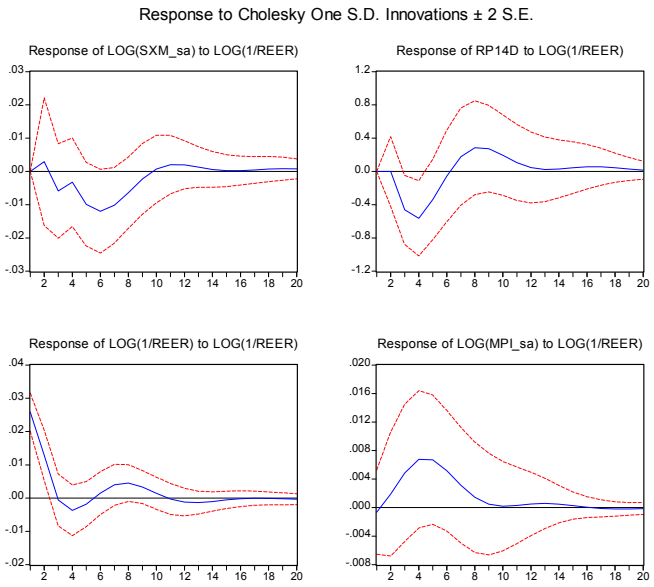
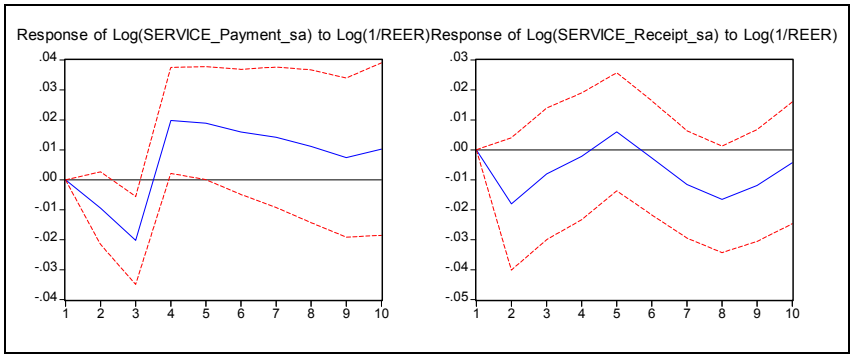


Figure 4.7 Service Balance In/Out System: Response to Cholesky One S.D. Innovation in Log(1/REER)



The outflow of service declined due to the shock in real exchange rate, consequently brings about the improvement in the service account. However, the rise in service outflow in the later period is seen to be a result of an increase in domestic income from a rise in production (MPI) due to the exchange rate depreciation. On the other hand, the service receipt, though response in the same direction as the service payment, is relatively insignificant to the exchange rate change. The sum of these two service account components partially offsets each other and therefore, produce the insignificant response of the overall service account to the exchange rate change.

Variance Decomposition

To find the share of variations in a given variable caused by different shocks, the variance decomposition from the VAR system is applied. The forecast error variance decomposition of current account, trade account and service account are displayed in Table 4.2 - 4.4. The results indicate that most variations in current account are explained by its own shocks.

Table 4.2 Variance Decomposition of current account (XMS)

Quarter	S.E.	Log(1/REER)	Log(MPI)	Log(XMS)	RP14D
1	0.026	15.7	1.2	83.2	0.0
2	0.032	18.3	3.7	77.9	0.1
3	0.036	15.8	7.1	75.5	1.6
4	0.037	16.7	8.7	70.6	4.0
8	0.040	13.2	6.7	76.5	3.7
12	0.042	12.5	7.0	76.7	3.9
16	0.043	12.2	8.2	75.2	4.4
20	0.043	12.0	8.9	74.6	4.5

For the current account, Table 4.2 reveals that its 83.2 percent of the variations are self-driven in the first quarter and gradually declining to 70.5-78.0 percent afterward. Among the other three endogenous variables, exchange rate variation displays the most explanatory power on current account variation relative

to the other shocks. However, while the explanatory power of exchange rate shock weakens over time, the opposite applies to RP14D and MPI shocks.

The variance decomposition pattern for the trade account in Table 4.3 is similar to that of the current account, whereby the innovation changes in trade account mainly stem from its own shocks. However, the percentage of its self-explanation decreases significantly from 91.7 percent in the first quarter to 67.2 and 51.2 percent in the second and the fifth year, respectively. In the first two years, the exchange rate shock possess a high explanatory power compared with the other two shocks while the explanatory powers of other shocks, especially the MPI shock, increase markedly after two years.

Table 4.3 Variance Decomposition of Trade Account (XM)

Quarter	S.E.	Log(1/REER)	Log(MPI)	Log(XM)	RP14D
1	0.029	6.0	2.2	91.7	0.0
2	0.035	6.8	1.3	89.0	2.9
3	0.038	5.0	1.3	88.7	5.0
4	0.040	7.3	1.9	83.8	7.0
8	0.049	19.9	3.2	67.2	9.8
12	0.054	18.0	12.7	59.3	10.0
16	0.057	16.1	20.3	53.9	9.7
20	0.059	15.3	24.1	51.2	9.4

Table 4.4 Variance Decomposition of Service Account (SXM)

Quarter	S.E.	Log(SXM)	RP14D	LOG(1/REER)	Log(MPI)
1	0.077	100.0	0.0	0.0	0.0
2	0.078	98.0	0.8	0.1	1.1
3	0.084	87.8	7.2	0.6	4.4
4	0.089	78.0	10.7	0.7	10.6
8	0.097	66.9	13.4	4.7	15.0
12	0.099	64.5	12.9	4.6	18.0
16	0.099	63.9	12.8	4.6	18.7
20	0.100	63.6	12.8	4.6	19.0

With regard to the service account, Table 4.4 indicates that the exchange rate, RP14D and MPI do not at all explain the one-quarter-ahead forecast error variance in service account. Most variations in service account are explained by its own movement. However, at the end of third quarter, the explanatory power of the other variables significantly increases, except for the exchange rate. Overall, exchange rate shock contributes comparatively little to service balance shock, while the income effect, as represented by MPI shocks, better explained variations in the service account.

To summarize, the results from the variance decomposition suggests that exchange rate shock is superior to interest rate (RP14D) shock in explaining the variations in trade and current account after a lag of more than one year. On the other hand, in the case of service account variations, the interest rate shock is superior to the exchange rate shock.

Trivial response to exchange rate: an explanation

The results from the statistical analyses above show a significant but small adjustment of the current account to change in exchange rate. This section attempts to provide some explanations to this evidence in the current account adjustment.

1. Service Account: The service component in the current account is relatively irresponsive to the exchange rate. Both single equation and the VAR methodology suggest that service account is not statistically sensitive to exchange rate movement. As a component with the share of approximately 30 – 50 percent in the current account vis a vis the trade account, an irresponsive service account could partly contribute to the slack in the current account response to the exchange rate. From the single equation analysis, the trade account reveals a larger coefficient for exchange rate compared to the current account. This reflects that the effect of the exchange rate on the current account could be dampened as the service component is added to the trade account. However, the coefficient on the trade account alone is not significantly higher than that of the current account prior to the addition. As a result, this might not be the main reason for the sticky response of the current account.

2. High Import Content in Export Sector: From the VAR analysis, impulse responses in Figure 4.5 above suggest that the effect of exchange rate change on the current account is dampened by positive correlation between exports and imports. Table 4.5 reveals the import contents of Thailand's main export products, providing evidence of high import content in high technology products such as integrated circuits and parts, electrical appliance, vehicle parts and accessories, and computer and parts, which accounted for more than a quarter of Thailand's total export value. This argument is supported by the least square estimation that will be later presented. The estimates suggest that the import quantity is significantly affected by the quantity of exports. A rise in exports derives higher imports that will be used in the production process.

Table 4.5 Import Content (%) from I-O table

Products	1990	1995	1998
Electrical appliance and IC	58.2	64.6	68.1
Electronic parts	59.5	55.3	44.4
Vehicle and parts	48.5	44.9	40.5
Computer and parts	61.2	44.1	25.8

Source: NESDB

3. The Sub-Sector Effect: The evidence of the sub-sector's various degree of exchange rate response could shed some light on explanation to the dampened effect of exchange rate movement on the current account in Thailand. Focusing on the trade account, each export and import industry, which composes Thaiand's overall trading activities, should possess various degrees of ability to react to exchange rate movement. To further investigate this issue, the paper divides trading sector into major industries of exports and imports. The export industries are agricultural, fishery, manufacturing and resource based while imports are divided into consumer goods, capital goods, and intermediate and raw materials.

First, the simple least square regressions are performed on export and import quantity by sector. The reduced form equation assumes export quantity to be a function of lagged price (to avoid the simultaneity problem), the trading partners'

GDP and the real effective exchange rate which proxies for the competitiveness of the country in terms of relative price. Nominal exchange rate should not influence export quantity since changes in exchange rates are not reflected in the export price in dollar terms. Consequently, the foreign importers observe no change in prices and hence do not alter their decisions on their imports. The regression results on export quantity are listed in Table 4.6 below.

Table 4.6 Export Elasticity by Sectors

	C	Lagged Price	Trading Partner	REER	AR(1)
Total export	-0.888	-0.397	1.871**	-0.197	0.789**
	(-0.226)	*(-1.338)*	*(2.956)*	*(-1.412)*	*(7.029)*
Agricultural	-0.308	0.016	1.588**	-0.449**	0.494**
	(-0.127)	*(0.114)*	*(3.993)*	*(-2.637)*	*(3.261)*
Fish	2.269	0.274	0.285	-0.048	0.124
	(0.389)	*(0.685)*	*(0.375)*	*(-0.196)*	*(0.624)*
Manufacturing	-0.144	-0.541*	1.823**	-0.166	0.795**
	(-0.034)	*(-1.684)*	*(2.662)*	*(-1.067)*	*(6.887)*
Labor intensive	6.302**	-0.359**	0.067	-0.133	0.772**
	(2.562)	*(-2.202)*	*(0.154)*	*(-1.016)*	*8.306)*
High-tech	-0.003	-0.678**	1.942	-0.141	0.796**
	(-0.001)	*(-2.470)*	*(2.818)*	*(-0.807)*	*(6.553)*
Resource based	1.711	-0.732**	1.309**	0.116	0.323*
	(0.447)	*(-2.533)*	*(2.526)*	*(0.534)*	*(1.932)*

1) The estimated equation is $Qx_{it} = \alpha + \beta Px_{it-1} + \chi TPGDP_t + \delta REER_t + \phi AR(1) + \varepsilon_t$ using the ordinary least square regression, correcting for the autoregressive components in the error term.
2) All variables are in the logarithm form. Trading partners' GDP and export quantity are corrected for seasonal factors.
3) T-statistics are in parenthesis. ** and * represent 95 and 90 percent confidence levels respectively.

Movement in exchange rate insignificantly affects the quantity of total exports. The evidence from the break down of export sectors suggests that the only agricultural sector that significantly responds to the real exchange rate change while, other export sectors reveal relatively trivial responses. The reasons could be the unique adjustment process within each industry and the amount in which each firm can withstand exchange rate pressure, as well as the bargaining power relative to the importers over the price of their products. This international strategic pricing issue will be investigated later in the section.

The import quantity, on the other hand, is directly affected by the nominal exchange rate. The fluctuation in the exchange rate impacts prices from the local

importers' perspective, which consequently results in changes in import quantity. As a result, the reduced form regression assumes import quantity to be a function of its price level, the domestic economic growth and the nominal exchange rates. Correcting for the autoregressive error terms, the AR(1) term is added in running e-view when the least square regression is performed. Table 4.7 reports the regression results for import quantity.

Table 4.7 Import Elasticity by Sectors

	C	Lagged Price	Domestic Demand	Baht/Dolar	Qx	AR(1)
Total import	-1.531	-0.123	0.768**	-0.420**	0.626**	0.687**
	(-1.222)	*(-0.479)*	*(4.441)*	*(-4.080)*	*(6.471)*	*(4.576)*
Consumer goods	1.322	-0.826**	0.881**	-0.216**	0.417**	0.330*
	(1.137)	*(-3.666)*	*(5.934)*	*(-2.076)*	*(3.837)*	*(1.806)*
Intermediate goods	2.526*	-0.680**	0.583**	-0.436**	0.589**	0.560**
	(1.813)	*(-3.222)*	*(2.558)*	*(-3.335)*	*(4.499)*	*(3.274)*
Capital goods	0.727	-0.724**	0.958**	-0.219	0.335**	0.157
	(0.642)	*(-4.092)*	*(5.295)*	*(-1.408)*	*(3.154)*	*(0.789)*
Electrical machinery	1.494	-0.525	0.627**	-0.153	0.394**	0.623**
	(0.698)	*(-1.271)*	*(2.539)*	*(-0.829)*	*(2.403)*	*(3.862)*
Non-electrical machinery	-5.520**	-0.938**	2.254**	-0.381	0.126	0.514**
	(-2.464)	*(-3.183)*	*(6.771)*	*(-1.527)*	*(0.535)*	*(2.577)*
Integrated circuit	1.700	-0.404**	0.348	-0.082	0.644*	0.816**
	(0.462)	*(-2.155)*	*(0.803)*	*(-0.292)*	*(1.885)*	*(6.457)*

1) The estimated equation is $Qm_{it} = \alpha + \beta Pm_{it-1} + \chi DD_t + \delta fxus_t + \gamma Qx_t + \phi AR(1) + \varepsilon_t$ using the ordinary least square regression, correcting for the autoregressive components in the error term.
2) All variables are in the logarithm form. Import quantity, export quantity and domestic demand are corrected for seasonal factors.
3) T-statistics are in parenthesis. ** and * represent 95 and 90 percent confidence levels respectively.

Estimates from the sectoral analysis suggest that the nominal exchange rate has a significant impact only on the quantity of total imports, imports of consumer and intermediate goods. An exchange rate depreciation raises the import costs and hence lowers import quantity of the industries. On the contrary, other types of imports are not statistically affected by the exchange rate change. Machinery types of imports including capital goods are considered as planned investment and hence the minor change in exchange rate may not affect the importer's decision. The

integrated circuit industry, on the other hand, depends mostly on the parental companies. Regardless of the change in the exchange rates, the import quantity in this case is primarily designated by the headquarters. Import elasticity with respect to the country's domestic demand

Export quantity significantly posts impacts on total imports and many of the import sectors such as intermediate and capital imports. As previously mentioned, the high import content in certain export industries causes higher imports of goods to supplement the change in export production. Import of consumer goods, despite being mostly final goods, also significantly rises with export quantity. This might be due to the indirect effect of a rise in income in the export sectors. Domestic demand also plays an important role in determining import quantity with relatively high elasticity compared to other exogenous variables.

In summary, the difference in significance and signs of each sub-sector consequently produces the small net effect and hence dampens the overall impact of exchange rate on trade and consequently the current account.

4. International pricing strategy: One of the most visited explanation to the ineffective drive of exchange rate on the trade and current account is the pricing power of the country over its exports and imports of goods. During the baht depreciation, while Thai exporters enjoy higher baht income, importers could bargain for a lower dollar price, which leaves the Thai exporters the original expected income. On the other hand, during the period of local currency appreciation, exporters could also ask for a higher price to maintain their income. The success of such bargaining schemes depends on market power of the exporters and importers in a given sector. Thailand, as a small country, tends to have relatively low international bargaining power on export prices, let alone prices on imports. However, some exceptions apply to particular products in the agricultural sectors in which Thailand is a main exporter, namely rice and rubber.

To look for evidence on international pricing strategy, one can observe the export price elasticity with respect to the exchange rate. The significant change in the export price in response to the exchange rate change implies the bargaining process. Since the exchange rate has an effect on export quantity through prices, the export price elasticity is estimated based on the following reduced form equation:

$$Px_{it} = f(Px_{it-1}, fxus_t, Pw_t)$$

where

Px_{it} = Export price of the interested industry

$fxus_t$ = Nominal exchange rate in terms of baht/US dollar

Pw_t = Weighted average world price level of the manufacturing unit value and the non-fuel commodity price

Since the export prices are widely quoted in terms of US dollars, the baht/dollar term of exchange rate is employed as an exogenous variable. The regression results are reported in Table 4.8.

Table 4.8 Export Price Elasticity by Sectors

	C	Lagged price	World Price	Baht/Dollar	AR(1)
Total export	0.581	0.670**	0.282**	-0.098**	0.298
	(0.953)	*(9.140)*	*(2.880)*	*(-2.279)*	*(1.433)*
Agricultural	-1.996**	0.574**	0.961**	-0.140**	0.204
	(-2.761)	*(9.569)*	*(6.093)*	*(-2.368)*	*(1.087)*
Fishery	1.505	0.818**	-0.058	-0.128	0.041
	(1.270)	*(9.503)*	*(-0.323)*	*(-1.594)*	*(0.191)*
Manufacturing	0.776	0.667**	0.243**	-0.095**	0.342
	(1.085)	*(7.302)*	*(2.223)*	*(-2.000)*	*(1.592)*
Hi-tech	0.696	0.672**	0.258	-0.095	0.411*
	(0.607)	*(4.804)*	*(1.492)*	*(-1.266)*	*(1.651)*
Labor	0.939	0.490**	0.387	-0.101	0.403
	(0.759)	*(2.179)*	*(1.599)*	*(-1.162)*	*(1.493)*
Resource based	-0.205	0.826**	0.246*	-0.033	0.326*
	(-0.260)	*(11.247)*	*(1.844)*	*(-0.600)*	*(1.658)*

1) The estimated equation is $Px_{it} = \alpha + \beta Px_{it-1} + \chi Pw_t + \delta fxus_t + \gamma AR(1) + \varepsilon_t$ using the ordinary least square regression, correcting for the autoregressive components in the error term.
2) All variables are in the logarithm form.
3) T-statistics are in parenthesis. ** and * represent 95 and 90 percent confidence levels respectively.

The estimates reveal evidence of international bargaining process in few export sectors, namely agricultural and manufacturing sectors. A one percent depreciation of the baht significantly brings down the export price by 0.14 percent and 0.10 percent respectively. This supports the idea that the bargaining power is found only in the sectors that the country is the main exporter into the world market.

Together with the price elasticity of export reported in Table 4.6, the exchange rate coefficients obtained from Table 4.8 is also an indicator to the sectoral

adjustment to exchange rate movement since the export quantity has direct relationship to the price level. A real exchange rate depreciation raises the export quantity especially that of the agricultural sector. At the same time, a nominal depreciation causes export prices to drop. The net effect of the depreciation on the value of export (price × quantity) therefore is rather ambiguous.

Overall, the statistical findings conclude that the impact of exchange rate movement on the current account is not significantly large. However, the comprehensive analysis suggests that these insignificant results stem from the offsetting effects among the current account components. Trading sectors and firms are essentially impacted by exchange rate fluctuation differently depending on their administrative structure. The more flexible their plans are in both pricing and production schemes, the better absorption the firms would have under the exchange rate variability. Therefore, the microeconomic adjustment in the trading sector is apparent despite the trivial macroeconomic responses from the statistical findings.

Limitations to the Exchange Rate Adjustment

As previously mentioned, the short-term exchange rate movement is determined by market forces of demand and supply of foreign currencies against the local currency. The transactions are, for example, movement in capital flows, speculative transactions and expectations of variables in the market. As a result, it should be rather difficult for the exchange rate to always move in a desirable way in order to correct the current account imbalances. In the period of current account deficit, the currency is expected to automatically depreciate to stimulate exports and hinder imports, hence improve the current account in the medium to long-run horizon. However, the short-term factors listed above could cause the exchange rate to move against the desired direction. This phenomenon is quite probable especially in a period of growth of an expanding economy. During this period, the current account deteriorates from high imports of capital and intermediate goods essential for the expansion. At the same time, as the economy expands, foreign investors' confidence rises and induces inflow of funds. This hike in the demand for local

currency is likely to bring about the appreciation, which could cause the current account to move further from the correction process in long-run[8].

The US problem of chronic deficit is one good example. Despite the considerable size and duration of the deficit, the continued capital inflows to the economy still provide the cushion for the value of the dollar. The weak dollar policy implemented in 2003 was evidently short-lived once the US economy showed signs of improvement, the dollar eventually regained its strength from foreign capital influx. New Zealand and Australia are also economies with fully flexible exchange rate facing the problem of chronic current account deficits.

In addition, to correct for prevailing current account imbalances, not only is it difficult to control for the direction of the exchange rate, but also, in this case, the exchange rate adjustment has to be sufficiently sizable. This is due to the small influence of the exchange rate on the current account. In order to restore current account balances, the exchange rate is required to greatly adjust.

With the interconnection among sectors in the economy, an effect of a large exchange rate adjustment to correct the imbalance in the current account could be extensively costly. The exchange rate fluctuation could post potential adverse effects on producing sectors in an economy. Exchange rate changes directly alter prices of tradable goods and induce businesses to reconsider their plans on pricing strategy as well as firms' production. An appreciating currency causes income in terms of the local currency to decline and squeezes on firms' profitability. Firms will eventually be forced to alter their prices and, therefore, lose their competitiveness over competitors in other countries where the appreciation is relatively less.

Not only are firm's decisions on prices and production affected, the decision to cover their foreign exchange position which should be encouraged under the floating exchange rate regime will be affected. The fluctuations in the current account require the exchange rate to frequently adjust should it be an instrument to correct imbalances. These frequent changes in exchange rate make it difficult for businesses to hedge away their exchange rate risk and hence many of them may

[8] The long-run equilibrium (optimal) level of current account deficit for Thailand is suggested at 2-3 percent of GDP. (Buranathanangs and Poonpipatkul, 2002)

choose to remain exposed. From the Business Liaison Program arranged by the Bank of Thailand to visit firms in major business sectors, currency fluctuation is one of the major uncertainties impacting their decisions. Firms can only take the limited loss on the adverse movement of the exchange rate before the price or production adjustment has to be done. These adjustments, eventually, are likely to affect employment and inflation in the macroeconomic settings.

Additionally, the currency fluctuation often influences the firm's decision on external funding and financing. Firms will borrow more externally if a currency appreciation is expected since the burden on debt repayment will decline in the future. On the other hand, a weakening currency will raise the debt obligation and therefore discourage external borrowings. These decisions on firms' funding could definitely alter their plans and production. Consequently, this is another channel that the effect of exchange rate fluctuation will be passed through to the factor employment in the economy.

As can be observed, movements in exchange rate have impacts on variables not only those in the external sectors but also those in the domestic economy. Therefore, to have the exchange rate adjust to solely serve the current account corrections as one of the intermediate targets, might eventually post conflicts with the country's other economic targets such as economic growth and inflation. For example, an expanding economy with rising inflation would give rise to imports and hence face with a deterioration of the current account. To stabilize the decline in the current account balance, exchange rate depreciation is needed. This would potentially worsen inflation, incur capital outflows, and obstruct the cheap imports necessary for investment expansion. However, the export sector will benefit from this currency movement. Therefore, the country's growth process might not be largely affected whereas the inflation situation could be worsened.

With limitations of exchange rate movement to correct for the current account imbalances, it is interesting to explore whether other macroeconomic policies could be used to support the exchange rate in the current account adjustment process. The next section investigates how macroeconomic policies have an impact on the current account and whether the side effects on other variables produces any conflict with the country's macroeconomic stability.

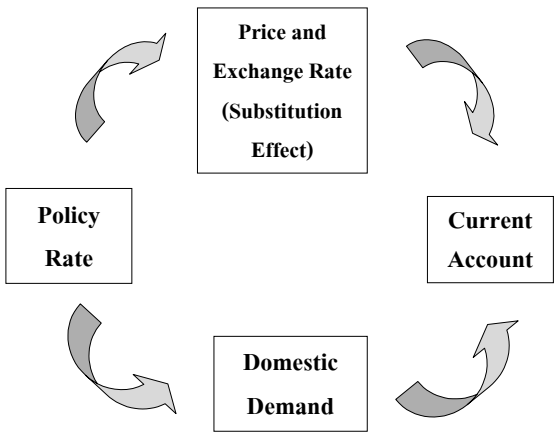
V. Effects of Other Macroeconomic Policies

Macroeconomic policies are designed to serve the stability of both domestic and external sectors of an economy. The important macroeconomic goals in achieving such stability are mainly economic growth and inflation. However, the country's current account can be recognized as an intermediate target in supporting external sectors towards the long-term stability. Therefore, despite the limitation of the exchange rate policy in managing the current account, policymakers are still obligated to search for other tools to help support the exchange rate policy in order to maintain the country's external stability. The two major macroeconomic policies being considered here are monetary policy and fiscal policy. The effectiveness of the two policies on the current account as well as the possible side effects to the main economic target will be investigated.

Monetary Policy

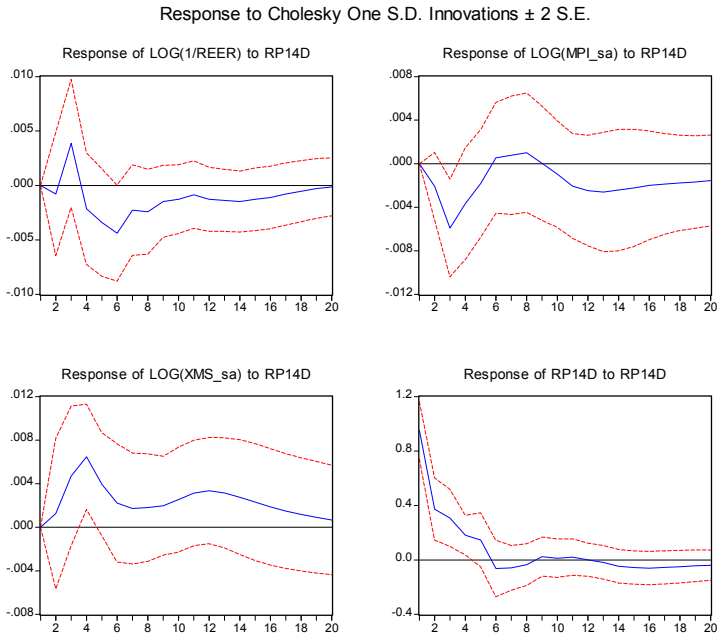
The effect of monetary policy on the current account is channeled through movement in exchange rate, price level, and GDP fluctuation. Interest rate rises discourage investment and domestic demand for goods and services. Price level will decline and exchange rate appreciates and, consequently, lead to the improvement in the current account.

Chart 5.1 Transmission Mechanism of Monetary Policy to Current Account



In view from the fact, the VAR system employed in the previous section to investigate the effect of an interest rate changes is being reexamined. Figure 5.1 shows the response of the current account (XMS), manufacturing production index (MPI) and exchange rate (1/REER) to one standard innovation shock in the policy rate (RP14D). The impulse responses reveal some persistence in the policy rate itself in which an increase in the interest rate lasts for slightly over a year. In response to this rise in interest rates, the manufacturing production index statistically decline while the real exchange rate weakly depreciates in the third quarter after the interest rate has risen. Importantly, the unexpected one standard deviation change in the interest rate has a conspicuously positive impact on the current account only from the third to the fifth quarter. In the third quarter, a one percent rise in the policy rate causes the current account to improve by 0.2 percent of GDP.

Figure 5.1 CA System: Response to Cholesky One S.D. Innovation in RP14D



This lagged effect could partly stem from the complex structure of the transmission channel of the interest rate change through the economic system to the current account. Interest rate changes affect price level, lending/borrowing behaviors, production plans as well as exchange rate. Therefore, the effect can be weakened along the way through each transmission channel before affecting the

current account. Relative to the exchange rate policy, the monetary policy has a more sluggish effect on the current account.

In terms of the magnitude, during the peak period (the period the specified policy affects the current account the most), the two policies are relatively comparable. However, the variance decomposition results above suggest that the variation of the current account can be explained more by the variation in the exchange rate relative to the interest rate. In other words, the current account changes are more often associated with exchange rate changes. Nevertheless, it should be noted that the variance decomposition does not imply the effectiveness of the policies.

According to the previous study on the monetary policy transmission for Thailand by Disayathat and Vongsinsirikul (2002), an increase by a standard deviation of the country's policy rate causes a decline in both exports and imports (goods and services) while the effect on the latter is stronger, hence improves the country's current account. This strong import movement is indirectly caused by the effect of the interest rate increase on domestic investment, which eventually lowers imports. At the same time, export sectors are trivially affected by the rise in the policy rates. The two responses together produce an increase in country's current account.

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Comparison of VAR Results to the Macroeconometric Model

A shock in policy rate (RP14 D) is fed through the macroeconomic model to confirm the interest rate effect on the current account. The model suggests that, in

the first period after the shock, one percent increase in the policy rate results in a 0.02 percent drops in the country's price whereas the domestic demand shrinks by 0.1 percent from consumption and by 0.08 percent from investment.[9] These effects altogether brings about the total of 0.05 percent of GDP improvement of the current account in the first quarter, compared to the 0.2 percent increase in the VAR model in the peak period. Therefore, the econometric result suggests that the monetary policy is effective in helping the current account to adjust. However, the current account statistically responds to the policy change only in the third quarter after the shock, reflecting some lag effect of the policy.

To examine the effect of the monetary policy in correcting the current account adjustment on other variables, assume the economy is in the stage of expansion. Acceleration in the country's investment causes imports to rise and the current account balance to decline. In this situation, an interest rate rise would help to prevent the current account decline. With a rise in interest rates, investment drops which slows down the rise in imports. Domestic demand declines from weakening investment and consumption, which in turn helps to ease inflationary pressure. Therefore, monetary policy, if necessary, can be used to stabilize the current account without any conflicts to inflation target while the country's growth process might be affected.

Fiscal Policy

The other pole of a country's macroeconomic policy is the fiscal policy. The government balance is essentially a part of the country's total savings that helps identify the current account by definition. Therefore, one could expect fiscal policy to have direct effect on the current account, which is fairly different from the long process of the monetary policy transmission. Without using the current account identification of saving – investment gap, the transmission mechanism of the fiscal policy are as follows: A change in government balance affects domestic demand through consumption and investment, hence influences imports and the current

[9] This result coincides with what is found in Disyatat and Vongsinsirikul (2002) where consumption responds more to the interest rate change relative to response of the investment in the first period after the shock.

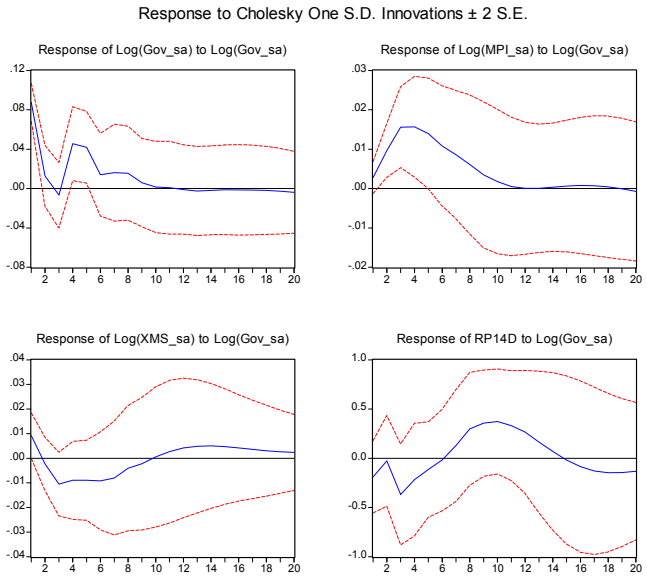
account. At the same time, a change in domestic demand also causes a change in the country's price level.

Given the above, a new VAR model is constructed since the previous system does not include the government balance due to the limited degrees of freedom. In this system, the exchange rate was assumed exogenous in the model. The major reason exchange rate is chosen to be exogenous is its relative randomness. The variable is affected by many factors including the short-term market forces which are not captured by the system. Hence, the modified VAR model can be expressed as:

$$\begin{bmatrix} \log(Gov) \\ \log(MPI) \\ \log\left(\frac{X}{M}\right) \\ RP14D \end{bmatrix}_t = \beta_0 + \sum_{i=1}^{3} \beta_i \begin{bmatrix} \log(Gov) \\ \log(MPI) \\ \log\left(\frac{X}{M}\right) \\ RP14D \end{bmatrix}_{t-i} + D1997 + \log[TPGDP\_sa]_{(-1to-2)} + \log\left(1/REER\right)_{(-1to-2)} + \begin{bmatrix} \varepsilon 1/REER \\ \varepsilon MPI \\ \varepsilon X/M \\ \varepsilon RP14D \end{bmatrix}_t$$

where Gov represents the ratio of the central government revenue to expenditure. This ratio, including the manufacturing index and the ratio of exports to imports of goods and services are seasonally adjusted. Figure 5.2 reports the responses of the current account (X/M), policy rate (RP14D) and manufacturing production index (MPI) to a fiscal balance shock. The result indicates the strong significant impact of the government budget on the current account only in the first quarter after the shock has been introduced to the system. However, the effect on current account quickly diminishes in the following periods. One percent increase of government balance to GDP produces a sharp rise in the current account by 0.5 percent of GDP and no effect thereafter. This reveals the instant but temporary effectiveness of the policy to adjust the current account.

Figure 5.2 Response of current account
to Cholesky One S.D. Innovation in log(Gov)
Cholesky Ordering: Log(Gov), Log(MPI), Log(XMS), RP14D



Comparison of VAR Results to the Macroeconometric Model

The macroeconometric model is again employed to verify the effects of the government balance suggested by the VAR system. In the estimation, however, the government expenditure is considered where the VAR system uses the ratio of government revenue to expenditure. As a result, the magnitude obtained cannot be directly compared. However, the responding direction of the variables could provide some guidance for the verification.

From the model, during the first period after one percent increase in the government expenditure has been introduced, investment and imports expand by 0.2 and 0.3 percent respectively. As a result the current account diminishes by 1.05 percent of GDP. This impact on government expansion subsides thereafter. Regarding the VAR analysis, the impulse response indicates that a one percent increase in government expenditure relative to government revenue produces a rise in the current account by 0.5 percent in the first period. Moreover, the impulse responses confirm the macroeconomic model that the effect of a government

injection becomes insignificant to the current account within the two quarters of the initial injection.

In terms of impact on macroeconomic variables, the fiscal policy results in a similar impact to the economy as with monetary policy. During the expansion stage, the current account declines. To mitigate the sharp deficit in the current account, the government needs to lowers spending or increase taxes. Such action would lower domestic demand and imports that possibly relieve pressure on the current account and inflation. This policy could also possibly cause a slowdown in the country's growth process.

Thailand is currently classified as expanding of which the current account is expected to dwindle. The fiscal devolution and ambitious infrastructure investments from the mega-projects may change the result path significantly. The current account could plunge further than expected while the size of the impact might depend on the import content of the spending plan. However, if the domestic available funds are bind, regardless of the import of the project, the stimulated total domestic demand will cause imports to eventually rise and fully deteriorate the country's current account.

In summary, the two macroeconomic policies are both somewhat effective if being used to manage the current account. Moreover, they are considered complimentary; one has a lagged effect while the other is instantaneously effective. Therefore, under the urgent needs to support the exchange rate policy in adjusting for potentially large deficit, the two polices can be implemented with discretion. This is due to the fact that these macroeconomic policies are accompanied with some limitations especially in terms of their effects on other economic targets. Therefore, depending on the prevailing economic condition, the policymaker should cautiously select an appropriate policy mix while ensuring that the main target of the economy should still be unaltered.

VI. Policy Recommendations

From the econometric results obtained from the previous sections, exchange rate, monetary and fiscal policies could be used to correct for the current account imbalances. However, each of these policies has a relatively small effect in inducing the current account adjustment and the effects diminish in a short period. These findings suggest that the three policies, therefore, can be appropriately combined in the short to medium-term, should an instantaneous assistance for the current account be needed.

These macro-policies are considered to be demand management polices due to their impact through the country's domestic demand in order to impact the current account. Moreover, the effectiveness of the policies are rather short-lived and could produce undesirable side effect to other sectors in the economy. As a result, the macro-policies tend to be more effective in restoring the cyclical shocks in the economy rather than the long-term structural imbalance. However, to ensure the external stability of the country, policies that aim to improve the long-run structure of the current account are necessary.

Given this point, enhancement in the country's competitiveness in the key export sectors as well as potential sectors could help simulate the country's foreign income. Tourism is a good example of a potential sector due to the uniqueness of its product, sufficient resources and capacity to expand. With much of the export receipts depending on trading partners, an improvement in the export sector could be accomplished through the supply side. Structural policies aimed to improve the country's research and development should be encouraged, especially in terms of improvement in products and trade structure.

Another approach in improving the trade structure of the countries lies in the import structure. Imports of capital goods, raw materials and capital goods have accounted for more than half of the country's import value while the share of their exports are much smaller. Figure 6.1 exhibits the import structure of Thailand, which, as can be seen, is dominated by the two categories, namely capital goods, intermediate goods and raw materials. These imports are usually highly priced which largely contribute to the country's import bill. If the dependency on these imports is reduced, the burden of the country's external sectors can be partly

relieved. Therefore, structural policies supporting the high-value import substitutions can be one of the solutions to this structural problem. Increased Investment in research and development therefore should also be allocated into this area as well.

Figure 6.1 Import Structure of Thailand

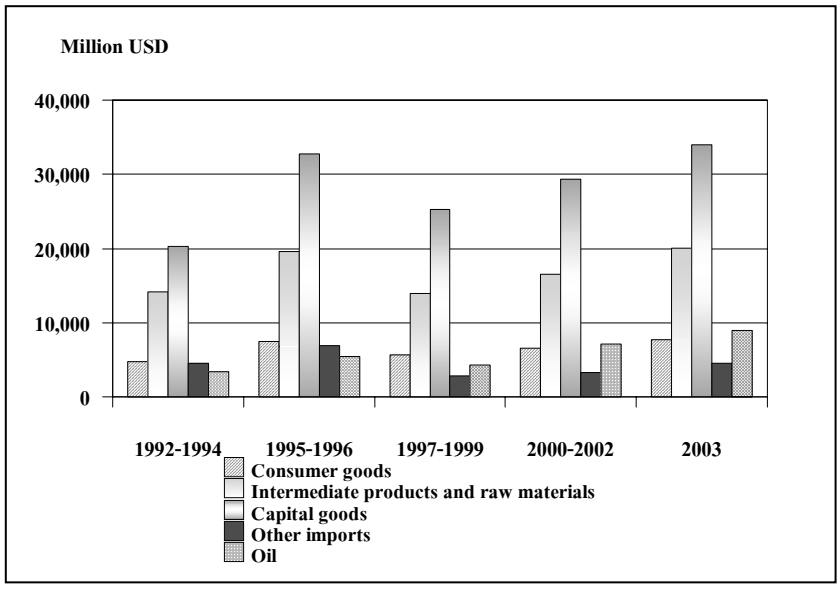
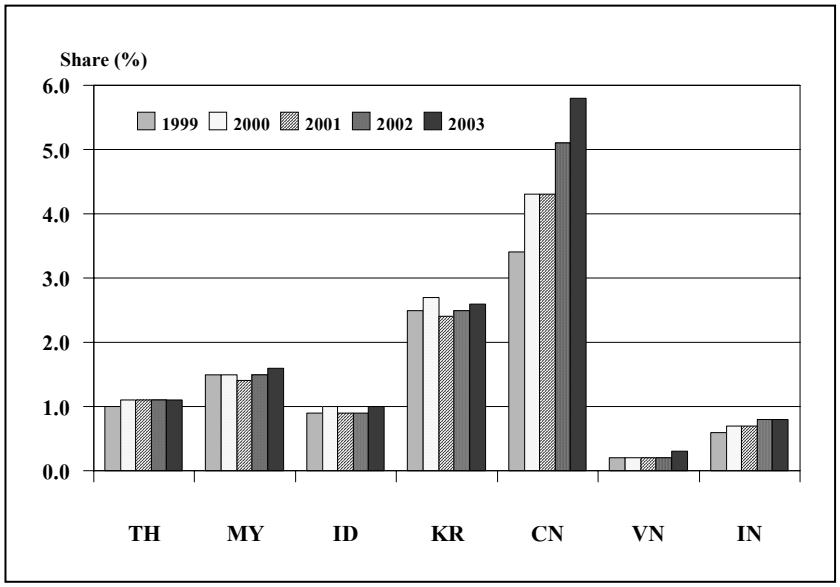


Figure 6.2 World Market Share of Thailand Relative to Competitors



At the same time, to better compete with our rising competitors, product quality and the value-added in export process have to be improved. Not only research and development is essential for the existing goods, but new products and new export markets are also to be explored in order to increase, or at least maintain, the country's share in the world market. Moreover, the rise in number of trading partners provides more flexibility in country's international trade and helps cushion for the possible market downturn in some regions. Figure 6.2 exhibits the Thai world market share relative with other competitors. As shown in the figure, despite the continuous expansion of Thai exports into new markets, the country's world market share remains relatively constant. While China rigorously conquers the world market, Thailand has to make a more intense attempt to improve its export sector to maintain this share. It is clear that without the devotion of resources and cooperation in this issue, the country's income from export will eventually suffer.

VII. Drawbacks and Possible Extensions

There are a number of limitations in both dataset employed in the analysis and the complication of the statistical results. One major drawback that possibly contributes a great deal to the result is the length of the data series. Despite the fact that the data starts from 1993:1, the period of fully flexible exchange rate is limited after 1997:2. During this short period of flexible exchange rate, the adjustment in economic variables is possibly not yet completed, or have reached their full cycles. The econometric result, therefore, might not capture the full adjustment that should have been presented. This could partially explain the weak effect of exchange rate on the current account in all of the statistical approaches.

An extension of the analysis, therefore, could be done through comparison of the exchange rate effect with the international cases. A country similar in sizes and economic settings, but with a longer history of flexible exchange rate may be considered. One good example is Canada. The international evidence could provide an example of a more completed adjustment of current account to exchange rate or advice what causes the different results. In addition, the panel data regression could also be employed to obtain more precise estimates.

Moreover, the specification on the current account determinants could also vary, depending on the model used to explain the current account. However, the reduced form approach in this analysis relies on the simple derivation and has limited power in explaining the current account. However, in explaining the net variables such as the current account, the clear interpretation of the results could not be reached without breaking down the variable for further analysis.

In terms of the application of results, the ratio of exports to import as well as the ratio of government revenue to expenditure employed in the VAR and single equation technique only indicate the surplus or deficit. The ratio exceeding one implies the surplus and vice versa. However, these results provide no nominal magnitude of such imbalances. As a result, difficulties arise when one attempts to designate the vulnerability of the ratio to the economy. Nevertheless, these ratios provide the solution to the scaling problems, which could possibly bias the results and their implications. For that purpose, using the ratios for the analysis might be more beneficial.

VII. Concluding Remarks

With the ongoing economic expansion, Thailand's current account surplus is expected to decline and eventually turn deficit. The sizable deficit would definitely post some concerns to the policymakers and businesses since this could signal the probable financial imbalances. To cope with the imminent deficit, exchange rate is theoretically supposed to act as an automatic stabilizer to prevent the current account divergence. However, the evidence from single equation and impulse response functions suggest that exchange rate, in practice, has a very small impact on the current account movement.

This low effectiveness of the exchange rate policy could partly be explained by the insignificant response of the service account to the exchange rate changes. Moreover, exports and imports somewhat co-move while international pricing strategy induces export prices to move against quantity in response of the exchange rate changes. This, therefore, nullifies the effect of the exchange rate on the current account. Additionally, difference response in the exchange rate changes in each trading sectors is also the key explanation.

The limitations of the exchange rate policy do not only include the small influence on the current account, but also the possible costs to other sectors and economic targets. An exchange rate adjustment to correct imbalances in the current account has to be sufficiently large. Such a change in the exchange rate could possibly incur side effects on the profit margin of the trading sectors and hence the sector's production. Moreover, the fluctuation in current account could affect investment and production decisions of businesses and finally impact the country's price level and growth process. Given these drawbacks, other macroeconomic policies, namely monetary and fiscal policies, are explored whether they can ease the pressure on exchange rate policy in correcting the current account.

The monetary policy posts a lagged effect on the current account due to the layers of its transmission mechanism while fiscal expenditure instantaneously effective in affecting the current account for a short period. With possible side effects on other variables in the economy, policymakers needs some prudence in mixing these policies for current account adjustment without producing any adverse effect to other economic targets. However, these demand management policies, due

to its short-term effect and pressures on other sectors, are suitable for the stabilizing the cyclical variations in the economy in the short-run. In order to support the structural improvement and sustainable deficits of the current account, the supply-side or structural policies have to be encouraged.

To stimulate enduring current account stability, improvement in export competitiveness and investment in research and development should be promoted. With the growing world export competition, it is essential for the country to move alongside with new and improved products as well as explore new markets to at least maintain the country's world market share. Additionally, the resources in research and development should also be allocated to the production of the high-value import substitution, such as imports of capital goods, intermediate goods and raw materials, to help lower the country's import bill since this import category account for more than 60 percent of the country's imports. Together with the enhancement in the export sector, this permanent reduction in foreign dependency can potentially improve the current account structure and the country's external stability in the long run.

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