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External Imbalances and Thai Baht

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Abstract

This paper examines the Thai baht predictability from the country's external imbalances. The idea of this study is based on the international financial adjustment through trade and valuation channel. I find no evidence of the in-sample fitness of the external imbalances in predicting the baht both short- and long-horizon. Nevertheless, there is evidence that, in long horizons forecasting, the Thai's external imbalances can forecast the out-of-sample of baht better than the random walk model.

1 Introduction

An increase in financial integration and globalization leads to various wealth transfers among countries in the world. This has altered country's external balances, for example, a change in country's trade balances and a country's holding of foreign assets and liabilities which resulted in a shift in a country's net foreign asset position (hereafter NFA). According to the traditional intertemporal approach of current account, when a country experiences a current account deficit, it will need to borrow from abroad to finance this deficit. Hence, its foreign liabilities increase. When a country has negative NFA, it is a debtor to the rest of the world.

Figure 1 and 2 depict Thailand's share of net export to GDP and its share of NFA to GDP respectively. As we could see, during 1999Q1–2019Q2, Thailand has a surplus in net export for most of the time in this period. The highest surplus is at the second quarter of the year 2016 when the surplus reaches 16

percent of GDP. Regarding the NFA position, Thailand has experienced a deficit in NFA during the same period. The country borrows from abroad so that its foreign liabilities are greater than foreign asset. This implies that the country is a debtor country to the rest of the world. To this extent, the negative position of net foreign assets had continued to improve (less negative) until the year 2010. After 2010 the NFA position has been worsen off for some periods. Then the NFA began to keep increasing from the year 2015 onward; however, the recent NFA position is still negative. The intertemporal approach to the current account suggests that a country will need to run trade surpluses to reduce a negative position in NFA imbalances. It seems that Thailand does not have enough trade surpluses to bring up the positive NFA. The adjustment in current account does not coincide with the adjustment in NFA.

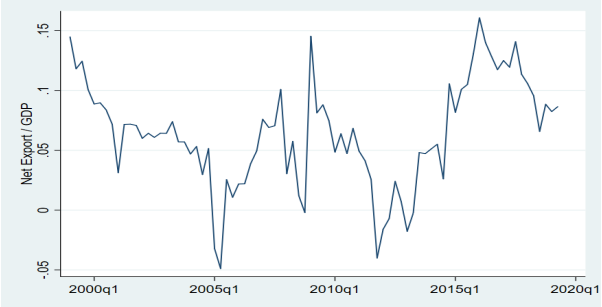

Figure 1: Thailand's Net Export to GDP 1999Q1-2019Q2

Figure 2: Thailand's Net Foreign Asset to GDP 1999Q1-2019Q2

Gourinchas and Rey (2007) argue that the adjustment of country's external imbalances does not only take place through trade channel but also through a change in the valuation of the country's foreign assets portfolio. The first channel of external imbalance adjustment, assumed total returns on net foreign assets are fixed, is through trade channel where today's net foreign liabilities is compensated by future

trade surpluses. The second channel is called the valuation channel. In this channel, the stochastic asset returns have an impact on the capital gains or losses on gross external positions. For example, a change in return of foreign bonds that a country holds would influence on the overall value of a country's net foreign assets. Computation of NFA based on the accumulation of the trade balances over time is proven to be incorrect by Lane and Milesi-Ferretti (2001, 2007). They construct estimates of external assets and liabilities for 145 countries for 1970–2011 and find mismatch between estimated stock positions and the balance of payment data. Moreover, Eugeni (2017) construct a model for exchange rate determination to relate exchange rates and net foreign assets through valuation effect and quantitatively show that the key process of adjustment of the external imbalance is from the valuation channel. As a matter of fact, part of the adjustment in valuation channel is from fluctuation in exchange rates. With constant local currency returns, a depreciation increases the domestic return on foreign assets. Moreover, an appreciation of home currency against the rest of the world would decrease the value of foreign currency denominated assets and liabilities while a depreciation of home currency would increase the value of these international assets.

It is well known in exchange rate predictability literature that the exchange rate is hard to predict using macroeconomic fundamentals, namely, money supply, output, inflation, and interest rate. The seminal paper of Meese and Rogoff (1983) finds that the performance of the traditional model in predicting exchange rates cannot beat the random walk model. In the standard model of exchange rate determination, traditional fundamentals fail to predict the exchange rates except possibly for the very long horizon predictability (Mark (1995)). In fact Engel and West (2005) theoretically find that the exchange rates exhibit a near random-walk behavior if fundamental, e.g. relative money supplies, outputs, inflation, and interest rates are I(1), and the discount factor of the future fundamentals is near one.

With an attempt to relate the exchange rate with economic fundamentals, Gourinchas and Rey (2007) propose the model of international financial adjustment in that the role of valuation in the adjustment process of a country external imbalances is captured by the movement in exchange rates. Empirically, Gourinchas and Rey (2007), and Della Corte et al. (2012) find the striking evidence that, given the U.S. data, external imbalances have a strong predictive power for movement in exchange rates even in a short horizon predictability. A negative net foreign asset position predicts a depreciation of the US dollar against major currencies. That is, the exchange rate plays a vital role both in the trade

adjustment channel, e.g. a currency depreciation helps improving future net exports, and the financial adjustment channel, e.g. the wealth transfers from foreign to domestic residents. More importantly, external imbalances can use to forecast the out-of-sample exchange rate. The striking result is that the model outperforms the random walk in predicting exchange rate depreciation at both long and short horizons.

The Thai baht has kept appreciating in its value against US dollar in a recent situation in Thailand, as seen in Figure 3, because the country has accumulated more of the foreign currency supplies as a result of the current account surplus and the influx of capital flows. The country's external imbalances are blamed for the baht currency apppreciation. In November, 2019 the Bank of Thailand announced new rules, for instance, relaxation of repatriation of export proceeds, allowing investment in foreign securities for retail investors, relaxation of outward transfers, and the settlement of gold trading in foreign currency, to facilitate capital outflow to promote capital flow imbalances and alleviate pressure on the baht.

Figure 3: Thai Baht per 1 US Dollar

In this paper, I investigate the relationship between Thailand external imbalances and its currency based on the model of international financial adjustment. The purpose of this study is to investigate the ability of country's external imbalances to predict movements in Thai baht in both short- and long-horizon. Instead of using traditional macroeconomic variables those fail to forecast movement in exchange rates, I lean on net external imbalances. Since the baht has been appreciating along with the current account surplus and the escalating of the NFA, this study would explore the relationship between movements in Thai baht and the country's external imbalances whether this two variables are related, and in what time horizon external imbalances have a predictive power on exchange rates. This study also tests for the ability of the Thailand external imbalances in predicting its currency both in-

sample and out-of-sample fitness. Regarding in-sample exchange rate forecasting, I find no evidence that Thailand external imbalances can predict the baht. One possible reason that the Thai external imbalances cannot reflect the adjustment in its currency is that the central bank occasionally performs intervention on Thai baht. Adjustment in baht does not purely rely on market forces but the central bank intervention. However, evidence from the out-of-sample exchange rate forecasting indicates that external imbalances perform better than the random walk model in long-horizon forecasting. I find that Thailand's external imbalances in forecasting the baht beats the random walk in forecasting depreciation rate at 8 quarters ahead onward. Although external imbalances are not the good predictor of exchange rates in a short-horizon, in forecasting exchange rates over a long-horizon, the external imbalances are significant predictor of exchange rates rather than a random walk.

The rest of the paper is organized as follows. Section 2 describes theoretical framework that used in the study. Section 3 briefly overviews Thailand's external imbalances situation. Empirical study is reported in section 4. Finally, section 5 presents conclusion.

2 International Financial Adjustment and Exchange Rates

Gourinchas and Ray (2007) propose a measure of external imbalances and show that current imbalances are offset by future improvement in trade surpluses or excess returns on the net foreign portfolio, or both. Since exchange rate fluctuations play a vital role in affecting future net exports and future returns on external assets and liabilities, so today's external imbalances contain useful information about future exchange rate returns. A depreciation of home currency improves trade imbalances via trade channel, according to the traditional approach to the current account. Moreover, the domestic currency depreciation causes a change in the value of foreign assets and liabilities. This change in net foreign portfolio returns causes a wealth transfer between foreign and domestic residents, contributing to external adjustment through valuation channel.

A country's external budget constraint is expressed in terms of the accumulation of net foreign assets between t and $t+1$ evolved with net exports and the return on the net foreign asset portfolio. The

accumulation identity can be written as follows:

$$NA_{t+1} \equiv R_{t+1}(NA_t + NX_t), \tag{1}$$

where NA_t denotes net foreign assets, defined as the difference between gross foreign assets and gross foreign liabilities; NX_t is net exports, defined as the difference between exports and imports of goods and services; and R_{t+1} is the gross return on the net foreign asset portfolio. Equation (1) states that the net foreign asset position improves with positive net exports and the return on the net foreign asset portfolio.

To investigate the implication of the external constraint, we need to observe, along a balanced-growth path, the ratios of exports, imports, foreign assets and liabilities to wealth are adjusted for time trends attributed to structural changes in the economy. The first-order approximation of the external constraint around its trend satisfies

$$nfa_{t+1} \approx \frac{1}{\rho} nfa_t + r_{t+1} + \Delta nx_{t+1}. \tag{2}$$

The term nfa_t is a linear combination of the stationary components of (log) assets, liabilities, exports, and imports relative to wealth. It is a measure of cyclical external imbalances which contain information from both the flow of trade balance and the stock of foreign asset position. The discount factor ρ depends on the steady-state ratio of the net export to the net foreign assets. The return r_{t+1} is the real return on the net foreign asset portfolio. The term Δnx_{t+1} represents detrended net export growth between t and $t+1$. A country increases its net foreign asset position either through a trade surplus or through a high return on its net asset portfolio.

The intertemporal external budget constraint satisfies

$$nfa_t \equiv -\sum_{j=1}^{\infty} \rho^j E_t[r_{t+j} + \Delta nx_{t+j}]. \tag{3}$$

This equation implies that the movements in the detrended trade balance and net foreign asset position must forecast either future portfolio returns or future net export growth, or both. Strictly speaking, a time variation in nfa must forecast either future portfolio returns or future net export growth. Consider the case where a country run nfa deficit, a negative nfa anticipates any adjustment through future

increases in net exports: $E_t \Delta nx_{t+j} > 0$. The channel of this adjustment is called the trade channel. Moreover, the second channel is the valuation channel in which the adjustment is through positive expected net foreign portfolio returns: $E_t r_{t+j} > 0$. The adjustment in portfolio returns can occur via a movement in domestic currency. Even though such depreciation can improve future trade balance, it also creates a wealth transfer from foreigners to domestic residents. In such this way of international financial adjustment, it is applicable to the exchange rate predictability in the sense that if a country holds foreign assets denominated in foreign currency and foreign liabilities denominated in domestic currency, the real return on net foreign asset portfolio can be written as

$$r_{t+1} = \mid \mu^a \mid (r^{*a}_{t+1} + \Delta e_{t+1}) - \mid \mu^l \mid r^l_{t+1} - \pi_{t+1} \tag{4}$$

where r^{*a}_{t+1} and r^l_{t+1} are the (log) nominal returns on foreign assets in foreign currency and the (log) nominal returns on gross liabilities in domestic currency; Δe_{t+1} is the rate of nominal exchange rate depreciation; and π_{t+1} is the realized domestic inflation rate between t and $t+1$. If the local currency returns are constant, a currency depreciation increases the domestic return on foreign assets. This negative correlation between nfa_t and future exchange rate is magnified by the degree of leverage of the net foreign asset holding when $\mid \mu^a \mid > 1$.

In summary, fluctuations in nominal exchange rate have an impact on an adjustment in country's external imbalances through valuation effect of the external financial adjustment. If the external imbalances contain information in exchange rates, we can predict movements of exchange rate using this imbalances.

3 External Imbalances in Thailand

Current account balance in Thailand is positive during the year 2000–2018. Figure 4 shows that a surplus is about 7 percent of GDP in 2000, then the surplus is down to a deficit in 2005. After that the surplus keeps increasing. However, there is a little stumbling during the year 2012-2013. From 2014 onward, the current account balance keeps rising. The highest surplus in current account is about 10.5 percent of GDP in 2006. Even though the country experiences the surplus in current account, but the growth rate of import of good and service grows more than the export growth as shown in Figure 5.

The growth rate of exports slowed down since 2012. The export growth drops from 2-digit growing to only about -2 percent growing of GDP in 2015. It may imply that the country might have a deficit in current account in the future if export growth declines and import grows excessively and greater than export.

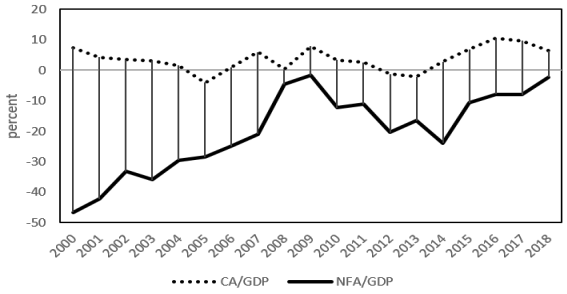

Figure 4: Thailand Current Account and Net Foreign Asset Position

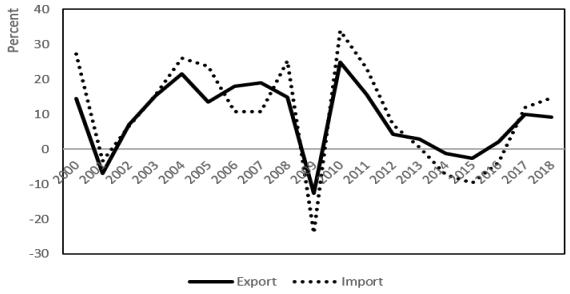

Figure 5: Export and Import Growth

The net foreign asset position (NFA) of a country measures the difference between the value of foreign assets that the country owns and the value of domestic assets owned by foreigners. If a country runs a positive (negative) NFA, it is a creditor (debtor) to the rest of the world. The data used in this study are from the balance of payments and international investment position (IIP) reported by the IMF. In general, international holdings and transactions are classified in the following categories:

- Foreign direct investment
- Portfolio investment
- Financial derivatives

- Other investment namely loans, trade credits, and currency deposits
- Reserve assets

For each of these categories, except reserve assets, it is divided into assets and liabilities holding.

Figure 6 displays that the country net foreign asset position is negative during the year 2000-2018. The foreign assets that the country holds are lower than its holding of foreign liabilities along this period. The deficit in NFA accounts for 50 percent of GDP in 2000. However, this deficit reduces to only 2 percent of GDP in 2018. A decrease in net external liabilities demonstrates a decrease in external financing as a result of the accumulation in current account surplus. Instead of receiving capital inflows, the country has accumulated more of capital outflows. Moreover, Figure 4 depicts that discrepancies between the share of current account per GDP and the share of NFA per GDP are lower during this period of the study.

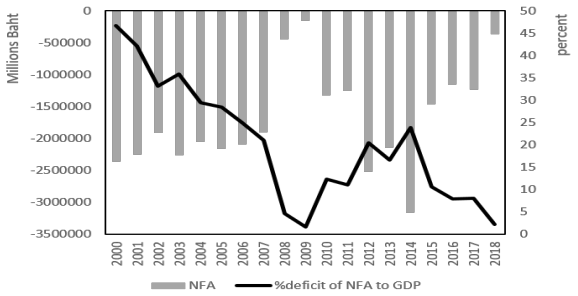

Figure 6: Thailand's NFA

We can see from Figure 7 that the value of foreign assets expands from about 53,979 U.S. dollar in 2000 to 482,715 U.S. dollar in 2018. The growth rate of foreign assets expansion is about 8 percent in 8 years. The foreign liabilities value ranges from 112,680 U.S. dollar in 2000 to 494,042 U.S dollar, which reckons for the growth rate of 3 percent in 8 years. The foreign assets have been multiplied more than the foreign liabilities but the overall value of foreign assets is lower than foreign liabilities so that the country's NFA is negative.

Figure 8 and 9 show the decomposition of the underlying asset and liabilities categories. Regarding asset composition, reserve assets account for most of the foreign assets. The share of reserve asset in total foreign assets is about 60 percent. Foreign assets from the other investment category, e.g. trade

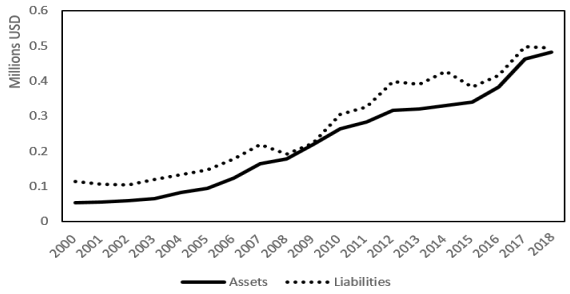

Figure 7: Foreign Asssets and Foreign Liabilities

credit, loan to government, and currency deposit is reckoned for the second highest in total foreign assets. Foreign assets from "other investment" constitute 20–30 percent of total foreign assets. Foreign direct investment increases its significance from 4 percent in 2000 to 28 percent of total assets in 2018. Portfolio investment accounts for about 10 percent in total assets. The rest of the foreign assets is from the holding of financial derivatives. Regarding foreign liabilities, Thailand is the country who receives large amount of investment from abroad in the form of both foreign direct investment and portfolio investment. Foreign direct investment constitutes major part in foreign liabilities. It reckons for almost 50 percent of total liabilities. Portfolio investment accounts for about 30 percent of total liabilities. The rest of foreign liabilities is composed of financial derivatives and other investment.

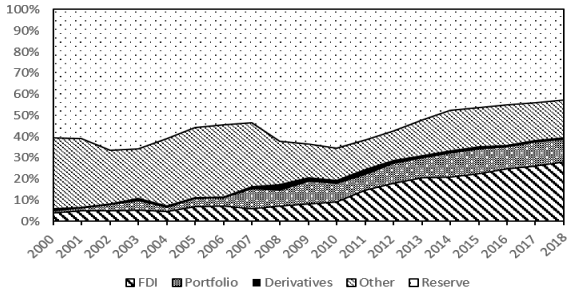

Figure 8: Composition of Thailand Foreign Assets

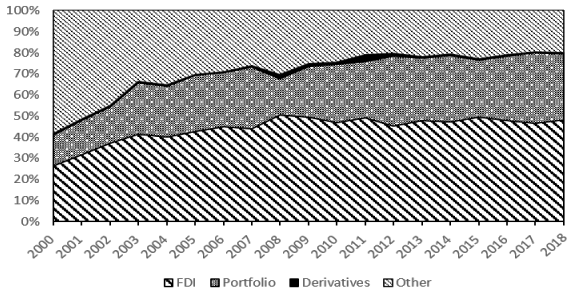

Figure 9: Composition of Thailand Foreign Liabilities

4 Empirical Estimation

In this section, I firstly describe the data used in the study. Then I report the estimation results both in-sample and out-of-sample fitness.

4.1 Data

The data used in this study are quarterly time series during 1999Q1–2019Q2. The exchange rate is the nominal effective exchange rate provided by the Bank of Thailand. It is a traded-weighted exchange rate between Thai baht and its 25 trading partners. To measure country external imbalances, I follow Gourinchas and Rey (2007)'s method as they propose a measure of cyclical external imbalances as follows:

$$nfa_t \equiv |\mu^a|\epsilon_t^a - |\mu^l|\epsilon_t^l + |\mu^x|\epsilon_t^x - |\mu^m|\epsilon_t^m \tag{5}$$

The term nfa_t in the equation above is a measure of cyclical external imbalances. It is a linear combination of the stationary components of (log) assets a, liabilities l, exports x, and imports m to wealth ratios. They are denoted by ϵ_t^a, ϵ_t^l, ϵ_t^x, and ϵ_t^m, respectively. These stationary components are multiplied by the weight μ that reflects the trend components in the data. The term μ^a denotes the (trend) share of assets in the net foreign assets, and is calculated by $\frac{\bar{A}}{\bar{A}-\bar{L}}$, while $\mu^l = \mu^a - 1$. The term μ^x represents the (trend) share of exports in the trade balance, $\mu^x = \frac{\bar{X}}{\bar{X}-\bar{M}}$, and $\mu^m = \mu^x - 1$.

To construct variables in the stationary components, I apply the Hodrick-Prescott (HP) filter to remove trend component out. For example, to construct ϵ_t^a, I first calculate $\ln(A_t/GDP_t)$, and then I

apply the HP filter to this ratio. The result after applying the filter gives the stationary component of the log of the ratio of assets to wealth.

4.2 Empirical Results

In this section, I study the predictive power of external imbalances on exchange rate depreciation rate at both short- and long-horizons. A regression model is of the form

$$\Delta e_{t+1} = \alpha + \beta nfa_t + \delta z_t + \epsilon_{t+1}, \tag{6}$$

where Δe_t is the rate of depreciation of exchange rate, z_t is additional control variable shown in the literature to have predictive power for exchange rates, namely, the lag of rate of depreciation (Δe_t), the stationary component from trade balance ($xm_t = \epsilon_t^x - \epsilon_t^m$), the interest rate differential which is the difference between Thailand three-month treasury bill interest rate and U.S. three-month treasury bill rate ($i_t - i_t^*$).

Table 1 reports the estimation results of the regression in equation (6) with various horizons predictability. Regarding predictability of one quarter ahead, results shown in column 2, even though the coefficient of nfa is of the right sign, a negative nfa leads to a subsequent depreciation of the baht against major currencies, but the coefficient is not statistically significant. This implies that the external imbalances has no predictive power on the exchange rates at one quarter horizon. Moreover, the inclusion of other control variables, e.g. exchange rate lag, stationary component of net export, and interest rate differential, are also statistically insignificant in predicting exchange rates at one quarter ahead. For the case of Thai baht, external imbalances do not have a predictive power in forecasting the baht against major currencies. The result is similar to the situation found in the traditional model of exchange rate determination that fundamentals have little power to explain the exchange rates.

I also investigate whether the predictive power of external imbalances on exchange rates changes over the long horizons by regressing k-horizon exchange rates, $\Delta e_{t,k} \equiv (\sum_{i=1}^{k} \Delta e_{t+i})$, between t and $t+k$ on nfa_t and other control variables. The results for forecasting exchange rates for a longer horizon are reported in column 3–7 in which the forecasting horizons of the exchange rate depreciation ranging from 2 to 12 quarters ahead. I find that external imbalances would not statistically have an impact on

exchange rates unless it is the depreciation rate at 8 quarters ahead onward. However, such impact has an opposite direction to which the theory suggested. When the external imbalance is positive, it induces exchange rates to depreciate.

Table 1: Regression Results of Depreciation Rates at Short- and Long-Horizon

Horizon (Quarters)	1	2	3	4	8	12
nfa_t	−0.0016	0.0333	0.0689	0.0754	0.1848***	0.1492**
	(0.0321)	(0.0430)	(0.0500)	(0.0562)	(0.0613)	(0.0722)
nfa_t	−0.0003	0.0266	0.0544	0.0741	0.1641**	0.1282*
	(0.0344)	(0.0442)	(0.0509)	(0.0581)	(0.0618)	(0.0742)
Δe_t	0.0401	−0.1277	−0.1016	−0.1746	−0.2721	−0.1657
	(0.1500)	(0.1706)	(0.1965)	(0.2247)	(0.2306)	(0.2834)
nfa_t	0.0490	0.1160	0.1242	0.1503	0.1163	0.0863
	(0.0737)	(0.1203)	(0.1397)	(0.1576)	(0.1672)	(0.1959)
xm_t	−0.0978	−0.1570	−0.1067	−0.1422	0.1328	0.1226
	(0.1418)	(0.2131)	(0.2475)	(0.2794)	(0.3012)	(0.3540)
nfa_t	−0.0013	0.0333	0.0681	0.0754	0.1814***	0.1427**
	(0.0323)	(0.0424)	(0.0488)	(0.0550)	(0.0579)	(0.0690)
$i_t - i_t^*$	−0.0023	−0.0042*	−0.0055*	−0.0064**	−0.0097***	−0.0101**
	(0.0022)	(0.0024)	(0.0028)	(0.0032)	(0.0032)	(0.0038)

Note: *,** ,*** denote significance at 10%, 5%, 1% level respectively.

The in-sample predictability of external imbalances on exchange rates appears to have a poor performance. It is well known that exchange rate fluctuations are hard to predict using fundamentals, and the random walk model provides the best prediction of exchange rates. The external imbalances are found to have strong predictive power for exchange rates in some literature. Rossi (2013) shows that the exchange rate predictability depends on the choice of predictor, forecast horizon, sample period, model, and forecast evaluation method. Even though the external imbalances are found to be the significant predictor in certain literature, it is not the case for Thailand's external imbalances as a predictor of Thai baht during the period in this study. One possible reason may stem from the fact that there exists a currency intervention in Thailand. Under the managed float exchange rate regime, the value of baht is not purely determined by the market forces; however, the Bank of Thailand would intervene the baht

when they believe the exchange rates are volatile excessively by buying or selling foreign currencies especially the U.S. dollar to preserve the desired baht level. The baht values as well as the foreign assets, for example, foreign reserves, are altered as a result of the intervention. The adjustment in exchange rates can not reflect by the change in external imbalances because the adjustment mechanism by market forces is distorted by the central bank intervention. Therefore, the country's external imbalances do not have strong predictive power on exchange rates in this study. I investigate further whether external imbalances have Granger causality on exchange rates or, in the opposite way, exchange rates have Granger causality on external imbalances. Table 2 reveals the result that external imbalances in the last period, denoted by nfa_{t-1}, fails to Granger-cause the depreciation rate at time t, denoted by Δe_t. And, the lag of depreciation rate Δe_{t-1} fails to Granger-cause the external imbalances nfa_t. This estimation also shows that the process of external imbalances is AR(1) but the process of depreciation rates is a random walk. External imbalances are not useful in predicting the depreciation of exchange rates in short horizon.

Table 2: Vector Autoregressive Estimation

Dependent variable	Δe_t	nfa_t
Δe_{t-1}	0.0405	-0.4010
	(0.1165)	(0.3233)
nfa_{t-1}	-0.0028	0.6929^{***}
	(0.0301)	(0.0832)

Note: *** denotes significance at 1% level.

The analysis so far is based on the ability of external imbalances to predict in-sample exchange rates. In the next section, I will study its ability to forecast exchange rates out of the sample.

4.3 Out-of-Sample Forecasting

In this section, I study the ability of external imbalances to forecast the out-of-sample depreciation rates against the random walk model. First, I keep the data from 1999Q1–2008Q4 as sample periods. I run regressions of the depreciation rates on external imbalances: $\Delta e_{t+1} = \alpha + \beta nfa_t + \epsilon_{t+1}$, and predict depreciation rates recursively over rolling window from 2009Q1 onwards. Then, I evaluate the forecast

by comparing the mean squared prediction error (MSPE) of the interested model and the random walk model. The model with lower MSPE is better.

In order to assess the statistical significance of the MSPE, I apply Clark and West (2007) method. The idea of the test is to use the point estimate of the difference between the MSPEs of the two models, adjusting for the noise associated with the nested model's forecast. Under the null hypothesis that additional parameters in the alternative model are not useful for prediction, the MSPE of the parsimonious model (random walk without drift) should be smaller than that of the alternative model. Let model 0 be the parsimonious model and model a be the larger model that nests model 0. The period t forecasts of y_{t+1} from the two models are $\hat{y}^0_{t,t+1}$ and $\hat{y}^a_{t,t+1}$. The forecasting errors are $y_{t+1} - \hat{y}^0_{t,t+1}$ and $y_{t+1} - \hat{y}^a_{t,t+1}$. The statistic for difference MSPE-adjusted defines as:

$$\hat{f}_{t+1} = (y_{t+1} - \hat{y}^0_{t,t+1})^2 - [(y_{t+1} - \hat{y}^a_{t,t+1})^2 - (\hat{y}^0_{t,t+1} - \hat{y}^a_{t,t+1})^2].$$

The null hypothesis is that the MSPE of the parsimonious model is lower than or equal to the MSPE of model a. The alternative is that model a has smaller MSPE. I test this hypothesis using t-test on the average of $\hat{f}_{t+1}$.

The out-of-sample forecasting results is presented in Table 3. The p-value of the difference MSPE-adjusted test is small so that we reject the null hypothesis that the random walk model is better than the external imbalance model for forecasting depreciation rates at 8 and 12 horizons. This result reveals that, in forecasting exchange rates, external imbalances model performs better than the random walk without drift model only in the long-horizon, e.g. 8 and 12 horizons, forecasting.

Table 3: Out-of-Sample Forecasting

Horizon (Quarters)	1	2	3	4	8	12
MSPE (random walk)	0.00060	0.00120	0.00178	0.0024	0.0017	0.0036
MSPE	0.00063	0.00119	0.00182	0.0027	0.0020	0.0021
ΔMSPE-adjusted	-0.000015	0.000048	0.000125	0.000136	0.0018	0.0052
p-value	0.3342	0.2805	0.2505	0.3248	0.0100	0.0003

5 Conclusion

This paper studies the ability of external imbalances in predicting exchange rates using Thailand's external imbalances and Thai baht data. Instead of using macroeconomic fundamentals to forecast exchange rates as in standard exchange rates determination model, the focus of this study is to use the country's external imbalances in forecasting exchange rates. I construct the cyclical external imbalances using measure proposed by Gourinchas and Rey (2007). The idea that relates external imbalances and exchange rates is based on the dynamic adjustment in future net export growth and future movement in returns of the net foreign asset portfolio in order to hold the country's external constraint.

For the case of Thailand, I find no in-sample fitness evidence that external imbalances have strong predictive power on the baht both in short- and long-horizon predictability. I also find that the two variables do not have Granger causality to each other. In fact, the process of external imbalances is AR(1) but the process of exchange rates is random walk. Therefore, it is difficult to use external imbalances to predict exchange rates. However, the out-of-sample forecasting results exhibit that external imbalances can forecast exchange rates better than the random walk when forecasting the depreciation rate at long horizons.

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