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The accumulation of income balance and its relationship with real exchange rate: Evidence from Japan

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The accumulation of income balance and its relationship with real exchange rate: Evidence from Japan*[1]

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Abstract

Recently, income balance has been gaining importance in current accounts among many countries. We assess the effect of the real effective exchange rate (REER) on income balance using Japan-specific data and multi-country data. Our results show that the REER does not affect income balance, both on gross and net basis. We also show that accumulation of net foreign assets, driven by the "localization" of Japanese manufacturing firms, has fostered the income balance surplus in Japan.

Keywords: Current account; Income account; International investment position; Exchange rates; Japan

JEL codes: F1; F32

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1. Introduction

As Obstfeld (2018) describes, the surpluses and deficits of the current account themselves are not problematic and even beneficial to each economy. However, the surplus or deficit could be excessive compared with their medium-term fundamentals, and the rise of such imbalance – so-called global imbalance – has been thought to be the risk to the global economy. In this context, the International Monetary Fund (IMF) has developed an economic model named the External Balance Assessment (EBA) to evaluate the appropriateness of the current accounts and exchange rates of the IMF's major member countries. The EBA model relies on the Saving and Investment Balance to estimate the "norm" of the current account balance (See Cubeddu et al., 2019). This estimation leads to the gap between "norm" and actual current account balance. Based on this gap, the IMF provides its view on whether the current account balance is in line with the medium-term fundamentals of major member countries. This evaluation model is called the CA model.

The IMF also evaluates the "norm" of *foreign exchange rate* based on the estimated gap of current account. In this calculation, the elasticity of current account to the REER plays an important role. The IMF evaluates the appropriateness of the level of exchange rate by dividing the current account gap with the elasticity of the current account to the REER. It is true that the IMF also has a specific model to directly assess the level of exchange rate (the REER model), but the IMF prioritizes the result of the CA model in the evaluation, as shown in the IMF's External Sector Report that illustrates the results of EBA of major member countries.

Interestingly, the elasticity of current account to the REER is grounded on the trade account instead of the current account itself, mainly because the current account in

1980 principally consisted of the trade balance (IMF 2002).[5] However, the importance of income accounts in current accounts has been increasing recently among many countries, including Japan. The literature has just started investigating how the exchange rate affects income balance and thus current account balance. As a matter of fact, existing literature (Alberola et al. 2018, 2020, and Joyce 2020) cannot reject the null hypothesis that the elasticity of income balance is zero, i.e. the elasticity of income balance to the REER is zero.

To add the empirical evidence, we investigate the effect of exchange rate on income balance using Japan-specific data. During the 1980s, it was well known that the surplus of current accounts in Japan was large, but this was mainly driven by trade account surplus. However, since the 2000s, the trade balance of Japan started to decrease, and now, it is under the negative territory while most of the current account surplus consists of income account surplus (see figure 1). This suggests that Japan's economy has experienced a structural change during the 2000s, where the trade balance was virtually zero (or even negative) while the income balances drastically increased. Based on such development, Japan should provide a good case study on how the REER affects income balance.

To investigate the effect of the REER on income balance, we empirically assess the effect of the REER on income balance using Japan-specific data. We confirm that the REER does not significantly affect Japan’s income balance from 1999 to 2020. We also extend the model by adding the variable related to “localization”, the transfer of Japanese manufacturing firms to overseas. During the 1990s, Japanese manufacturers suffered from the appreciation of the Japanese yen (JPY) and moved abroad (see Shimizu and Sato

[5] Krugman et al. (2018) focus on export and import as current account by identity CA=EX-IM.

2013). This relocation should drive the accumulation of foreign assets, generate the revenues of interest rate and dividends, thereby contributing to increasing income balances. In order to capture such dynamics, we add the proxy of "localization," which is the ratio of sales of overseas subsidiaries to GDP. The result shows that this proxy has a positive relationship with income balance, which implies that "localization" has contributed to the growth of income flows. We also confirm that the REER does not significantly affect the income balance even after we control this factor.

Furthermore, we also assess the effect of the REER on income balance using multi-country data to see the robustness of the result. The result is consistent with the former studies of Alberola et al. (2018, 2020) and Joyce (2020); we also cannot obtain a statistically significant result.

This paper is composed as follows. Section 2 describes the literature review. Section 3 shows the empirical research using Japan's data, and section 4 conducts robustness checks. Section 5 provides discussions, and section 6 concludes.

2. Literature review

The past literature has mainly focused on the relationship between exchange rate and trade balance. Krugman et al. (2018) shows the significant relationship between the two and discusses that in most industrial countries, the duration of the J-curve effect is over six months but less than one year.[6] Others, on the other hand, discuss that there could be no significant relationship between the two. For example, Rose and Yellen (1989) investigate the impact of the real exchange rate on the trade balance using data between the US and its major trading partners, including Japan, for 1960-1985. They show that the

[6] Krugman et al. (2018) refer Artus and Knight (1984).

relationship was not significant in either the short or long term. The results do not support the J-curve effect hypothesis.[7]

As we described in the introduction, income balance has been gaining importance and can no longer be negligible in the current account among many countries. However, relatively few studies have investigated the driving factors of income balance development. We can expect that Net Foreign Assets (NFAs) should affect income balance, especially investment income balance as the main component of income balance. This is because investment income balance, the receipt and payment of interest/dividends, are generated by foreign assets and liabilities. At the same time, the exchange rate should affect income balance. This is because foreign assets and liabilities are denominated in foreign currencies.

Alberola et al. (2018, 2020) are the early studies that tackle this issue. They discuss what factors affect income balance, by running regressions using country-based panel data. The result shows that the exchange rate does not have a statistically significant effect, but NFAs affect income balances.[8] Joyce (2020) focuses on developing countries' data and concludes that no statistically significant relationship is found between income balance and exchange rate.[9]

Unlike these two studies, Colacelli et al. (2021) find a statistically significant relationship between the income balance and the exchange rate. The biggest difference from Alberola et al. (2018, 2020) is that they separately regress income credit/debit on the REER to construct the semi-elasticities of the income balance to the REER. This

[7] IMF model tries to capture long-run effect by including the lag value of the REER.
[8] For the exchange rate variable, Alberola et al. (2018, 2020) uses a nominal financial effective exchange rate as well as the real effective exchange rate based on trade weights. The financial effective exchange rate is calculated with weights reflecting the currency composition of financial assets (liabilities).
[9] Joyce (2020) uses a dollar exchange rate as an exchange rate variable.

approach, consistent with the IMF's EBA methodology, is called the CGER-inspired approach.[10] Colacelli et al. (2021) shows that the income credit/debit significantly affects the REER, and concludes that for larger creditor countries, such as Japan, the response of income balance to changes in the REER would (marginally) amplify the trade balance response.

The contribution of our paper folds into two parts. First, we extend the model of Alberola et al. (2018, 2020) to reveal the factors that drive income balance surplus in Japan's context. The transfer of Japanese manufacturers to overseas is thought to increase the remittance to Japan, thereby boosting the income balance surplus. This paper is the first empirical study to model these dynamics.

Second, we provide robust evidence that the REER does not provide a statistically significant effect on the income balance, consistent with Alberola et al. (2018, 2020) and Joyce (2020). This could potentially have a policy implication for the IMF's EBA methodology; Cubeddu et al. (2019) describes that the current EBA methodology neglects income balance and only uses the trade balance to estimate the elasticity of current account to the REER. Our result suggests that the income balance and the trade balance react to the exchange rate differently, suggesting the necessity to update the IMF's

[10] Specifically, they assume the following relationship for η^{IB}, the semi-elasticity of the income balance to the REER.

$$\eta^{IB} = \eta^{IC} s^{IC} - \eta^{ID} s^{ID}$$

η^{IC} is the exchange rate elasticity of IC to GDP ratio; η^{ID} is the elasticity of ID to GDP; $s^{IC}$is the ratio of IC to GDP; and s^{ID} is the ratio of ID to GDP. Note that the first two variables are common among all countries in the panel data, and the last two are country-specific variables. In the annex, a Japan-specific regression is included but the sample size is very small (20).

EBA methodology. Table 1 compares our approach with the previous studies.

3 Japan-specific analysis

3.1 Model

Following the motivation we described, we firstly use Japan's data to investigate the relationship between income balance and the REER. By following Alberola et al. (2018, 2020) and Joyce (2020), we first run regressions using Japan's data as below:

$$IB_t = \alpha + \beta_1 NFA_{t-1} + \beta_2 \Delta ln(REER_{t-1}) + \beta_3 GDP\ Growth_{t-1} + \varepsilon_t, \qquad (1)$$

where IB_t is income balance over GDP, NFA_t is net foreign assets over GDP, $REER_t$ is the real effective exchange rate, $GDP\ Growth_t$ is the GDP growth rate, and ε_t is an error term. t is time. All exploratory variables are lagged by one period from theoretical reason. In addition, the lagged value should help avoid endogeneity as in the previous literature (Alberola et al. 2018, 2020 and Joyce 2020).

Figure 2 describes the dynamics between the REER and income balance, according to Alberola et al. (2020). NFA provides a positive effect on IB through the return of NFA, such as a dividend. In addition, NFA affects IB through the REER, but the coefficient depends on the composition of foreign assets. The IB consists of CA, which attribute to the next NFA (△NFA). Therefore, the theoretical prediction of β_1 is positive while β_2 could be positive and negative. In addition, NFA and $REER$ should be lagged variables in terms of the effect to IB. We include $GDP\ Growth$ as a control variable following Joyce (2020).

We also regress income credit and income debit on the REER as below:

$$IC_t = \alpha + \beta_1 FA_{t-1} + \beta_2 \Delta ln(REER)_{t-1} + \beta_3 GDP\ Growth_{t-1} + \varepsilon_t, \qquad (2)$$

$$ID_t = \alpha + \beta_1 FD_{t-1} + \beta_2 \Delta ln(REER)_{t-1} + \beta_3 GDP\ Growth_{t-1} + \varepsilon_t, \quad (3)$$

where IC_t is income credit over GDP, ID_t is income debit over GDP, FA_t is a foreign asset over GDP, and FD_t is foreign debt over GDP.

Regressing income credit/debit separately is consistent with Colacelli et al. (2021), following the CGER-inspired approach by the IMF. Colacelli et al. (2021) argues that this approach uncovers the offsetting effects on the flows of income credit/debit.

3.2 Driving factors of income balance development

Figure 1 shows the time series of Japan's current account balance and income balance. The trade balance surplus largely accounted for the current account surplus in the 1980s to 2000s, but the income balance surplus has become dominant of the current account surplus after the 2000s. The development of income balance in Japan can be attributed to two factors. First, the accumulation of trade balance surpluses has led to the rise of NFAs, boosting the receipt of interest and dividends from overseas. Second, the yen appreciation since the 1990s has shifted domestic firms to embark on “localization”, increasing their outward direct investment that later generates interest and dividends to Japan.

To capture such development, we construct the proxy variable of localization, named as overseas business (OB). Since the variable of NFA already captures the first factor, we include OB into eq. (1) - (3) to examine its effect on the income balance as follows:

$$IB_t = \alpha + \beta_1 NFA_{t-1} + \beta_2 \Delta ln(REER_{t-1}) + \beta_3 GDP\ Growth_{t-1} + \beta_4 OB_{t-1} + \varepsilon_t, (4)$$

$$IC_t = \alpha + \beta_1 FA_{t-1} + \beta_2 \Delta ln(REER_{t-1}) + \beta_3 GDP\ Growth_{t-1} + \beta_4 OB_{t-1} + \varepsilon_t, (5)$$

$$ID_t = \alpha + \beta_1 FD_{t-1} + \beta_2 \Delta ln(REER_{t-1}) + \beta_3 GDP\ Growth_{t-1} + \beta_4 OB_{t-1} + \varepsilon_t, (6)$$

3.3 Data

The data period is 1999Q4-2020Q3 (quarterly data), and the descriptive statistics of each variable are summarized in Table 2. We mainly use the data from the IMF. Since IMF's Balance of payment (BOP) data is based on the dollar, we collect quarterly dollar base GDP from the OECD. Data of foreign assets/liabilities before 2009 were linearly interpolated from yearly into quarterly, as only yearly data are available during that period.

OB is constructed as the sales of overseas subsidiaries of manufacturers divided by GDP. The overseas sales data is obtained from the Ministry of Economy, Trade and Industry's Quarterly Survey of Overseas Subsidiaries, which is the only available dataset to analyze Japanese companies' overseas business on a quarterly basis. Since the sales are denominated in JPY, here we use JPY based GDP collected from SNA (National Accounts of Japan).

3.4 Results

Table 3 illustrates the baseline results of Japan-specific analysis, based on eq. (1), (2), and (3). Columns (1) to (3) are the result of eq (1). We estimate our model with only the NFA variable included, with NFA and REER variables included, and full variables included. As the top panel results show, NFA has a statistically significant positive impact on the income balance. This result can be interpreted that the accumulation of NFA attributed to the increase of income balance. This result does not change even when we include control variables. On the contrary, the coefficient of the REER is not significant, consistent with Alberola et al. (2018, 2020) and Joyce (2020).

Similarly, the estimates of eq. (2) are shown in columns (4) to (6), and those of eq. (3) in columns (7) to (9). These gross level results indicate that foreign assets or debts

have statistically significant impacts on income flows (IC or ID), while the REER is still non-significant. Although our results contradict Colacelli et al. (2021), which show the significant relationship between Japan's income flows and REER, it should be noted that we employ a larger number of Japan's specific quarterly data to obtain statistically reliable results.

Table 4 shows the result of the extended regression. The columns (1), (2), and (3) are the results based on eq. (4), (5), and (6) (i.e., the OB variable is added on the right-hand side of each equation), respectively. The coefficients of OB are statistically significant in columns (1) and (2), which is the same result as before. This is consistent with our discussions; the localization factor does not affect income debit, but it does affect income credit and thus income balance. The coefficients of OB are not statistically significant in column (3). This result can be natural since the transfer of the branch by the Japanese international firm just affects the accumulation of foreign assets, but it does not necessarily affect the foreign debt. The coefficient of NFA is also statistically significant, which is still consistent with our prediction.

Table 4 also shows the REER does not affect the significant result on income effect even if we include OB. This provides robust evidence that the elasticity of income balance to the REER is not statistically different from zero.

4. Robustness check

4.1 Model and data

We also run a panel regression using multi-country data to see the robustness of the result illustrated in section 3. We attempt to fill the gap in previous literature for developed countries, where net income level analysis conducted by Alberola et al. (2018, 2020) contrast with gross level analysis by Colacelli et al. (2021). As Joyce (2020) examines

both net income balance and gross income credit/debit for only developing countries, we use both net income balance and gross income balance (IC and ID) as a dependent variable in eq. (1), (2), and (3), respectively.

To incorporate the panel setup, we extend our model into the equation below:

$$IB_{it} = \alpha + \beta_1 NFA_{it-1} + \beta_2 \Delta ln(REER)_{it-1} + \beta_3 GDP\ Growth_{it-1} + \alpha_i + \lambda_t + \varepsilon_{it}, \quad (7)$$

$$IC_{it} = \alpha + \beta_1 FA_{it-1} + \beta_2 \Delta ln(REER)_{it-1} + \beta_3 GDP\ Growth_{it-1} + \alpha_i + \lambda_t + \varepsilon_{it}, \quad (8)$$

$$ID_{it} = \alpha + \beta_1 FD_{it-1} + \beta_2 \Delta ln(REER)_{it-1} + \beta_3 GDP\ Growth_{it-1} + \alpha_i + \lambda_t + \varepsilon_{it}, \quad (9)$$

where IB_{it} is income balance over GDP, NFA_{it} is net foreign assets over GDP, $REER_{it}$ is the real effective exchange rate, $GDP\ Growth_{it}$ is the GDP growth rate, ε_{it} is an error term, α_i as a country fixed effect, and λ_t as time fixed effect. Similarly, IC_{it} is income credit over GDP, ID_{it} is income debit over GDP, FA_{it} is a foreign asset over GDP, and FD_{it} is foreign debt over GDP.

Our dataset consists of 39 countries.[11] The dataset excludes 10 countries from the EBA-targeted economies used in Colacelli et al. (2021) because their REER data is not publicly available from the IMF's International Financial Statistics (IFS). The data period is 1999 to 2018 (annual data), and the descriptive statistics are summarized in Table 5.

The data sources are mostly the same as described in 3-3 except for the GDP data. Since we use annual data in this section, we collect annual dollar based GDP from the IMF.

[11] Australia, Austria, Belgium, Brazil, Canada, Chile, China, Colombia, Costa Rica, Czech Rep., Denmark, Finland, France, Germany, Greece, Hungary, Ireland, Israel, Italy, Japan, Malaysia, Mexico, Morocco, Netherlands, New Zealand, Norway, Pakistan, Philippines, Poland, Portugal, Russia, South Africa, Spain, Sweden, Switzerland, Tunisia, United Kingdom, United States, and Uruguay.

4.2 Results

Table 6 reports the results of the multi-country analysis. The results of eq. (7), (8), and (9) are shown in columns (1) to (3), columns (4) to (6), and columns (7) to (9), respectively. In all models, we add explanatory variables one by one to demonstrate the effect of each variable. As in the result of Japan-specific regressions, columns (1) to (3) show that the NFA coefficient estimates are positive and significant. This result is consistent with our baseline result based on Japan's data.

In contrast, foreign assets and debts become statistically insignificant for gross income flows (IC, ID). As a result, the estimates of REER coefficients concerning the net income balance and gross income credit/debit are overall statistically insignificant, especially when control variables (GDP growth) are included. Our results support the findings in Alberola et al. (2018, 2020) and Joyce (2020), who suggest the insignificant effects of exchange rates in multi-country analysis, while they contradict Colacelli et al. (2021). We obtain a different result from Colacelli et al. (2021) partially because Colacelli et al. (2021) do not sufficiently incorporate foreign assets (debts) variables in their main regressions, which should be the primary drivers of income flows fluctuations.

5. Discussions

The statistical insignificance of exchange rates to income balance could be attributed to the mix of various factors if we focus on the components of income balance, which are i) income flows generated by direct investment and ii) income flows generated by portfolio investment. The former, flows by direct investment, is associated with the "localization" of Japanese manufacturers. We confirmed that the REER does not affect income balance even if we control the factor of "localization." Therefore, income flows caused by direct

investment, which is irreverent to exchange rates, can make the whole income balance irrelevant to exchange rates. This could be particularly valid to Japan, where the NFA is the major generator of the current account surplus. The latter, income flows caused by portfolio investment, or primary income flows, could be more complicated. When JPY is depreciated, domestic investors are less motivated to buy foreign stocks/bonds, while foreign investors are more motivated to buy Japanese stocks/bonds. These will lead to lower prime income inflows on a net basis. On the other hand, inflows denominated in a foreign currency will be mechanically fueled by the JPY depreciation. So, the total effect of exchange rates on primary income flows could be mixed. This paper does not aim to reveal the underlying mechanisms, but further analysis on this front will give a clearer understanding of why income balance does not respond to exchange rate movement.

On the policy side, our results suggest that the non-responsive nature of exchange rates on income balance could be reflected in the EBA methodology. Indeed, NFA is already included as an explanatory variable in the current account regression. However, further improvements could be considered for two reasons. First, the NFA variable cannot fully explain the dynamics underlying the development of income balance. Therefore, improving the specification, including adding a “localization” variable as we did in our study, is one direction the IMF could pursue. Second, the norm of current account cannot be completely free from the “noise” of income balance no matter how we improve the specification. Therefore, using the elasticity of the REER to *trade* balance, instead of the current account balance, could also involve the noise in evaluating exchange rates. Considering that views on the effect of the REER on the income balance are divergent, the elasticity could be set not as a single value but as a band.

The development of the income account is observed across the globe, along with greater financial integration through the global value chain. Therefore, the IMF should continue

its work to incorporate the nature of the income account into the EBA methodology. Ultimately, the concept of EBA that links current account balance with exchange rates could be revisited, particularly for the economy where income balance surplus is dominant in their current account surplus.

6. Conclusions

We empirically assess the effect of the REER on income balance using Japan-specific data and multi-country data. Our contribution to the literature folds into two parts. First, we extend the model of Alberola et al. (2018, 2020) and Joyce (2020) to reveal the factors that drive income balance surplus in Japan's context, where the current account surplus is dominated by income balance surplus. We add the proxy variable of "localization" to capture the effect of the transfer of Japanese manufacturing firms to overseas. The result confirms that the REER does not significantly affect the income balance in Japan, and the rise in income balance can be attributed to the "localization" of Japanese manufacturers. Second, we provide robust evidence that the REER does not provide a statistically significant effect on the income balance using multi-country panel data. This result is consistent with Alberola et al. (2018, 2020) and Joyce (2020).

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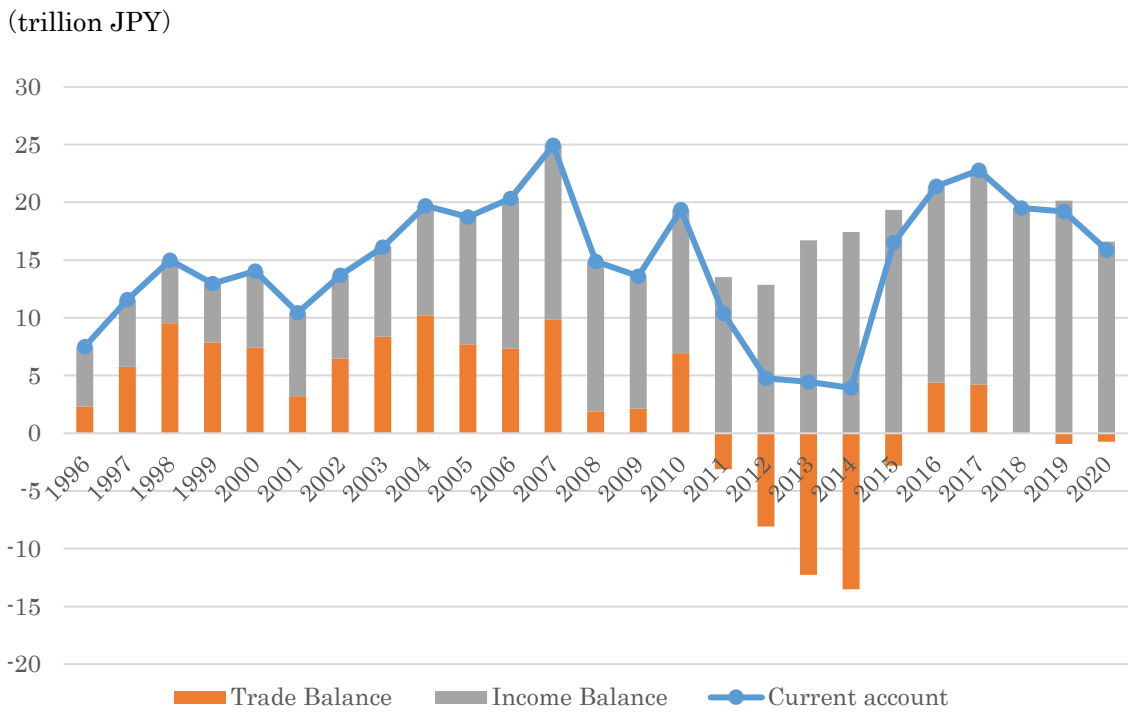
Figure 1 The time series of trade balance and income balance in Japan



Source: Ministry of Finance, Japan

Figure 2 The dynamics of REER and income balance

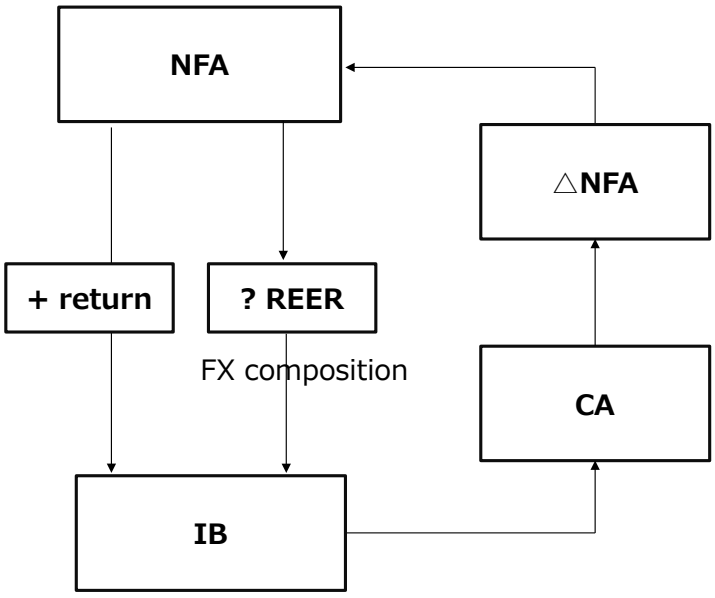


Figure adapted from Fig. 6. in Alberola et al. (2020).

Table 1 Comparison with previous studies

	Type of IB	Countries	Methodology	Does REER affects IB?
Joyce (2020)	gross, net	26 countries	Multi-country panel (mainly EMDE)	No
Alberola et al. (2018, 2020)	net	39 countries	Multi-country panel	No
Colacelli et al. (2021)	gross	47 countries, Japan*	CGER-inspired approach	Yes
Our study	gross, net	Japan, 39 countries	Japan, Multi-country panel	No

*Japan's elasticity of the REER to IB is estimated based on panel data of 47 countries. In the annex, Japan-specific regression is included, but the sample size is very small (20).

Table 2 The fundamental Statistics of Japan's data

Variables	Observations	Mean	Standard	Min	Max	Source
Income Balance/GDP	83	0.007	0.002	0.003	0.011	IMF BOP
Income Credit/GDP	83	0.011	0.003	0.006	0.017	IMF BOP
Income Debit/GDP	83	0.005	0.002	0.002	0.009	IMF BOP
Net Foreign Assets/GDP	83	0.525	0.126	0.251	0.758	IMF BOP
Foreign Assets/GDP	84	1.335	0.353	0.812	2.172	IMF BOP
Foreign Liabilities/GDP	83	0.801	0.249	0.428	1.441	IMF BOP
Real Effective Exchange Rate	84	91.989	15.623	68.255	128.06	IMF IFS
GDP Growth	84	1.006	0.018	0.913	1.097	OECD
Overseas Sales/ GDP	83	0.04	0.014	0.016	0.06	Quarterly Survey of Overseas Subsidiaries, SNA

Note: This table describes the fundamental statistics in our data set. We obtain Income Balance, Income Credit, Income Debit, Net Foreign Assets, Foreign Asset, Foreign Liability, Real Effective Exchange Rate from the IMF. GDP is obtained from OECD. OB is constructed from Overseas Sales obtained from the Ministry of Economy, Trade and Industry, Quarterly Survey of Overseas Subsidiaries and GDP from SNA, Japan.

Table 3 Estimation result based on eq. (1), (2) and (3)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
VARIABLES	IB	IB	IB	IC	IC	IC	ID	ID	ID
NFA	0.0108***	0.0109***	0.0107***						
	(9.566)	(9.656)	(8.982)						
FA				0.00790***	0.00795***	0.00795***			
				(19.99)	(20.31)	(19.57)			
FD							0.00575***	0.00571***	0.00580***
							(18.33)	(17.92)	(17.28)
△ln(REER)		-0.00553	-0.00666		-0.00427	-0.00416		0.00210	0.00295
		(-1.569)	(-1.595)		(-1.512)	(-1.226)		(0.922)	(1.229)
Growth			-0.0118			0.00114			0.00916
			(-0.732)			(0.104)			(1.254)
Observations	82	82	82	82	82	82	82	82	82

Note: This result shows the regression result based on eq. (1), (2), and (3). The parenthesis is the standard error adjusted by Newey and West. The symbols *, **, *** denote statistical significance of 10%, 5% and 1%.

Table 4 Estimation result based on eq. (4), (5) and (6)

VARIABLES	IB	IC	ID
NFA	0.00704***		
	(6.379)		
FA		0.00583***	
		(6.544)	
FD			0.00692***
			(7.803)
OB	0.0544***	0.0569***	-0.0211
	(5.729)	(2.751)	(-1.456)
△ln(REER)	-0.00540	-0.00250	0.00222
	(-1.306)	(-0.800)	(0.917)
L.Growth	-0.00732	-0.000532	0.00943
	(-0.641)	(-0.0555)	(1.367)
Constant	0.00845	0.00207	-0.00960
	(0.735)	(0.214)	(-1.373)
Observations	82	82	82

Note: This result shows the regression result based on eq. (1), (2) and (3). The parenthesis is the standard error adjusted by Newey and West. The symbols *, **, *** denote statistical significance of 10%, 5% and 1%.

Table 5 The fundamental statistics of multi-country data

	Observation	Mean	Standard Deviation	Min	Max	References
Income Balance/GDP	738	-0.012	0.04	-0.244	0.112	IMF BOP
Income Credit/GDP	738	0.081	0.074	0.004	0.477	IMF BOP
Income Debit/GDP	738	0.093	0.088	0.009	0.619	IMF BOP
Net Foreign Assets/GDP	738	-0.195	0.519	-1.966	2.217	IMF BOP
Foreign Assets/GDP	738	1.939	2.692	0.069	19.26	IMF BOP
Foreign Liabilities/GDP	738	2.134	2.685	0.115	20.831	IMF BOP
Real Effective Exchange Rate	738	97.342	11.445	47.952	132.683	IMF IFS
GDP Growth	738	1.057	0.107	0.652	1.514	IMF WEO

Note: This table describes the fundamental statistics in our data set in multi-country analysis. We obtain Income Balance, Income Credit, Income Debit, Net Foreign Assets, Foreign Assets, Foreign Liability, Real Effective Exchange Rate, GDP from the IMF.

Table 6 The estimation result based on eq. (7), (8) and (9)

VARIABLES	(1) IB	(2) IB	(3) IB	(4) IC	(5) IC	(6) IC	(7) ID	(8) ID	(9) ID
NFA	0.0250***	0.0248***	0.0247***						
	(0.00526)	(0.00545)	(0.00524)						
FA				0.0147	0.0128	0.0130			
				(0.0131)	(0.0134)	(0.0129)			
FD							0.0154	0.0137	0.0139
							(0.0121)	(0.0122)	(0.0118)
ln_ER		-0.00474	0.0262		-0.0365***	0.0838		-0.0320**	0.0560
		(0.00944)	(0.0170)		(0.0109)	(0.0582)		(0.0127)	(0.0526)
Growth			-0.0259*			-0.101*			-0.0736
			(0.0152)			(0.0514)			(0.0467)
Constant	-0.00383	-0.00358	0.0225	0.0501***	0.0491**	0.150**	0.0555***	0.0541**	0.128**
	(0.00386)	(0.00314)	(0.0160)	(0.0169)	(0.0201)	(0.0600)	(0.0184)	(0.0211)	(0.0568)
Observations	699	672	672	699	672	672	699	672	672
R-squared	0.165	0.156	0.162	0.322	0.296	0.321	0.364	0.341	0.354
Number of ifs_code	39	39	39	39	39	39	39	39	39
Country FE	YES	YES	YES	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES	YES	YES	YES

Note: This result shows the regression result based on eq. (7), (8) and (9). The parenthesis is the standard error adjusted by White (1980). The symbols *, **, *** denote statistical significance of 10%, 5% and 1%.