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Real Exchange Rates and Inward Foreign Direct Investment in Japan and East Asia and Pacific Region

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Abstract

The purpose of this research was to investigate the relationship between real effective exchange rates and inward foreign direct investment in the East Asia and Pacific region and examine whether Japan had a higher response to real effective exchange rate volatility than other countries in the region. The research was motivated by the empirical evidence that Japan has a lower-than-average rate of inward foreign direct investment compared to its gross domestic product for the region, as well as a higher-than-average level of real effective exchange rate volatility. The sample included 21 countries and regions in the East Asia and Pacific region (1993 to 2022). Analysis included descriptive statistics, t-tests, and linear regression. The t-tests confirmed that Japan had significantly higher real effective exchange rate volatility and significantly lower inward foreign direct investment flows. Linear regression analysis showed that real effective exchange rate volatility had a negative effect on inward foreign direct investment flows, although this effect was only significant in some conditions. The regression analysis also showed that there was a significant negative effect from the Japan dummy variable, indicating that inward foreign direct investment flows were significantly lower in Japan compared to other countries. The implication of this research is while inward foreign direct investment is significantly lower in Japan than the regional average, exchange rate volatility is not the underlying causal mechanism. Therefore, more research is needed to investigate Japan's inward foreign direct investment flows.

Keywords

East Asia and Pacific, Exchange Rate Volatility, Inward Foreign Direct Investment, Japan, Real Effective Exchange Rate

1. Introduction

Inward foreign direct investment (FDI) has some significant advantages for receiving countries. In many countries, it has been associated with increased gross domestic product (GDP), as well as technology and knowledge transfer that ultimately improves local industries (Denisia, 2010). However, Japan appears to be an anomaly with respect to inward FDI flows. Prior studies have shown that inward FDI does not contribute to Japan's GDP (Asheghian, 2009) and that it may not be an attractive inward FDI target for a variety of policy and market-related reasons (Yakubovskiy et al., 2020). However, there is also the possibility of macroeconomic factors, such as the exchange rate, influencing the attractiveness of Japan as an inward FDI target. Theoretically, while currency depreciation can increase the attractiveness of investing in a destination country, exchange rate volatility can create increased risk, therefore reducing the attractiveness of the destination (Goldberg, 2009). In general, exchange rate volatility has been shown to have a negative impact on inward FDI flows, although there is a great deal of heterogeneity within prior research (Kosteletou & Liargovas, 2000; Moraghen et al., 2019). Thus, while a possible relationship is suggested, it cannot be stated with certainty. The researcher did not identify any studies that had previously investigated the relationship between exchange rate volatility and inward FDI in Japan, which could provide more insight into this question. This research gap is addressed within the current study.

The purpose of this research is to investigate the relationship between real effective exchange rates and inward foreign direct investment in the East Asia and Pacific region and examine whether Japan had a higher response to real effective exchange rate volatility than other countries in the region. The research asks two key questions: 1) How does exchange rate volatility affect inward FDI flows in the East Asia and Pacific region? And 2) Does Japan differ from its neighbours with respect to the relationship between exchange rate volatility and inward FDI flows?

2. Literature Review and Hypothesis Development

2.1. Exchange Rates

An exchange rate is the value of one currency if exchanged for another currency (Evans, 2011). Exchange rates may be fixed against the value of another currency, may float in response to market demand, or may be influenced by intermediate policies that allow them to float within a specified range (managed float or intermediate) (Evans, 2011). These different behaviours are influenced by exchange rate policies or regimes, though they may also be influenced by other policy and practice choices (Levy-Yeyati & Sturzenegger, 2005). Exchange rates may be expressed as nominal exchange rates (which are not adjusted for inflation) or real exchange rates (which are adjusted for inflation) (Auboin & Ruta, 2013). Exchange rates may be measured as bilateral exchange rates (Evans, 2011). They may also be measured as effective exchange rates, reflecting the aggregated exchange

rate of a country's currency against a basket of trade partners (Hassan & Holmes, 2013).

This study uses the real effective exchange rate (REER), an inflation-adjusted aggregate exchange rate (Darvas, 2024). The REER is known to be affected by economic fundamentals including terms of trade, public spending, foreign exchange reserves, and other factors (Lubu et al., 2023). However, outside these exchange rates, it is uncertain what effect the REER may have due to high variability of findings in different economies (Velic, 2024).

There are various theories regarding how floating exchange rates are set, outside the superficial influence of supply and demand. The oldest of these theories is the so-called "law of one price", which hypothesizes that the same good in markets A and B cost the same (Miljkovic, 1999). The implication of this "law" is that the exchange rate between A and B represents a direct correspondence in value (Evans, 2011). However, the "law of one price" makes many inaccurate assumptions, such as the assumption of frictionless trade, ignoring factors such as tariffs and non-tariff barriers to trade (Miljkovic, 1999). As a result, this "law" has long lacked empirical support (Isard, 1977), and cannot be considered an adequate explanation. A second explanation for exchange rate determination is absolute purchasing power parity (APPP), which is based on the law of one price (Rogoff, 1996). However, APPP goes further by arguing that under conditions of market efficiency, the same basket of goods should cost the same in markets A and B; therefore, the exchange rate A/B can be determined by the price of the basket of goods in country A divided by the price of the basket of goods in country B (Rogoff, 1996). Furthermore, it implies that a change in the relative price of goods will produce a change in the A/B exchange rate (Evans, 2011). The modified relative PPP theory (RPPP) argues that different levels of price inflation in countries A and B also need to be considered when determining the exchange rate (Officer, 1978). Ultimately, however, none of these causal explanations is strongly supported, and in fact, determining what influences exchange rates is a challenging problem as they are typically unpredictable (Rossi, 2013).

2.2. Foreign Direct Investment

Foreign direct investment (FDI) refers to "the process whereby residents of one country (the source country) acquire ownership of assets for the purpose of controlling the production, distribution, and other activities of a firm in another country (the host country)" (Moosa, 2002: p. 1). The key element of FDI within this definition is that the foreign investor takes a direct role in management and control of the assets (Moon, 2016). This assumption of control differentiates FDI from foreign portfolio investment (FPI), where foreign investors play a passive role and do not attempt to control the assets, they have invested in (Goldstein & Razin, 2006). FDI and FPI can be considered complementary; FDI trades a higher associated level of risk for more information about and control of the asset, while FPI is associated with commensurately less risk and less control (Goldstein &

Razin, 2006). Therefore, FDI is the higher-risk, higher-reward approach to foreign investment compared to FPI. FDI may also be considered in terms of directionality, with inward FDI reflecting the host country perspective and outward FDI reflecting the home country perspective (Moosa, 2002). The most basic theory for why FDI occurs is the Ricardian comparative advantage theory—in brief, that investors can receive a better return in country A than in country B (Moosa, 2002). Comparative advantage alone cannot explain FDI decisions, given the complexity of international trade and the impact of trade barriers and other factors (Zeqiri & Bajrami, 2016), but it has served as the basis for later elaborations on FDI theory. Internationalisation theory argued that firms would choose to engage in FDI in the absence of competition and with a clear competitive advantage (Hymer, 1976). The later elaboration of the eclectic or OLI paradigm set out the specifics of what kinds of advantage firms might seek in undertaking FDI, including ownership advantages (which stem from the firm's control of assets), location advantages (which stem from the host market compared to the home market), and internalization advantages (which stem from the firm engaging in the host market rather than licensing their ownership advantages) (Dunning, 1988). These advantages may be of different types; for example, one author differentiates between expansionary (or market-seeking FDI) and defensive (or resource-seeking) FDI, which are targeted at taking advantage of market gaps and seeking resources such as cheap labour respectively (Chen & Ku, 2000). Broader internationalization theories, such as the Uppsala model (Johanson & Vahlne, 1977), also propose that FDI is part of a learning process of internationalization. Thus, while comparative advantage lies at the heart of FDI, there are many factors that control to how, where, and why firms choose to engage in it.

2.3. Exchange Rates and Inward Foreign Direct Investment

REER has been shown to have effects on economic indicators such as GDP growth (Lubu et al., 2023), but the evidence for its effect on other indicators is less certain. The theoretical explanation for a link between a country's exchange rate and inward FDI flows is based in currency depreciation (Goldberg, 2009). As Goldberg (2009) explains, if country A's currency depreciates against country B's currency, it becomes cheaper in relation to country B to produce goods within that country. Therefore, a depreciating A/B exchange rate creates competitive advantage for country B (Goldberg, 2009). In terms of the eclectic paradigm, a depreciating exchange rate could be said to create location advantage (Dunning, 1988). However, this very simple explanation ignores a number of factors, such as the relative cost of imported goods, which will make a firm engaged in market-seeking FDI less likely to see comparative advantage (Chen & Ku, 2000). There is also the question of exchange rate volatility, which can create investor uncertainty and higher levels of investment risk and therefore deter investment (Goldberg, 2009). Thus, in general, it could be expected that a depreciating exchange rate would spur FDI, but if this were accompanied by higher exchange rate volatility, this may detract from

it. Empirical evidence for floating exchange rate economies does generally support the influence of exchange rates on FDI flows (Kosteletou & Liargovas, 2000), as well as a negative effect of exchange rate volatility on inward FDI flows (Moraghen et al., 2019). However, there is a lot of heterogeneity between countries based on factors like human capital, trade openness, and intellectual property rights protection, which moderate the impact of exchange rate volatility on FDI (Moraghen et al., 2019). Furthermore, in some countries, there is no clear link between exchange rates or exchange rate volatility and FDI flows, depending on other economic factors (Maryam & Mittal, 2020). This research investigates the relationship between REER volatility and FDI flows as the basis of its first hypothesis.

Hypothesis 1: Volatility of the real effective exchange rate (REER) will be a negative determinant of inward foreign direct investment (FDI) flows in East Asia and Pacific countries.

2.4. Exchange Rate Volatility and Inward Foreign Direct Investment in Japan

The central question of this research is whether Japan has a unique relationship between exchange rate volatility and inward FDI than other countries in the East Asia and Pacific region. FDI is known to have heterogeneous responses to exchange rates and exchange rate volatility depending on other economic and policy factors (Moraghen et al., 2019), and evidence suggests that Japan is even more variable than other countries. Recent research has indicated that inward FDI to Japan is lower than would be expected given a counterfactual analysis, which authors attributed to the failure of the "Abenomics" international trade policy to attract FDI (Hoshi & Kiyota, 2019). Earlier research has also suggested that historically, there is no significant link between inward FDI and economic growth within Japan (Asheghian, 2009). Furthermore, evidence has indicated that outbound FDI is far more profitable than inbound FDI in Japan, suggesting it may not be an attractive inbound FDI target (Yakubovskiy et al., 2020). However, there has historically been little effort to investigate Japanese inward FDI (Hara & Razafimahefa, 2005). Hara and Razafimahefa (2005) investigated inward FDI flows (1980-2001) and found that exchange rate volatility had a significant negative effect on FDI in Japan during these periods. There has been some comparative work done with Japan. A study examined net FDI in Canada, the United States, and Japan (Chowdhury & Wheeler, 2008). These authors found that overall, net FDI in Japan was less responsive to exchange rate volatility than in either of the comparator countries (Chowdhury & Wheeler, 2008). However, as authors did not decompose inward and outward FDI flows, it is difficult to determine whether this is an effect related to foreign investment in Japan or Japanese foreign investment in other countries. Overall, there is some evidence that the effect of exchange rate volatility on inward FDI may be attenuated or different from other countries in Japan, but there have not been a large number of studies or a recent re-investigation of such effects. Therefore, the second hypothesis investigated in the research

is:

Hypothesis 2: The effect of exchange rate volatility on inward FDI in Japan will be weaker than in East Asia and Pacific countries as a whole.

3. Methodology

3.1. Population and Sampling

The research population of interest included Japan and comparator countries and regions in the East Asia and Pacific region. These countries were selected using the East Asia and Pacific country group of the World Bank (World Bank, 2024a). Countries were screened for data availability, including: 1) availability of real effective exchange rate (REER) data, 2) availability of FDI data, 3) availability of macroeconomic data, and 4) exchange rate regime (countries were required to have their own currency). This resulted in a sample of 21 countries and regions, which are summarized in Table 1. The maximum data collection period was 1993-2022. However, analyses that included political stability (PS) include only 1996-2022, due to the starting date of the worldwide governance indicators (WGIs) series (World Bank, 2020).

Table 1. Countries and regions included in the study.

Australia	Hong Kong SAR (China)	Mongolia	Singapore
Brunei Darussalam	Indonesia	Myanmar	Solomon Islands
Cambodia	Japan	New Zealand	South Korea
China	Lao PDR	Papua New Guinea	Thailand
Fiji Islands	Malaysia	Philippines	Tonga
			Viet Nam

3.2. Variables and Collection

Table 2 summarizes the variables used within the study. Data was collected from a variety of macroeconomic indicator databases. Following data collection, data screening was used to include countries based on the first three criteria of data availability. An additional screening was conducted using the Annual Report on Exchange Arrangements and Exchange Restrictions (AREAER) report, which details exchange rate policies for individual countries (International Monetary Fund, 2024b). This led to the removal of one country, Kiribati, because it does not have its own currency (International Monetary Fund, 2024b). Following data collection, data was screened for outliers using box plots (Biagini & Campanino, 2016). Note that some variables, particularly FDIR and KA_OPEN, did not have complete coverage, which reduced the size of the final dataset.

3.3. Data Analysis

Data analysis was conducted using a combination of techniques, including

Table 2. Variables and data sources.

Variable		Definition	Data Source
		Dependent Variable	
Inward FDI Flows	IFDI	Inward FDI flows as a percentage of GDP	UNCTAD STAT Trade Database (UNCTAD, 2024)
		Independent Variables	
REER Volatility	REER_VOL	Standard deviation of monthly REER	Bruegel REER Database (Darvas, 2024)
Japan	JPN	Dummy variable (1 = Japan)	Author
	REER_VOL * JPN	Interaction variable	Author
		Control Variables	
GDP Per Capita	LNGDPPC	Log of GDP per capita	
GDP Growth	GDPG	Percent annual increase in GDP	World Bank Open Data (World Bank, 2024a)
Consumer Price Inflation	CPI	Percent annual increase in consumer prices	
Unemployment	UNE	Percent of workforce unemployed	Labour Force Statistics Database (ILOSTAT, 2024)
Political Stability	PS	Percentile rank of political stability and absence of violence/terrorism index	Worldwide Governance Indicators (World Bank, 2024b)
FDI Restrictions	FDIR	FDI restriction index (Total) (Note: 0 indicates completely open, 1 indicates completely closed)	Organisation for Economic Cooperation and Development (OECD, 2024)
Capital Controls	KA_OPEN	Normalized index of economic openness	Chinn-Ito Index of Economic Openness (Chinn & Ito, 2023)
Floating Exchange Rate Policy	FLOAT	Country uses a managed or free floating exchange rate policy (Dummy: 1 = true)	International Monetary Fund Annual Report on Exchange Arrangements and Exchange Restrictions (AREAER) (IMF, 2024a)
Landlocked Country	LANDLOCK	Country does not have access to seaports (Dummy: 1 = true)	Author

descriptive statistics, correlation, and panel regression. Panel regression using the fixed effects assumption is the analysis technique of the gravity model, which is used to investigate bilateral trade flows such as exports and FDI flows (Anderson, 2011).

The slope-intercept regression model was used as the basis for the regression equation (Afifi et al., 2019):

$$Y = \alpha + \beta X \tag{1}$$

The dependent variable (IFDI) and independent variable (REERVOL) were then added to the regression model:

$$Y_{IFDI} = \alpha + \beta_1 REER\_VOL \tag{2}$$

Construction of the regression model continued with addition of control variables, which are heterogeneous variables known to play a role in both exchange rates and FDI flows. These variables included GDP per capita (LNGDPPC) (Lajevardi & Chowdhury, 2024), GDP growth (GDPG) (Encinas-Ferrer & Villegas-Zermeño, 2015), consumer price inflation (CPI) (Sayek, 2009), unemployment rates (UNE) (Schmerer, 2014), and political stability (PS) (Kim, 2010). In recognition that exchange rates are at least to some extent determined by exchange rate regimes, particularly in the instance of fixed exchange rates, and that this makes different exchange rate regimes to some extent incommensurate (Rose, 2011), a dummy variable representing a managed floating or free-floating exchange rate regime (FLOAT) was added. This dummy was based on the International Monetary Fund (IMF) Annual Report on Exchange Arrangements and Exchange Restrictions (AREAER) reports (IMF, 2024a).

Additional control variables were added based on known factors that influence trade flows under the gravity model. Based on the known importance of geography in trade flows (Anderson, 2011), LANDLOCK was added as a dummy variable, indicating that the country does not have any seaports. Referencing the obvious role of regulatory restrictions on FDI in certain industries or overall in resulting FDI flows (Ghosh et al., 2012), an FDI restrictiveness (FDIR) variable was added. This variable draws on the Organisation for Economic Cooperation and Development (OECD) FDI Restrictiveness index (OECD, 2024). Finally, in recognition that controls of capital flows could influence investment decisions (Asiedu & Lien, 2004), a capital control variable was added (KA_OPEN), which was drawn from the Chinn-Ito index of economic openness (Chinn & Ito, 2023).

The addition of these control variables resulted in the following equation:

$$\begin{aligned} Y_{IFDI} = {} & \alpha + \beta_1 REER_{VOL} + \beta_2 LNGDPPC + \beta_3 GDPG + \beta_4 CPI \\ & + \beta_5 UNE + \beta_6 PS + \beta_7 FLOAT + \beta_8 LANDLOCK \\ & + \beta_9 FDIR + \beta_{10} KA\_OPEN \end{aligned} \tag{3}$$

The final addition to the regression model was in Equation (4), in which the Japan-REER_VOL interaction variable (REER_VOL * JPN) was added in order to test whether there are country-specific effects of REERVOL on IFDI:

$$\begin{aligned} Y_{IFDI} = {} & \alpha + \beta_1 REER_{VOL} + \beta_2 LNGDPPC + \beta_3 GDPG + \beta_4 CPI \\ & + \beta_5 UNE + \beta_6 PS + \beta_7 FLOAT + \beta_8 LANDLOCK + \beta_9 FDIR \\ & + \beta_{10} KA_{OPEN} + \beta_{11} REER\_VOL * JPN \end{aligned} \tag{4}$$

The effects of all regression coefficients are considered to be significant at $p < 0.05$ (Afifi et al., 2019).

4. Findings and Discussion

4.1. Descriptive Statistics and t-Tests

Descriptive statistics for the variables are summarized in **Table 3**. Descriptive statistics were calculated for other countries and regions and Japan separately, in order to investigate mean differences using independent t-tests. The descriptive

Table 3. Descriptive statistics and t-tests.

	Country/ Region	N	Missing	Mean	Median	SD	Skewnesss	Kurtosis	T-statistic
IFDI	Other	600	0	5.510	3.115	7.7876	2.260	9.501	3.749[a] ***
	Japan	30	0	0.175	0.150	0.1951	1.177	1.749	
REER_VOL	Other	566	34	2.667	1.972	2.4100	2.975	12.126	−3.318 ***
	Japan	30	0	4.176	3.609	2.7391	1.687	3.002	
LNGDPPC	Other	599	1	8.977	8.812	1.2540	0.278	−0.886	−6.227[a] ***
	Japan	30	0	10.405	10.443	0.2208	−0.257	−1.206	
GDPG	Other	598	2	4.335	4.807	4.5852	−1.528	10.205	4.287[a] ***
	Japan	30	0	0.727	1.032	1.9911	−1.488	3.451	
UNE	Other	371	229	4.083	3.650	2.6981	3.069	24.755	0.514[a]
	Japan	30	0	3.829	3.945	0.9399	0.031	−1.319	
CPI	Other	577	23	6.107	3.462	14.6796	11.812	187.357	2.173*
	Japan	30	0	0.279	0.026	0.9442	0.970	1.048	
PS	Other	472	128	52.984	54.501	27.1662	−0.062	−1.161	−5.668[a] ***
	Japan	24	6	84.464	83.925	4.0904	0.092	−0.422	
FDIR	Other	144	456	0.260	0.259	0.1377	0.366	−0.522	5.559[a] ***
	Japan	14	16	0.055	0.052	0.0076	2.800	8.027	
KA_OPEN	Other	506	94	0.486	0.420	0.3336	0.348	−1.297	−8.129[a] ***
	Japan	29	1	0.990	1.000	0.0231	−1.831	1.446	

Note: *p < 0.05, **p < 0.01, ***p < 0.001; [a]Levene's test p < 0.05; equal variances not assumed.

statistics illustrate a wide variation in most of the variables. There are several variables where skewness and/or kurtosis values fall outside the range of −2 to 2, which is indicates a reasonably normal distribution (Holcomb, 2017). In Japan, most variables were within normal ranges according to skewness and/or kurtosis, with exceptions including REER_VOL and GDPG (>2 kurtosis) and FDIR (>2 skewness and kurtosis). Among other countries/regions, most variables were normally distributed (>2 skewness and kurtosis), with the exception being LNGGDPPC, PS, FDIR, and KA_OPEN. The fact that Japan's data, which comes from a homogenous economy, is more normal than the set of 20 additional countries/regions that were included, is unsurprising. Furthermore, a high degree of non-normal distribution is expected in real-world panel data (Farzammehr et al., 2021). Therefore, the non-normal distribution of the variables was not considered to be an issue that should be corrected.

Because the research is concerned with differences between Japan and other countries in the East Asia and Pacific region, independent t-tests for difference in means were used to compare means between Japan and the other countries included in the analysis. The t-tests indicated a significant difference between Japan

and other countries in the sample for most variables. Japan had significantly lower IFDI, GDPG, and CPI than other countries, but significantly higher REERVOL, LNGDPPC, PS, FDIR, and KA_OPEN. This is consistent with Japan being a more politically stable, lower-inflation, and higher-income country than the average for the region, but also indicates that it attracts less inward FDI as a share of its GDP and has slower economic growth. Additionally, it has significantly higher REER volatility than average. However, this is probably due to its use of a free-floating exchange rate (International Monetary Fund, 2024b). Furthermore, the t-tests show that Japan has lower capital controls than the overall average for other countries/regions (as indicated by its higher mean value for KA_OPEN) as well as lower FDI restrictions (as indicated by its lower FDIR). Thus, this suggests that Japan's policies regarding FDI are substantively different from other countries/regions in the analysis.

Correlations were calculated to investigate internal relationships between variables and to ensure that the variables were independent (Table 4). There were significant correlations between most variables, but these tended to be low to moderate. The highest correlation was for CPI-REERVOL (r = 0.428). Therefore, it can be assumed that most regression variables are independent of each other. However, the correlation of CPI-REERVOL was high enough to suspect shared causation or a causal relationship. Therefore, CPI was removed from the regression equation prior to its calculation.

Table 4. Correlations.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
(1) IFDI	—								
(2) REER_VOL	−0.150***	—							
(3) LNGDPPC	0.305***	−0.214***	—						
(4) GDPG	0.091*	−0.189***	−0.161***	—					
(5) UNE	−0.046	0.054	0.053	−0.157**	—				
(6) PS	0.263***	−0.106*	0.509***	−0.25***	0.298***	—			
(7) CPI	−0.044	0.428***	−0.272***	0.014	−0.046	−0.252***	—		
(8) FDIR	−0.211**	0.250**	−0.477***	0.396***	0.045	−0.549***	0.247**	—	
(9) KA_OPEN	0.255***	−0.038	0.408***	−0.048	0.037	0.249***	−0.134**	−0.659***	—

Note: *p < 0.05, **p < 0.01, ***p < 0.001.

4.2. Regression

During the course of analysis, several variables were removed. LANDLOCK was removed to full covariance. A collinearity test (the Belsley-Kuh-Welsch statistic) was used to evaluate collinearity for the variables, with variables that indicated a high collinearity (BKW ≥ 30) being removed in order to reduce the overall collinearity in the model (Baltagi, 2021). Specifically, variables LNGDPPC, FLOAT, and PS were eliminated due to high collinearity. Therefore, there was a relatively small group of remaining variables.

A summary of the regression analysis is in Table 5. The model was moderately predictive (R-squared = 0.569), indicating that 56.9% of variance in IFDI was predicted by the dummy variables. As shown, REER_VOL did have a significant negative effect on IFDI (Beta = −1.313, p< .001). Significant negative effects were also seen for UNE (Beta = −1.247, p = 0.011) and FDIR (t = −21.484, p = 0.002). These effects are consistent with the theoretical effects expected. However, KA_OPEN did not have a significant effect (Beta = 1.240, p = 0.769). Additionally, and central in importance to this research, REER_VOL * JPN did not have a significant effect on IFDI (Beta = 1.773, p = 0.123). This indicates that Japan is not substantively different in the relationship between REER_VOL and IFDI compared to other countries/regions in the East Asia and Pacific region.

Table 5. Summary of regression.

	Coefficient	SE	t-ratio	p-value
const	13.474	3.434	3.93***	<0.001
REER_VOL	−1.313	0.328	−4.00***	<0.001
GDPG	0.329	0.127	2.59*	0.011
UNE	−1.247	0.572	−2.18*	0.032
FDIR	−21.484	6.73	−3.19**	0.002
KA_OPEN	1.240	4.210	0.29	0.769
REER_VOL * JPN	1.773	1.141	1.55	0.123
Mean dependent var	3.295		LSDV F(18, 100)	7.339
Sum squared resid	1714.685		P(F)	<0.001
LSDV R-squared	0.569		Durbin-Watson	1.585

Note: Dependent variable: IFDI; *p < 0.05, **p < 0.01, ***p < 0.001; IFDI = inward FDI flows (% of GDP); REERVOL = REER VOLATILITY; GDPG = GDP growth (%); UNE = Unemployment (% of labour force); FDIR = FDI restrictiveness index; KA_Open = Normalized index of economic openness; REER_VOL * JPN = Interaction term.

In summary, REER volatility does have a significant negative effect on inward FDI flows. Therefore, Hypothesis 1 can be accepted with the acknowledgement that REER volatility may influence inward FDI flows. With respect to Hypothesis 2, while there was evidence that inward FDI in Japan was significantly lower than in other countries, and REER volatility was significantly higher, per the t-tests.

However, the inclusion of an interaction variable representing REER volatility in Japan specifically did not result in a significant effect. Overall, this did not support Hypothesis 2. Therefore, it must be stated that while the characteristics of both FDI flows and REER volatility are different in Japan compared to other countries/regions, the underlying causal relationship between them is similar.

5. Discussion

The research findings of this study are generally consistent with theoretical linkages between exchange rate volatility and inward FDI flows. For example, it was shown that a higher REER volatility was negatively associated with inward FDI flows, as explained by Goldberg (2009) through the lens of currency depreciation and investor risk. This finding is also consistent with prior research, which has shown a generally negative (though not always significant) effect of exchange rate volatility on inward FDI flows (Moraghen et al., 2019). Therefore, it can be stated that while the effect of REER volatility was not significant in all models, this is common in research on the topic and the findings are consistent with what was identified.

The findings in relation to whether Japan had a significantly different relationship between REER volatility and inward FDI flows are more complicated. The t-tests indicated that the means of Japan and other countries were significantly different for almost all variables, indicating that Japan was very different from other countries in terms of macroeconomics. This included a higher level of exchange rate volatility than the average of other countries. Earlier studies have indicated that inbound FDI may be atypical in Japan compared to other countries, for example, not significantly affecting GDP growth (Asheghian, 2009) and being less expensive to exchange rate volatility (Chowdhury & Wheeler, 2008). Here, it was shown that Japan had significantly lower inward FDI flows as measured by GDP, but the reason for this difference did not seem to lie in interaction with REER volatility, as there was no significant interaction observed. Therefore, the reason for Japan having significantly lower inward FDI flows than other countries in the region does not seem to lie in its higher exchange rate volatility. There are other possibilities, such as economic policies (Hoshi & Kiyota, 2019), which could provide a stronger explanation.

6. Conclusion

This research investigated the relationship between exchange rate volatility and inward FDI flows, comparing Japan to other countries in the East Asia and Pacific region. The research was based on observation that there has been little focus on inward FDI in Japan, with most studies investigating Japan's outward FDI flows instead. This research sought to address that research gap by comparing inward FDI flows in 21 countries and regions in the East Asia and Pacific region (1993-2022). The analysis indicated that exchange rate volatility, measured through the real effective exchange rate, does have a negative effect on inward FDI flows, although

whether this effect is significant depends on the macroeconomic factors under consideration. Thus, in line with much other empirical research into the relationship between exchange rates and inward FDI flows, it can be concluded that this relationship is inconclusive and may be heavily confounded by different macroeconomic and situational variables. The second question of the research addressed whether Japan's comparatively low levels of inward FDI could be explained through an increased response to exchange rate volatility. The findings showed that Japan had a significantly higher level of exchange rate volatility compared to other countries in the sample, and it had a significantly lower level of inward FDI flows. However, there was no evidence of this stronger effect.

The implication of this research is that while exchange rate volatility may be higher in Japan than elsewhere, it is not necessarily an underlying cause of lower-than-expected inward FDI flows compared to other countries in the region. Instead, answers for Japan's relatively low levels of inward FDI must be sought elsewhere. Some possibilities include economic policies that have failed to encourage FDI (Hoshi & Kiyota, 2019) or factors such as saturated consumer markets, which may discourage expansionary FDI (Moon, 2016). As the research did not find any clear relationships, policy action would not be warranted based on these findings.

Additional research into the causal factors associated with inward FDI would be warranted, as Japan may be a unique market that could offer opportunities to better understand what drives FDI. There are also opportunities for future research based on the limitations of this study. Although there are many different factors that could influence FDI, the research could include only a relatively small number of these factors due to limitations on data availability. There are also opportunities to compare Japan from regional perspective, which may yield better insights.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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