

Exchange Rate Volatility and FDI Response during the Financial Crisis: Empirical Evidence from Vietnam

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Abstract

This study is to examine the foreign direct investment (FDI) response to real effective exchange rate volatility in Vietnam by using the vector autoregression model. The research data are quarterly frequency data in the period from 2004:Q1 to 2019:Q2. The data on real effective exchange rate were collected from the statistics of Bruegel (Europe) and FDI data were collected from the International Financial Statistics. The quantitative study was conducted with two steps: (1) measuring exchange rate volatility by the GARCH(1,1) method; and (2) examining the impact of exchange rate volatility on FDI in the context of the global financial crisis. The estimation results show that FDI responded significantly to real exchange rate volatility with the lag of 3 periods at the 5% significance level. The FDI response increased after the exchange rate volatility with the lag of 3 periods, and the impact extended to the lag of 6 periods, and then gradually stabilized. The research findings indicate that FDI in Vietnam responds positively and significantly to exchange rate volatility with the lag of 3 periods. Simultaneously, the negative impact of the global financial crisis in 2008 with the lag of 2 periods leads to a slight decrease in FDI inflows into Vietnam.

Keywords: Foreign Direct Investment, Real Effective Exchange Rate, Volatility, VAR, Vietnam

JEL Classification Code: F21, F31, G01, G15, P45

1. Introduction

Foreign direct investment (FDI) plays an important role and is a fundamental component for a country's economic growth (Borensztein, De Gregorio, & Lee, 1998; Alfaro, Chanda, Kalemli-Ozcan, & Sayek, 2004; Azman-Saini, Law, & Ahmad, 2010; Bibi, 2014). Its motivations to each country will be different from creating, increasing and improving employment to technology and know-how transfers, or even

looking just for the right financial resources. FDI is seen as the attractive capital flow for most of emerging economies to meet the demands of advanced technology and increase production capacity (Barrell & Pain, 1996).

Vietnam has been quite successful in attracting FDI inflows. It has contributed significantly to the economic development of the country. Therefore, Vietnam attaches great importance to this source of capital and implement many reforms to attract foreign investors. In 2005, Vietnam enacted the Law on Investment, which ended the distinction between domestic and foreign enterprises, an important turning point in the process of integration and attracting foreign investment. Although the Vietnamese political and economic environment has undergone many reforms and is increasingly attractive to foreign investors, there are still other factors that influence the decision of foreign investors in Vietnam. Foreign investors are always interested in the profit earned by the project as well as the investment cost. Among them, the sunk costs arising from exchange rate fluctuations is an important factor that investors consider when deciding to invest into a country.

According to Mensah, Bokpin, and Dei Fosu-Hene (2017), FDI inflows into developing economies are related

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to investors' expectations about exchange rates. Exchange rates can affect FDI in two aspects: the total amount of FDI that takes place and the allocation of the investment capital among countries. During the past decades, many studies have found that FDI is influenced by exchange rate volatility (Cushman, 1985; Cushman, 1988; Froot & Stein, 1991; Klein & Rosengren, 1994). The impact of exchange rate volatility on FDI has been clearly noted from the angle of risks. For example, the studies undertaken by Cushman (1985, 1988) show that exchange rate volatility leads to a decline in FDI inflows because foreign investors are concerned about risks. Urata and Kawai (2000) also stated that exchange rate volatility tends to discourage FDI inflows due to the increasing uncertainty associated with the economic environment of the FDI recipient countries.

In Vietnam, the studies on the impact of exchange rates on FDI are still limited and mainly focus on the impact of the exchange rate level on FDI inflows into Vietnam. For instance, Pham and Nguyen (2013) indicated that the real exchange rate has an impact on FDI inflows into Vietnam. Meanwhile, the studies on the impact of exchange rate volatility on FDI are restricted. The question is how FDI in Vietnam responds to real effective exchange rate volatility. Has the FDI response in Vietnam to real effective exchange rate volatility changed during the financial crisis? This study has two objectives: (1) measuring real effective exchange rate volatility in Vietnam; (2) examining the FDI response in Vietnam to real exchange rate volatility in the period before and after the global financial crisis. The study will provide a foundation for regulatory agencies in reviewing and adjusting macroeconomic policies to boost FDI attraction.

2. Literature Review

Cassel's (1922) purchasing power parity (PPP) theory argued that, if markets have no trade barriers and exchange rate movements simply reflect the price difference between countries, then the actual purchasing power parity will maintain and the exchange rate will have little effect on the investment decisions of foreign investors. However, according to Taylor and Taylor (2004), there is ample evidence to show that, in reality, purchasing power parity often decreases. Therefore, exchange rate volatility can be a determinant of foreign investment. The theory of Froot and Stein (1991), then extended by Klein, Peek, and Rosengren (2002), emphasized the role of exchange rates and the debates about asset effects on FDI investment decisions. Their studies noted that the reaction of international capital flows stemming from exchange rate volatility.

Goldberg and Kolstad (1995) hypothesized that exchange rate volatility would increase FDI if such volatility correlated with the shock of export demand in the markets where they intend to sell the goods. Ménil (1999)

found that when the real exchange rate becomes volatile, trade costs will increase and this will lead economic entities to make decisions on more FDI investment to replace trade. In contrast, Kiyota and Urata (2004) stated that the high volatility of currency exchange rates in the FDI recipient country would discourage the investment decisions of foreign companies due to the increasing uncertainty about the economic and business prospects in the future. In addition, a number of other views suggested that FDI in developing countries responds more strongly to exchange rate volatility (Urata & Kawai, 2000; Tomlin, 2000; Lee & Wang, 2018; Qamruzzaman, Karim, & Wei, 2019; Ta, Le, Nguyen, Phan, & Do, 2020).

2.1. The Positive Impact of Exchange Rate Volatility on FDI into Countries

Gottschalk and Hall (2008) studied the effect of exchange rate volatility on the FDI location decisions of the US and Japan in ASEAN-4 countries (Indonesia, Malaysia, Philippines and Thailand). As a result, exchange rate volatility in ASEAN-4 countries tends to have a positive impact on Japanese FDI into ASEAN-4. Moreover, because Japanese investors invest heavily in ASEAN-4, the Japanese FDI in ASEAN-4 countries is more sensitive to exchange rate volatility than the US FDI.

Dhakai, Nag, Pradhan, and Upadhyaya (2010) suggested that multinational corporations are motivated to seek resources in Asian countries in order to take advantage of global production development opportunities, as well as participate in the export markets of these countries. Dhakai et al. (2010) built a research model on the factors affecting FDI in some Asian countries (China, Indonesia, Malaysia, Philippines, South Korea and Thailand), which was conducted with the data in the period from 1974 to 2005. The research results of Dhakai et al. (2010) show that exchange rate volatility has a positive effect on FDI in all the sample countries.

Takagi and Shi (2011) estimated the impact of exchange rate volatility on FDI by using the data on the Japanese FDI inflow into nine Asian countries. Consistent with the arguments of Itagaki (1981) and Cushman (1985) that exchange rate volatility promotes FDI as an alternative to export, the research results show that FDI responds positively when exchange rates are volatile.

2.2. The Negative Impact of Exchange Rate Volatility on FDI into Countries

Vita and Abbott (2007) examined the impact of exchange rate volatility on the UK FDI inflows from seven major countries (the United States, France, Germany, the Netherlands, Switzerland, Australia and Japan) in the period 1975–2001. The study measures exchange rate volatility

by using the GARCH(1,1) method and then uses fixed effects and the GMM method with the manufacturing data disaggregated by the high and low R&D content of the sector of investment. The research results show that exchange rate volatility has a negative impact on FDI flows into the UK, irrespective of the sector of investment.

Ruiz and Pozo (2008) found that exchange rate volatility is one of the reasons for the decline in FDI inflows from the United States to Latin American countries (Argentina, Brazil, Chile, Colombia, Mexico, Peru and Venezuela) during the period from 1994 to 2005. Similarly, the study by Udomkerdmongkol, Morrissey, and Görg (2009) also showed that exchange rate volatility reduces the US FDI in 16 emerging countries (1990s).

Ahmed (2018) studied the long-term and short-term effects of exchange rate volatility on FDI in Nigeria by using the time series data in the period of 1990–2016. The results show that exchange rate volatility significantly reduces the FDI capital into Nigeria in the short and long term. In particular, in the short term, exchange rate volatility is a major determinant of FDI into Nigeria. During the periods of small exchange rate volatility, FDI increases, and conversely, during the periods of high exchange rate volatility, FDI decreases in the short term. In the long term, a stable exchange rate will be beneficial for attracting FDI into Nigeria.

2.3. No Statistically Significant Impact of Exchange Rate Volatility on FDI has been Found

In addition to the studies showing that exchange rate volatility has an impact on FDI, there are also studies that have not found a statistically significant impact of exchange rate volatility on FDI. Görg and Wakelin (2002) examined the FDI response (inward and outward) of the United States and 12 developed countries in the period from 1983 to 1995. The study found that no evidence for the impact of exchange rate volatility on the inward and outward FDI in the United States despite the implementation of many different estimation procedures.

Pradhan, Schuster, and Upadhyaya (2004) examined the effect of exchange rate volatility on aggregate private investment in Indonesia, Malaysia, the Philippines and Thailand through the VECM model using the time series data from 1972 to 2000. The study has not found a statistically significant relationship between real exchange rate volatility and aggregate private investment.

Polat and Payashoğlu (2016) used the monthly data in the period of 2004–2014 with the Markov switching model to examine the impact of real exchange rate (RER) volatility on FDI inflows into Turkey along with control factors. The research results have not found a statistically significant impact of exchange rate volatility on FDI capital.

2.4. Empirical Evidence for Exchange Rate Volatility and FDI Response during the Financial Crisis

After regional and global financial crises, many studies have been conducted to examine FDI response to exchange rate volatility. The study by Ahmed and Zlate (2014) shows that the trend of FDI inflows to emerging countries is significantly different during the crisis and after the global financial crisis in 2008. Similarly, Garg and Dua's (2014) study found a sharp decline in FDI flows during the global financial crisis in 2008 and a strong revival in the post-crisis period. According to Lee (2015), regional and global financial crises create many types of economic instability, including exchange rate uncertainty, and thus, they are likely to alter FDI inflows. Lee's (2015) study found the evidence for the impact of the global financial crisis of 2008–2009 on FDI inflows in Korea.

Overall, exchange rate volatility and the FDI response to exchange rate volatility have been of great interest to many researchers. These studies have provided interesting and important empirical evidence for the impact of exchange rate volatility on FDI flows. Most researchers have admitted that FDI is influenced by exchange rate volatility. However, these effects have different directions depending on the investor's investment orientation, the characteristics of the company and the background of the FDI recipient country. Lin, Chen, and Rau (2010) shows that the impact of exchange rate fluctuations on FDI investment of Taiwan firms in China is not heterogeneous depending mainly on the orientation of investors. For companies seeking markets, exchange rate fluctuations have a negative impact on FDI investment. Conversely, for export-oriented companies and risk-averse companies, exchange rate fluctuations will spur FDI.

In Vietnam, the quantitative studies on the relationship between exchange rates and FDI are quite limited. Moreover, the studies on the relationship between exchange rates and FDI in Vietnam often used real exchange rate (Pham & Nguyen, 2013). Based on previous studies, the authors conducted this study to fill this gap with two important new points: (1) the study applied the GARCH(1,1) method to measure real effective exchange rate volatility on the data on Vietnam's real effective exchange rate with 143 trading partners; (2) the study used the VAR model to measure the FDI response in Vietnam to real effective exchange rate volatility in the context of the global financial crisis.

3. Research Methodology and Data

The quantitative study was conducted with two steps: (1) measuring exchange rate volatility by the GARCH(1,1)

method using the data on the real effective exchange rate of Vietnam with 143 trading partners; and (2) examining the impact of exchange rate volatility on the FDI in the context of the global financial crisis.

The research data are quarterly frequency data in the period from the first quarter of 2004 (2004:Q1) to the second quarter of 2019 (2019:Q2). The data on real effective exchange rate (REER) with 143 trading partners were collected from the statistics of Bruegel (Europe). These data will be used to measure exchange rate volatility. The FDI data were collected from the International Financial Statistics. These data will be used to examining the impact of exchange rate volatility on FDI.

3.1. Measuring Exchange Rate Volatility

According to Crowley and Lee (2003), Vita and Abbott (2007), the authors calculated the index of real effective exchange rate volatility (V_reer) based on the quarterly real effective exchange rate data (REER) by using the following GARCH(1,1) model:

$$V_reer_t = \beta_1 + u_t \quad (1.1)$$

$$u_t \approx N(0, h_t) \quad (1.2)$$

$$h_t = \gamma_0 + \sum_{j=1}^p \gamma_j u_{t-j}^2 + \sum_{i=1}^q \delta_i h_{t-i} \quad (1.3)$$

Where, V_reer_t is real effective exchange rate volatility; u_t is random error; h_t is variance of real effective exchange rate.

3.2. Examining the Impact of Exchange Rate Volatility on FDI

Based on previous studies such as Kodongo and Ojah (2013) and Boateng, Hua, Nisar, and Wu (2015), the authors used a research model to examine the impact of exchange rate volatility on FDI with the following form:

$$FDI_t = \alpha_0 + \sum_{j=1}^n \alpha_{1j} FDI_{t-j} + \sum_{j=1}^n \alpha_{2j} V_reer_{t-j} + \text{dummy} + \varepsilon_t \quad (2)$$

Where, dependent variable FDI is FDI data in Vietnam; independent variable V_reer is real effective exchange rate volatility which was calculated in item 3.1 (Measuring Exchange Rate Volatility); dummy variable is the global financial crisis which receives a value of 1 during the global financial crisis from 2008:Q3 to 2009:Q1 (Fratzscher, 2012; Ahmed & Zlate, 2014), and receives a value of 0 beyond the crisis.

Steps to examine the impact of exchange rate volatility on FDI:

Step 1: Test the stationarity of the data series. If the data series is stationary in the original data series, use the VAR (vector autoregression) model to examine the impact of exchange rate volatility on FDI. If the data series is not stationary in the original series, test the stationarity of the first-order differential data series. If all variables are stationary in the first-order differential data series, go to Step 2.

Step 2: Determine the optimal lag of the model.

Step 3: Test the cointegration among the data series by the Johansen method.

Step 4: Develop a regression model of the impact of exchange rate volatility on FDI with 2 cases: (1) the case of no cointegration: Using the VAR model for estimation; (2) the case of cointegration: Using the VECM model for estimation.

Step 5: Test the autocorrelation and the stability of the model.

Step 6: Analyze the impulse response function (IRF) of exchange rate volatility to FDI.

4. Research Results

4.1. The Measurement Results of Real Effective Exchange Rate Volatility

The exchange rate volatility was measured by employing the GARCH(1,1) model. The results are shown in Figure 1.

The results show that the real effective exchange rate volatility was relatively stable at most of the observation times with an average volatility level of 0.059%. In particular, the real effective exchange rate was the most volatile in 2009:Q1 (0.185%) and the least volatile (0.034%) in 2008:Q1. Especially, the real effective exchange rate volatility was greatly different between the observation times in the period from 2008:Q3 to 2009:Q2, the period when the global financial crisis occurred.

4.2. Stationarity Test

The study used Dickey-Fuller test (Dickey & Fuller, 1979) to test the stationarity of the data series. With the hypothesis H_0 : the data series is not stationary.

The stationarity test results showed that the “ V_reer ” variable was stationary in the original data series at the 1% significance level while the “FDI” variable was not stationary in the original data series. Therefore, the study conducted the first-order differential calculation for both variables, and then tested the stationarity of two first-order differential series. The stationarity test results showed that both series were stationary in the first-order differential;



Figure 1: Exchange Rate Volatility in Vietnam in the Period of 2004–2019

Table 1: The Result of Unit Root Tests

Variable	Original data series		First-order differential data series	
	Test statistic	Prob.	Test statistic	Prob.
FDI	-2.29	0.18	-12.55	0.00***
V_reer	-3.65	0.00***	-9.60	0.00***

Note: *** indicates significance at the 1% level.

thus, the authors decided to use the first-order differential data series to conduct the study.

4.3. Determining the Optimal Lag

Based on the results of testing the optimal lag, the criteria LR, FPE, AIC, HQIC showed that the model has an optimal lag of 3. Accordingly, the study identified the use of the estimation model with the lag of 3.

4.4. Cointegration Test

The results of the cointegration test showed that there was no cointegration in the long term in the data series; therefore, the authors used the VAR model in the study (Engle and Granger, 1987).

4.5. VAR Coefficient

The test results showed that the VAR model with the lag of 3 was stable and suitable. The results of the VAR model test with the optimal lag of 3 are below:

The estimation results of the VAR model showed that FDI responded significantly to real exchange rate volatility with the lag of 3 periods at the 5% significance level. Specifically, the FDI response increased after the exchange rate volatility

with the lag of 3 periods, and the impact extended to the lag of 6 periods, and then gradually stabilized (Figure 2).

The research results show that FDI responds in the same direction to exchange rate volatility (with the lag of 3 periods). These results are supported by previous studies such as Goldberg and Kolstad (1995), Ménéil (1999), Gottschalk and Hall (2008), Dhakal et al. (2010), Takagi and Shi (2011). The empirical results in Vietnam are consistent with the views of Takagi and Shi (2011) that exchange rate volatility will promote FDI to replace export. In reality, the FDI sector has important contributions to Vietnam’s export, positively affecting the expansion of export markets to European countries and especially some key markets such as Germany, France, England, the Netherlands, and Italy. The export from the FDI sector accounted for a large proportion of Vietnam’s total merchandise export turnover, averaging over 66% in the period of 2011–2016.

Regarding the FDI response to the financial crisis, the results of the VAR model showed that the global financial crisis in 2008 (with the lag of 2 periods) had a negative impact, causing a decrease in FDI inflows. During the crisis, the economy was volatile, creating the psychology of risks and uncertainty, making foreign investors reduce the amount of investment capital. The research results are consistent with previous studies such as Ahmed and Zlate (2014) and Lee (2015).

Table 2: Determining the Optimal Lag

Selection-order criteria Sample: 5 – 70					Number of obs = 66			
Lag	LL	LR	Df	P	FPE	AIC	HQIC	SBIC
0	-47.89				0.02	1.75	1.78	1.82
1	-38.82	88.16	4	0.00	0.02	1.57	1.66	1.79*
2	-35.98	5.67	4	0.23	0.02	1.61	1.75	1.97
3	-25.32	21.33*	4	0.00	0.01*	1.38*	1.57*	1.88
4	-22.98	4.67	4	0.32	0.01	1.44	1.69	1.08

Table 3: Johansen Test for Cointegration

Trend: constant Sample: 4–62			Number of obs = 59 Lags = 2		
maximum rank	Parms	LL	Eigenvalue	Trace Statistic	5% critical value
0	6	-73.14		74.25	15.41
1	9	-48.82	0.56	25.61	3.76
2	10	-36.01	0.35		

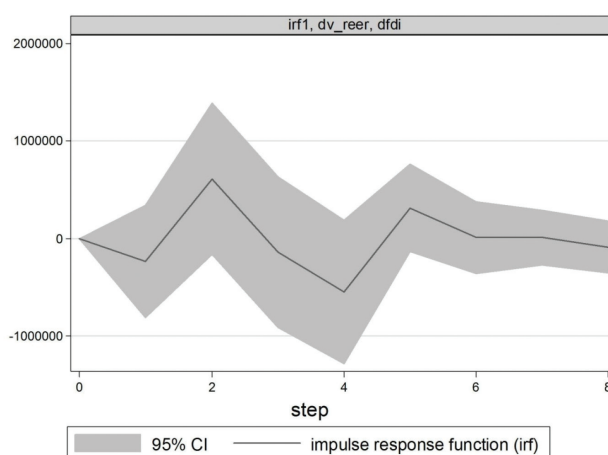
Table 4: The Model Results of Examining the Impact of Exchange Rate Volatility on FDI

Variable	Δ FDI	
	Regression coefficient	Significance level
Constant	252.92	0.00***
$\Delta V_{reer}(-1)$	-233693.80	0.42
$\Delta V_{reer}(-2)$	281218.00	0.45
$\Delta V_{reer}(-3)$	811205.30	0.03**
dummy(-1)	93.67	0.83
dummy(-2)	-1032.91	0.07*
dummy(-3)	-74.08	0.85

Note: *, ** and *** indicate significance at the 10%, 5% and 1% levels, respectively.

5. Conclusion and Policy Implications

The study used the vector autoregression (VAR) model to examine the FDI response to exchange rate volatility in Vietnam in the period 2004–2019. The exchange rate volatility was measured by employing the GARCH(1,1) model using the data on the real effective exchange rate of Vietnam with 143 trading partners. The results of testing the VAR model showed that FDI responded positively

**Figure 2:** Impulse Response Function of Exchange Rate Volatility on FDI

and significantly to exchange rate volatility in Vietnam. Specifically, FDI into Vietnam increased when there was exchange rate volatility with the lag of 3 periods.

The study also found that the global financial crisis decreased FDI inflows into Vietnam. The research results are empirical evidence for the FDI response to exchange rate volatility in Vietnam during the stable period and the crisis, providing more foundations for managers in managing FDI capital and regulating the exchange rate to limit uncertainty in the economy.

In reality, a stable and less volatile economy creates a sense of security and attracts many foreign investors. Although FDI in Vietnam has responded positively to exchange rate volatility during the past time, this is because FDI inflows into Vietnam are mainly export-oriented. Therefore, in the future, policy makers should focus on the solutions to attract more FDI capital for other orientations such as supplying goods for the domestic market to replace imported goods and encouraging FDI in the high-tech sector. Accordingly, a stable economy with decreased exchange rate volatility will help Vietnam attract more FDI capital in many different sectors. The paper provides the useful information to the policy makers and researchers for studying and designing macroeconomic policies.

References

- Ahmed, A. (2018). Modelling the Effect of Stock Market Volatility and Exchange Rate Volatility on Foreign Direct Investment in Nigeria: A New Framework Approach. *Asian Economic and Financial Review*, 8(12), 1482–1505. <https://doi.org/10.18488/journal.aefr.2018.812.1482.1505>
- Ahmed, S., & Zlate, A. (2014). Capital flows to emerging market economies: A brave new world? *Journal of International Money and Finance*, 48, 221–248. <https://doi.org/10.1016/j.jimonfin.2014.05.015>
- Alfaro, L., Chanda, A., Kalemli-Ozcan, S., & Sayek, S. (2003). Foreign direct investment and economic growth: the role of local financial markets. *Journal of International Economics*, 10, 38–42.
- Azman-Saini, W. N. W., & Law, S. H. (2010). FDI and economic growth: New evidence on the role of financial markets. *Economics Letters*, 107(2), 211–213. <https://doi.org/10.1016/j.econlet.2010.01.027>
- Barrell, R., & Pain, N. (1996). An econometric analysis of US foreign direct investment. *The Review Of Economics and Statistics*, 78 (2), 200–207.
- Boateng, A., Hua, X., Nisar, S., & Wu, J. (2015). Examining the determinants of inward FDI: Evidence from Norway. *Economic Modelling*, 47, 118–127. <https://doi.org/10.1016/j.econmod.2015.02.018>
- Borensztein, E., De Gregorio, J., & Lee, J. W. (1998). How does foreign direct investment affect economic growth?. *Journal of International Economics*, 45(1), 115–135. [https://doi.org/10.1016/S0022-1996\(97\)00033-0](https://doi.org/10.1016/S0022-1996(97)00033-0)
- Bibi, S., Ahmad, S. T., & Rashid, H. (2014). Impact of trade openness, FDI, exchange rate and inflation on economic growth: A case study of Pakistan. *International Journal of Accounting and Financial Reporting*, 4(2), 236. <http://dx.doi.org/10.5296/ijaf.v4i2.6482>
- Cassel, G. (1922). *Money and foreign exchange after 1914*. New York, NY: Macmillan.
- Crowley, P., & Lee, J. (2003). Exchange rate volatility and foreign investment: international evidence. *The International Trade Journal*, 17(3), 227–252. <https://doi.org/10.1080/08853900390222171>
- Cushman, D. O. (1985). Real exchange rate risk, expectations, and the level of direct investment. *The Review of Economics and Statistics*, 67(2), 297–308. <https://doi.org/10.2307/1924729>
- Cushman, D. O. (1988). Exchange-rate uncertainty and foreign direct investment in the United States. *Weltwirtschaftliches Archiv*, 124(2), 322–336. <https://doi.org/10.1007/BF02706782>
- Dhakal, D., Nag, R., Pradhan, G., & Upadhyaya, K. P. (2010). Exchange rate volatility and foreign direct investment: Evidence from East Asian countries. *The International Business & Economics Research Journal*, 9(7), 121. <https://doi.org/10.19030/iber.v9i7.603>
- Dickey, D. A., & Fuller, W. A. (1979). Distribution of the estimators for autoregressive time series with a unit root. *Journal of the American Statistical Association*, 74(366a), 427–431. <https://doi.org/10.1080/01621459.1979.10482531>
- Engle, R. F., & Granger, C. W. (1987). Co-integration and error correction: representation, estimation, and testing. *Econometrica: Journal of the Econometric Society*, 55(2), 251–276. <https://doi.org/10.2307/1913236>
- Froot, K. A., & Stein, J. C. (1991). Exchange rates and foreign direct investment: an imperfect capital markets approach. *The Quarterly Journal of Economics*, 106(4), 1191–1217. <https://doi.org/10.2307/2937961>
- Garg, R., & Dua, P. (2014). Foreign portfolio investment flows to India: determinants and analysis. *World Development*, 59, 16–28. <https://doi.org/10.1016/j.worlddev.2014.01.030>
- Goldberg, L. S., & Kolstad, C. D. (1995). Foreign direct investment and demand uncertainty. *International Economic Review*, 36, 855–873. <https://doi.org/10.3386/w4815>
- Gottschalk, S., & Hall, S. (2008). Foreign direct investment and exchange rate uncertainty in South-East Asia. *International Journal of Finance & Economics*, 13(4), 349–359. <https://doi.org/10.1002/ijfe.355>
- Görg, H., & Wakelin, K. (2002). The impact of exchange rate volatility on US direct investment. *The Manchester School*, 70(3), 380–397. <https://doi.org/10.1111/1467-9957.00308>
- Itagaki, T. (1981). The theory of the multinational firm under exchange rate uncertainty. *Canadian Journal of Economics*, 14(2), 276–297. <https://doi.org/10.2307/134798>
- Kiyota, K., & Urata, S. (2004). Exchange rate, exchange rate volatility and foreign direct investment. *World Economy*, 27(10), 1501–1536. <https://doi.org/10.1111/j.1467-9701.2004.00664.x>
- Klein, M. W., & Rosengren, E. (1994). The real exchange rate and foreign direct investment in the United States: relative wealth vs. relative wage effects. *Journal of International Economics*, 36(3-4), 373–389. [https://doi.org/10.1016/0022-1996\(94\)90009-4](https://doi.org/10.1016/0022-1996(94)90009-4)
- Klein, M. W., Peek, J., & Rosengren, E. S. (2002). Troubled banks, impaired foreign direct investment: the role of relative access to credit. *American Economic Review*, 92(3), 664–682. <https://doi.org/10.1257/00028280260136309>

- Kodongo, O., & Ojah, K. (2013). Real exchange rates, trade balance and capital flows in Africa. *Journal of Economics and Business*, 66, 22–46. <https://doi.org/10.1016/j.jeconbus.2012.12.002>
- Lee, J. W. (2015). Dynamic Relationships between exchange rates and foreign direct investment: Empirical evidence from Korea. *Asian Economic Journal*, 29(1), 73–90. <https://doi.org/10.1111/asej.12048>
- Lee, J. W., & Wang, Z. (2018). Spillover effects of foreign direct investment inflows and exchange rates on the banking industry in China. *Journal of Asian Finance, Economics and Business*, 5(2), 15–24. <http://doi.org/10.13106/jafeb.2018.vol5.no2.15>
- Lin, C. C., Chen, K. M., & Rau, H. H. (2010). Exchange Rate Volatility and the Timing of Foreign Direct Investment: Market-Seeking versus Export-Substituting. *Review of Development Economics*, 14(3), 466–486. <https://doi.org/10.1111/j.1467-9361.2010.00565.x>
- Linh, N. & Lien, N. (2020). The impact of real effective exchange rate volatility on trade balance in Vietnam. *Accounting*, 6(6), 1167–1172. <https://doi.org/10.5267/j.ac.2020.7.001>
- Mensah, L., Bokpin, G. A., & Dei Fosu-Hene, E. (2017). Foreign exchange rate moments and FDI in Ghana. *Journal of Economics and Finance*, 41(1), 136–152. <https://doi.org/10.1007/s12197-015-9342-6>
- Ménil, G. D. (1999). Real capital market integration in the EU: How far has it gone? What will the effect of the euro be? *Economic Policy*, 14(28), 166–201. <https://doi.org/10.1111/1468-0327.00047>
- Pham, T. H. H., & Nguyen, T. D. (2013). Foreign direct investment, exports and real exchange rate linkages in Vietnam: evidence from a co-integration approach. *Journal of Southeast Asian Economies*, 30(3), 50–262.
- Polat, B., & Payaslıoğlu, C. (2016). Exchange rate uncertainty and FDI inflows: the case of Turkey. *Asia-Pacific Journal of Accounting & Economics*, 23(1), 112–129. <https://doi.org/10.1080/16081625.2015.1032312>
- Pradhan, G., Schuster, Z., & Upadhyaya, K. P. (2004). Exchange rate uncertainty and the level of investment in selected Southeast Asian countries. *Applied Economics*, 36(19), 2161–2165. <https://doi.org/10.1080/0003684042000282498>
- Qamruzzaman, M., Karim, S., & Wei, J. (2019). Does Asymmetric Relation Exist between Exchange Rate and Foreign Direct Investment in Bangladesh? Evidence from Nonlinear ARDL Analysis. *Journal of Asian Finance, Economics and Business*, 6(4), 115–128. <https://doi.org/10.13106/jafeb.2019.vol6.no4.115>
- Ruiz, I., & Pozo, S. (2008). Exchange rates and US direct investment into Latin America. *Journal of International Trade and Economic Development*, 17(3), 411–438. <https://doi.org/10.1080/09638190802137083>
- Ta, V. L., Le, Q. H., Nguyen, T. L. H., Phan, T. T., & Do, A. D. (2020). Investigating Foreign Direct Investment Attractive Factors of Korean Direct Investment into Vietnam. *Journal of Asian Finance, Economics and Business*, 7(6), 117–125. <https://doi.org/10.13106/jafeb.2020.vol7.no6.117>
- Takagi, S., & Shi, Z. (2011). Exchange rate movements and foreign direct investment (FDI): Japanese investment in Asia, 1987–2008. *Japan and the World Economy*, 23(4), 265–272. <https://doi.org/10.1016/j.japwor.2011.08.001>
- Taylor, A. M., & Taylor, M. P. (2004). The purchasing power parity debate. *Journal of Economic Perspectives*, 18(4), 135–158. <https://doi.org/10.1257/0895330042632744>
- Tomlin, K. M. (2000). The effects of model specification on foreign direct investment models: an application of count data models. *Southern Economic Journal*, 67(2), 460–468. <https://doi.org/10.2307/1061481>
- Udomkermongkol, M., Morrissey, O., & Görg, H. (2009). Exchange rates and outward foreign direct investment: US FDI in emerging economies. *Review of Development Economics*, 13(4), 754–764. <https://doi.org/10.1111/j.1467-9361.2009.00514.x>
- Urata, S., & Kawai, H. (2000). The determinants of the location of foreign direct investment by Japanese small and medium-sized enterprises. *Small Business Economics*, 15(2), 79–103. <https://doi.org/10.1023/A:1008173912813>
- Vita, G. D., & Abbott, A. (2007). Do exchange rates have any impact upon UK inward foreign direct investment? *Applied Economics*, 39(20), 2553–2564. <https://doi.org/10.1080/00036840600749748>