



The effects of exchange rate level and volatility on FDI inflows: A theoretical and empirical literature review

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Abstract

This paper reviews the theoretical and empirical literature on the effects of exchange rate level and volatility on FDI inflows. There are two hypotheses that explain the relationship between exchange rate level and FDI: the wealth position hypothesis and the relative labor cost hypothesis. There is another argument known as the expectation of future profitability argument. Moreover, changes in exchange rate level can have an impact on various types of FDI. The existing theoretical literature about exchange rate volatility-FDI nexus is divided into two strands: the production flexibility arguments and the risk aversion arguments. Both approaches provide contradictory results. Previous empirical studies' findings varied in the long and short term. Some studies found a positive effect, others found a negative effect, and still others found no effect of exchange rate level and volatility on FDI inflows. The research's findings make it clear that there is controversy in the theoretical and empirical literature.

Keywords: Exchange Rate, Exchange Rate Level, Exchange Rate Volatility, Foreign Direct Investment.

JEL Codes: B27, G15, F21.

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1. INTRODUCTION

Due to a combination of factors, including economic integration, the opening up of the financial markets, and technological innovation, there has been an increase in the movement of international capital in recent years (Omorokunwa & Ikponmwosa, 2014). If a nation's saving level is lower than its investment level, it must find a way to fill the saving gap. When there is a liquidity crisis in developing economies, short-term capital inflows, which are often made by portfolio investors, can be damaging to the financial stability. In this context, foreign direct investment (FDI) is a more reliable and preferred option for funding the domestic saving deficit. Thus, for developing economies, attracting FDI becomes a key objective (Cambazoğlu & Güneş, 2016).

One of the key components of financial stability that boosts economic growth and social progress is foreign direct investment (Azzouzi & Bousselhami, 2019). The FDI inflows have the potential to have a wide range of effects in the host countries. FDI inflows have an impact on the country's economic development and help to address issues including the transfer of advanced technologies and integration with international markets. Firms can produce their high-quality goods and services at lower costs thanks to investment's superior technology. This increased competitiveness in the firm's development, and FDI is essential for boosting the capital and production components in the host country (Sagarik, 2015). In addition to these benefits, FDI boosts the host country's balance of payments and generates new job opportunities (Cambazoğlu & Güneş, 2016).

It is crucial to identify the factors that would encourage FDI given the significant contributions that FDI makes to both home and host countries (Kiyota & Urata, 2004). The exchange rate is one of these factors. The exchange rate is a key element of international macroeconomics; its effects on recent currency crises in numerous economies have drawn the attention of policymakers all over the world. In this period of globalization and trade liberalization, the exchange rate has

demonstrated its behavior in influencing the economic position of the country (Shafi, Hua, Idrees, & Nazeer, 2015).

When formulating FDI and exchange rate policies, it is critical to look into the relationship between the two variables (Xing, 2006). If we consider FDI to be a transfer of capital, it can be interpreted as a comparison of expected returns on various investment options. Thus, both the level and volatility of exchange rates can affect the amount of FDI inflows (Chowdhury & Wheeler, 2008). Changes in exchange rates and their volatility appear to be significant factors that investors evaluate when deciding whether to make an international investment (Osinubi & Amaghionyeodiwe, 2009).

Following the collapse of Bretton Woods in 1971, the investigation of the link between the exchange rate, as well as its volatility, and macroeconomic variables such as foreign direct investment, gained major importance in recent decades. After the collapse of this system, the majority of the countries used a flexible/floating exchange rate system and experienced extreme fluctuations in the value of their currency prices. There have been numerous studies in this field, and the majority of them have shown a link between the exchange rate and foreign direct investment (Chaudhary, Zulfiqar, Shah, Majid, & Bagram, 2012).

The first study of the association between financial factors and FDI was done by Aliber in 1970. His hypothesis, referred to as "the Aliber hypothesis" in the literature, proposed that the existence of various kinds of cash flows is what causes the presence of FDI (Polat & Payaslıoğlu, 2016). Despite Aliber's basic arguments, this explanation was not widely accepted until the late 1980s and early 1990s, which was also the period in which the exchange rate issue was seriously raised as one of the factors affecting foreign direct investment (Sharifi-Renani & Mirfatah, 2012). However, theoretical perspectives on how exchange rate volatility affects FDI inflows differed.

Considering the significant importance of the link between exchange rates and foreign direct investment, the purpose of this paper is to review the theoretical and

empirical literature on how exchange rate level and its volatility affect FDI inflows. In this context, this research paper addresses the following questions regarding the relationship between FDI and exchange rates:

- What impact do exchange rate level and volatility have on FDI inflows?

The remainder of this paper is organized as follows: Following this introduction, Section 2 reviews the theoretical relationship between exchange rate level and FDI inflows; Section 3 explains the arguments about the relationship between exchange rate volatility and FDI flows; the empirical literature is reviewed in Section 4; finally, Section 5 provides a conclusion.

2. Exchange rate level and FDI inflows

The relationship between financial factors and FDI was originally studied by Aliber in 1970. His hypothesis, called "the Aliber hypothesis" in the literature, asserted that the presence of various sorts of cash flows is what drives foreign direct investment (Polat & Payaslıoğlu, 2016). The main explanation for the pattern of foreign direct investment, according to Aliber (1970), is that there is a bias in the market's estimation of exchange risk and that the world is separated into distinct currency zones (Aliber, 1970).

On the basis of the relative strength of the various currencies, he offered his theory of foreign investment. In terms of the variations in the strength of the currencies in the host and source countries, he advanced his theory. He proposed that, in order to benefit from variations in market capitalization rates, weaker currencies had a greater potential to attract foreign direct investment. After testing his hypothesis, Aliber discovered that the result was accurate for FDI in the US, the UK, and Canada (Nayak & Choudhury, 2014).

This argument did not become widely accepted until the end of the 1980s and the beginning of the 1990s, which was also the period that the exchange rate subject was seriously addressed as one of the factors affecting foreign direct investment (Sharifi-Renani & Mirfatah, 2012). The conventional thinking stated that there could

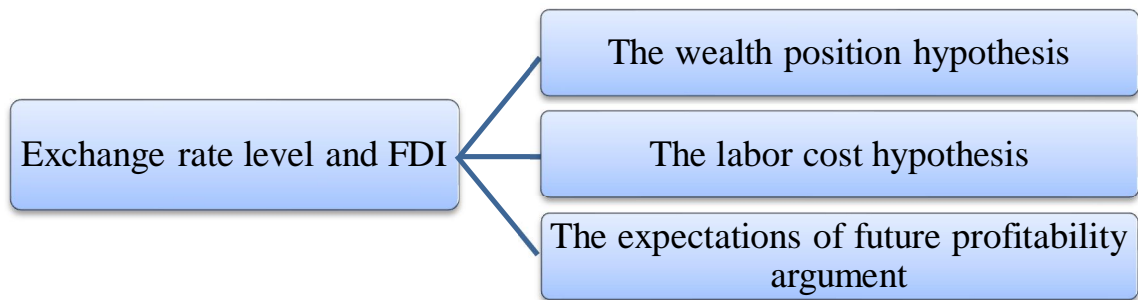
be no connection between exchange rates and foreign direct investment until the early 1990s. The primary assumption is that, assuming perfect capital mobility, risk-adjusted expected returns on all international assets will be equalized, therefore changes in the exchange rate cannot consistently benefit either foreign or domestic firms in terms of cost of capital. In other words, if a currency depreciates, the relative value of domestic against foreign firms for those assets won't change because the returns on those assets would likewise decline.

Even through its logical justification, Caves (1988) challenged the theory that FDI decisions are theoretically independent of exchange rates. He examined inward investment flows into the US from a number of countries and discovered that the strength of a country's currency in relation to the US dollar was a significant explanatory variable for that country's FDI into the US. Several hypotheses have emerged to explain the apparent contradiction between conventional theory and empirical evidence and to provide insight into how FDI and both the level and volatility of the exchange rate are related (Abbott & De Vita, 2008). Exchange rates can affect both the overall volume of foreign direct investment and how these investments are distributed among various countries (Okwuchukwu, 2015). The mechanism by which exchange rates impact FDI flows has been modeled in a few theoretical studies, including those conducted by Cushman (1985), Froot and Stein (1991), and Kohlhagen (1977) (Xing, 2006).

The explanations for how changes in the level of the exchange rate affect FDI flows have also been the subject of various hypotheses. The wealth position hypothesis is one of them. The literature refers to the relative labor cost hypothesis as the second hypothesis with regard to the effect of changes in exchange rate level on FDI flows (Payaslioglu & Polat, 2013). With accordance to these different hypotheses, a weak currency either reduces investment costs, hence boosting investor wealth, or lowers continuous production costs (Polat & Payaslioglu, 2016). On the other hand, a different justification for the link between the level of the exchange rate and foreign direct investment, known as the expectations of future profitability

argument, was proposed by Campa (1993) (Payaslioglu & Polat, 2013). Additionally, other forms of foreign direct investment may be impacted by changes in the level of the exchange rate.

Fig. 1. Exchange rate level and FDI



Source: Prepared by the researcher based on the theoretical literature.

2.1. The wealth position hypothesis

According to the wealth position hypothesis, foreign direct investment is connected to the foreign exchange market by the impact of variations in exchange rate level on the relative wealth of both the home and host countries (Payaslioglu & Polat, 2013). The level of the exchange rate, according to Froot and Stein (1991), may have an impact on FDI. This is because foreigners' relative wealth rises as a result of the host country's currency depreciating versus their home currency, which makes the country more appealing to FDI because firms can buy assets in the host country for comparatively less prices. Therefore, FDI should increase in the host country when the host currency depreciates and decrease when the host currency appreciates (Osinubi & Amaghionyeodiwe, 2009).

Contrary to these claims, it is frequently asserted that the price of assets should not matter; only the asset's rate of return should be taken into consideration. Not only does the price of the assets in the host country currency decrease, but so does the nominal return when the host country currency depreciates in relation to the home country currency. Exchange rate changes shouldn't affect FDI because both asset

prices and asset return rates decline. According to Froot and Stein (1991), exchange rate fluctuations do affect foreign investment when capital markets are influenced by imperfect information.

Since lenders pay monitoring costs and are therefore forced to lend less than the asset's full value, information asymmetry results in a divergence between internal and external financing, making the latter more expensive than the former. If foreign investors choose to keep their wealth in foreign currency in this context, the depreciation of the domestic currency would elevate foreign agents' wealth positions above those of domestic agents, which will encourage foreign investors to make strong bids for domestic assets (Osinubi & Amaghionyeodiwe, 2009).

2.2. The labor cost hypothesis

According to the relative labor cost hypothesis, host currency depreciation encourages more FDI inflows by reducing day-to-day production costs and attracting more foreign investors (Payaslioglu & Polat, 2013). The movement of the exchange rate when a currency depreciates—that is, when its value decreases in relation to the value of another currency—could have two effects on FDI. It lowers labor and production costs in that country in comparison to those of its competitors abroad. With everything else being equal, the country that is actually experiencing depreciation in its currency has a greater "locational advantage" or appeal as a location for attracting investments in productive capacity. By way of this "relative labor" channel, the depreciation in the exchange rate raises the overall rate of return for foreigners thinking about doing an overseas investment project in this country (Okwuchukwu, 2015).

The impact of the exchange rate level on FDI through this channel depends on a number of fundamental factors. First, the change in the exchange rate must be related to a shift in the relative production costs between countries and should not be compensated by an increase in wages and production costs in the market where

investment capital will be used. Second, if exchange rate changes are expected, the significance of the "relative wage" channel may be diminished. Since interest rate parity conditions equalize risk-adjusted expected rates of return across countries, expected exchange rate volatility may be reflected in a greater cost of financing the investment project (Okwuchukwu, 2015).

2.3. The expectations of future profitability argument

Campa (1993) advances a different justification for the connection between the level of the exchange rate and FDI. According to his model, a firm's decision to invest abroad is based on its expectations for future profitability (Osinubi & Amaghionyeodiwe, 2009). His logic was that multinational corporations look to generate profits in local markets, and if they are confident about future profitability, they will expand their investment there. The model of Campa (1993) thus asserts that an appreciation of the local currency will lead to an increase in FDI inflows to the host country.

In this case, the higher the level of the exchange rate (measured in foreign currency units per host currency) and the faster it increases, the higher the expectation of future profits from entering a foreign market. In contrast to Froot and Stein's assumption, Campa's model suggests that an increase in FDI into the host country will result from an appreciation of the host currency, *ceteris paribus*. His empirical findings, which examined the number of foreign investors entering the US, provided evidence to support his model (Osinubi & Amaghionyeodiwe, 2009).

2.4. The effect of exchange rate level on different types of FDI

Depending on where the produced goods are going, the level of the exchange rate has a variety of effects on FDI. Foreign direct investment (FDI) and trade could

be viewed as alternatives if the investor wishes to produce for the local market. In that situation, a local currency appreciation promotes FDI inflows by boosting local consumers' purchasing power. However, a depreciation in the recipient country's real exchange rate boosts FDI by lowering the cost of capital (Chowdhury & Wheeler, 2008).

Different types of FDI (such as vertical, export-platform, and horizontal) may be impacted by exchange rate changes in different ways. First, the relationship between a developed (home) country and a developing (host) country that offers less expensive labor appears to be reflected by the vertical FDI model. According to this model, foreign direct investment (FDI) relies on the trade-off between the costs of producing intermediate goods in a host country and the costs of importing them into a home country. If the host country's labor costs are lower, FDI can reduce cost of production and thus offset trade costs. However, when it comes to vertical FDI, the impact of the home currency's appreciation on FDI behavior may be insignificant because the reduced production costs will likely be offset by higher trading costs as a result of the currency appreciation.

The export of intermediate goods to third countries rather than the home country is made easier by export-platform FDI, which has grown recently. FDI is dependent on third-country characteristics, such as third-country accessibility, rather than on the cost of trade with the home country. Because exports to third countries may not be significantly affected by changes in the bilateral exchange rate, the effect of the home currency's appreciation on FDI behavior in the context of export platforms may be minor.

Finally, horizontal FDI, in which multinational corporations engage in the same economic activities in a host country, is determined by the trade-off between export costs and fixed production costs in the host country. Savings on export costs can help offset fixed costs if the host country's market is reasonably large. When a firm in a developed (home) country seeks entry to the large market of another developed (host)

country, horizontal FDI appears particularly relevant. When it comes to horizontal FDI, the home currency's appreciation might lead to an increase in FDI because the decrease in the host country's fixed costs may be greater than the savings on export costs (Kubo, 2019).

3. Exchange rate volatility and FDI flows

Extreme volatility can be seen in macroeconomic variables, especially in developing countries. International trade, domestic investment, and foreign direct investment are all impacted by these variables' excessive volatility. Recent research aims to determine the theoretical relationships and the ways via which uncertainty influences investment. These researches are generally inconclusive. Uncertainty has a tendency to influence investment in many ways depending on the assumptions made. The degree of the effect is also influenced by a number of other variables. As a result, the specific link between uncertainty and investment is still unclear from a theoretical viewpoint (Dhakal, Nag, Pradhan, & Upadhyaya, 2010).

Since the Bretton Woods system collapsed in the 1970s, exchange rate volatility has become a critical topic and area of study. Exchange rate volatility became a major player in financial markets, and trading and speculation activities increased, becoming the subject of much research (Martins, 2015). The short-term fluctuations of the exchange rate around its long-term trends are known as exchange rate volatility (Giannellis & Papadopoulos, 2011). In other terms, currency price fluctuation of one currency relative to another is referred to as exchange rate volatility. Volatility is the term used to describe any movements and fluctuations that cause a currency to appreciate or depreciate (Kilicarslan, 2018). In the case of developing and emerging market economies, the volatility creates uncertainty in the economy, increases business and investment risks, and it has extensive negative spillover effects (Oaikhenan & Aigheyisi, 2015).

Studies have shown that the impact of exchange rate risk, which is caused by exchange rate volatility, on the flow of FDI can be both positive and negative

(Dhakal, Nag, Pradhan, & Upadhyaya, 2010). Exchange rate changes would have relatively little impact if they simply affected price changes, satisfying real purchasing power parity. However numerous researches have demonstrated that purchasing power parity is not constant over all periods. As a result, the competitiveness of companies in various countries can be impacted by volatility in exchange rates. In fact, it has the potential to have both positive as well as negative effects. Companies have to deal with the risk that comes with volatile exchange rates, on the one hand. On the other side, companies have the option to transfer production to another location to benefit from lower costs there (Chowdhury & Wheeler, 2008). According to recent empirical investigations, the real exchange rate's behavior can be attributed to the failure to establish the law of one price (Kyereboah-Coleman & Agyire-Tettey, 2008).

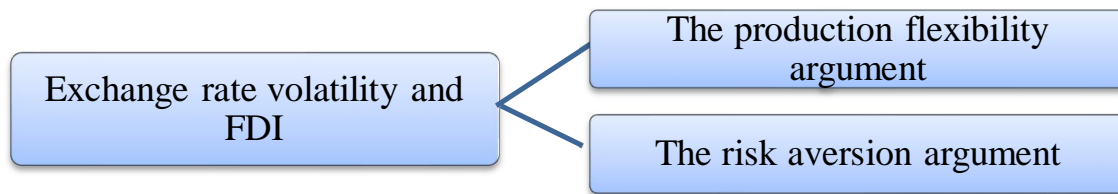
Since persistent exchange rate fluctuations are a sign of a country's currency instability, currency stability is a crucial consideration for foreign investors. A lower exchange rate in a host country indicates that the currency of the investing country has more purchasing power in the host country (Jayasekara, 2013). There are a number of disadvantages to fluctuating exchange rates. First, exchange rate depreciation impacts could be unfavorable if price elasticities are low. Second, exchange rate risks and uncertainties are frequently linked to it. Third, exchange rate changes have the potential to significantly lower the value of assets held in the host country as well as the potential earnings from the investment. Finally, speculation about the future direction of exchange rate fluctuations can be destabilizing, which can lead to losses in economic efficiency and possibly avoidable capital flight (Udoh & Egwaikhide, 2008).

According to Kosteletou and Liargovas (2000), there is no obvious distinction between real exchange rate volatility and foreign direct investment in terms of their relationship's direction. In the literature, there are at least six competing models that fall under the categories of trade-integrated models and models of financial behavior.

The first category distinguishes between models for traded and non-traded goods. The second category makes a distinction between relative labor cost theory, imperfect capital market theory, international firm strategic behavior, and the monetary approach to determining balance of payments. The models in the first category imply that the causality is from FDI to the real exchange rate, whereas the models in the second category imply that the causality is otherwise (Kyereboah-Coleman & Agyire-Tettey, 2008).

Regarding how volatility of the exchange rates affect FDI flows, there are opposing viewpoints (Jayasekara, 2013). In order to address the effects of exchange rate volatility over various time horizons, the theoretical literature that is currently available can be separated into two strands. In terms of the direction of the relationship between exchange rate volatility and FDI inflows, the results from the two approaches are contradictory (Brzozowski, 2003). In his discussion of the relationship between FDI and exchange rates for the Princeton Encyclopedia of the World Economy, Goldberg (2009) essentially separates the arguments into two categories: (i) The production flexibility argument and (ii) The risk aversion argument. Because exchange rate movements affect expected profits, they have an impact on the attractiveness of FDI (Asmah & Andoh, 2013).

Fig. 2. Exchange rate volatility and FDI



Source: Prepared by the researcher based on the theoretical literature.

3.1. The production flexibility argument

According to the production flexibility argument, there is a direct relationship between FDI and exchange rate volatility (Wang, 2013). Macroeconomic uncertainty should increase FDI flows if the goal of foreign investors is to benefit from production flexibility rather than export or re-export abroad. For risk-neutral competitive companies that must deal with convex adjustment costs, Abel (1983) claims that output price uncertainty leads to increased investment (Dal Bianco & Loan, 2017). The theoretical basis of the production flexibility argument is that production companies have the flexibility to adapt variable factors in response to price changes caused by fluctuations in exchange rates, which encourages them to increase their investment in the host country as exchange rate volatility in the host country increases (Payaslioglu & polat, 2013). In this specific case, companies prioritize the benefits of production flexibility over the risk of uncertainty (Dal Bianco & Loan, 2017).

The production flexibility argument demonstrates that before making decisions, producers must commit investment capital and production costs to domestic and foreign capacity (Wang, 2013). According to the production flexibility arguments, increased volatility is linked to increased FDI ex-ante, as well as increased possibility for surplus capacity and production moving ex-post, once exchange rates are observed (Asmah & Andoh, 2013). Arguments for production flexibility state that foreign investment is increased by exchange rate volatility because firms can alter the usage of one of their variable factors after experiencing nominal or real shocks. The

production flexibility argument is based on the concept that companies may modify variables, as the argument would not hold if variables were fixed (Osinubi & Amaghionyeodiwe, 2009).

In general, a positive link between the exchange rate or price volatility suggests that companies invest more in a foreign market in order to diversify their production, use the market as a shock absorber, or to compete against other companies in the same industry (Dal Bianco & Loan, 2017).

3.2. The risk aversion argument

A different approach for connecting exchange-rate volatility and investment focuses on "risk aversion" arguments (Okwuchukwu, 2015). According to the risk aversion argument, there is an inverse relationship between the two variables (Wang, 2013).

Due to foreign investors' uncertainty about the advantages and disadvantages of making irreversible investments in the host country, the risk aversion approach suggests a probable negative link between exchange rate volatility and FDI inflows (Polat & Payaslioglu, 2016). Because investors are risk-averse and demand a return for risks, the risk aversion hypothesis implies that greater exchange rate variability affects investment projects like FDI (Wang, 2013). According to Ruiz and Pozo (2008), there would be a negative association between FDI and exchange rate uncertainty if the goal of FDI were to either serve another market or bring output back to the home country (Payaslioglu & polat, 2013).

One body of research focuses on the impact of risk aversion on the willingness of foreign investors to delay making investment decisions. Yet Campa (1993) demonstrated that risk-neutral investors could potentially exhibit the same behavior (Jayasekara, 2013). By using the argument of future expected profits, Campa (1993) extends this assumption to include risk-neutral firms. According to his hypothesis, firms will delay making a choice to enter as the exchange rate becomes more volatile because investors will be worried about future expected profits. So, risk-neutral firms will be discouraged from entering foreign markets when there is high exchange rate volatility (Osinubi & Amaghionyeodiwe, 2009).

4. Empirical literature review

After reviewing recent previous empirical studies that looked at the impact of the level and volatility of the exchange rate on foreign direct investment inflows, it was obvious that the findings of these studies varied, as indicated in the following table:

Table 1. Previous empirical studies based on the findings

Effects on FDI	Positive effects	Negative effects	No effects
Exchange rate Volatility (Long run)	(Chaudhary et al., 2012); (Asmah & Andoh, 2013); (Dhakal et al., 2010); (Osinubi & Amaghionyeodiwe, 2009); (Chowdhury & Wheeler, 2008)	(Dal Bianco & Loan, 2017) ; (Okwuchukwu, 2015); (Hanusch, Nguyen, & Algu, 2018); (Azzouzi & Bousselhami, 2019); (Ullah-Khan, Sultan, & Rehman, 2017); (Wang, 2013); (Ngowani, 2012); (Chaudhary et al., 2012); (Udoh & Egwaikhide, 2008) ;(Brzozowski, 2003); (Azhar, Ullah, & Malik, 2015); (Jayasekara, 2013); (Asmah & Andoh, 2013); (Yousaf, Shahzadi, Kanwal, & Hassan, 2013); (Ullah, Haider, & Azim, 2012); (Sharifi-Renani & Mirfatah, 2012b); (Ellahi, 2011); (Osinubi & Amaghionyeodiwe, 2009); (Kyereboah-Coleman & Agyire-Tettey, 2008); (Abbott & De Vita, 2008); (Macdermott, 2008); (Morrissey & Udomkerdmongkol, 2008); (Kiyota & Urata, 2004)	(Azzouzi & Bousselhami, 2019); (Polat & Payaslioglu, 2016); (Omorokunwa & Ikponmwosa, 2014); (Wang, 2013); (Chaudhary et al., 2012); (Furceri & Borelli, 2008); (Azhar et al., 2015); (Jayasekara, 2013); (Chowdhury & Wheeler, 2008); (Payaslioglu & Polat, 2013)
Exchange rate Volatility (Short run)	(Ellahi, 2011)	(Okwuchukwu, 2015) ; (Ullah-Khan et al., 2017); (Azzouzi & Bousselhami, 2019); (Hanusch et al., 2018); (Wang, 2013); (Chaudhary et al., 2012); (Amuedo-Dorantes	(Azzouzi & Bousselhami, 2019); (Omorokunwa & Ikponmwosa, 2014); (Wang, 2013); (Chaudhary et al.,

		& Pozo, 2001)	2012)
Exchange rate level (long run)	(Kubo, 2019) ; (Ullah-Khan et al., 2017); (Bilawal et al., 2014) ;(Xing, 2006) ;(Ngowani, 2012) ; (Azhar et al., 2015) (Pakistan and India) ; (Asmah & Andoh, 2013); (Yousaf et al., 2013) ;(Ullah et al., 2012) ;(Sharifi-Renani & Mirfatah, 2012) ;(Ellahi, 2011) ; (Osinubi & Amaghionyeodiwe, 2009) ;(Morrissey & Udomkerdmongkol, 2008);(Kiyota & Urata, 2004)	(Cambazoğlu & Güneş, 2016); (Azhar et al., 2015); (Asmah & Andoh, 2013); (Dhaka et al., 2010); (Kyereboah-Coleman & Agyire-Tettey, 2008); (Macdermott, 2008)	(Mistura & Roulet, 2019); (Kubo, 2019); (Polat & Payaslıoğlu, 2016); (Jayasekara, 2013); (Abbott & De Vita, 2008); (Chowdhury & Wheeler, 2008); (Payaslıoğlu & Polat, 2013)
Exchange rate level (Short run)	(Ullah-Khan et al., 2017)	(Ellahi, 2011)	(Cambazoğlu & Güneş, 2016); (Amuedo-Dorantes & Pozo, 2001)
Expected exchange rate (long run)	/	(Morrissey & Udomkerdmongkol, 2008)	(Jayasekara, 2013)

Source: Prepared by the researcher based on the previous empirical studies.

As can be observed from Table 1, there are variations in the long-term and short-term effects of exchange rate level and volatility on foreign direct investment inflows. While some studies found a positive effect, others a negative effect, and yet others found no effect of exchange rate level and volatility on foreign direct investment inflow.

Furthermore, it is clear from this table that most studies indicate a negative long-term effect of exchange rate volatility on FDI inflows. The majority of the findings regarding the exchange rate level indicated that it had a positive effect on FDI inflows.

It's possible that the variety and usage of several econometric methodologies contributed to the variation in the findings of these empirical studies. The majority of studies relied on time series data collected from one country or multiple countries, as shown in Table 2, while other studies employed panel data and they included different samples from different countries (See Table 3).

Table 2. Samples used in time series studies

Time series studies	Sample countries
(Azzouzi & Bousselhami, 2019)	Morocco and Turkey
(Ullah-Khan et al., 2017)	Pakistan
(Polat & Payaslıoğlu, 2016)	Turkey
(Cambazoğlu & Güneş, 2016)	Turkey
(Okwuchukwu, 2015)	Nigeria
(Martins, 2015)	Brazil
(Azhar et al., 2015)	SAARC countries (Pakistan, India and Sri Lanka)
(Omorokunwa & Ikponmwosa, 2014)	Nigeria
(Bilawal et al., 2014)	Pakistan
(Jayasekara, 2013)	Sri Lanka
(Wang, 2013)	Brazil, Russia, India, and China (BRIC).
(Yousaf et al., 2013)	Pakistan
(Payaslioglu & Polat, 2013)	Turkey
(Ullah et al., 2012)	Pakistan
(Ngowani, 2012)	Zambia
(Chaudhary et al., 2012)	Four main regions of Asia: the South-Asian region, Southeast Asian region East Asia, West Asia.
(Sharifi-Renani & Mirfatah, 2012b)	Iran
(Ellahi, 2011)	Pakistan
(Osinubi & Amaghionyeodiwe, 2009)	Nigeria
(Kyereboah-Coleman & Agyire-Tettey, 2008)	Ghana
(Udoh & Egwaikhide, 2008)	Nigeria
(Chowdhury & Wheeler, 2008)	Canada, Japan, the United Kingdom, and the United States
(Amuedo-Dorantes & Pozo, 2001)	United States

Source: Prepared by the researcher based on the previous empirical studies.

Table 3. : Samples used in Panel data studies

Panel data studies	countries
(Kubo, 2019)	Southeast Asia (Indonesia, Malaysia, the Philippines, and Thailand)
(Hanusch et al., 2018)	80 developing and developed countries
(Dal Bianco & Loan, 2017)	10 Latin American and Caribbean countries
(Asmah & Andoh, 2013)	27 sub-Saharan African countries
(Dhakal et al., 2010)	East Asian Countries (China, Indonesia, Malaysia, the Philippines, South Korea, and Thailand)
(Furceri & Borelli, 2008)	35 EMU neighbourhood countries
(Morrissey & Udomkerdmongkol, 2008)	16 emerging market countries
(Abbott & De Vita, 2008)	The seven major investing countries in the UK, namely the USA, France, Germany, the Netherlands, Switzerland, Australia and Japan.
(Macdermott, 2008)	55 developed and developing countries
(Xing, 2006)	Japanese FDI for nine Chinese manufacturing sectors
(Kiyota & Urata, 2004)	Japan's FDI by industries to its partner countries
(Brzozowski, 2003)	19 emerging market and 13 transition countries

Source: Prepared by the researcher based on the previous empirical studies.

It is important to note that some prior studies employed both the level and volatility of the exchange rate, whereas other studies used either the level or volatility of the exchange rate. Additionally, the majority of the studies relied on national-level FDI data, with the exception of the (Kubo, 2019) study, which used industry-specific data, the studies of (Abbott & De Vita., 2008; Xing, 2006), where data were used at the sector level (Sectoral FDI data), and the study of (Kiyota & Urata, 2004), which relied on data by region and by sector.

The choice of variables used in earlier studies varied as well, particularly when it came to the conditional measure of volatility in exchange rates based on the GARCH model, which was utilized in the majority of studies, like the studies of each of (Abbott & De Vita, 2008; Amuedo-Dorantes & Pozo, 2001; Asmah & Andoh, 2013; Azhar et al., 2015; Azzouzi & Bousselhami, 2019; Chaudhary et al., 2012; Chowdhury & Wheeler, 2008; Dal Bianco & Loan, 2017; Dhakal et al., 2010; Kirshner, 2003; Kyereboah-Coleman & Agyire-Tettey, 2008; Ngowani, 2012; Payaslioglu & Polat, 2013; Polat & Payaslioglu, 2016a; Ullah-Khan et al., 2017; Yousaf et al., 2013). The rest of the studies, on the other hand, mostly used the unconditional volatility of the exchange rate, measured by the standard deviation of

the exchange rate.

Furthermore, as demonstrated in table 4, previous studies employed a variety of exchange rate variables. The real effective exchange rate and the real exchange rate were employed in the majority of studies, while nominal exchange rates were used in some others. The informal exchange rate was also used by (Sharifi-Renani & Mirfatah, 2012).

Table 2. : Previous empirical studies by exchange rate variable

Exchange rate variables	Exchange rate Volatility	Exchange rate level
Real Effective Exchange Rate	(Azzouzi & Bousselhami, 2019) ; (Martins, 2015) ; (Polat & Payaslioglu, 2016) ; (Asmah & Andoh, 2013) ; (Chowdhury & Wheeler, 2008) ; (Amuedo-Dorantes & Pozo, 2001)	(Cambazoğlu & Güneş, 2016) ; (Hanusch et al., 2018) ; (Polat & Payaslioglu, 2016) ; (Yousaf et al., 2013) ; (Chowdhury & Wheeler, 2008) ; (Amuedo-Dorantes & Pozo, 2001)
The real exchange rates	(Dal Bianco & Loan, 2017) ; (Azhar et al., 2015) ; (Jayasekara, 2013) ; (Asmah & Andoh, 2013) ; (Payaslioglu & Polat, 2013) ; (Sharifi-Renani & Mirfatah, 2012b) ; (Dhakal et al., 2010) ; (Kyereboah-Coleman & Agyire-Tettey, 2008) ; (Abbott & De Vita, 2008) ; (Macdermott, 2008) ; (Morrissey & Udomkerdmongkol, 2008) ; (Kiyota & Urata, 2004)	(Kubo, 2019) ; (Bilawal et al., 2014) ; (Xing, 2006) ; (Azhar et al., 2015) ; (Jayasekara, 2013) ; (Asmah & Andoh, 2013) ; (Payaslioglu & Polat, 2013) ; (Ellahi, 2011) ; (Dhakal et al., 2010) ; (Kyereboah-Coleman & Agyire-Tettey, 2008) ; (Abbott & De Vita, 2008) ; (Macdermott, 2008) ; (Kiyota & Urata, 2004)
The nominal exchange rates	(Wang, 2013) ; (Chaudhary et al., 2012) ; (Brzozowski, 2003)	(Asmah & Andoh, 2013) ; (Osinubi & Amaghionyeodiwe, 2009)
Informal Exchange rate	/	(Sharifi-Renani & Mirfatah, 2012b)
Not mentioned	(Okwuchukwu, 2015) ; (Omorokunwa & Ikponmwosa, 2014) ; (Ngowani, 2012) ; (Udoh & Egwaikhide, 2008) ; (Furceri & Borelli, 2008) ; (Hanusch et al., 2018) ; (Ullah-Khan et al., 2017) ; (Jayasekara, 2013) ; (Yousaf et al., 2013) ; (Ullah et al., 2012) ; (Ellahi, 2011) ; (Osinubi & Amaghionyeodiwe, 2009) ; (Morrissey & Udomkerdmongkol, 2008)	(Ullah-Khan et al., 2017) ; (Ullah et al., 2012)

Source: Prepared by the author based on the previous empirical studies.

The methods used in earlier empirical studies to estimate the model varied as well. Some time series-based studies employed various methodologies, including the

method of least squares (OLS) and the technique of (ARDL bound testing). The majority of the studies that employed panel data also used the fixed and random effects models method as well as the GMM method.

5. CONCLUSION

The theoretical and empirical literature on the link between the level and volatility of the exchange rate and foreign direct investment were reviewed in this research paper. After addressing the theoretical relationship between the exchange rate and foreign direct investment, it is discovered that the theoretical literature indicates that both the level and volatility of exchange rates can have an impact on the level of FDI.

For the exchange rate level, there are two hypotheses that explain how FDI inflows respond to changes in the exchange rate level. The first hypothesis is called the wealth position hypothesis. The second hypothesis is known as the relative labor cost hypothesis. According to the wealth position hypothesis and the relative labor cost hypothesis, a weak currency either leads to lower investment costs, which increases the wealth of investors, or leads to lower daily production costs. However, there is another argument known as the expectation of future profitability argument. This argument implies that the higher the level of the exchange rate (measured in foreign currency units per host currency) and the faster it increases, the higher the expectation of future profits from entering a foreign market. It suggests that an increase in FDI into the host country will result from an appreciation of the host currency, *ceteris paribus*. Furthermore, changes in the level of the exchange rate can have an impact on various types of foreign direct investment.

As for the relationship between exchange rate volatility and foreign direct investment, the theoretical arguments were divided into two categories: the production flexibility argument and the risk aversion argument. The production flexibility argument assumes a positive correlation between exchange rate volatility

and FDI, while the risk aversion argument states that there is an inverse relationship between exchange rate volatility and FDI inflows.

After reviewing recent previous empirical studies that looked at the impact of the level and volatility of the exchange rate on FDI inflows, it was obvious that the findings of these studies varied in the long-term and short-term. While some studies found a positive effect, others a negative effect, and yet others found no effect of exchange rate level and volatility on FDI inflows. The variations in the econometric methodologies employed, the many variables used in the studies, as well as the various measures of exchange rate volatility, may be the cause of the variations in the studies' findings. Many studies have relied on conditional volatility while others have utilized the exchange rate's standard deviation as a measure of volatility.

The research's findings make it clear that there is controversy in the theoretical and empirical literature regarding the impact of the level and volatility of the exchange rate on FDI inflows.

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