DOI: 10.5281/zenodo.14560924

Journal of Contemporary Macroeconomic Issues
www.scekr.org

Estimating The Effect of Macroeconomic Volatility on Different Types of FDI

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PAPER INFO

Information:
Received: 01 May, 2024
Revised: 14 June, 2024
Published: June, 2024

Keywords:
FDI, macroeconomic volatility, GARCH, GMM, trade openness

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ABSTRACT

Using a panel data from 111 countries from 2003 to 2021 the study attempts to analyze the effect of macroeconomic volatility on different types of FDI (Foreign Direct Investment) inflows. GARCH variances of GDP per capita are used to model the macroeconomic volatility and to further estimates the effect of this volatility on different types of FDI the study utilized system GMM (Generalized Method of Moments). The results indicate that macroeconomic volatility has a negative and significant impact on the total stock of FDI, FDI through mergers and acquisitions, and greenfield investment. We have also found that the macroeconomic volatility is non-linearly related with various types of FDI in different groups of countries according to their trade openness. The findings suggest that policy makers need promote a stable economic environment to avoid macroeconomic volatility and consequently the curtailing levels of FDI inflows.

1 Introduction

An important source of capital inflows, especially for developing countries, is foreign direct investment (FDI), which fosters technical innovation and capital accumulation to support economic growth. With FDI inflows ranging from zero to nearly half the size of gross fixed capital creation, it is the major source of capital inflows in industrialized countries. The trend toward globalized manufacturing and marketing has influenced FDI attractiveness in developing countries. Empirically studies indicate that the impact of Foreign Direct Investment (FDI) on economic growth is multifaceted and encompasses factors such as employment, productivity, competitiveness, and technological spillovers.

In least developed countries, Foreign Direct Investment (FDI) results in increased exports, market access, funding, and alternatives to bank loans. There is evidence to support FDI's involvement in globalization and its encouragement of local enterprises' competitiveness (Smarzynska, 2002). About politics, economy, and society, the six countries that make up the Western Balkans are North Macedonia, Kosovo, Albania, Bosnia and Herzegovina, Serbia, and Montenegro. According to Jusufi and Lubeniqi (2019) despite Kosovo and other Western Balkan republics possessing abundant natural

and human resources, they remain neglected by foreign investors. But because the Eurozone countries which are the main sources of FDI inflows have been disproportionately affected by the global financial crisis, which peaked in 2008, there has also been a transmission of its effects to the decline in FDI in the western Balkans. These countries experienced economic suffering as a result of the crisis's onset, which decreased foreign direct investment (Lubeniqi, 2020). Kristo (2004) claims that foreign direct investment (FDI) is the acquisition of diverse investment activities and the entry of several organizations that include foreign investment.

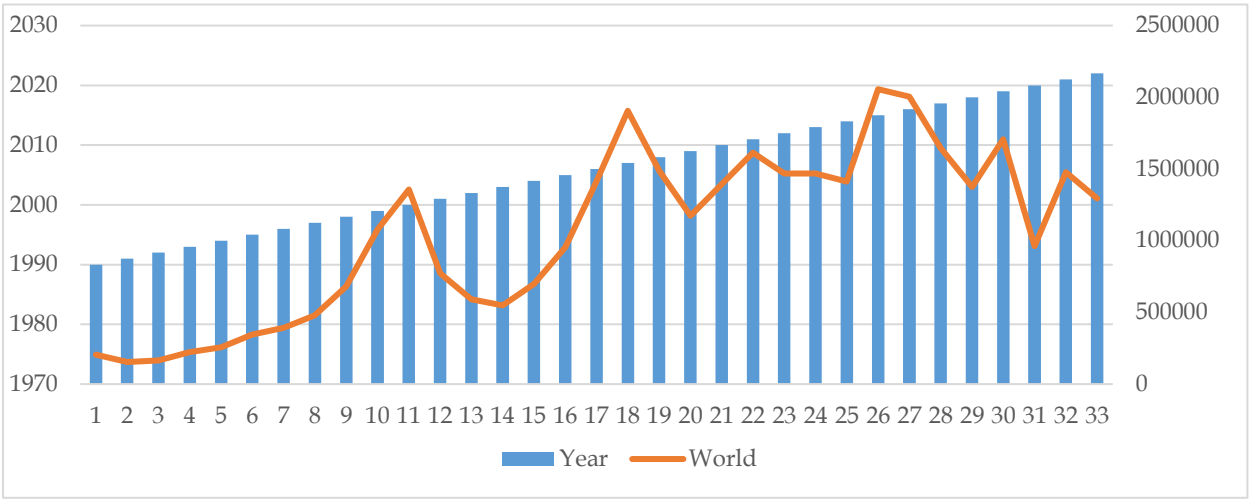

Figure 1
Global trend of FDI inflows
Source: UNCTAD

The diagram of the FDI global trend shows the current global financial crisis is the worst since the Great Depression of 1929, with detrimental effects on foreign direct investment (FDI) and the actual economy. The capacity of businesses to fund foreign projects has been undermined by tighter lending standards and decreased corporate earnings, while company confidence and the desire to develop globally have been undermined by the impending global economic downturn and rising risk. Many huge international firms have rewritten their plans for worldwide expansion as a result, and they have either canceled or put on hold cross-border and greenfield merger and acquisition operations. The government of the investment environment has been steadily becoming worse; from 1990 to 2008, worldwide FDI inflows were predicted to drop by around 21% to reach an estimated $1.4 trillion. The establishment of favorable conditions for a speedy recovery depends heavily on how well public policy responses work. Companies anticipate a sharp decline in their FDI expenditures from 2009 to 2011 due to the negative effects of the ongoing financial and economic crisis, as well as significant uncertainties regarding its evolution in the short term. From 2011 to 2018 FDI increased in the world with different fluctuations. In this era, the FDI increased in developing and developed countries. According to UNCTAD's most recent Global Investment Trends Monitor, economic consequences from COVID-19 caused global foreign direct investment (FDI) flows to decline 49% in the first half of 2020 compared to 2019.

In the host countries, FDI has both advantages and disadvantages. Foreign investors should be closely regarded by the host countries, which should also recognize their economic contributions. Both good and bad features of FDI follow in a certain country. Capital formation, new technologies, regional and geographic growth, entrepreneurship and internal rivalry, and employment are among the positive elements. Negative elements, on the other hand, include individual supremacy, technical reliance, worries about the economic strategy, cultural shifts, and aversion to local governance (Lubeniqi, 2020). Foreign Direct Investment (FDI) facilitates economic growth by supplying funds for investment, knowledge transfer, and employment creation. Economic growth and foreign direct

investment are positively correlated (Metawa et al., 2019). If the advantages of FDI mostly favor a small portion of the population or certain geographic areas, then income inequality may worsen (Carkovic & Levine, 2005). While FDI frequently contributes to economic development and stability, it may also bring about some turbulence.

Foreign direct investment has a complex relationship with macroeconomic volatility in host countries. Economic crisis risks are decreased by FDI, which stabilizes capital flows. Moreover, it lowers unemployment and societal instability by fostering the development of jobs. Furthermore, it promotes technology transfer, raising the productivity and competitiveness of regional sectors. Income disparity, currency rate fluctuations, boom-bust cycles, weakness in world economic conditions, and policy uncertainty are all potential outcomes of foreign direct investment. It can increase income inequality, bring about economic instability in particular industries, and create uncertainty in government policy. Moreover, FDI inflows may affect a country's currency, leading to trade imbalances and exchange rate fluctuations.

Macroeconomic volatility shows the uncertainty in key economic indicators and the variability of variables change over time. An economy suffers from macroeconomic volatility, and higher volatility increases uncertainty in the economy. Which makes it difficult for individual investors to plan for the future. Macroeconomic volatility fluctuation is measured by GDP per capita growth, which indicates expansion and contractionary in the economy. Increase in macroeconomic volatility harms FDI. According to the amount of time of the investment, macroeconomic volatility has varying effects on FDI, with long-term investors being more tolerant of short-term moves (Johansson et al., 2008). Asiedu (2014) macroeconomic volatility impacts FDI differently across regions and countries, with some countries attracting FDI due to favorable factors like market size or natural resource access. Economic crises can enhance macroeconomic volatility, which reduces foreign direct investment (FDI) as a result of increased investor apprehension and uncertainty (Aizenman & Noy, 2006). MNCs use FDI as a risk-reduction strategy by spreading their assets across countries with different levels of macroeconomic volatility (Kogut & Kulatilaka, 1994).

A complex and dynamic relationship exists between macroeconomic volatility and mergers and acquisitions (M&A), which has significant implications for both the timing and success of M&A deals. Macroeconomic volatility is the term used to describe fluctuations in overall economic stability. The value and cost of M&A deals can be greatly impacted by macroeconomic volatility (Moeller et al. 2004). Macroeconomic instability may increase risk and uncertainty in M&A transactions, causing purchasers to be more cautious when analyzing potential risks like currency risk or economic instability (Hitt et al., 2006). Success in uncertain economic conditions depends on the ability of merged firms to face risks after the purchase since businesses that adapt well can prosper (Shabir et al., 2021). Global economic trends have a significant impact on cross-border M&A activity, with the ability to restrict international transaction flow and influence the strategic choices made by multinational firms (Gugler et al., 2013). Due to economic instability, government policies including monetary policy and restrictions on trade may have an impact on M&A activities, potentially impacting transaction approvals and antitrust concerns (Pan et al., 2013). In international business and economics, the relationship between macroeconomic volatility and Greenfield investment, which involves constructing entirely new businesses or facilities in foreign countries, is of great interest and importance. Macroeconomic volatility, such as currency rates, inflation, interest rates, and economic stability, can significantly impact the decision-making processes of MNCs involved in Greenfield investments. The relationship between macroeconomic instability and the allure, viability, and results of Greenfield investments is examined through the use of empirical data and academic ideas in this conversation. In particular, currency rates, which can create uncertainty about future returns on investment, have a substantial impact on macroeconomic volatility and MNCs' reason for risk when checking Greenfield projects (Liargovas & Skandalis, 2012). MNCs must carefully evaluate ways to manage currency risk, such as hedging, to protect their assets from unfavorable currency fluctuations

in Greenfield projects (Rugman & Verbeke, 2001). High-tech businesses often invest in Greenfield investments to get access to new markets, but macroeconomic instability might influence their decisions to set up shop foreign (Cantwell & Mudambi, 2011).

Macroeconomic volatility may have different effects on the different types of FDI. Because investing in other countries through MAs has dynamics compared to launching new Greenfield projects in other countries. High economic uncertainty decreases the FDI in countries. Previous researchers found that the FDI decreases due to high macroeconomic volatility. Increased FDI in a country is risky for foreign investors (Sharifi & Mirfatah, 2012; Ullah et al., 2012). In our study gap to check the macroeconomic volatility effect on M&A FDI and Greenfield investment and also check the macroeconomic effects in openness-level countries. The high macroeconomic volatility decreases FDI through mergers and acquisitions and Greenfield investment. The research has established specific goals based on a comprehensive review of the existing literature. The primary objective of this study is to investigate the effects of macroeconomic volatility on various forms of Foreign Direct Investment (FDI). It is important to note that investing in foreign countries through mergers and acquisitions (M&As) involves different dynamics compared to initiating new greenfield projects. The presence of macroeconomic volatility improves the risks faced by foreign investors, leading to a reduction in M&A investments as well as a decrease in new Greenfield projects in host countries. The research's precise objectives are delineated as follows:

- To scrutinize the influence of macroeconomic volatility on three key FDI categories: FDI In-stock, FDI through mergers and acquisitions, and Greenfield investments.
- To analyze how macroeconomic volatility affects FDI In-stock, FDI via mergers and acquisitions, and Greenfield investments within diverse economic environments, categorized by a country's level of trade openness.
- To formulate policy recommendations aimed at mitigating macroeconomic volatility and fostering an increase in FDI Instock within host countries.

Rest of the paper is structured as follows. Section 2 includes a comprehensive review of literature. Section 3 presents the relevant data and methodologies utilized in the study. And the las section, section 4, explains the empirical results of the study.

2 Literature Review

Foreign Direct Investment (FDI) is a key factor in influencing the economic direction of countries, as it is a means to transfer capital, technology and expertise. Macroeconomic volatility has been identified as a key determinant of FDI decisions due to the complex array of factors influencing FDI decisions. Macroeconomic volatility, as defined by fluctuations in inflation rates, exchange rates, and overall economic growth, is a powerful determinant of FDI inflows and particularly on long term FDI inflows like Green field FDI (GFDI) and Mergers and Acquisitions (M&A). This literature review examines the relationship between macroeconomic volatility and different types of FDI, although it specifically looks at the effects of volatility on investment decisions for both developed and developing countries, and on mixed effects that volatility can contribute to investment decisions.

FDI Instock, or the total accumulated foreign investments in a country, has been extensively studied and it was shown how it relates to macroeconomic volatility. Based on research, FDI inflows are known to be sensitive to high levels of economic instability in particular, measured (e.g.) by inflation, exchange rates, and economic growth. Investors are risk averse and will typically prefer more stable economies which is to say that high volatility decreases investors' certainty around returns in the future. Empirical studies consistently have found that macroeconomic volatility is associated with decreasing FDI Instock as financial risks and investor uncertainty increase (Akin & Duru, 2021; Ashraf et al., 2020; Mencía & Roldán, 2020).

New investment in physical capital and infrastructure (Greenfield FDI) is more volatile than other types of FDI with respect to macroeconomic conditions. In fact, there are many studies that show how the high volatility decreases the attractiveness of the new investments, especially in the countries with unstable economic environment. Investors are less willing to commit substantial resources to countries with volatile inflation or exchange rates, and therefore GFDI flows decrease. Beyond that, GFDI is more vulnerable to risk factors, including sudden policy changes and economic downturns, that are more common in volatile economies (Herzer & Schmelmer, 2022; Yılmaz et al., 2021; Fruijtier et al., 2022).

Mergers and Acquisitions (M&A) and Macroeconomic Volatility: In volatile environments, M&A transactions are more resilient than Greenfield investments. M&A is lower risk because it's acquiring existing companies instead of setting up new operations. But even M&A transactions are not spared the ill effects of an unstable economy. In times of high macroeconomic volatility, M&A activity is known to decrease, because firms struggle to value the targets and to estimate the risks involved in the transactions. Political and economic instability tends to exacerbate regulatory challenges and therefore discourages M&A deals (Frenkel et al., 2021; Baker & Mahoney, 2021; Perroni & Vantaggiato, 2020).

Macroeconomic volatility has a greater impact on FDI in developing countries than in developed ones. Stronger institutions, better regulatory frameworks, lower levels of volatility – all that and more is what developed economies have in comparison and they are much preferable to foreign investors. But in developing countries, economic instability is often higher and they are more exposed to the bad effects of volatility. For example, fluctuations in exchange rates and inflation make it more probable that developing countries with a dependence on long term investments to fuel growth and development will see falls in FDI inflows. In countries with highly volatile economies, high volatility risks are even more pronounced in countries overly reliant on commodity exports or those with fragile institutional frameworks (Gnangnon, 2020; Cömert et al., 2021; Cahill et al., 2022).

On the other hand, developed countries with stable economic environment can at least reduce the impact of volatility. In any case, it should be emphasized that even in such economies, excessive volatility may be harmful with regard to investor confidence, especially in those sectors that require long term investments, like infrastructure and the hig- tech industries. According to empirical studies, FDI in developed countries tends to display a more nuanced relation with volatility than in developing countries (Zhu, 2021; Fazio, 2022).

Another determining factor for the effect macroeconomic volatility has on FDI is the amount of economic openness of a country, or the degree to which its economy is integrated into the global economy. More open countries to international trade and investment are likely to be more sensitive to external economic shocks, therefore the role of macroeconomic instability in inducing negative growth effects may be accentuated. Previous studies indicate that even a modest increase in volatility depresses FDI in highly open economies because its increased risk of capital flight or currency devaluation deters investors (Akin & Duru, 2021; Ashraf et al., 2020; Mencía & Roldán, 2020). However, less open economies may realize less of a decline in the level of FDI driven by volatility, although their attractiveness for investment may be constrained by lower standards of international exposure and trade opportunities (Perroni & Vantaggiato, 2020).

Macroeconomic volatility has a large impact on FDI, and its effects differ by type of investment and host country economic context. Developed countries are less sensitive to volatility, but the effects are much stronger in developing economies, where higher levels of economic instability depress FDI inflows, especially Greenfield investments. Both M&A activities and foreign capital are more resilient to volatility, and policy measures aimed at reducing uncertainty and encouraging stabilization are both needed to attract foreign capital.

3 Data and Methodology

This study investigates the impact of macroeconomic volatility on Foreign Direct Investment (FDI) in-stock and its relationship with macroeconomic variables. The study utilizes a panel dataset of 111 countries from 2003 to 2021. The sources for the data collections are UNCTAD, WDI, and WGI data.

As a first step, the study models the GARCH variances of GDP per capita to proxy the macroeconomic volatility and then analyzes the effect of this volatility on different types of FDI using GMM. The study uses GMM because it solves the problem of potential endogeneity in the model. Panel data is more reliable and efficient due to its large sample size and the correlation with independent variables. However, panel data also deals with individual heterogeneity of different cross-sectionals, which can lead to confounding variables.

The Model

On the bases of rigorous review of available literature, the study estimates the following three models econometric models using GMM.

$$FDI\_instock = \beta_0 + \beta_1(VOL)_{it} + \beta_2(Squ\_vol)_{it} + \beta_3(inf)_{it} + \beta_4(voice)_{it} + \beta_5(resource)_{it} + \beta_6(time)_{it} + \beta_7(pop)_{it} + \beta_8(openness)_{it} + \beta_9(saving)_{it} + \mu_{it} \quad (1)$$

$$FDI\_MA_s = \beta_0 + \beta_1(Vol)_{it} + \beta_2(Squ\_vol)_{it} + \beta_3(inf)_{it} + \beta_4(voice)_{it} + \beta_5(resources)_{it} + \beta_6(time)_{it} + \beta_7(pop)_{it} + \beta_8(openness)_{it} + \beta_9(saving)_{it} + \mu_{it} \quad (2)$$

$$FDI\_GF_{number} = \beta_0 + \beta_1(Vol)_{it} + \beta_2(Squ\_vol)_{it} + \beta_3(inf)_{it} + \beta_4(voice)_{ti} + \beta_5(resource)_{it} + \beta_6(time)_{it} + \beta_7(pop)_{it} + \beta_8(openness)_{it} + \beta_9(saving)_{it} + \mu_{it} \quad (3)$$

All the variables in included in this study are explained in Table 1 with their definitions are sources.

Table 1

Variables' Description

Variable	Sources	Definition
FDI_instock	UNCTAD	It is used to define the aggregate amount of foreign investment received by one country into another country.
FDI_MA	UNCTAD	The term "MA sellers" is often used in M&A analysis and reporting to identify and understand the entities changing ownership as a result of these transactions. The term "MA sellers" is often used in M&A analysis and reporting to identify and understand the entities changing ownership as a result of these transactions.
FDI_GF	UNCTAD	It includes launching a new business or expanding current actions in a foreign country, constructing new facilities or operations from the ground up.
Vol	By Author	Macroeconomic volatility is measured by making a GARCH variance series using different countries. Macroeconomic volatility analyses the degree of variability and uncertainty or trend.
Squ-vol	By Author	Economic analysis shows that uncertainty exists due to means deviating from the origin over time, so the squaring value is used to get more significant results in estimations.
Saving	WDI	It is an important indicator for determining a country's economic health and its capacity for investment and future growth.
Pop	WDI	The "population aged 16-64 total" denotes the working-age population in a country or region, including individuals aged 16 and 64 who are predicted to be employed or actively seeking employment.

Trade	WDI	Trade openness is a measure of a country's economic activity, based on factors such as exports and imports, trade-to-GDP ratio, tariffs and trade barriers, and foreign direct investment (FDI).
Inf	WDI	Inflation is an economic indicator that reflects the continuing rise in the overall price levels of goods and services within an economy over time, leading to a reduction in the purchasing power of a currency
Resource	WDI	Mining activities are the source of mineral rent, oil extraction is the source of oil rent, and forest rent is the utilization of forest resources.
Time	WDI	The "Time required to start a new business (days)" indicator assesses the efficiency of business registration processes, which indirectly influences governance and political participation.

4 Results and discussion

This section first discusses the descriptive analysis of the data and then furthers to interprest the regression results. Table 2 presents the statistical summary of all variables.

Table 2

Descriptive Statistics Results

Variables	Obs	Mean	Std. Dev.	Min	Max
FDI_MA	2,090	35.318	91.402	-2	868
FDI_GF	2,071	94.283	205.822	-13	1626
FDI_instock	2,109	120825.5	277474	-2073.42	2634202
Vol	2,105	1.21	4.15	0.000	1.82
Vol-sqr	2,105	1.72	7.28	3.43	3.33
Pop	2,109	3.50	1.21	57.344	9.88
Resource	2,109	7.312	10.944	0	65.163
Openness	2,052	101.664	191.079	-217.348	2543.79
Time	2,071	33.277	56.037	-32	713
Voice	2,096	-0.23	0.972	-2.259	1.751
Inf	2,033	7.130	22.831	-36.699	557.201

Results in Table 2 show that the GDP growth rate has a high level of volatility. The volatility series (volatility) has a high standard deviation (4.15E+08) while the mean is 1.21E+07. The GARCH model is used to model the volatility of the GDP growth rate series and the optimal GARCH specification for every country is reported in Table A1 in the appendix. The generalized method of moments (GMM) is used to tackle the possible endogeneity issue arising from the simultaneity between trade openness and FDI. Tables 2, 3, and 4 report coefficient estimates for the basic equation with contemporaneous explanatory variables in column (1) and all independent variables, in column (2).

Table 3

Effect of Macroeconomic Volatility on FDI Through Greenfield Projects

	Model 1	Model 2	Model 3	Model 4
Variables	**FDI_GF**	**FDI_GF**	**FDI_GF**	**FDI_GF**
FDI_GF(-1)	0.832***	0.609***	0.761***	0.520***
	78.78	17.04	43.72	34.07
Vol	-1.085*	10.65***	-2.28	-3.265***
	(-2.25)	5.26	(-1.24)	(-7.36)
Vol-squ	0.022	-0.369**	0.445**	0.112***
	1.08	(-2.79)	2.77	5.03
Saving	0.016	1.124**	0.452*	0.038
	0.21	2.89	2.08	1.71

Population	-0.000**	-0.000*	8.26E-07	-5E-07
	(-3.21)	(-2.53)	0.92	(-0.42)
Resource abundance	0.637***	4.157***	-1.267***	0.471***
	6.36	6.62	(-4.61)	7.58
Openness	0.0173***	0.430***	1.603***	-1E-05
	7.12	8.27	7.75	(-0.01)
Time	-0.0167	-0.041	-0.268*	-0.024*
	(-0.41)	(-0.25)	(-2.39)	(-2.02)
Voice	4.57	-34.66**	14.04	-8.713*
	1.55	(-3.10)	1.18	(-2.29)
Inflation	0.009	0.084*	0.066	0.391***
	0.75	2.33	1.12	14.62
_cons	19.51***	-14.3	-121.6***	-6.206
	3.78	(-0.42)	(-4.85)	(-1.05)
N	1734	580	555	599
AR (1)	-2.51	-1.72	-2.5	-2.72
AR (2)	1.19	0.87	-0.06	-1.25

In Table 3, the results of the complete sample are reported in models 1, and model 2, model 3, and model 4 show the results for countries with low, middle, and high levels of trade openness respectively. The results show that countries that attracted a high number of GF projects last year also attracted a high number of GF projects in the current year. This finding remains the same in groups of countries with low, middle, and high levels of trade openness. According to research by Su and Tao (2010), a country's ability to invest in its health sectors may be positively impacted by its economic stability, thereby increasing its appeal for GF projects. Asiedu (2002) found that countries with low openness, economic stability, and reduced political risk attract more Greenfield projects. Barro (1991) found that countries with moderate levels of openness, from high economic growth lead to increased investment in greenfield projects. Countries with high levels of trade openness, as countries open to new ideas encourage innovation and technology sharing, leading to long-lasting benefits (Jaffe and Trajtenberg, 2002).

Macroeconomic volatility has a negative impact on the number of greenfield projects in the complete sample and remains the same in a group of countries with middle and high levels of trade openness. However, in countries with low levels of openness, macroeconomic volatility positive impact on greenfield investment projects. Increased volatility decreases the number of foreign direct investments (GF) in a country, as high uncertainty in the economy reduces the number of foreign investors. Higher volatility increases risk for investors, and political and economic instability correlated with macroeconomic volatility negatively affects FDI, including greenfield investment. Rajan and Subramanian (2008) found that countries with high levels of openness are more attractive for foreign investors due to their higher potential for long-term growth and large profits. Li and Resnick (2003) found that countries with moderate levels of openness are more stable and predictable due to their established infrastructure and marketplaces. In the complete sample, all the variables' coefficient value shows that saving, resource abundance, openness, and voice has a positive impact on FDI greenfield projects except for population and time required. The results indicate that countries possessing abundant natural resources usually attract foreign direct investment (FDI) for extraction, production, or processing. (Sachs & Warner, 2001) and (Markusen, 1995). Higher FDI attracts open economies because of easier market access and lower trade barriers (Wei, 2000; Helpman et al., 2004). Attracting FDI also involves institutional voice and quality. Due to market saturation or complexity, greater populations could not have a favorable correlation with FDI. FDI may also be discouraged by extended investment approval procedure periods (Busse & Hefeker, 2007).

Saving, resource abundance, inflation, and openness have a significant positive relationship with FDI greenfield projects except for time required and voice in the countries with low level of trade openness. Dunning (1993) suggests that the size of the domestic market significantly influences the attraction of foreign direct investment (FDI). According to Caves (1971) and Markusen (1995), Resource abundance can attract foreign direct investment (FDI) for projects involving natural resource extraction. According to Wheeler and Mody (1992) and Borensztein et al. (1998), low savings and inflation may encourage investments in infrastructure projects. Stable political environments and favorable government policies can encourage FDI (Blonigen, 2005). Countries with middle levels of trade openness, Domestic saving, population, resource abundance, and trade openness coefficient all significantly attract foreign direct investment (FDI) in greenfield projects except for inflation and voice. A country that has a large population is likely to have a rising customer base, which attracts foreign direct investment (FDI) to expand the marketplace found by (Carkovic and Levine, 2002; Wheeler and Mody, 1992). According to Djankov et al. (2002) to attract foreign direct investment (FDI), government policies, regulatory frameworks, and a favorable investment climate are necessary. Countries with high levels of openness, population, voice and time required, inflation, and openness, specify a significant negative relationship with FDI greenfield projects except for saving, inflation, and resource abundance. According to Luu (2016), Large populations might be a sign of saturated markets or strong competition, which discourages foreign direct investment (FDI) because it's difficult to get started. Gupta et al. (2014) discussed that investor confidence may be adversely affected by inflation volatility and uncertainty, even in cases when moderate inflation does not discourage investment. A country may be weak if it has a high degree of trade openness without protection or depends heavily on foreign commerce, as noted by (Rodrik, 1998) and (Aizenman & Noy, 2006). The results show a significant relationship between the current variable and its lagged value at two time periods ago. However, the AR (1) coefficient is not statistically significant, suggesting no significant relationship with the variable's value at two time periods ago.

Table 4

Effect of Macroeconomic Volatility on FDI Through Mergers and Acquisition

	Model 1 **FDI_MA**	Model 2 **FDI_MA**	Model 3 **FDI_MA**	Model 4 **FDI_MA**
FDI_MAs (-1)	0.775***	0.567***	0.599***	0.117***
	74.15	18.51	40.14	4.56
Vol	-0.465*	2.928***	-7.989***	-1.368***
	(-2.29)	7.97	(-6.92)	(-9.01)
Vol- squ	0.059***	-0.069**	1.022***	0.118***
	3.63	(-3.37)	9.17	6.92
Saving	0.091**	0.509***	0.968***	0.181***
	3.19	3.55	7.85	9.5
Population	3.32E-08	-1.56E-08	1.24E-06	-0.000*
	0.38	(-0.12)	1.4	(-2.21)
Resource	0.159**	0.487***	-0.722***	-0.097*
	2.91	3.55	(-7.88)	(-2.41)
Openness	0.002**	0.118***	0.340***	-0.003**
	1.98	5.92	9.03	(-3.34)
Time	0.018	-0.003	0.021	0.009*
	1.38	(-0.10)	0.26	1.71
Voice	1.069	-2.516	9.733*	-14.19***
	0.83	(-0.82)	1.76	(-11.95)
Inflation	-0.016	0.031**	0.002	0.018
	(-1.49)	2.77	0.09	1.52

Cons	11.26* 2.61	-34.87** (-2.94)	-30.80* (-2.59)	-9.735* (-2.66)
N	1751	596	572	583
AR (1)	-2.21	-2.64	-1.59	-2.33
AR (2)	-0.85	0.63	0.17	-1.74

In Table 4, the results of the complete sample are reported in models 1, and 2, 3, and 4 show the results for countries with low, middle, and high levels of trade openness respectively. The result show that the countries which attracted a high number of mergers and acquisitions last year also attracted a high number of FDI through mergers and acquisitions in the current year. This finding remains the same in countries with low, middle, and high levels of trade openness. According to Moeller et al. (2004), countries with strong M&A activity levels can attract more deals because of market opportunity, growth in industries, or competitive advantage. Stable economic policies and regulatory environments can encourage continuous M&A activities (Aktas et al., 2015; Harford, 2005).

Macroeconomic volatility hurts FDI through mergers and acquisitions in the complete sample and remains the same in a group of countries with middle and high levels of trade openness. However, in countries with low levels of openness, macroeconomic volatility positively impacts greenfield investment projects. Macroeconomic instability can make M&A-driven foreign direct investment (FDI) in open economies more unpredictable and make investors hesitant to engage in large-scale transactions (Alfaro et al., 2004; Campa and Goldberg, 1997). Macroeconomic volatility may be advantageous for the low level of trade openness economies initially but the negative sign with square shows that the higher level of macroeconomic volatility is negatively linked to FDI through M7A. M&A may be considered a calculated strategy to establish a grip on the market, with the anticipated advantages outweighing the volatility-related risks (Gozgor, 2018; Buckley et al., 2007). The principle of risk-return trade-off in finance suggests that investors and firms may accept higher risks for higher returns. Blonigen (2005) also found in countries with low openness, macroeconomic volatility can positively influence the number of MAs, leading to favorable asset prices and increased FDI and M&A activity. According to Henisz and Delios (2001) in middle-openness countries, macroeconomic volatility can negatively impact FDI due to increasing transaction costs and making investments less attractive (Huyghebaert & Quan, 2011). In countries with high levels of openness, macroeconomic volatility can negatively affect FDI through the number of MAs, encouraging foreign investors to send home funds to more stable markets (Ghosh et al., 2019).

Countries with a low level of openness show a positive relationship of saving and resource abundance and openness with FDI through mergers and acquisitions. Higher levels of domestic savings, reduce costs and risks associated with FDI and M&A activities, making countries more attractive to foreign investors (Keller, 2002). Infrastructure development can increase FDI, while resource curses and "Dutch diseases" can affect governance, corruption, and environmental sustainability (Sachs & Warner, 1997). In countries with middle levels of trade openness, domestic saving and voice and accountability, and trade openness all significantly help attract foreign direct investment (FDI) through mergers and acquisitions. Moderately indices countries offer a stable investment climate and economic potential by balancing protectionism and openness (Nguyen, 2022). Moderate-sized populations are attractive for FDI, institutional development, and economic expansion because they provide a sizable customer base without approaching market saturation (Borensztein et al., 1998). In countries with high levels of openness; population, voice and time required, inflation, and openness, specify a significant negative relationship with FDI through mergers and acquisitions except for saving, inflation, and resource abundance. A large number of people have the potential to cause overabundance in markets, which would limit the opportunity for competitors to gain a sizable market share and expand (Zhang et al., 2003). The study demonstrates a significant relationship between the current variable and its lagged value at one time, with no significant relationship

between the two time periods. The results also show no significant relationship between the variables' lagged values at two time periods ago.

Table 5

Effect of Macroeconomic Volatility on Total FDI Inflows

	Model 1 **FDI_Instock**	Model 2 **FDI_Instock**	Model 3 **FDI_Instock**	Model 4 **FDI_Instock**
FDI_Instock (-1)	0.943***	0.991***	0.933***	0.986***
	197.94	38.69	95.02	174.23
Vol	-446.7*	-2127.3*	8311.3***	-662.5**
	-2.08	-2.06	8.55	-2.96
Vol-squ	90.18***	220.5**	-463.5***	64.73**
	4.88	2.73	(-5.70)	2.87
Saving	178.4***	-608.4**	-251.3**	190.8***
	5.66	-3.17	-3.42	9.61
Pop	0.000***	-7.2E-05	-0.000	0.001*
	3.57	(-0.34)	-1.15	2.18
Resource	30.36	396.2**	1078.7***	15.84
	0.65	2.76	9.46	0.29
Time	-3.57	-85.45	-108.4	-6.586
	-0.40	-0.69	(-1.66)	(-0.78)
Openness	-10.48***	-94.75**	-359.4***	2.342*
	(-4.85)	(-2.96)	(-5.63)	2.25
Inflation	-0.987	-40.12	-256.4***	-496.2***
	(-0.54)	(-1.62)	(-4.70)	(-12.30)
Voice	-5955.8***	30458.0*	-18152.3**	1149.9
	(-3.69)	2	(-3.36)	1.47
_cons	22254.5***	36351.5***	21890.0***	-2732.6
	-10.13	-3.87	-4.1	(-0.70)
N	1836	597	572	599
AR (1)	-2.53	-1.83	-1.34	-1.43
AR (2)	-0.41	-1.81	0.28	0.25

In Table 5, the results of the complete sample are reported in models 1, and model 2, 3, and 4 show the results for countries with low, middle, and high levels of trade openness respectively. The result is that countries that attracted an FDI Instock last year also attracted an FDI Instock in the current year. This finding remains the same in groups of countries with low, middle, and high levels of trade openness. Foreign direct investment (FDI) is continually attracted to countries with stable investment climates because of things like stable regulations, continuous policies, and stable economies (Globerman & Shapiro, 2002). FDI may be a component of a long-term investment plan where investors want to maintain current relationships and investments while also benefiting from future growth or increases in trade openness (Meyer & Nguyen, 2005). Limited trade openness does not always mean a lack of opportunity; certain economies attract targeted foreign direct investment (FDI) because they are experts in particular goods or services (Blonigen, 2005).

The coefficient of macroeconomic volatility reveals that it has a significant negative impact on foreign direct investment (FDI) inflows. Economic instability, including factors like inflation may make foreign investors uncertain to pursue FDI creating uncertainty (Borensztein et al., 1998). Rapid macroeconomic changes may make FDI projects less profitable, as investors may be unwilling to invest in countries with unstable conditions (Blonigen, 2005). Macroeconomic volatility, however, can also promote FDI in stocks by offering chances for arbitrage, higher profits, and portfolio diversification. The coefficient value sign is positive of the square of volatility, this shows that the

negative effect is moderated at high level of volatility. In low and high-openness countries, the coefficient value is negative, indicating that if volatility increases, FDI Instock decreases (Agarwal, 1980). The coefficient value of volatility indicates that increased volatility leads to increased FDI instock in middle level of openness countries. In countries with a low level of openness; saving and openness, specify a significant negative relationship with FDI instock, and resources abundance and voice and accountability positively affect FDI inflows. Countries with a middle level of openness, saving, the time required, inflation, voice, and openness, specify a significant negative relationship with FDI instock except for resource abundance. Countries with a high level of openness, saving, time required, inflation, and openness, specify a significant positive relationship with FDI instock except for the time required and inflation. Based on economic principles, there are differences in the link between a country's openness and foreign direct investment (FDI). Limited market access, unstable political environments, unpredictable policy, and a lack of legal frameworks are some of the consequences of low levels of openness that might put off international investors. Investors may be discouraged by poor governance, and middle levels may have limited access and legal restrictions. Openness levels high enough to attract international investment may also include stable government, consistent policy, and market access and integration.

5 Conclusion and Policy Suggestion:

This study examines the impact of macroeconomic volatility on Foreign Direct Investment (FDI) across 111 countries from 2003 to 2022. FDI is crucial for driving economic growth and globalization, providing benefits to both home and host countries. However, macroeconomic volatility can have a detrimental effect on FDI, as investors face uncertainty in assessing risks and returns. Factors such as high inflation rates, and costly capital further exacerbate economic uncertainty, reducing investment. The analysis employs estimation techniques involving GARCH and GMM, and results show that high macroeconomic volatility is inversely related to foreign investment, negatively impacting FDI. High inflation discourages FDI inflows, while voice accountability negatively correlates with a decline in FDI inflow to countries. Macroeconomic volatility is particularly relevant for nations with high levels of economic openness, as heightened volatility contributes to economic uncertainty. The study suggests that macroeconomic volatility is a major factor in reducing foreign direct investment (FDI). To increase investment, the government should implement policies to reduce volatility, improve voice and accountability, and encourage mergers and acquisitions. Additionally, a stable economic environment is crucial for attracting FDI, as it creates a more favorable environment for investment.

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