



THE IMPACT OF GLOBAL UNCERTAINTY AND SUBSTITUTION STRATEGY ON FOREIGN DIRECT INVESTMENT: ASIAN PERSPECTIVE

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Rani Dhiyas Pratita¹✉, Khoirunnurrofik²

^{1,2} Economics and Business Faculty, Universitas Indonesia

✉ rani.dhiyas@ui.ac.id

Abstract

This study analyzes causality between global uncertainty and Foreign Direct Investment (FDI) substitution to FDI, specifically for some Asian Countries. United Nations (2004) explains FDI is an indicator for sustainable development. It becomes crucial within the scope of Asian Countries because the majority are still developing. Measurement of global uncertainty uses the World Uncertainty Index (WUI) which is based on the quantification of text mining results in the Economic Intelligence Unit (EIU) report by The Economist. This study assumes that when global FDI is moved from certain sub-regions to other areas, the percentage of FDI to GDP of countries located in these sub-regions will decrease. The method used is fixed effect with research period of 2012-2020, this study analyzes 35 Asian Countries. However, the panel data is unbalanced. The results obtained are that WUI has no effect on FDI within the Asian countries, while substitution of FDI at the sub-regional level has a negative and significant effect.

Keywords: Foreign Direct Investment (FDI) Inflows, global uncertainty, FDI substitution, Asian countries

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INTRODUCTION

According to Ahir et al. (2018), one of the factors that can further impede and worsen economic performance is uncertainty. Besides the Economic Policy Uncertainty (EPU) Index, which has commonly been used as a proxy for uncertainty, global uncertainty has also been quantified by Ahir et al. (2020) through the World Uncertainty Index (WUI). However, this EPU index is still relatively underutilized in empirical studies.

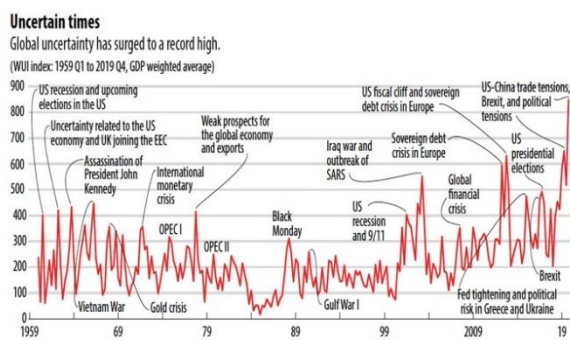


Figure 1. Global WUI from 1959 to 2019 (Quarterly)
Source: Ahir et al. (2020b)

In Figure 1, since the year 2000, the trend of global uncertainty has shown an upward trajectory, but according to Ahir et al., (2020) a more significant increase in global uncertainty predominantly occurred from the year 2012 onwards. It can be asserted that the current state of global uncertainty has become increasingly complex.

Several empirical studies have indeed been conducted to analyze the impact of global uncertainty, as proxied by the WUI, on investments. For instance, research conducted by Avom et al. (2020), Suleyman

(2020), Demir et al. (2020), and Karadag (2021) has demonstrated mostly negative effects of global uncertainty on Foreign Direct Investment (FDI).

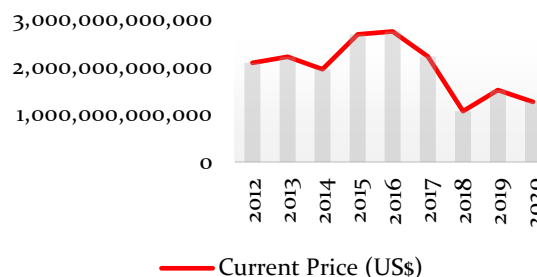


Figure 2. Global FDI from 2012-2020 (US\$)
Source: World Development Indicators, World Bank Data, 2021

There are fluctuations in the global trend and a tendency of declining FDI during the study period, as depicted in Figure 2. In the OECD publication of 2002, stability in the growth of FDI is consistently expected, as it serves as a major catalyst and a source of development. Concerning the Asian continent, recent data from UNCTADSTAT in Table 1 indicates that, on average, during the study period, FDI to this continent indeed outperformed other continents.

Table 1. Total FDI to Every Continent 2012-2020

Year	Continent				
	Asia	Europe	America	Oceania	Africa
2012	442.966	463.748	444.250	60.702	57.087
2013	450.606	443.616	457.167	57.017	50.637
2014	499.347	364.931	423.916	59.831	54.498
2015	549.227	763.718	664.156	28.615	57.922
2016	521.599	794.426	631.778	51.371	46.250
2017	545.543	513.250	484.971	48.699	40.176
2018	540.558	398.049	392.970	71.315	45.384
2019	552.384	404.756	434.007	43.801	45.678
2020	562.644	80.786	260.287	20.469	38.952

Source: UNCTAD STAT, 2022

In total, the average FDI to the Asian continent during that period amounted to \$518.319 million, with a yearly increasing trend. This surpasses the achievement of the European continent, which amounted to \$494.034 million. The European continent is generally considered to be advanced.

On the other hand, based on the WUI data, it is revealed that only 19 out of a total of 41 countries in the Asian continent exhibit a global uncertainty trend that aligns with the overall global trend. In other words, the majority of countries in Asia experienced a decrease in global uncertainty during the study period. Indonesia is one of the countries where the WUI trend has decreased. In 2012, the average WUI was approximately 0.322. However, by the year 2020, the average WUI had reduced to 0.112.

This research also aims to include other independent variables that are deemed significant and influential on FDI beyond global uncertainty. Nonetheless, the study relies on several previous empirical studies to determine control variables. The second independent variable pertains to investment diversions or shifts at the sub-regional level with respect to FDI in each country within that sub-region. The research utilizes data on total global FDI and FDI directed towards sub-regions in Asia to ascertain the percentage of diversions. The FDI data is obtained from UNCTAD STAT (United Nations Conference on Trade and

Development Statistics). In essence, when FDI decreases in a specific sub-region, it is assumed that the "import" of FDI is reduced for countries within that sub-region.

According to Research and Knowledge Management (2018) by Samruk Kazyna, the Central Asian sub-region faces challenges related to low institutional quality, in addition to geographic limitations such as being landlocked and still being influenced by the situation and conditions in post-Soviet Russia. It is observed that an increase in the percentage of global FDI substitution shifting away from the Central Asian sub-region leads to a reduction in the percentage of FDI to GDP in each country within that sub-region during the study period. This illustration is presented in Table 2.

Table 2. FDI Substitution in the Central Asian Sub-Region and the Decline of FDI in Each Country from 2012 to 2020 (USD).

Year	Percentage of FDI to GDP				
	1*	2*	3*	4*	5*
2012	6,56	3,95	-	-	3,2
2013	4,23	8,34	-	-	3,4
2014	3,3	4,59	-	-	3,6
2015	3,57	17,13	-	-	5,5
2016	12,54	9,09	3,46	-	3,5
2017	2,83	-1,39	2,47	2,89	2,5
2018	0,05	1,74	2,84	1,18	2,8
2019	2,05	4,55	2,56	3,86	2,6
2020	4,2	-5,16	1,3	2,88	1,3

*: 1) Kazakhstan, 2) Kyrgyzstan, 3) Tajikistan, 4) Uzbekistan, dan 5) Turkmenistan

Source: UNCTADSTAT and World Bank Indicators, World Bank Data, 2022

There is a lack of empirical studies specifically addressing FDI substitution at the sub-regional level. Therefore, this research only refers to statements made in the United

Nations ESCAP (Economic and Social Commission for Asia and the Pacific) (2015). According to this report, obstacles to FDI inflows in a particular region can result in the relocation of investments to other regions.

Overall, this research aims to investigate the dynamics observed when global uncertainty started to increase significantly in 2012, while the majority of countries in Asia experienced a tendency of decreasing global uncertainty. Concurrently, the trend of FDI inflows in the region showed an upward trajectory. Additionally, based on the case study in the Central Asian sub-region, an analysis of FDI substitution at the sub-regional level is also deemed intriguing for further elaboration. Given these aspects, further research is warranted to delve into the issues concerning FDI in Asian countries and its correlation with uncertainty and investment diversions. This study will attempt to address the following questions: i) what is the impact of global uncertainty on FDI and to what extent? And, ii) how does FDI substitution at the sub-regional level influence FDI and what is the magnitude of this effect?

THEORETICAL BASIS

Foreign Direct Investment (FDI)

The classical theory in Blanchard (2017) elucidates the significant role of investment in general, on the output (GDP or Y) which represents the production output of a country. The output plays a determining

factor in a nation's prosperity. GDP is the sum of: i) consumption (C), ii) investment (I), iii) government expenditure (G), and iv) net exports (NX). Often, these functions are expressed in the form of $Y = C + I + G + (X - M)$.

From the research by Razin and Sadka (2012), it is known that FDI is the only flow of cross-border capital investment that corresponds to the long-term relationship between the home country of foreign investors and/or Multinational Corporations (MNCs) with the destination country of their investments. There are two types of FDI flows. According to the World Bank and OECD, FDI refers to the value of direct investments made by non-resident foreign investors and/or MNCs in the reporting economy. On the other hand, FDI outflows or outward flows represent the value of direct investments made by domestic investors and/or resident domestic companies in the reporting economy.

The most popular types of FDI are FDI greenfield and M&A (Merger and Acquisition). FDI greenfield refer to FDI in new production units fully owned by foreign investors and/or MNCs in the host country of FDI. According to Byun et al., (2012) the government plays a significant role in maintaining the attractiveness of FDI in its country. In the presence of high financial risks due to financial instability, there is a tendency for an increase in FDI M&A. This is

evident during financial crises when many companies in crisis-hit countries are eventually sold at low prices (sharp decline in the company's value). Conversely, financial stability will lead to an increase in FDI greenfield. FDI greenfield are generally regarded as the easiest and most commonly practiced type of FDI.

According to Hong (2014), FDI has an effect on economic development. FDI triggers positive spillover effects across sectors to increase output through upstream and downstream companies. Moreover, Noor (2007) and Hong (2014) also believe that spillover effects in developing countries can encourage progress in the application of technology and employment.

Global Uncertainty

Taleb (2020) explains the existence of efforts to elucidate relatively unknown, abstract, and inherently uncertain phenomena. This is reflected in the quantification of uncertainty using the EPU Index and WUI. According to Taleb (2020), this is caused by an illusion of understanding, wherein humans seek to 'certify' uncertain events occurring in the world, which are inherently more random than perceived.

Research by Bommadevara and Sakharkar (2021), Choi et al. (2021), dan Nguyen and Lee (2021) Using the EPU Index to represent uncertainty, following Baker et al. (2016) who developed the index approximately 5 years ago. The research

findings of Bommadevara and Sakharkar (2021), Choi et al. (2021), and Nguyen & Lee (2021) confirm the negative impact of the EPU Index on FDI.

Research that utilizes the EPU Index as an independent variable can be summarized, as both the EPU Index and WUI represent the same construct, although the WUI is more comprehensive and expansive, hence being chosen for use in this study. Avom et al. (2020), Suleyman (2020), Demir et al. (2020), and Karadag (2021) in their respective researches also proxy the EPU Index with the WUI in representing uncertainty, while the study by Canh et al. (2020) combines the EPU Index and WUI.

Table 3. Recapitulation of Difference between EPU Index and WUI

Aspects	EPU Index	WUI
Data Availability	143 countries	23 countries
Source	Reports in Economics Intelegent Unit from The Economist app	Newspaper in every country
Scope	Economic policy uncertainty, risks, volatile stock markets, low economic growth, elections, terror attacks, pandemics, wars, and natural disasters.	Stock market volatility, investment, and employment growth.

The studies conducted by Avom et al. (2020), Suleyman (2020), and Demir et al. (2020) successfully confirmed a negative impact, consistent with the theoretical expectations.

However, the research by Canh et al. (2020) and Karadag (2021) yielded contrasting results. According to Avom et al. (2020), these divergent outcomes are attributed to the limited sample size and research period.

FDI Substitution

According to Cantwell & Bellak's (2000) concept, foreign investors and/or MNCs, typically dominated by economically powerful or advanced countries with significant capital, find it cost-effective to export their capital in the form of FDI. Consequently, other countries facing a "capital deficiency" may import it. On the other hand, Liao et al. (2021) explain the 'Qi-Hartman-Abel' theory, which suggests that risk-averse foreign investors and/or MNCs take on more risks, leading to increased investments to offset potential losses. Unfortunately, there is limited exploration regarding the impact of FDI substitution on global uncertainty.

Several other commonly understood reasons prompt foreign investors and/or MNCs to redirect their investments. For instance, reverse factors that drive FDI disinvestment (inhibitors) according to the ECB Economic Bulletin by the European Central Bank include: a) Exhaustion of potential markets that can support the business expansion of foreign investors and/or MNCs, b) Rising labor costs, c) Natural Resource Curse, d) Macroeconomic instability, and e) Low institutional quality.

The European Central Bank states that low institutional quality is the most important and primary discouraging factor in FDI. Institutional quality is closely related to other drivers of FDI inflows. With good institutional quality, the government should be able to enforce appropriate governance in regulations and policies related to natural resources for countries abundant in natural wealth. Additionally, foreign investors and/or MNCs will be more motivated when the domestic market of the FDI destination country is cooperative and supported by the government through its policies, maintaining strong purchasing power among the population.

This research assumes that foreign investors and/or MNCs will resort to FDI substitution when operating costs rise due to increasing labor wages. According to paycor.com, labor is one of the components of business costs. Wu et al. (2012) explain that institutional quality can reduce business costs.

Regarding macroeconomic stability, foreign investors and/or MNCs rely on institutional quality to handle large swings in inflation and exchange rate volatility. Salahodjaev & Chepel (2014), suggest that high-quality institutions also contribute to successful implementation of anti-inflation policies in developing economies. On the other hand, institutional quality is an indicator in financial development that can

address exchange rate volatility. The IMF has included institutional quality in one of its indicators for measuring financial development.

Foreign investors and/or MNCs also avoid institutional instability due to concerns about frequent changes in the legal framework and potential asset expropriation in the future. The European Central Bank explains that foreign investors and/or MNCs feel more secure when the FDI recipient country or region upholds the rule of law and private property rights.

Control Variable

The control variables are utilized in this research as an effort to address the Omitted Variable Bias (OVB). Nasrudin (2021) explains that a good control variable is one that acts as a confounder, simultaneously influencing both the dependent and independent variables. However, achieving this condition is often challenging. Generally, control variables are considered neutral as they only affect the dependent variable.

This study employs 8 control variables, with most of them having been used in previous empirical studies. Some of these control variables are also linked to the theory of uncertainty in general to elucidate the causal relationship between these control variables and the main independent variable, WUI. This is necessary due to the scarcity of research on global uncertainty.

a. Metric Ton of CO₂ Emissions per Capita:

The impact of environmental degradation on FDI is positive. According to Sarkodie & Strezov (2018), both developing and underdeveloped countries tend to excessively focus on exploiting their natural resources, leading to exploitation. Weak environmental regulations and policies facilitate excessive exploitation of the environment, which can drive larger FDI inflows. Unfortunately, there is limited direct research investigating the influence of environmental degradation on uncertainty or global uncertainty.

b. Percentage of Trade to GDP

The effect of international trade openness on FDI and uncertainty is positive. Fontagne (1999) explains that in the past, international trade encouraged FDI, but currently, FDI drives international trade. On the other hand, borrowing from the theory of uncertainty in general, increased international trade openness may lead to risk-averse behavior. Limao & Maggi (2018) explain that governments tend to enter trade agreements to mitigate risks.

c. Financial Development Index

The impact of financial development on FDI is positive, while the impact of financial development on global uncertainty is negative. According to Keykanloo et al, (2020) and Nguyen &

Lee (2021), there is a positive effect of financial development on FDI. On the other hand, according to Lensink (2000), argues that as the level of financial development in a country increases, the negative impact of global uncertainty decreases.

d. Institutional Quality Index

The influence of institutional quality has a positive effect on FDI, while institutional quality has a negative impact on uncertainty. Aziz (2018) research proves that strong institutions can attract FDI by creating a conducive business environment, thereby providing a favorable impact on FDI. On the other hand, drawing from the theory of uncertainty in general, Cabolis (2019) explains that the political and economic stability associated with institutional quality can mitigate uncertainty.

e. REER Index

The impact of exchange rate on FDI and global uncertainty is positive. According to Alba et al. (2009), an increase in the exchange rate will also increase FDI. On the other hand, Zeng et al. (2022) explain that the exchange rate of some countries may cause global uncertainty when experiencing high volatility.

f. Inflation Rate

The influence of inflation on FDI is negative, while the influence of inflation on global uncertainty is positive. Empirical

studies suggesting the adverse impact of inflation on FDI were conducted by Elar (2018). On the other hand, drawing from the theory of uncertainty in general, Logue & Sweeney (1981) explain that inflation generates uncertainty in various aspects and complicates economic agents' decision-making.

g. Per Capita GDP, Constant LCU

The impact of per capita GDP on FDI is positive, while the impact of per capita GDP on global uncertainty is negative. Hakizimana (2015) and Alshamsi et al. (2015) prove that per capita GDP influences FDI. When the economic performance improves due to an increase in per capita GDP, more FDI is attracted. On the other hand, borrowing from the theory of uncertainty in general, Avalos et al. (2022) argue that countries with high per capita GDP tend to have lower uncertainty.

h. Participation on FTA dan EIA

The influence of participation in Free Trade Agreements (FTA) and Economic Integration Agreements (EIA) on FDI is positive, while the influence of participation in FTA and EIA on global uncertainty is negative. Worth (2017) explains that international trade agreements that promote trade will increase FDI. On the other hand, drawing from the theory of uncertainty in general, increasing participation in trade agreements reduces risks and uncertainty

in general. This is explained in the research by Limão & Maggi (2018).

RESEARCH METHODS

This research will hypothesize the existence or absence of an influence of global uncertainty on FDI and the substitution of FDI at the sub-regional level on FDI itself. For the first objective, Ho states that there is no influence of global uncertainty on FDI, while H1 states that there is an influence of global uncertainty on FDI. On the other hand, for the second objective, Ho states that there is no influence of substitution of FDI at the sub-regional level on FDI, while H1 states that there is an influence of substitution of FDI at the sub-regional level on FDI.

The unit of analysis for this research is 35 countries in Asia. According to the United Nations as reported by Worldometers.com, the total number of countries in Asia is 51. However, the sampling of countries for this research is based on the criteria set by the IMF for WUI, which requires a minimum population of 2,000,000. Therefore, some of the 51 countries are excluded from the study due to not meeting the criteria, such as Bahrain, Timor Leste, Cyprus, Bhutan, Maldives, and Brunei Darussalam. Additionally, countries like Taiwan, Macau, Syria, North Korea, Lebanon, Turkmenistan, Iraq, Iran, Afghanistan, and Palestine are not included due to inadequate data availability. The research period is limited to the years 2012-2020.

Due to missing data for certain subjects in certain years, the panel data is unbalanced. This research primarily employs the fixed-effect method, which is believed to provide robust results, especially when using year dummy variables to make it a Two Way Fixed Effect (TWFE) model. Furthermore, as explained by Wooldridge (2015) and in the Econometrics Learning Material for Economic Policy by Rezki (2021) the assumption of random effects (unobserved factors are uncorrelated with independent variables) is considered too strong and highly unlikely to hold.

Table 4. List of Variables and Data Source

Variable		Source	
Percentage of FDI net Inflows to GDP		World Bank Data	
WUI		IMF	
Substitution of FDI		UNCTAD STAT	
Metric Ton of CO2 Emissions per Capita		World Bank Data	
Percentage of International Trade to GDP		World Bank Data	
Financial Development Index		World Bank Data	
Institutional Quality Index		World Bank Data	
Inflation Rate		World Bank Data	
GDP per Capita		World Bank Data	
REER Index		Bruegel	
Participation in FTA dan EIA		CEPII (<i>Gravity RTA</i>)	

Regarding its operational definition, the variables are as follows:

a. Dependent Variable

Foreign Direct Investment

FDI is defined as the cumulative global direct investment from foreign investors and/or MNCs into economies worldwide. As it is expressed as a percentage of net FDI inflows to GDP for each sampled country multiplied by 100%, the values of this variable range from 0 to 100%. The data source for FDI is the Percentage of FDI net Inflows to GDP provided by the World Bank on an annual basis.

b. Independent Variable

Global Uncertainty

As for the main independent variable, the World Uncertainty Index (WUI) is calculated by quantifying the number of words "uncertainty," "uncertain," or "uncertainties" in the Economic Intelligence Unit (EIU) Report by The Economist. This word count is then scaled up by multiplying by 1,000, resulting in a range of values from 0 to 1. A higher value of WUI indicates greater global uncertainty, and the index is published by the IMF based on the work of its authors, Ahir et al. (2018). Since the WUI is presented quarterly, this study averages the WUI for each quarter across all sampled countries to obtain an annual value.

Substitution of FDI

The Substitution of FDI at the sub-regional level, as the second independent variable, is assumed to occur when FDI decreases in each country located in a particular sub-region due to an increase in FDI substitution within that sub-region, such as in the case of Central Asian sub-region. The formula for calculating the Substitution of FDI at the sub-regional level is specified in equation 1. As it is expressed as a percentage, the values of this variable range from 0 to 100%. The data sources for this variable are annual FDI Inward Flows, both globally and per sub-region in Asia, provided by UNCTAD STAT.

Calculation formula:

$$\frac{(Global\ FDI) - (FDI\ to\ Sub-Region\ X)}{Global\ FDI} \times 100\% \dots (1)$$

c. Control Variable

Metric Ton of CO₂ Emissions per Capita (COE)

COE expressed in decimal units, is assumed to be a consequence of economic activities with negative impacts on the environment. The references for using this variable are the studies conducted by Avom et al. (2020), Bommadevara & Sakharkar (2021), and Canh et al. (2020).

Percentage of International Trade to GDP (TP_GDP)

TP_GDP expressed in percentage units, is assumed to measure international trade activities within the economy. The references for using this variable are the

studies conducted by Canh et al. (2020) and Demir et al. (2020).

Financial Development Index (FD_Index)

FD_Index expressed in decimal units with a range from 0 to 1, is assumed to provide an overview of financial conditions, with higher values indicating better financial depth, access, and efficiency. The references for using this variable are the studies conducted by Canh et al. (2020) and Demir et al. (2020).

Institutional Quality Index (IQI)

IQI expressed in decimal units with a range from -2.5 to 2.5, is related to indicators such as a) voice and accountability, b) political stability and absence of violence or terrorism, c) government effectiveness, d) regulatory quality, e) rule of law, and f) control of corruption. The reference for using this variable is the study conducted by Bommadevara & Sakharkar (2021).

Real Effective Exchange Rate (REER) Index (REER_Index)

REER_Index expressed in percentage units, is assumed to be one of the indicators that often experiences volatility during macroeconomic instability. This index represents the flexible real exchange rate with available data. The reference for using this variable is the study conducted by Canh et al. (2020).

Inflation

Inflation expressed in percentage units, is assumed to be an indicator of

macroeconomic instability, representing the general increase in prices within the economy. Inflation is calculated based on the Consumer Price Index (CPI) as it is also a component of the REER Index. The references for using this variable are the studies conducted by Bommadevara & Sakharkar (2021), Canh et al. (2020), Nguyen & Lee (2021), and Suleyman (2020).

GDP per Capita (GDPcapita)

GDPcapita expressed in US dollars, is one of the indicators of economic performance calculated by dividing the GDP per capita of each sampled country in a specific year by the country's population at mid-year. The references for using this variable are the studies conducted by Choi et al. (2021) and Demir et al. (2020).

Participation in Trade Agreements (dumFTA_EIA)

dumFTA_EIA expressed as a dummy variable (1: participating in Free Trade Agreements (FTA) and Economic Integration Agreements (EIA), 0: not participating in FTA and EIA at all). FTA and EIA are types of Regional Trade Agreements (RTA) that address trade in goods and services simultaneously.

Using STATA version 16, this study attempts to process the main econometric model that includes all variables in the research. The econometric model is as follows:

$$FDI_{it} = \alpha_i + \beta_1 WUI_{it} + \beta_2 SubsFDI_{it} + \beta_3 \log COE_{it} + \beta_4 TP_GDP_{it} + \beta_5 FD_Index_{it} + \beta_6 IQI_{it}$$

$$+ \beta_7 REER_{it} + \beta_8 Inflation_{it} + \beta_9 \log GDP_{capita_{it}} + \beta_{10} dumFTA_EIA_{it} + \mu_t + \lambda_i + \varepsilon_{it} \dots \dots \dots (2)$$

Note:

- i = 1, 2, ... n (countries)
- t = 1, 2, ...t (periods)
- FDI = Percentage of Foreign Direct Investment net Inflows to GDP
- WUI = *World Uncertainty Index*
- Subs FDI = Substitution of FDI at the sub-regional level
- logCOE Emissions = Metric Ton of CO₂ per Capita
- TP_GDP = Percentage of International Trade to GDP
- FD_Index = *Financial Development Index*
- IQI = *Institutional Quality Index*
- REER_Index = REER Index
- Inflation = Inflation Rate
- logGDPcapita = GDP per Capita (Constant Price)
- dumFTA_EIA = Participation in FTA dan EIA
- α = Constanta
- β₁, β₂, ..., β_i = Coefficients estimating the causality between FDI and the main independent variables and control variables for each sample country
- μ_t = Coefficients estimating time effects for period t
- λ_i = Coefficients estimating country effects for country i
- ε_{it} = Error term

This study will also attempt other regression models based on the categories of control variables on the right-hand side of the model. The reason for this model breakdown is to enrich the regression results with various

variations and, at the same time, conduct a robustness check.

RESULT AND DISCUSSION

Research Results

The total sample of this study consists of 290 observations from 35 selected countries. All these countries are categorized according to their geographic regions into sub-regions in Asia, namely East Asia, South Asia, Southeast Asia, West Asia, and Central Asia. The following are the sample countries used:

- a. East Asia: 1) China, 2) Japan, 3) South Korea, 4) Mongolia, and 5) Hong Kong.
- b. South Asia: 1) India, 2) Pakistan, 3) Bangladesh, 4) Nepal, and 5) Sri Lanka.
- c. Southeast Asia: 1) Indonesia, 2) the Philippines, 3) Vietnam, 4) Thailand, 5) Myanmar, 6) Malaysia, 7) Cambodia, 8) Singapore, and 9) Laos.
- d. West Asia: 1) Saudi Arabia, 2) Jordan, 3) United Arab Emirates, 4) Oman, 5) Kuwait, 6) Qatar, 7) Yemen, 8) Turkey, 9) Azerbaijan, 10) Georgia, 11) Armenia, and 12) Israel.
- e. Central Asia: 1) Kazakhstan, 2) Kyrgyzstan, 3) Tajikistan, and 4) Uzbekistan.

The results of the Hausman test shown in Table 5, where the p-value (significance) is 0.6616, which is greater than the alpha (α) of 0.05 for a confidence level of 95%. This means that the test supports the use of the random effect method as more appropriate. However, based on Wooldridge

(2015) and the Course Material on Econometrics for Economic Policy by Rezki (2021), it is explained that the assumption of random effects (unobserved factors not correlated with independent variables) is considered too strong and is likely to be very difficult to occur. Therefore, conservatively, the fixed effect will still be used.

Table 5. Hausman Test Result

	WUI	Subs FDI
Coef. Fixed Effect (b)	0,031	-0,32

Random Effect (B)	0,032	-0,34
Diff. (b-B)	-0,0006	0,03
Sqrt(diag(V_b-V_B)) S.E	0,008	0,13

Source: World Bank Data, IMF, UNCTAD STAT, 2022, reprocessed

The estimation obtained from the main econometric model with all control variables in Table 6 indicates that WUI has no significant impact on FDI, while Substitution of FDI at the sub-regional level has a negative and significant effect at a 95% confidence level on FDI. This

Table 6. Estimation Result

Variables (Y=FDI)	Model 1 FDI	Model 2 FDI
WUI	0.026 (0.021)	0.032 (0.025)
Subs FDI	-0.34** (0.131)	-0.322** (0.132)
Metric Ton of CO2 Emissions per Capita	0.077 (0.046)	0.062* (0.035)
Percentage of International Trade to GDP	0.02 (0.02)	0.025 (0.024)
Inflation Rate	0.493 (0.334)	0.585 (0.369)
GDP per Capita	-0.16 (0.021)	-0.144 (0.096)
Financial Development Index		-0.061 (0.067)
REER Index		0.001 (0.000)
Institutional Quality Index		0.012 (0.055)
0. FTA and EIA Participation	0.000 (.)	0.000 (.)
1. FTA and EIA Participation	-0.021** (0.009)	-0.019* (0.010)
Year Effect	Yes	
Country Effect	Yes	
cons	1,15* (0.59)	1.006* (0.510)
N	290	290
r2	0,117	0.129
r2_a	0.069	0.071

Standard errors in parentheses, * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Source: World Bank Data, IMF, UN Comtrade, CEPII, dan Bruegel, 2022, reprocessed

means that if there is a 1% increase in Substitution of FDI at the sub-regional level, FDI in the respective sub-regional sample country will decrease by 0.322%.

Regarding robustness checking, the data processing results in Model 1 show similar findings. Consistently, at a 5% significance level, WUI remains insignificant in influencing FDI across all sample countries, while Substitution of FDI at the sub-regional level continues to have a statistically significant negative impact. This study deliberately excluded control variables related to indices, especially the Institutional Quality Index that measures institutional quality, to highlight their role in estimating the coefficients of independent variables.

The choice of the Institutional Quality Index as the variable to measure institutional quality is based on empirical studies, as this variable is considered one of the determining factors for FDI and also most relevant in preventing FDI substitution. Although this variable does not significantly affect FDI, it is considered a good control variable because the estimated coefficients of WUI and Substitution of FDI tend to be constant, and the adjusted R² increases.

In the adjustment process, when control variables such as Financial Development Index, REER Index, and Institutional Quality Index are excluded in Model 1, the adjusted R² value is 6.9%. However, when these control variables are

included in the main econometric model, the adjusted R² increases by 0.2 percentage points due to the corrective effects. Overall, in the model comparison test, this study demonstrates that the main econometric model (Model 2) outperforms Model 1. Therefore, this study will also further incorporate one of the most important control variables, namely institutional quality, into policy recommendations.

Discussion

In confirming the research hypotheses, this study rejects H₁ for the hypothesis related to the relationship between global uncertainty and FDI. In other words, this study finds no significant influence of WUI on FDI. Regarding the hypothesis on the relationship between Substitution of FDI and FDI, this study rejects its null hypothesis (H₀) and provides evidence of the impact of FDI substitution on FDI, as confirmed in this research.

The assumption in this study is that global uncertainty cannot explain the variation in FDI across each country within the scope of a continent, even if the continent is classified as an emerging economy as a whole. Moreover, this study significantly differs from previous empirical studies conducted by Avom et al. (2020), Suleyman (2020), Demir et al. (2020), and Karadag (2021), which found evidence of the influence of global uncertainty on FDI. The fundamental difference lies in the scope of

research, as these empirical studies categorized countries into developed, developing, and less developed, instead of analyzing a continent with a relatively homogenous level of economic development.

Regarding the second independent variable, this study confirms the assumption of investment substitution. It is observed that the impact of Substitution of FDI at the sub-regional level on FDI in the respective sub-regional sample countries is consistent with the expected direction, as it shows a negative sign. This finding aligns with the case study of the Central Asian sub-region, which refers to the United Nations ESCAP (Economic and Social Commission for Asia and the Pacific) (2015).

Figure 3 illustrates the low level of WUI within the scope of the Asian continent, where the economies are relatively still developing. Within the range of 0-1 for WUI, the majority of the sample countries show that global uncertainty is indeed low in this research. This is indicated by the distribution of the samples, which is close to 0. As the value approaches 1, it is considered that the impact of global uncertainty becomes more significant. In further calculations at the sub-regional level, Southeast Asia experiences the lowest impact of global uncertainty during the studied period, with an average WUI of 'only' 0.12, whereas the opposite is observed in the Central Asian sub-region, with a value of 0.17.

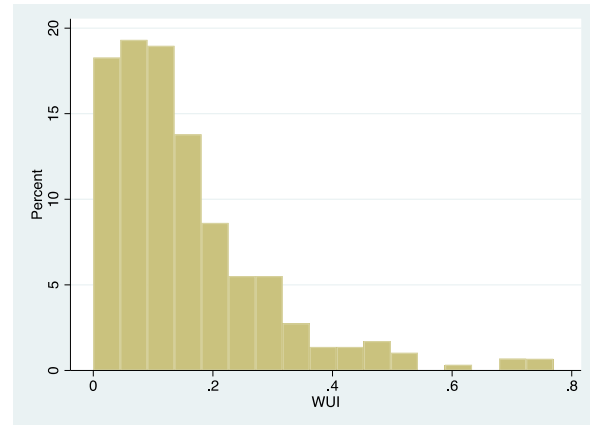


Figure 3. Distribution of WUI
Source: IMF, 2021, reprocessed

This study aims to extend the analysis to include the overall WUI for the continents of Africa, America, Europe, and Oceania during the research period. It is noted that the WUI data is available for 143 countries, comprising 41 countries in Asia, 44 countries in Africa, 22 countries in America, 33 countries in Europe, and 3 countries in Oceania. On average, as shown in Table 7, the WUI in Asia tends to be lower compared to the other four continents. Conversely, Africa is the continent with the highest average WUI value.

This study confirms the statement by Ahir et al. (2020b) regarding higher global economic uncertainty in more advanced economies, as evidenced by the average WUI value in Europe, which is 0.273, being higher than that of America and Oceania. Furthermore, when compared to the average WUI value in Asia, which is 'only' 0.157, the difference can be considered quite drastic. However, advanced economic regions indeed possess the ability to adjust quickly to such shocks due to strong connectivity within the

Global Value Chains (GVC) and high levels of financial development.

Table 7. Average WUI in Each Continent Worldwide for the Years 2012-2020

Continent	Asia	Africa	America	European	Oceania
Rerata WUI	0,157	0,281	0,268	0,273	0,171

Source: IMF, 2022

On the other hand, Ahir et al. (2018) themselves stated that the WUI, as a global uncertainty index they constructed, has a positive association with the EPU Index due to similar trends. Over the period from 1996 to 2017, the correlation coefficient between WUI and EPU Index reached 0.705. This study attempts to confirm the same for the years 2012 to 2020, and the obtained correlation is much smaller. The results from this study in Table 8 for 23 countries that include WUI and EPU Index also show a correlation coefficient of 0.1958. Moreover, even for countries in Asia with available data such as China, Hong Kong, India, Japan, South Korea, and Singapore, the correlation relationship is only 0.046.

Table 8. Correlation between WUI dan EPU Index 2012 - 2020

	23 Countries		6 Countries (Asian Countries)	
	EPU	WUI	EPU	WUI
EPU	1,0000		1,0000	
WUI	0,1958	1,0000	0,046	1,0000

Source: IMF and Economic Policy Uncertainty, 2022, reprocessed

Based on the trends shown in Table 9, FDI is expected to continue flowing to the continent of Asia. However, the United Nations ESCAP (Economic and Social

Commission for Asia and the Pacific) (2019) also explained the threat of a decline in FDI Greenfields in 2019 due to the Covid-19 pandemic. Nevertheless, the table also indicates that overall FDI managed to increase in 2019. Furthermore, Gopalan & Sharipova (2021) stated that, overall, the continent of Asia remains predictable, stable, and conducive for foreign investors and/or MNCs to invest. According to these researchers, regardless of the post-Covid-19 situation, there is a tendency for FDI to continue increasing as countries in Asia are opening up further to global FDI through incentives and relaxed FDI policies. Additionally, the trade tensions between the United States and China are seen as an opportunity for developing and less developed countries in Asia to position themselves as alternative destinations for global FDI.

Table 9. FDI Trend to Asia Continent 2012-2020

Year	FDI
2012	442.966
2013	450.606
2014	499.347
2015	549.227
2016	521.599
2017	545.543
2018	540.558
2019	552.384
2020	562.644

Source: UNCTAD STAT, 2022

Regarding the other independent variables, the average FDI substitution rate during the study period for the entire continent of Asia is approximately 65%. This means that 65% of the total global FDI is redirected from the region of Asia to other regions, while 32% of the total global FDI continues to be directed towards Asia. This percentage can be considered quite significant. It is assumed that 65% of the total global FDI will be distributed among the four continents other than Asia. If evenly distributed, each of Europe, America, Australia (Oceania), and Africa will receive only about 16.25%.

In more detail, at the sub-regional level, it is found that the average global FDI directed to the East Asia sub-region reaches about 18.2%, leaving 81.8% of the global FDI substituted to other regions. Additionally, the Southeast Asia sub-region became the second-ranked destination for FDI as 90.9% of the global FDI is redirected to regions other than the Southeast Asia sub-region. The largest FDI substitution is experienced by the Central Asia sub-region, as it only receives approximately 1% of the global FDI. This information is shown in Table 10.

Table 10. Average FDI for Asia and Global for the Years 2012-2020

Year	Scope	
	Asia	World
2012	442.966	1.468.753
2013	450.606	1.459.043
2014	499.347	1.402.522
2015	549.227	2.063.638

2016	521.599	2.045.424
2017	545.543	1.632.639
2018	540.558	1.448.276
2019	552.384	1.480.626
2020	562.644	963.139

Source: UNCTAD STAT, 2022

The global FDI is mostly absorbed by the East Asia sub-region. The economies of most countries in this sub-region are indeed very strong. Despite the structural changes in China that have played a significant role in FDI substitution outside the East Asia sub-region, it remains the most favored sub-region. This sub-region can be considered to have the most attractive prospects for FDI, which is why a large portion of the global FDI is directed there.

Table 11. Substitution of FDI in Asia Sub-Region

Year	1	2	3	4	5
2012	93,5	85,9	68,6	92,6	98,8
2013	95,8	87,8	80,8	96,0	99,0
2014	96,1	89,9	80,9	96,4	99,0
2015	96,1	90,5	82,7	96,8	99,3
2016	96,2	90,7	82,8	97,0	99,3
2017	96,8	91,9	84,5	97,3	99,4
2018	96,9	92,3	84,7	97,5	99,5
2019	97,5	94,4	85,4	97,5	99,5
2020	97,6	94,5	85,8	97,8	99,5

*: 1) West Asia, 2) Southeast Asia, 3) East Asia, 4) South Asia, and 5) Central Asia

Source: UNCTAD STAT, 2022

The global FDI is predominantly absorbed by the East Asia sub-region. The economies of most countries in this sub-region are indeed very robust. Despite the structural changes in China that have significantly influenced FDI substitution outside the East Asia sub-region, the East Asia sub-region remains the most favored destination. This sub-region can be considered to have the most attractive

prospects for FDI, leading to a substantial inflow of global FDI.

In the case of the Central Asia sub-region, almost all global FDI is directed towards other regions. However, it is important to note that the Central Asia sub-region is comprised of only five countries: Kazakhstan, Uzbekistan, Turkmenistan, Kyrgyzstan, and Tajikistan. According to a report from the Research and Knowledge Management Department of Samruk Kazyna, one of the stock companies in Kazakhstan, the share of FDI in the GDP of the Central Asia sub-region is lower compared to other sub-regions with similar developing economies.

Table 12. Coefficient of Correlation Relationships on Independent and Dependent Variables.

	FDI	WUI	Subs FDI
FDI	1,0000		
WUI	-0,0283	1,0000	
Subs FDI	-0,2787	0,0722	1,0000

Source: World Bank Data, IMF, UNCTAD STAT, 2022, reprocessed

There is a correlation relationship between the WUI variable and FDI substitution, as shown in Table 12, although it is relatively small. According to UCLA Advance Research Computing of Statistical Methods and Data Analytics, a correlation relationship is detected when the coefficient obtained falls within the range of 0-1. The data processing results between these two independent variables show a coefficient of 0.0722 with a positive direction. There is a

possibility that an increase in FDI substitution occurs along with an increase in WUI. On the other hand, the correlation relationship between FDI and FDI substitution is larger than the correlation relationship between FDI and WUI. Moreover, the coefficient of the correlation relationship between FDI and WUI is only 0.0283. However, both correlation relationships have a negative direction as assumed. In other words, in the correlation relationship, an increase in global uncertainty and FDI substitution occurs simultaneously with a decrease in FDI.

This study conducted additional tests through regression analyses conducted for each sub-region in Asia. Although not the main findings, the results in Table 13 are quite interesting. Using the panel data TWFE method, this study attempted to detect the causal relationship between global uncertainty and FDI substitution towards FDI.

WUI can significantly and negatively affect FDI in the sample countries in the Central Asia sub-region, while WUI also has a positive impact on FDI in the sample countries in the East Asia and Southeast Asia sub-regions. In the Central Asia sub-region, a 1% increase in WUI will decrease FDI in those sub-region countries by 0.345% each, while in the countries of the East Asia and Southeast Asia sub-regions, it experiences an increase of 0.118% and 0.031%, respectively. On the other

hand, FDI substitution at the sub-regional level does not have any significant impact on FDI in the sample countries across all sub-

regions. This is due to the limited number of observations and variations in that variable during the data processing.

Table 13. Results of Regression Tests per Sub-Region in Asia

Dependent Variable = FDI	Central Asia	East Asia	Southeast Asia	South Asia	West Asia
WUI	-0.345*** (0.056)	0.118*** (0.025)	0.031** (0.012)	0.003 (0.005)	0.032* (0.015)
Subs FDI	5.828* (2.408)	-1.279* (0.555)	-0.215 (0.571)	0.017 (0.099)	0.409 (0.581)
Metrik Ton of CO ₂ Emissions per Capita	0.491 (0.212)	0.403 (1.115)	0.012 (0.024)	0.001 (0.023)	0.082 (0.094)
Percentage of Int. Trade to GDP	-1.899* (0.794)	0.074 (0.174)	-0.009 (0.024)	0.002 (0.017)	-0.012 (0.019)
Financial Development Index	5.456* (2.248)	-0.448 (0.575)	-0.222 (0.127)	0.057 (0.056)	0.003 (0.072)
Institutional Quality Index	0.364* (0.147)	0.141 (0.246)	0.019 (0.020)	-0.016* (0.007)	-0.000 (0.020)
REER Index	-0.026** (0.008)	0.002 (0.002)	0.000 (0.001)	0.000 (0.000)	0.000 (0.000)
Inflation Rate	-2.687 (1.409)	5.330*** (1.199)	0.065 (0.131)	0.012 (0.036)	0.261* (0.143)
GDP per Capita	3.541* (1.494)	-1.025 (0.524)	-0.111 (0.296)	0.037 (0.027)	-0.085 (0.125)
0.fta_eia	0.000 (.)	0.000 (.)	-	0.000 (.)	0.000 (.)
1.fta_eia	-0.187 (0.114)	0.231* (0.101)	0.000 (.)	0.000 (.)	-0.002 (0.009)
_cons	-17.655* (7.048)	6.595 (3.153)	0.992 (2.269)	-0.227 (0.247)	-0.072 (0.701)
Country Effect	Yes				
Year Effect	Yes				
N	27	45	81	40	97
r2	0.908	0.540	0.241	0.306	0.244
r2_a	0.699	0.250	0.051	-0.176	0.081

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Source: World Bank Data, IMF, UN Comtrade, dan Bruegel, 2022, reprocessed

WUI has a negative and significant impact on FDI in the sample of countries in the Central Asian sub-region, while it also affects FDI in the samples of countries in the East Asian and Southeast Asian sub-regions, but with a positive influence. In the Central Asian sub-region, a 1% increase in WUI will lead to a decrease in FDI in these countries by 0.345% each, while in the East Asian and Southeast Asian sub-regions, FDI will

increase by 0.118% and 0.031%, respectively. On the other hand, Substitution FDI at the sub-regional level has no significant effect on FDI in the entire sample of sub-regions. This lack of effect is due to the limited number of observations and variations in this variable during the data processing.

The Central Asian sub-region indeed has the highest average global uncertainty. Therefore, its strong influence can be

detected. Additionally, most of the sample countries in this sub-region are third-world countries, which tend to follow the increasing trend of global uncertainty during the research period.

The results showing a positive influence of global uncertainty on FDI at the sub-regional level have also been obtained in the empirical studies by Canh et al. (2020) and Karadag (2021). In the case of the East Asian and Central Asian sub-regions, this might happen because foreign investors and/or MNCs expect higher returns, even with increased risks. If anchored with an anchoring bias, this might not align with the initial perception of uncertainty. Moreover, the average global uncertainty in the East Asian and Southeast Asian sub-regions is the second lowest. The economies of these two sub-regions are also prominent. According to Karadag (2021), despite being beneficial for FDI, global uncertainty still needs to be considered.

Overall, to sustain FDI to Asia, improving institutional quality is essential. Policies, legislation, regulations, and institutions need proper reform to encourage FDI's greater role in development. For instance, countries in Asia with abundant natural resources require regulations that govern their sustainable utilization, preventing environmental degradation due to exploitation. Moreover, for countries in Asia with large populations, policies to boost

purchasing power are needed to accommodate the motives of foreign investors and/or MNCs seeking business expansion and marketing.

Regarding good governance, institutional quality is the most important driver and pillar for other drivers. According to Siyakiya (2017), institutional quality plays a crucial role in enhancing the economic performance of advanced countries. Therefore, developing countries need to make strong efforts to improve their institutional quality to attract more FDI and stimulate economic performance. Moreover, for countries facing some lag due to geographical conditions, such as the countries in the Central Asian sub-region, these efforts can help address the issues causing high FDI substitution there.

CONCLUSIONS AND SUGGESTIONS

Conclusion

This research was unable to detect the influence of global uncertainty on FDI to Asia. Therefore, the research hypothesis rejects the existence of causality between global uncertainty and FDI. Through robustness checking, consistent results were obtained, confirming the same conclusion. The research only found a correlation where the low global uncertainty represented by the low WUI values of Asian countries coincided with high FDI inflows to the continent. However, this does not imply a cause-and-effect relationship between the two variables.

This research identifies the influence of Substitution FDI at the sub-regional level on FDI in the sample countries of that sub-region. Hence, the hypothesis that stated the absence of a causal relationship between the two variables is rejected by this study. Robustness checking also yielded consistent results, confirming the same conclusion. Quality institutions can also reduce Substitution FDI at the sub-regional level, especially when the sub-region faces geographical constraints. Based on the results of panel data regression, the best model of this research was obtained, namely the Fixed Effect Model. The results showed that partially the General Allocation Fund (GAF) and Special Allocation Fund (SAF) had a positive and significant effect on district/city expenditures in Bengkulu Province, while economic growth had a negative and significant effect on district/city expenditures in Bengkulu Province, while Local Own-Source Revenue (OSR) did not affect district/city expenditures in Bengkulu Province. Meanwhile, simultaneously General Allocation Fund (GAF), Special Allocation Fund (SAF), Economic Growth and Local Own-Source Revenue (OSR) have a positive and significant effect on district/city expenditures in Bengkulu Province with an Adjusted R-squared amount of 89 percent. This shows that economic growth, General Allocation Fund (GAF), Special Allocation Fund (SAF) and Local Own-Source Revenue

(OSR) are able to explain the Regional Expenditure by 89.04 percent, while 10.96 percent is explained by other variables outside the variables of this study.

Suggestion

The attractiveness of FDI in Asia should be carefully considered in investment decisions as the FDI trend consistently indicates an increasing tendency. However, each country still needs continuous efforts to sustain the inflow of FDI. The data processing results have not provided significant evidence of the influence of institutional quality on FDI due to various factors such as the research period's context and the selection of sample countries. The research aligns with the argument that institutional quality is the most critical and relevant factor among all motives driving FDI, and it should be prioritized for improvement. Institutional quality also plays a role in promoting the other three motives. Therefore, this research includes the variable of institutional quality in the control variables.

Implications and Limitations: This research has not considered the potential endogeneity between the independent variables and the dependent variable. Therefore, there is a possibility of unaddressed reverse causality. On the other hand, in the sub-regional analysis, the limited sample size during data processing could potentially reduce the R², indicating the model's fit. Future research is expected to

address these issues to improve the estimation results.

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