

## THE EFFECT OF CORPORATE TAX POLICY ON FOREIGN DIRECT INVESTMENT: EMPIRICAL EVIDENCE FROM ASIAN COUNTRIES

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### ABSTRACT

The phenomenon of Corporate Tax Rate (CTR) reduction to attract Foreign Direct Investment (FDI) has been an interesting subject given the lack of consensus from empirical studies. This study aims to provide empirical evidence on the relationship between CTR and FDI, and examine factors that influence FDI inflows. Using data for 28 Asian countries from 1999 to 2014, we find that CTR has a significant negative effect on FDI inflows. FDI inflows increase by 4.38% due to a 1% CTR reduction. We also find that other economic factors, such as economic openness, market size, and exchange rates play an important role in attracting FDI inflows.

*Keywords:* Foreign direct investment; Corporate tax rates; Fixed effect model; System GMM.

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## I. INTRODUCTION

Global corporate tax rates have decreased by 17.08%, from 41.74% in 1980 to 24.66% in 2019 (Tax Foundation, 2021). This dynamic, which has emerged over the past half-century, in the classical economic sense, is a race to the bottom in Corporate Tax Rates (CTR).<sup>1</sup> This is driven by the government's fear of the potential loss of revenue if due to the imposition of exorbitant corporate taxes, multinational companies move their operations overseas. This phenomenon is also linked to the government's desire to attract and increase inflows of Foreign Direct Investment (FDI).

This paper examines whether, or not, these reductions in CTR are attracting more FDI into the country. We, therefore, hypothesize that the CTR reduction policy explains the FDI movement. We also investigate other factors which may be effective in attracting FDI. In all, we examine issues which are of great interest to policy.

Using Arellano-Bond Estimator to minimize the endogeneity issue as explained by Leszczensky *et al.* (2018), we document several interesting findings. First, we find a significant role of CTR in attracting FDI, such that, for every 1% CTR reduction corresponds to an increase in FDI inflows by 4.38%. Second, our analysis identifies other effective factors that influence FDI. In addition to CTR, the degree of openness, market size, and exchange rates also play a key role to attract FDI inflows.

To ascertain the robustness of our result, we perform a few important robustness checks. We conduct our analysis by breaking the variables into three models to analyse to what extent the results of study are consistent. We also use four different estimators to find out the best estimation. Moreover, we have clustered standard errors at the country level to obtain accurate standard errors.

Our motivation for examining the relative importance of CTR reduction policy in attracting FDI is twofold. The first motivation is theoretical and has roots in the work of Dunning (2000). He emphasized that the scope, geography, and composition of foreign production industries conducted by multinational companies were determined by the interaction of three interdependent variables (sub-paradigms). These variables include Ownership (O) specific advantage, Internalization (I) advantage, and Locational (L) specific advantage. According to Eden and Dai (2010), this consideration is a critical point for companies deciding to export or provide FDI. This strategy is known as location advantage (L) and tax policy can influence FDI through this advantage. The second motivation comes from Indonesia's CTR reduction policy to attract more FDI which has accelerated in the pandemic era. The Indonesian administration has revealed that over the period 2020-2022, the CTR has been slashed gradually from 25% to 20%.<sup>2</sup> On the other side, the current literature documents that Indonesia's Tax Ratio is getting lower indicating that we need more tax revenues to finance economic recovery. This raises a question of how large CTR reduction effectively attracts FDI.

<sup>1</sup> The opinion is sourced from washingtonpost.com available at <https://www.washingtonpost.com/opinions/2021/06/09/janet-yellen-global-corporate-minimum-tax-finance-ministers/>

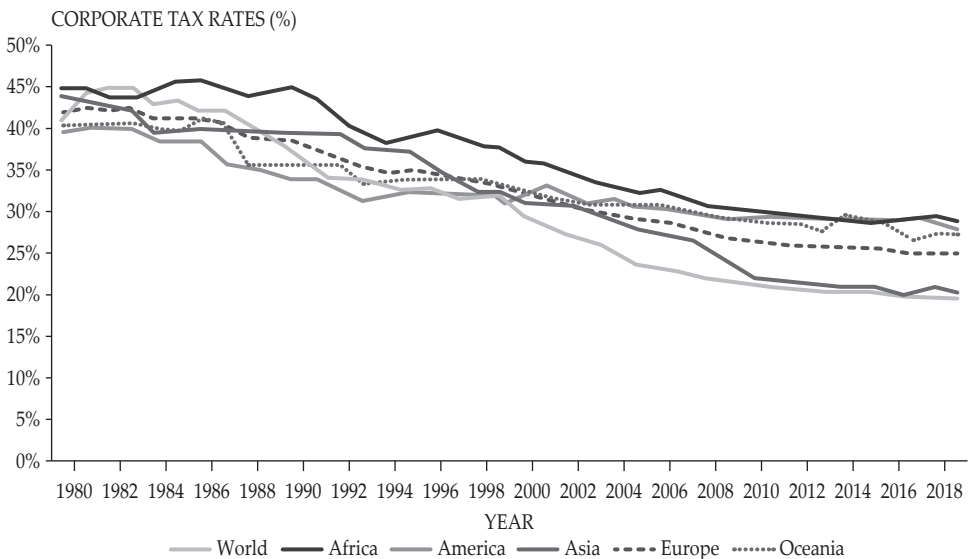
<sup>2</sup> This policy is stated in Government Regulation Number 30 of 2020. It is stated that the 22% tariff will apply in 2020 and 2021 and a 20% tariff will come into effect in the 2022 fiscal year.

FDI plays a vital role in accelerating economic growth and sustainable development in most countries. Its positive externalities, saving, technology transfer and innovation, entrepreneurship and linkages, and employment and skill development are the main channels (UNCTAD, 1999). According to Afin *et al.* (2005), the main aspect of FDI is its effect on the host country's economy, which for developing countries is essential as investment inflows are seen as improving economic performance.<sup>3</sup>

Those positive externalities, then justify most countries to conduct tax reduction policies to attract investment. As noticed from Figure 1, globally, CTR decreased by 17.08% from 41.74% in 1980 to 24.66% in 2019. Geographically, the smallest CTR reduction was in the American region, 12.05% from 39.60% to 27, 55%. Meanwhile, the largest decline was in the Asian region by 23.21% from 43.75% to 20.54%, followed by the European regional average of 21.25% from 40.50% to 19.25%. As for Africa and Oceania, they fell by 15.66% and 13.25%, respectively. This CTR reduction policy is an effort to attract investment from various countries.

**Figure 1.**  
**Corporate Tax Rates Decreasing Trend**

This Figure shows the CTR reduction trend for the last four decades throughout the world. Source: Author calculation based on Tax Foundation (2021).



However, the OECD (2008) shows that although tax is recognized as an important factor in investment decision-making, it is not the main determinant. Multinational corporations move to countries that offer access to markets and profit opportunities, predictable and non-discriminatory legal and regulatory

<sup>3</sup> Afin *et al.* (2008), "Perdagangan Internasional, Investasi Asing, dan Efisiensi Perekonomian Negara-negara ASEAN", Bulletin of Monetary Economics and Banking, January 2008, page 287.

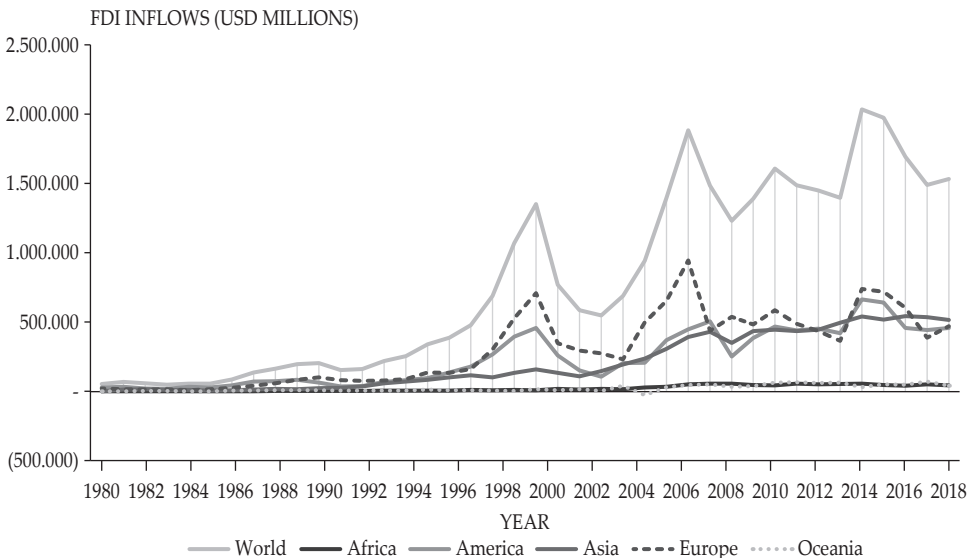
frameworks, macroeconomic stability, skilled and responsive labour markets, and well-developed infrastructure. All these factors will affect the long-term profitability of a project.

Apart from tax policy, studies indicate several economic and non-economic factors that can influence FDI inflows. From the economic aspect, the degree of openness is the most important factor determining investment decisions (Asiedu, 2002; Gould *et al.*, 2014; Jafarnejad *et al.*, 2009). Another economic factor that has also been empirically proven to have the most influence on FDI inflows is the market size (Ang, 2008; Azam, 2015; Castro *et al.*, 2013; Chan *et al.*, 2014; Juárez Rivera and Castro, 2013; Moosa and Cardak, 2006; Sujarwati and Qibthiyyah, 2020; Tintin, 2013) and resource availability (Bevan and Estrin, 2004; Hunady and Orviska, 2014; Huyen, 2015). Meanwhile, non-economic aspects that most influence investment decisions include the policy framework (Lokesha and Leelavathy, 2012), regulatory aspects (Mahbub and Jongwanich, 2019), and institutions (Ali *et al.*, 2010).

For this reason, the effectiveness of the CTR reduction policy to attract foreign investment is a big question mark. Although competition between countries in reducing CTR has globally been existing, the development of FDI inflows may differ for each region. We present the explanation in Figure 2. In the American and European regions, FDI inflows during this period increased with quite high fluctuations, while it tends to be flat in Africa and Oceania region. Meanwhile, the most consistent, stable FDI growth came from the Asian region. This region also achieved the largest share of total FDI inflows in the last two years (UNCTADSTAT, 2021). All these figures indicate that other factors could influence changes in FDI inflows.

**Figure 2.**  
**FDI Increase Trend Throughout the World, 1980-2019**

This figure shows the FDI inflows fluctuating growth from 1980 to 2019, yet the trend varies over certain regions. Source: Author calculation based on UNCTADSTAT (2021).



There is a lack of consensus in previous empirical studies on whether a lower CTR will attract Foreign Direct Investment (FDI). Some studies show that CTR is negatively correlated with FDI (Abdioglu *et al.*, 2016; Coelho *et al.*, 2010; Djankov *et al.*, 2010; Mandinga, 2015; Mudenda, 2015; Root and Ahmed, 1978; Wijeweera and Siriwardana, 2005). The others suggest that CTR changes do not affect FDI (Blechová, 2016; Hunady and Orviska, 2014; Sujarwati and Qibthiyyah, 2020). Concerning the second group of empirical results, the unclear reason in selecting the sample might be the gap in why they revealed that no effect of CTR on FDI.

Our study, then, specifically contributes to the literature by studying the Asian region where the CTR decline has been the largest (see Figure 1) and FDI growth has been the most stable (see Figure 2) compared to other regions. Moreover, although there has been previous research in this area, research on Asian countries is still missing.

The rest of this paper is organized as follows. Section II explains the data and methodology. Section III presents the results, and section IV provides a concluding remark.

## **II. DATA AND METHODOLOGY**

### *A. Data*

In this study, we have collected annual data from selected countries. The sample size is dictated by data availability and spans from the period 1999 to 2014. We use the data from 28 Asian countries since they show a remarkable decline in their CTR.<sup>4</sup> Besides, our motivation for that 16 years sample period is related to the completeness of the available data to provide strongly balanced panel data. Moreover, the selection of the variables is explained below.

The main variables consist of FDI and CTR. Since this study analyses FDI from the host country's point of view, the dependent variable is measured as FDI net inflows (US dollars at current prices in millions), accessed from UNCTAD. Meanwhile, to measure an independent variable, CTR, we use statutory tax rates as a proxy for tax policy. The statutory tax rate is a basic measure of corporate income taxes – marginal rate of tax applied to any additional income including profits and surcharges given the level of allowance (Coelho *et al.*, 2010). Statutory tax rates can determine the incentives for companies to transfer income between countries depending on where their real activities take place (Devereux and Griffith, 2002). According to Mudenda (2015), this approach is appropriate considering the data available.

Furthermore, to determine the control variables, we partially adopt the OECD Policy Framework for Investment (OECD, 2007). We utilize the aspect of market characteristics (market size and market access; availability/cost of labour, energy, raw materials, and infrastructure) and the aspect of framework conditions (political stability; monetary system and fiscal stability; legal protection; corruption) as control variables. In Table 1, we present all variables and proxies.

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<sup>4</sup> In total, there are 50 economies in Asia, some of which is lack of data. Therefore, we selected 28 economies with the most complete data, and all of which have implemented the CTR reduction policy.

**Table 1.**  
**Research Variable Definition and Data Source**

This table clarifies the details and source of the data used for the empirical analysis.

<b>Variable</b>	<b>Variable Proxy</b>	<b>Definition</b>	<b>Source</b>
FDI	FDI inflows (US dollars at current prices in millions)	Capital provided by foreign investors directly to foreign affiliates.	UNCTADSTAT (2021)
CTR	Statutory Corporate Income Tax Rate (%)	Central government statutory income tax base rate (at the middle or upper limit).	Tax Foundation (2021)
OPENNESS	Trade	Total exports and imports of goods and services measured as a share of GDP.	World Bank (2021a)
M_SIZE	GDP per Capita	GDP divided by midyear population.	World Bank (2021a)
UNEMPLOYMENT	Unemployment Rates (% of labour force) (modelled ILO estimates)	Percentage of the workforce who are unemployed but available for and looking for work.	World Bank (2021a)
ENERGY	Electric power transmission and distribution losses (% of output)	Loss of transmission and distribution of electric power.	World Bank (2021a)
MANUFACTURING	Manufacturing, value added (% of GDP)	Percentage of total net output from the manufacturing sector to total GDP.	World Bank (2021a)
INFRASTRUCTURE	Individual use of internet (% of population)	Percentage of internet users to total population.	World Bank (2021a)
EXC_RATES	Real effective exchange rate index (2010 = 100)	The nominal effective exchange rate (a measure of the value of a currency) against a weighted average of several foreign currencies) divided by the price deflator or cost index.	World Bank (2021a)
INFLATION	Inflation, consumer prices (annual %)	Inflation as measured by the consumer price index reflecting the annual percentage change in the average consumer's cost of acquiring a basket of goods and services that can be fixed or changed at certain intervals.	World Bank (2021a)
POL_STABILITY	Political Stability and Absence of Violence (score ranging from approximately -2.5 to 2.5)	Measuring perceptions of possible political instability and/or politically motivated violence, including terrorism.	World Bank (2021b)
C_CORRUPTION	Control of corruption (score ranging from approximately -2.5 to 2.5)	Capturing perceptions of the extent to which public power is exercised for personal gain, including petty and major forms of corruption, as well as the "conquest" of the state by elites and private interests.	World Bank (2021b)

**Table 1.**  
**Research Variable Definition and Data Source (Continued)**

Variable	Variable Proxy	Definition	Source
L_PROTECTION	IEF Property right index (score ranging from 0 to 100)	Property right index ranging from 0 to 100.	the Heritage Foundation, (2021)
FDI <sub>-1</sub>	FDI inflows (US dollars at current prices in millions) t-1	Previous year FDI inflows.	UNCTADSTAT (2021)
TAX_COMPETITION	Average of neighbouring countries statutory CTR Rate (%) t-1	Average of neighbouring countries' corporate tax rates in the previous year.	Tax Foundation (2021)

### B. Methodology

To attract foreign investment, the government needs to know what factors determine the investment decisions of multinational companies. The Eclectic Paradigm/OLI Framework is a concept explaining the determinants of investment (OECD, 2007).<sup>5</sup> Dunning (2000) explained that the eclectic paradigm was a simple, but profound, construction. He emphasized that the scope, geography, and composition of foreign production industries of multinational companies were determined by the interaction of three interdependent variables (sub-paradigms), namely, Ownership (O) specific advantage, Internalization (I) advantage, and Locational (L) specific advantage. Eden and Dai (2010) note that this consideration is a critical point for companies deciding to export or provide FDI. This strategy is known as location advantage (L) and tax policy can influence FDI through this advantage. Similarly, Hajkova et al. (2007) revealed that all the three OLI advantages bring tax effect to FDI. This OLI framework then becomes the conceptual basis of our empirical analysis.

With panel data of 28 countries during 1999 – 2014, we use the fixed-effect model and system generalized method of moments/GMM (Arellano-Bover/Blundell-Bond Estimator). First, we use the fixed-effect model approach, referring to the individual-specific effects model, with the following specifications:

$$\log FDI_{it} = \beta_0 + \beta_1 CTR_{it} + \varepsilon_{it} \quad (1)$$

$$\begin{aligned} \log FDI_{it} = \beta_0 + \beta_1 CTR_{it} + \beta_2 OPENNESS_{it} + \beta_3 \log M\_SIZE_{it} + \\ \beta_4 UNEMPLOYMENT_{it} + \beta_5 ENERGY_{it} + \beta_6 MANUFACTURING_{it} + \\ \beta_7 INFRASTRUCTURE_{it} + \varepsilon_{it} \end{aligned} \quad (2)$$

<sup>5</sup> Eclectic Paradigm/OLI Framework is a concept/theory often used to explain the determining factor of investment. This concept firstly announced by J. Dunning (1977) aims to offer a holistic framework to identify and evaluate several significant factors affecting the will to start and increase production. This is an idea that an explanation of investment goal of multinational company needs to refer to economic theory. FDI is one of the possible channels for international economic involvement which is determined by several factors.

$$\begin{aligned}
 \log FDI_{it} = & \beta_0 + \beta_1 CTR_{it} + \beta_2 OPENNESS_{it} + \beta_3 \log M\_SIZE_{it} + \\
 & \beta_4 UNEMPLOYMENT_{it} + \beta_5 ENERGY_{it} + \beta_6 MANUFACTURING_{it} + \\
 & \beta_7 INFRASTRUCTURE_{it} + \beta_8 \log EXC\_RATES_{it} + \beta_9 INFLATION_{it} + \\
 & \beta_{10} POL\_STABILITY_{it} + \beta_{11} C\_CORRUPTION_{it} + \\
 & \beta_{12} \log L\_PROTECTION_{it} + \varepsilon_{it}
 \end{aligned} \tag{3}$$

The model specification allows each cross-sectional unit to have a different intercept even though the slope is similar (Cameron and Trivedi, 2005). In this study, we assume that the individual-specific effect of each country (cross-sectional unit) is correlated with the independent variable ( $x_{it}$ ). Therefore, the panel data model will remove the unobserved individual effects,  $\alpha_i$ , to ensure the reliability of the estimated value  $\beta$ .

This research, however, suffers the endogeneity issue coming from the problem of reverse causality and the tax competition phenomenon.<sup>6</sup> To overcome the reverse causality, we use the dynamic panel regression method. According to Leszczensky *et al.* (2018), this method can solve the endogeneity problem caused by reverse causality. With this method, the interaction between the dependent variable and the independent variable can be mapped over time by including the one-period lag value of the dependent variable (FDI in the previous year) on the right side of the equation as an endogenous variable following Sato (2012).<sup>7</sup> According to him, the previous year's FDI affected the current year's FDI. This variable is then influenced by the two-period lag value of the dependent variable (FDI two years earlier) as an exogenous variable (instrumental variable).

To overcome the problem of endogeneity coming from unobserved variables, we also include an instrumental variable in the form of the lagged Tax Competition variable. We adopt this instrument from the work of Overesch and Rincse (2011) which concludes that there is a strong influence of tax competition on the statutory tax rates decline. This instrument is the average of the neighbouring countries' previous year CTR. For example, the one-period lagged value of the Indonesian Tax Competition variable comes from the average value of Southeast Asian countries' previous year CTR (Myanmar, Malaysia, Philippines, Singapore, Thailand, Vietnam, and Brunei Darussalam). This instrument aims to control the effect caused by the phenomenon of tax competition that has the potential to affect the CTR variable as an endogenous variable.

We use this dynamic panel regression with the System GMM (Arellano-Bover/Blundell-Bond estimator), with the following specifications:

<sup>6</sup> Reverse causality is an effect from FDI (dependent variable) on CTR (independent variable). This issue exists when CTR reduction policy is conducted on FDI inflows realization in the previous year. Besides, tax competition phenomenon could play an important role in why government performs a CTR reduction policy. In other words, they have an incentive to reduce CTR after observing the declining trend of neighbouring countries' CTR.

<sup>7</sup> The equation:  $y_{it} = \beta_1 y_{it-1} + \beta_2 x_{it} + \alpha_i + \varepsilon_{it}$



$$\log FDI_{it} = \beta_0 + \gamma \log FDI_{it-1} + \beta_1 CTR_{it} + \varepsilon_{it} \quad (4)$$

$$\begin{aligned} \log FDI_{it} = \beta_0 + \gamma \log FDI_{it-1} + \beta_1 CTR_{it} + \beta_2 OPENNESS_{it} + \\ \beta_3 \log M\_SIZE_{it} + \beta_4 UNEMPLOYMENT_{it} + \beta_5 ENERGY_{it} + \\ \beta_6 MANUFACTURING_{it} + \beta_7 INFRASTRUCTURE_{it} + \varepsilon_{it} \end{aligned} \quad (5)$$

$$\begin{aligned} \log FDI_{it} = \beta_0 + \gamma \log FDI_{it-1} + \beta_1 CTR_{it} + \beta_2 OPENNESS_{it} + \\ \beta_3 \log M\_SIZE_{it} + \beta_4 UNEMPLOYMENT_{it} + \beta_5 ENERGY_{it} + \\ \beta_6 MANUFACTURING_{it} + \beta_7 INFRASTRUCTURE_{it} + \\ \beta_8 \log EXC\_RATES_{it} + \beta_9 INFLATION_{it} + \\ \beta_{10} POL\_STABILITY_{it} + \beta_{11} C\_CORRUPTION_{it} + \\ \beta_{12} \log L\_PROTECTION_{it} + \varepsilon_{it} \end{aligned} \quad (6)$$

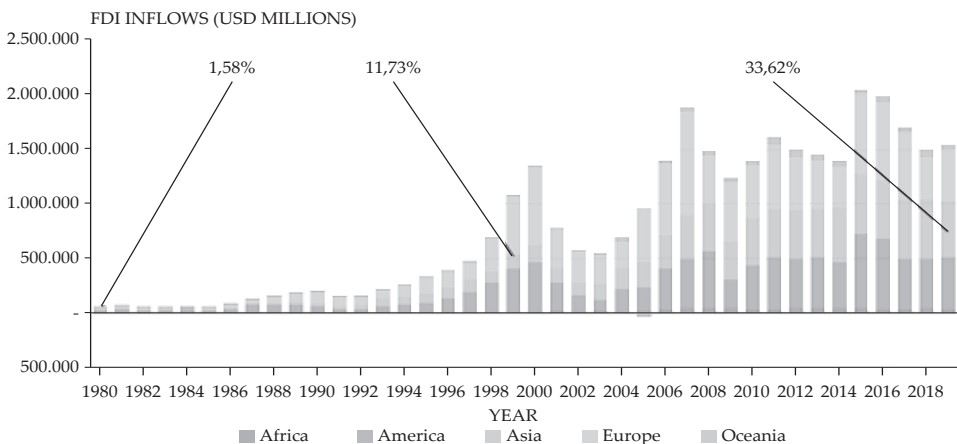
### III. RESULTS

#### A. FDI Growth and CTR Reduction Trend in Asia Region

Although the global increase in FDI growth suffered fluctuation throughout 1980-2019, the Asian region experienced the most stable FDI growth compared to other regions. FDI inflows into the Asian region have also been increasing since 1980. From reaching a share of 1.58% in 1980, it significantly increased to 11.73% in 2000 and continued to increase to reach 33.62% in 2019, the largest portion compared to the share of FDI inflows to other regions (see Figure 3). Therefore, our focus on Asian countries is relevant.

**Figure 3.**  
**FDI Growth by World Regions, 1980-2019**

This figure shows the FDI trend over the world from 1980 to 2019. Source: Author calculation based on UNCTADSTAT (2021).



**Table 2.**  
**FDI over Asia Subregions**

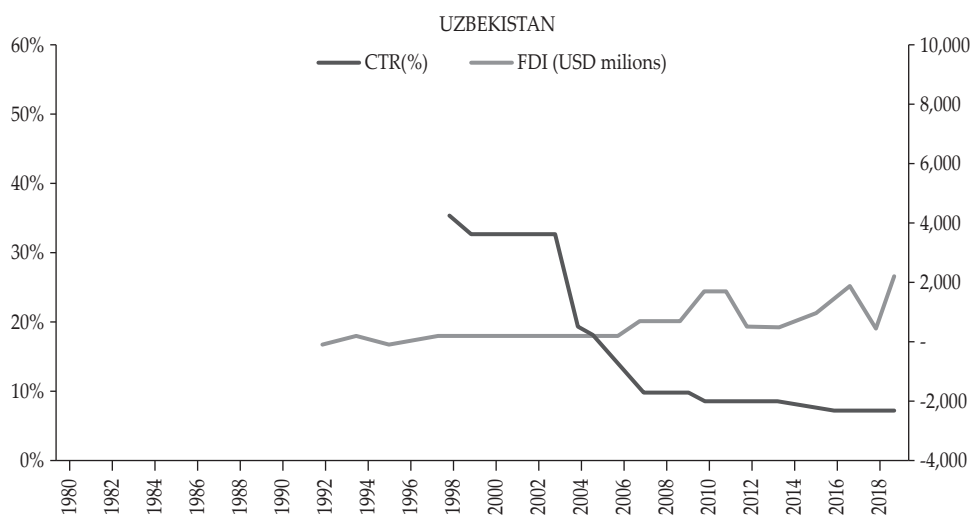
The following table provides the FDI portion coming to each Asia Subregion from 1980 to 2019. Source: Author calculation based on UNCTADSTAT (2021).

Asia Region	1980	1990	2000	2010	2019
Central Asia	0.00%	0.00%	0.95%	3.98%	1.54%
Eastern Asia	20.73%	43.94%	75.46%	45.80%	47.77%
South-eastern Asia	26.41%	51.46%	13.66%	25.81%	30.10%
Southern Asia	2.08%	0.85%	3.06%	7.96%	11.09%
Western Asia	50.78%	3.75%	6.87%	16.46%	9.50%

Although FDI growth in Asian Region has grown rapidly in the last few decades, the portion varies over the subregions.<sup>8</sup> Table 2 shows the change in the share of FDI inflows to each subregion since 1980. This indicates that a high level of competition to attract investment exists in East Asian, Southeast Asian, South Asian, and West Asian subregions.

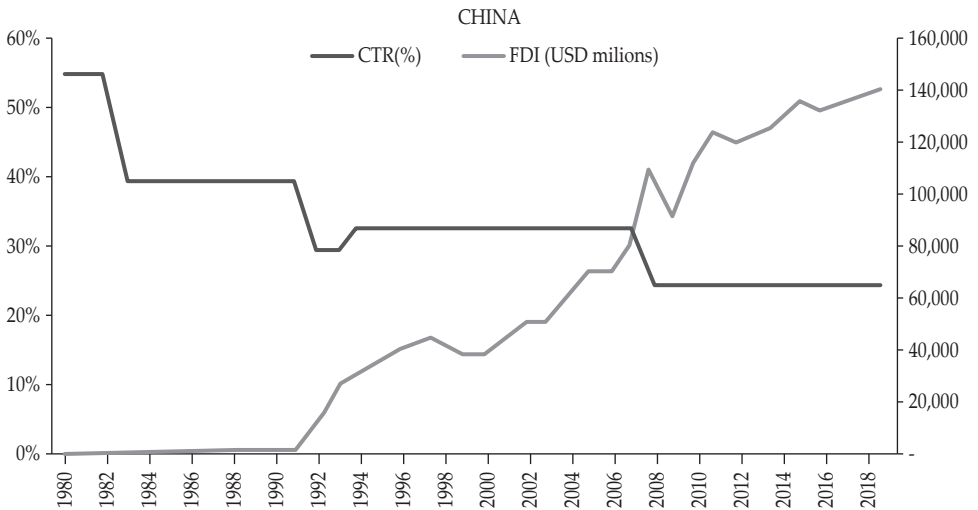
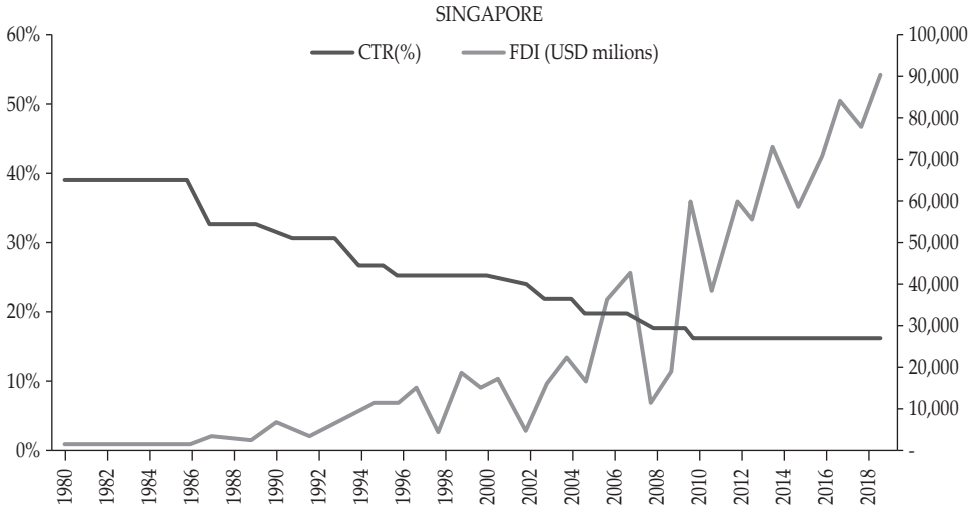
**Figure 4.**  
**Correlation between CTR and FDI in Selected Asian Countries**

This figure shows the behavior of FDI in responding to CTR during four decades in several countries. Source: Author calculation based on Tax Foundation (2021) and UNCTADSTAT (2021).

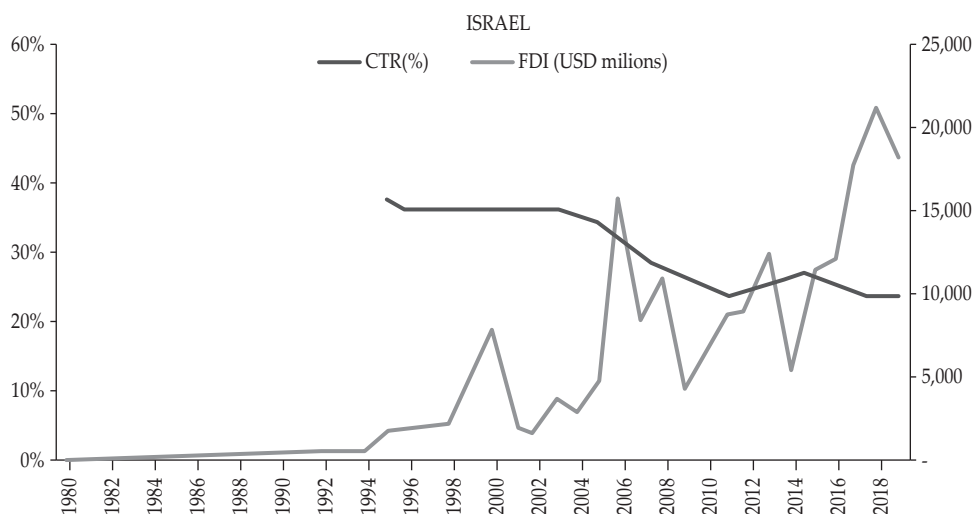
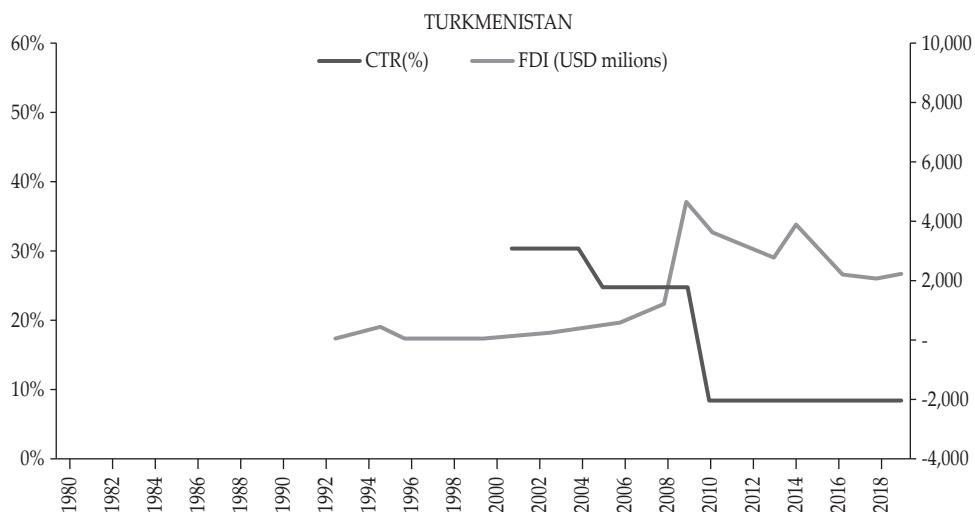


<sup>8</sup> **Central Asia** (Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, Uzbekistan); **East Asia** (China, Hong Kong, Macau, Taiwan, Japan, North Korea, South Korea, Mongolia); **South East Asia** (Brunei Darussalam, Cambodia, Indonesia, Laos, Malaysia, Myanmar, Philippines, Singapore, Thailand, Timor-Leste, Vietnam); **South Asia** (Afghanistan, Bangladesh, Bhutan, India, Iran, Maldives, Nepal, Pakistan, Sri Lanka); dan **West Asia** (Armenia, Azerbaijan, Bahrain, Georgia, Iraq, Israel, Jordan, Kuwait, Lebanon, Oman, Qatar, Saudi Arabia, Palestine, Syria, Turkey, Yemen).

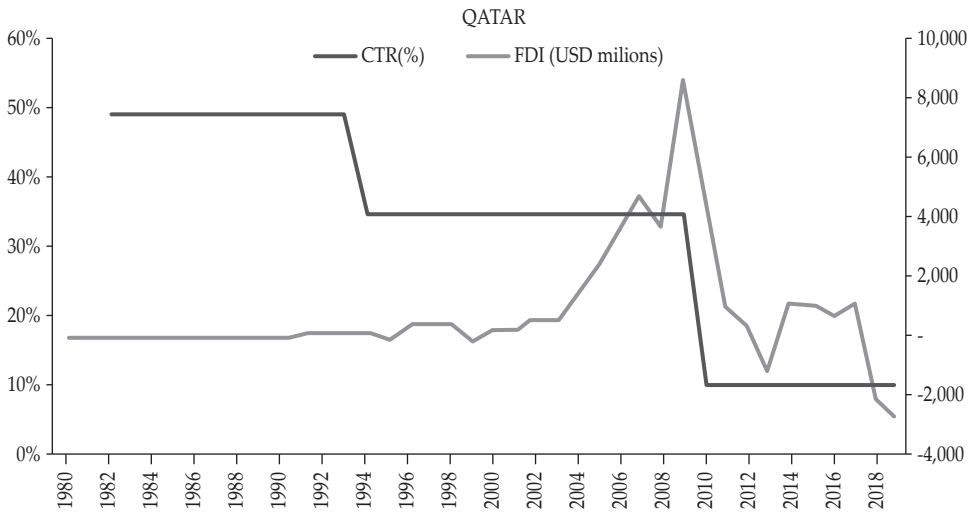
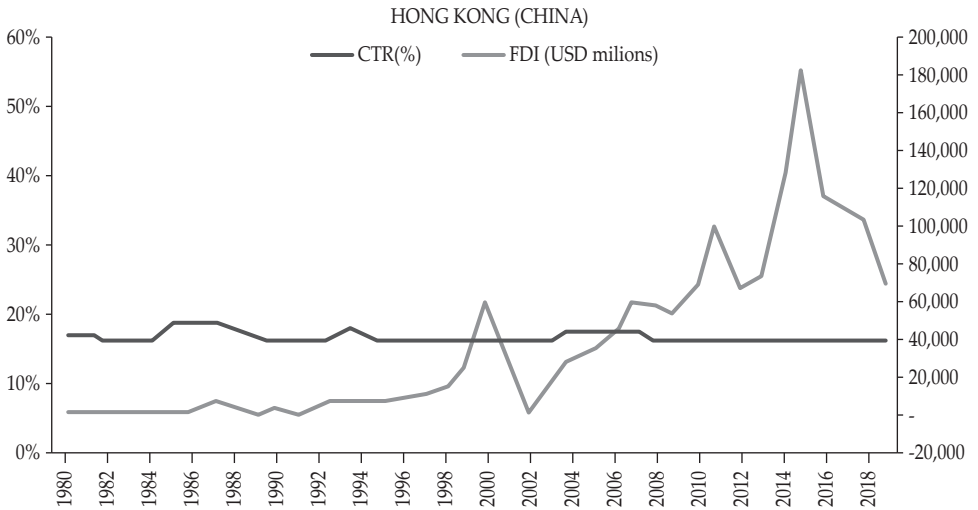
**Figure 4.**  
**Correlation between CTR and FDI in Selected Asian Countries (Continued)**



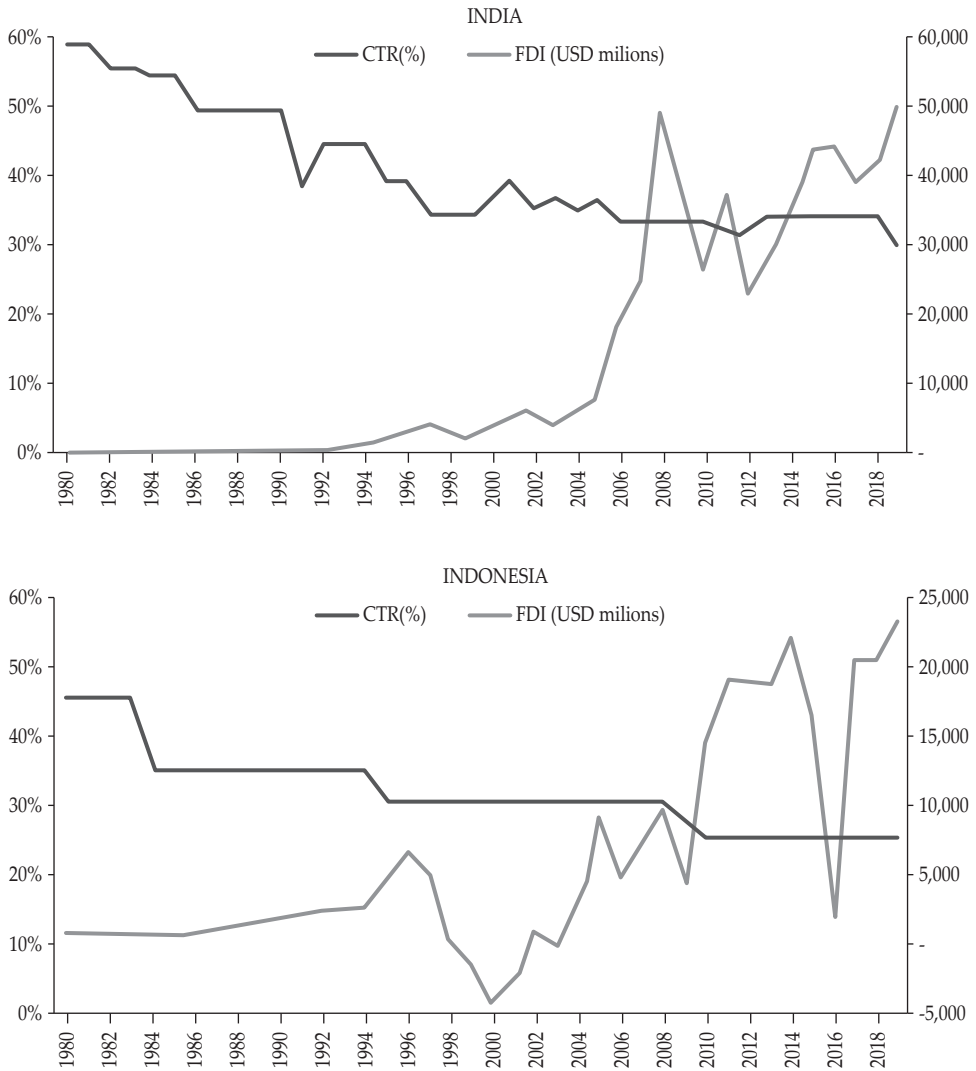
**Figure 4.**  
**Correlation between CTR and FDI in Selected Asian Countries (Continued)**



**Figure 4.**  
**Correlation between CTR and FDI in Selected Asian Countries (Continued)**



**Figure 4.**  
**Correlation between CTR and FDI in Selected Asian Countries (Continued)**



The significant trend of FDI growth in the Asian region is strongly related to various pro-FDI policies in Asian countries. One of the popular policies is the CTR reduction policy. Asian countries are currently vying to lower the CTR to attract foreign investment into their countries. Figure 5 illustrates the correlation between CTR reduction and FDI increases in nine Asian countries. In general, the movement of CTR and FDI show identical figures, where FDI increases are followed by CTR decreases. The correlation clearly exists in Singapore, Israel, India, and China. Over the last forty years, the trend of CTR in these countries has been getting lower. Consequently, the trend of FDI has been increasing since 1990.

*B. Main Findings*

We begin our discussion by examining the descriptive statistics presented in Table 3. Each variable has 448 observations, with 28 countries over 16 years. The dependent variable, FDI reports the smallest value of -6505.844 and the largest value of 128502. The standard deviation value of this variable is a little bit high, 20515.78, suggesting that the variable is highly volatile. The independent variable, CTR reports the smallest value of 0.1 and the largest value of 0.55. The standard deviation value of this variable is 0.092, lower than the average value (mean) of 0.274, indicating a low level of variation.

**Table 3.**  
**Variable Descriptive Statistics**

The following table presents a descriptive statistical analysis of all variables based on fixed-effect model.

<b>Variable</b>		<b>Mean</b>	<b>Std. Dev.</b>	<b>Min</b>	<b>Max</b>	<b>Observations</b>
FDI	overall	10169.010	20531.370	-6505.844	128502.000	N = 448
	between		18178.980	396.169	83625.790	n = 28
	within		10107.000	-38193.850	71181.750	T = 16
CTR	overall	.274	.090	.100	.550	N = 448
	between		.069	.143	.401	n = 28
	within		.059	.024	.473	T = 16
OPENNESS	overall	.970	.841	.002	4.426	N = 448
	between		.834	.090	3.787	n = 28
	within		.188	-.265	1.958	T = 16
M_SIZE	overall	10969.610	13528.590	137.168	57562.530	N = 448
	between		12728.540	571.816	38822.240	n = 28
	within		5142.370	-9052.662	31397.850	T = 16
UNEMPL~T	overall	.059	.042	.002	.207	N = 448
	between		.040	.008	.155	n = 28
	within		.014	.012	.114	T = 16
ENERGY	overall	.121	.065	.011	.391	N = 448
	between		.061	.030	.279	n = 28
	within		.025	.008	.233	T = 16
MANUFA~G	overall	.162	.076	.012	.324	N = 448
	between		.061	.030	.279	n = 28
	within		.025	.008	.233	T = 16
INFRAS~E	overall	.262	.254	1.521	.891	N = 448
	between		.193	.016	.712	n = 28
	within		.168	-.215	.766	T = 16
EXC_RATES	overall	108.268	17.511	73.105	210.391	N = 448
	between		10.988	85.957	144.108	n = 28
	within		13.782	59.830	174.551	T = 16
INFLATION	overall	.070	.105	-.085	.688	N = 448
	between		.079	.001	.384	n = 28
	within		.070	-.238	.511	T = 16
POL_ST~Y	overall	-.379	.956	-2.810	1.388	N = 448
	between		.910	-2.043	1.185	n = 28
	within		.338	-1.261	.924	T = 16
C_CORR~N	overall	-.108	.888	-1.672	2.326	N = 448

**Table 3.**  
**Variable Descriptive Statistics (Continued)**

Variable	Mean	Std. Dev.	Min	Max	Observations	
	between	.881	-1.430	2.189	n = 28	
	within	.200	-1.083	.936	T = 16	
L_PROT-N	overall	45.368	22.439	5.000	90.000	N = 448
	between		21.671	10.000	90.000	n = 28
	within		7.044	33.493	76.618	T = 16
TAX_CO-N	overall	.270	.060	.100	.409	N = 448
	between		.042	.132	.353	n = 28
	within		.043	.188	.379	T = 16

Table 4 shows the regression results of the effect of CTR on FDI in three models with the FE approaches. We find the strong effect of CTR on FDI. This result supports the previous empirical evidence (Abdioglu *et al.*, 2016; Coelho *et al.*, 2010; Djankov *et al.*, 2010; Mandinga, 2015; Mudenda, 2015; Root and Ahmed, 1978; Wijeweera and Siriwardana, 2005) that CTR has a negative relationship to FDI. In other words, lowering corporate tax rates can increase FDI inflows in a country. The coefficient value is reported at -6.662 (Model 3), and this is statistically significant at the 1% level. This result supports the previous panel studies with an average estimation result of -2.94 with a range of -0.10 to -5.37 (Mooij and Ederveen, 2005).

We also perform robustness test by using three models shown in Table 4.<sup>9</sup> As the results, in terms of direction and significance, are consistent in the three models, indicating that the estimates are robust. We also tested the robustness of our results across four methods. We present these results in Appendix.

**Table 4.**  
**Fixed Effect Model Regression Results**

The following table reports the fixed effect model regression result. Standard errors in parentheses \*  $p < .1$ , \*\*  $p < .05$ , \*\*\*  $p < .01$ . We have clustered standard errors at country level on this regression.

	(1)	(2)	(3)
<b>Tax Policy: Corporate Tax Rate Changes</b>			
CTR	-10.355*** (1.274)	-6.850*** (1.374)	-6.662*** (1.527)
<b>OECD Policy Framework for Investment: Market Characteristics</b>			
OPENNESS		1.027***	0.793***
		-0.256	-0.266
M_SIZE		0.773***	1.140**
		-0.258	-0.415
UNEMPLOYMENT		2.248	2.52
		-3.223	-3.431
ENERGY		-3.643	-3.235
		-3.253	-3.329

<sup>9</sup> Model 1 is the baseline model, estimating the effect of the interest variable, CTR on FDI. We then adopt market characteristics and framework condition factors from OECD Policy Framework for Investment as control variables in Model 2 and 3 respectively.



**Table 4.**  
**Fixed Effect Model Regression Results (Continued)**

	(1)	(2)	(3)
MANUFACTURING		-0.328	-0.222
		-3.378	-4.012
INFRASTRUCTURE		-0.461	-0.764
		-0.626	-0.566
<b>OECD Policy Framework for Investment: Framework Conditions</b>			
EXC_RATES			-1.892*
			-0.926
INFLATION			-1.769***
			-0.62
POL_STABILITY			0.061
			-0.161
C_CORRUPTION			-0.322
			-0.466
L_PROTECTION			-0.22
			-0.337
Constant	10.651***	2.685	9.532***
	-0.346	-2.449	-3.28
Observations	436	436	436
	0.302	0.445	0.476

This study suffers the endogeneity issue coming from reverse causality and the tax competition phenomenon. To overcome the reverse causality, we use the dynamic panel regression method following Leszczensky *et al.* (2018) and utilize the one-period lag value of the dependent variable (FDI in the previous year) on the right side as an endogenous variable following Sato (2012). To overcome the problem of endogeneity coming from unobserved variables, we also include an instrumental variable in the form of the lagged Tax Competition variable following the work of Overesch and Rincke (2011). In addition, these instruments are valid and are not correlated with the error term, based on the Sargan test result (see Table 5).<sup>10</sup>

Table 5 shows the results relating to the three models estimated using the System GMM approach (Arellano-Bover/Blundell-Bond Estimator). After solving the endogeneity problem, we continue to find a negative correlation between FDI and CTR at a 10% significance level, in line with the work of Abdioglu *et al.* (2016). The coefficient estimate is reported at -4.386 (Model 6), lower than that of the FE method, indicating that estimation bias due to endogeneity problems has been minimized with the instrumental variable in this dynamic panel regression.

As with the fixed effect method, we checked the robustness of this result by using three models shown in Table 5. The directions are still showing a negative

<sup>10</sup> Sargan test is a test of overidentifying restrictions and it is distributed as chi-square under the null of instrument validity. As the result, the null cannot be rejected at a level of 5% for Model 2 and 3. Thus, the instruments used in this study for both models are valid and are not correlated with the error term.

correlation. The estimates are significant at the 90% to 99% level of confidence. These indicate that the estimates are quite robust. To fit our check, we also conducted a more in-depth robustness check using three models across four methods. We present these results in Appendix.

**Table 5.**  
**System GMM Regression Results**

The following table reports the system GMM regression results. Standard errors in parentheses \*  $p < .1$ , \*\*  $p < .05$ , \*\*\*  $p < .01$ . We have clustered standard errors at country level on this regression.

	(4)	(5)	(6)
<b>Lagged Dependent Variable</b>			
FDI <sub>-1</sub>	0.449*** (0.126)	0.331** (0.163)	0.280 (0.173)
<b>Tax Policy: Corporate Tax Rate Changes</b>			
CTR	-6.286** (2.921)	-4.445* (2.634)	-4.386* (2.639)
<b>OECD Policy Framework for Investment: Market Characteristics</b>			
OPENNESS		1.032** (0.446)	1.028** (0.411)
M_SIZE		0.286 (0.217)	0.516** (0.211)
UNEMPLOYMENT		-2.943 (3.745)	-2.708 (4.002)
ENERGY		-4.954 (4.428)	-5.661 (4.930)
MANUFACTURING		4.078 (2.846)	4.813 (3.422)
INFRASTRUCTURE		-0.375 (0.543)	-0.507 (0.503)
<b>OECD Policy Framework for Investment: Framework Conditions</b>			
EXC_RATES			-1.141** (0.448)
INFLATION			-0.918 (0.775)
POL_STABILITY			-0.366* (0.218)
C_CORRUPTION			-0.374 (0.271)
<b>OECD Policy Framework for Investment: Framework Conditions</b>			
L_PROTECTION			-0.006 (0.305)
Constant	6.112*** (1.552)	3.329 (3.260)	6.994* (3.921)
Observations	401	401	401
Chi2	44.549	202.295	442.598
Sargan	0.0427	0.0565	0.0873

For policy recommendation, we opt for model 6 from the System GMM regression since the estimation is lower than those of FEM, indicating that estimation bias due to endogeneity problems has been minimized. With these results, we reveal that a reduction in a country's corporate tax rate will increase FDI inflows, supporting the previous empirical evidence (Abdioglu *et al.*, 2016; Coelho *et al.*, 2010; Djankov *et al.*, 2010; Mandinga, 2015; Mudenda, 2015; Root and Ahmed, 1978; Wijeweera and Siriwardana, 2005). The effect is also significant at the 10% level. The sensitivity of FDI is reported at -4.386. In other words, FDI inflows would increase by 4.38% for every 1% CTR reduction.

We also find that apart from corporate tax policy, there are other factors effectively influencing FDI inflows. From market characteristics, economic openness and market size are effective in increasing FDI inflows. Meanwhile, from the framework condition factors, only the exchange rate plays an important role to attract that investment.

FDI responds quite differently to changes in those factors. From market characteristic factors, FDI inflows increases by 1.02% for every 1% increase in economic openness. This is quite reasonable because the higher openness of the economy represents lower trade barriers so that it seems more attractive to foreign investors (Hunady and Orviska, 2014). The market size factor also plays an important role, with every 1% increase will attract FDI inflows by 0.52%. This also accepts the hypothesis as countries with higher GDP per capita tend to have higher purchasing power, better infrastructure, and a more conducive investment environment (Hunady and Orviska, 2014). A large potential market will be more attractive to investors because it allows investors to capture large-scale production profits. From the framework condition factors, the exchange rate also has a significant contribution in attracting FDI inflows. We find that the exchange rate negatively affects FDI inflows. Every one-point increase will reduce FDI inflows by 1.14%. This is logical as the higher REER represents a more expensive export value and a cheaper import value. It also indicates a decrease in trade competitiveness hence it will affect investors' decisions.

In addition, the resulting estimates are not sufficient to prove the influence of other factors on changes in FDI inflows. The unemployment rate, infrastructure, energy inefficiency, manufacturing, infrastructure, inflation rate, corruption control, and legal protection of property rights, affect FDI inflows insignificantly. Data used to measure some of these variables may not be sufficient. For example, the infrastructure availability factor, proxied by the percentage of individuals using the internet, may not be able to represent the overall infrastructure availability.

Surprisingly, institutional factor such as political stability has a negative correlation with FDI. In other words, countries with a more stable political system will reduce their foreign investment. This is contrary to the expectation that countries with stronger institutional backgrounds will be more attractive to investors. This discrepancy is probably because the selected data might not be a good proxy.

#### IV. CONCLUSION AND POLICY RECOMMENDATION

Our research has provided sufficient analysis to answer the research questions. First, following economic theories and previous empirical evidence, our estimates show that CTR is a statistically significant predictor of FDI inflows in Asian countries. FDI inflows will increase by 4.38% for a 1% CTR reduction. Second, we document several other factors most effective in increasing FDI. In addition to CTR, the economic openness, market size, and exchange rates also play important roles in attracting FDI inflows.

Several policy implications can be drawn from our research. Our study demonstrates that FDI inflows responds to several determinants which can be used by policymakers to develop strategies for attracting more FDI. We know from our study that CTR changes, degree of openness, market size, and exchange rates impact FDI inflows. Fiscal policy, such as the decline in CTR will attract FDI inflows to the host country and will have an indirect effect on its economic development. Therefore, fiscal authorities, if the goal is to accelerate economic development, need to consider the fact that fiscal policy will affect FDI inflows. This policy also needs to be complemented by improvements in other factors such as economic openness, market size, and exchange rates.

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## APPENDIX

**Table A.1.**  
**Robustness Check**

It is crucial to have a robustness check of our findings. To do so, we simply break the variables into three models. In the case of Model 1 (baseline), we only use two main variables in the equation. We then add a group of market characteristic variables into Model 2 and a group of framework condition variables into Model 3, based on the OECD Policy Framework for Investment. Additionally, we consider four estimators, OLS, FE, RE, and System GMM to fit our check. In the case of OLS, FE, and RE estimator, we correct for standard errors using robust standard errors. Moreover, we cluster standard errors at country level for the system GMM estimator. The results then are reported in Table A. Overall, our findings are robust for all models and estimators.

	OLS			Fixed Effect Model		
	(1)	(2)	(3)	(1)	(2)	(3)
<b>Tax Policy: Corporate Tax Rate Changes</b>						
CTR	-4.929*** (1.185)	-3.038** (1.240)	-2.646* (1.423)	-10.355*** (1.274)	-6.850*** (1.374)	-6.662*** (1.527)
OPENNESS		0.398*** (0.101)	0.593*** (0.148)		1.027*** (0.256)	0.793*** (0.266)
<b>OECD Policy Framework for Investment: Market Characteristics</b>						
M_SIZE		0.042 (0.092)	0.374*** (0.116)		0.773*** (0.258)	1.140* (0.415)
UNEMPLOYMENT		0.647 (1.718)	-0.805 (1.690)		2.248 (3.223)	2.520 (3.431)
ENERGY		-1.661 (1.837)	-0.437 (1.783)		-3.643 (3.253)	-3.235 (3.329)
MANUFACTURING		9.298*** (1.314)	9.778*** (1.352)		-0.328 (3.378)	-0.222 (4.012)
INFRASTRUCTURE		2.004*** (0.484)	1.575*** (0.464)		-0.461 (0.626)	-0.764 (0.566)
<b>OECD Policy Framework for Investment: Framework Conditions</b>						
EXC_RATES			-0.913** (0.434)			-1.892* (0.926)
INFLATION			-2.888*** (0.681)			-1.769*** (0.620)
POL_STABILITY			-0.484*** (0.084)			0.061 (0.161)
C_CORRUPTION			-0.002 (0.215)			-0.322 (0.466)
L_PROTECTION			-0.453** (0.181)			-0.220 (0.337)
Constant	9.179*** (0.334)	6.058*** (0.875)	8.885*** (2.559)	10.651*** (0.346)	2.685 (2.449)	9.532*** (3.280)
Observations	436	436	436	436	436	436
R <sup>2</sup>	0.0514	0.3754	0.4318	0.302	0.445	0.476



**Table A.1.**  
**Robustness Check (Continued)**

	Random Effect Model			System GMM		
	(1)	(2)	(3)	(1)	(2)	(3)
<b>Tax Policy: Corporate Tax Rate Changes</b>						
CTR	-10.086*** (1.190)	-6.721*** (1.305)	-6.396*** (1.465)	-6.286** (2.921)	-4.445* (2.634)	-4.386* (2.639)
OPENNESS		0.640*** (0.222)	0.625*** (0.194)		1.032** (0.446)	1.028** (0.411)
<b>OECD Policy Framework for Investment: Market Characteristics</b>						
M_SIZE		0.562*** (0.212)	0.857*** (0.307)		0.286 (0.217)	0.516** (0.211)
UNEMPLOYMENT		0.922 (3.063)	1.034 (3.260)		-2.943 (3.745)	-2.708 (4.002)
ENERGY		-4.196 (3.105)	-3.514 (3.075)		-4.954 (4.428)	-5.661 (4.930)
MANUFACTURING		3.380 (3.099)	2.747 (3.602)		4.078 (2.846)	4.813 (3.422)
INFRASTRUCTURE		0.113 (0.553)	-0.222 (0.494)		-0.375 (0.543)	-0.507 (0.503)
<b>OECD Policy Framework for Investment: Framework Conditions</b>						
EXC_RATES			-1.352* (0.726)			-1.141** (0.448)
INFLATION			-1.799*** (0.634)			-0.918 (0.775)
POL_STABILITY			-0.062 (0.154)			-0.366* (0.218)
C_CORRUPTION			-0.352 (0.462)			-0.374 (0.271)
L_PROTECTION			-0.353 (0.246)			-0.006 (0.305)
FDI <sub>-1</sub>				0.449*** (0.126)	0.331** (0.163)	0.280 (0.173)
Constant	10.587*** (0.476)	4.188* (2.192)	9.412*** (3.386)	6.112*** (1.552)	3.329 (3.260)	6.994* (3.921)
Observations	436	436	436	401	401	401
Chi2	71.853	187.032	464.806	44.549	202.295	442.598

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