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International Tax Competition and Foreign Direct Investment in the Asia-Pacific Region: A Panel Data Analysis

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Abstract

Purpose - The purpose of this study is to investigate how a country's competitive tax policy influences its inward foreign direct investments (FDI) in the Asia-Pacific region, even when given particular constraints (e.g., population, public governance, skilled labor, and so on) exist.

Design/methodology/approach - The paper uses the system GMM estimation approach to test the hypothesis. Data on FDI, corporate income tax, and various confounding factors were drawn from Ernst and Young's worldwide corporate tax guide, the World Bank, and other sources to create a panel of 28 economies over the period 2000-2016.

Findings - The present research confirms the negative association between corporate income tax (CIT) and FDI inflows. The effects of other confounding factors on FDI net inflows are also supported (e.g., connectivity, GDP per capita, population, skilled labor, and trade openness). Our results support the argument that foreign investments may be more sensitive to CIT. Therefore, CIT is an effective indicator to observe international tax competition.

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Originality/value - The present research uses rich data on statutory CIT and other economic and public governance factors to investigate the relationship between tax competition and FDI inflows in the Asia-Pacific region. The findings add important supplements to the nuanced understanding of the political-economic dynamics in this region, especially when cut-throat tax competition, trade tensions, and stagnant economic growth have been key challenges for global economies.

Keywords: FDI, Tax competition, Tax policy, Corporate income tax, Asia-Pacific

Introduction

Promoting economic development is one of the top priorities for policymakers all over the world, especially after the slowdown of the global economy caused by 2008 financial crisis (EUCS, 2016). Foreign investment is considered one of the most important determinants of economic growth. Success in attracting foreign investments is believed to boost a country's economy by creating jobs, raising income, improving residents' livelihoods, and generating higher tax revenues. During the past decades, foreign direct investments (FDI) in the Asia-Pacific region have been increasing sharply (e.g., FDI in East Asia and the Pacific and South Asia have grown by 942% and 740% respectively from the 1980s to 2000). Nowadays this region has been the largest FDI recipient in the world (about 35% of the total FDI in 2018). Among the majority of Asian developing countries (e.g., China, India, and Vietnam), FDI has been credited with facilitating economic development during the past two decades (Bissinger, 2012; Hoang et al., 2010; Sahoo, 2006). For example, China has witnessed an economic miracle since its opening-up to foreign investments after the 1980s. Yearly statistics show that the average contribution of inward FDI to Chinese gross domestic product (GDP) was 3-6% from 1990 to 2009 (Li, 2013). More generally, the Asia-Pacific region is made up of many developing countries boasting some of the fastest GDP growth rates in the world [1]. Competing for investment has been a core component of economic miracles in many contexts; therefore, different strategies have been developed to attract FDI inflows. Among others,

many governments utilize tax policy (e.g., competitive tax rates), one of the most important fiscal tools, to boost FDI inflows and retain foreign investments (Gardiner et al., 2013; Liou, 2012).

An important puzzle is whether it works in the Asia-Pacific region and under what conditions. The target region of our study has been an increasingly important economic powerhouse in the 21st century. FDI and related tax policies could be critical answers to the region's economic growth. Nevertheless, we need to answer how different tax policies influence foreign capital inflows in this region. More empirical evidence on this issue is needed since, with few exceptions (e.g., Bissinger, 2012; Fletcher, 2002), most of the empirical studies in the past were conducted in non-Asian countries (Azemar and Delios, 2008). Different strategies, particularly tax policies utilized by governments in the Asia-Pacific region, have hit newspaper headlines, provoking some policy reactions from the Western part of the world. For example, the United States passed the historic tax reform bill at the end of 2017. Based on the new Tax Cuts and Jobs Act, the corporate tax rate has been reduced from 35% to 21% from January 1, 2018, onwards, and profits earned from overseas are exempted from American taxation. Many believed that the new policy would encourage investors to move back their overseas investments and promote FDI inflows as the Tax Reform Act of 1986 did (Morgan and Becker, 2017; Swenson, 1994). The new tax regime would also exacerbate other countries' capital outflows (An, 2017). Some European countries and Asia-Pacific economies expressed their concerns that the US tax cut would lure international capital to the USA and instigate tax competition among the global economies (Thomas and Buell, 2017; Wei, 2017; Zimmermann, 2017). Australia, among others, has developed an initiative to reduce its tax rate (Kelly and Benson, 2018). Tax competition may not be a poor solution for a thriving global economy. However, more empirical evidence is needed to shed light on the relationship between tax policy and FDI inflows in this region. Given the unique economic and political characteristics of economies and increasing FDI share in this region, how could a country succeed in fierce competition for development opportunities with neighbors

sharing many similarities (e.g., location and cheap labor)? Does reducing the CIT of the host countries effectively signal the eagerness to accommodate more FDI?

The aim of this study is to provide a reliable understanding of these questions using empirical evidence from the Asia-Pacific region. Panel data from 28 economies in this region, including seven South Asian economies and 21 East Asian and Pacific economies, are used to examine our questions. We select these countries in the sample for several reasons: (1) they are geographically close or connected and competition for capital is more likely to occur between neighboring economies; (2) countries in this region are highly economically integrated [2]; and (3) developing countries in this region share many similarities (e.g., the fastest GDP growth and lower labor cost) and a country must compete harder if it wants to succeed. Our findings confirm that corporate income tax (CIT) is negatively associated with FDI inflows, even after controlling for time lags and various economic, labor, demographic, governance, and trade factors. Based on the findings, implications for domestic policymaking and international tax governance, especially for the Asia-Pacific region, the most economically vibrant region in the 21st century, are discussed.

Literature Review and Hypothesis Development

The extant literature on tax competition has argued that FDI is sensitive to tax policies all over the world (Gardiner et al., 2013). Among the determinants of inward FDI, factors such as tax policy, public governance, infrastructure, trade, and labor quality (Asiedu and Lien, 2011; Buchanan et al., 2012; IMF/OECD, 2018; Li, 2013; Matthews, 2011; Reed et al., 2016; Stone and Jeon, 2000) are essential. Based on a business survey conducted in 2017 by the Organisation for Economic Co-operation and Development (OECD), taxation is one of the top five determinants of investment location decisions (e.g., clean government, current and expected macroeconomic conditions, political certainty, the overall tax environment, and labor costs). Although a country's capital inflows are not fully determined by taxation, tax rates could have a

significant influence (Botman et al., 2010; Fletcher, 2002; De Mooij and Ederveen, 2003; OECD, 2007). Many studies demonstrate that a lower corporate income tax rate predicts higher capital returns and more FDI inflows (Bretschger and Hettich, 2002). For example, evidence shows that investments from Germany and US are more likely to be located in countries with lower taxes (Buttner and Ruf, 2007; Benassy-Quere et al., 2007). Based on a literature review of 25 empirical studies, De Mooij and Ederveen (2003) indicate that a one percent reduction of tax rate may raise capital inflows by 3.3% on average. In addition, economic globalization and trade integration further intensify tax competition between capital recipients (Swank and Steinmo, 2002). To attract and retain foreign investments, host countries are likely to reduce their tax rates in the long run (Genschel and Schwarz, 2011). Data show that almost all the global economies' CIT rates have decreased sharply during the past two decades (Cnossen, 2018). Therefore, we hypothesize that:

A country's corporate income tax rate is negatively associated with its inward foreign investments.

However, empirical evidence shows that the effects of tax competition on FDI are unequal between countries. Larger countries tend to have more FDI inflows while smaller countries tend to have less FDI inflows (Campbell and Hopenhayn, 2005; Olibe and Crumbley, 1997; Plumper€ et al., 2009). On the contrary, smaller countries' governments are more likely to reduce their tax rates to an inefficiently low level (OECD, 2007). For example, China, despite its high tax (according to the World Development Indicators, China's total tax rate of commercial profits was 66.5% in 2017), still receives the most FDI in the region. Amongst other things, skilled and cheap labor is an important factor that attracts foreign investments in the Asia-Pacific region (Blomström et al., 1997; Cheng and Kwan, 2000; Dees, 1998; Lucas, 1993; Quazi and Mahmud, 2006; Sahoo, 2006). Countries with better economic conditions such as GDP per capita, infrastructure connectivity, a larger size of public goods provision, may attract more investments (Busse and

Hefeker, 2007; Billington, 1999; Chakrabarti, 2001; Cheng and Kwan, 2000; Cole et al., 2009; Garrett, 1995; Habib and Zurawicki, 2002; Ketkar et al., 2005; Quazi, 2014; Quinn, 1997; Yuan et al., 2010). Existing literature also demonstrates that open economies with larger international trade tend to attract more FDI (Makki and Somwaru, 2004; Quazi and Mahmud, 2006). Both the share of trade volumes in GDP and free trade agreements have been examined (Buchanan et al., 2012; Dees, 1998; Reed et al., 2016; Stone and Jeon, 2000). However, Liargovas and Skandalis (2012) state that the relationship between trade and FDI can be complicated. For example, a country with large exports may attract export-led foreign investments while an open economy with low trade barriers may facilitate imports but may not attract more FDI. Besides, public governance (e.g., democratic regime, political stability, and clean government) plays a critical role (Egger and Winner, 2005; Habib and Zurawicki 2002; Jensen, 2003, 2008; Ketkar et al., 2005; Kim, 2010; Quazi, 2014). Therefore, our analysis should consider all the above-mentioned factors.

Methodology

Data and Variables

To investigate the above hypothesis, we collect panel data from 28 economies from the Asia-Pacific region in 2000-2016 (see Table 1). The dependent variable of the present study is FDI net inflows. The main independent variable is CIT. The selection of control variables is generally grounded in Dunning's (1998) "Ownership-Location-Internalization (OLI)" paradigm. As the present study mainly focuses on the impact of taxation costs on the host countries' inbound FDI, we build our regression model from the location (L) perspective and thus select the following control variables: connectivity, GDP per capita, population, skilled and cheap labor, trade openness, and the level of public goods provision.

Measurements

FDI. Since this study is interested in the changes of FDI inflows as a function of tax rates and other host country factors rather than the total FDI stock, annual FDI net inflow is used as the dependent variable. FDI net inflows range from -2.80 to 46.83 billion.

Corporate income tax. The existing literature argues that a country's statutory tax rate is an imperfect measure of tax levels, as it ignores tax planning effects and special tax arrangements. Effective or average tax rates are depicted to be a better approximation of the tax burden on foreign investments (De Mooij and Ederveen, 2003; Matthews, 2011). However, it is difficult to calculate the effective tax rates of countries accurately as countries' tax incentives and preferential policies for companies and industries have to be taken into account. The view that the statutory tax rate is the only tax variable factored in by investors continues to hold (Fletcher, 2002; OECD, 2007). Further, studies find that governments compete over both the effective average tax rate and the statutory tax rate (Devereux and Griffith, 1998; Devereux et al., 2008; Mistura and Roulet, 2019). Some evidence even suggests that FDI locations are more sensitive to statutory CIT rates rather than effective tax rates (Buettner and Ruf, 2007). Besides, economists commonly suggest that an individual economy's effective tax rate follows its trend of the statutory tax rate (Mintz and Chen, 2014). Therefore, we mainly focus on the statutory corporate tax rate. However, to check the robustness of our findings, alternative tax measures from the World Bank, including the total tax rate, the profit tax rate, and the share of tax revenue in GDP are examined.

Connectivity. We measure two aspects of connectivity: transportation connectivity and information connectivity. Transportation infrastructure has a significant influence on FDI inflows (Asiedu, 2002; Cheng and Kwan, 2000; Kumar, 2006). Due to data availability, we use two proxy variables to evaluate connectivity. The first proxy is the volume of goods transported by air transportation (million tons per kilometer) and its log form is used in the regression models (Barthel et al., 2010). Since the ICT infrastructure and skills play an increasingly important role in attracting foreign investments (Addison and Heshmati, 2003), the second proxy indicator is mobile

cellular subscriptions per 100 people. Although alternative indicators are also available (e.g., the length of rail lines, internet access, or secure internet servers), they are not used due to the high correlation with GDP per capita or existing connectivity measures.

Public governance. Empirical evidence suggests that a host country's governance factors have significant associations with its inward FDI (Asiedu and Lien, 2011; Busse and Hefeker, 2007; Jensen, 2003, 2008). We use the Institutional Democracy Index (IDI) and two indicators from Worldwide Governance Indicators (WGI) to evaluate the governance level in each host economy. The IDI is a composite measure of three aspects of democracy: the selection of policies and leaders, institutionalized constraints on the power of the political leaders, and civil liberties and political participation. Its value ranges from zero to ten. The data of institutional democracy are from "The Polity IV Project: Political Regime Characteristics and Transitions 1800–2017" (Marshall et al., 2018). The two WGIs are corruption control and political stability (Kaufmann et al., 2010). Our analysis does not include government effectiveness, regulatory quality, voice and accountability, and the rule of law due to their high intercorrelations ($r > 0.80$). The values of the WGIs range from 2.5 to 2.5.

Skilled and cheap labor. Skilled labor is an important consideration for many foreign investors, particularly those in advanced industries (Blomström et al., 1997). Therefore, we include skilled labor as an explanatory variable. We use the gross enrolment ratio in tertiary education to evaluate skilled labor. The higher ratio of enrolment in tertiary education represents a better labor market quality. For comparison purposes, we also use the gross enrolment ratio in lower secondary education (nine years) as another indicator of skilled labor.

Cheap labor is also regarded as one of the driving factors for developing countries' inbound FDI. However, Quazi (2014) argues that the advantages of cheap labor can be counterbalanced by low productivity (see other empirical studies as well, e.g., Hoang et al., 2010; Reed et al., 2016). Since the data for average monthly earning of employees are substantially missing, we use the

percentage of the rural population as a proxy of cheap labor. A larger proportion of the rural population may also suggest cheaper labor costs (Tiffen, 2003).

Trade openness. Trade plays an important role in promoting inward FDI especially for export-led growth economies (Liargovas and Skandalis, 2012; Liu et al., 2001; Quazi and Mahmud, 2006; Stone and Jeon, 2000). Reed (2016) argues that the participation of open economies in free trade agreements (FTAs) is either uncorrelated with FDI or may discourage FDI. The present study measures trade openness by using the share of total trade (exports plus imports) in GDP and the number of FTAs entered in force.

Level of public goods provision. We use the share of total public expenditure in GDP to measure this variable. Total public expenditure refers to the general government's final consumption spending, which includes all government expenses on goods and services as well as payments to employees (World Bank, 2020). The share of total public expenditure in GDP has been used as an indicator of the level of public good provision (e.g., Bénassy-Quéré et al., 2005). Empirical evidence supports a positive association between public goods provision and FDI (Yuan et al., 2010).

Descriptive analysis

Tables 1 and 2 show the descriptive statistics of the variables. The inward FDI was highly imbalanced among the 28 economies. For example, mainland China, Hong Kong, and Singapore received US$170.56, US$117.11, and US$61.60 billion, respectively, in 2016. At the same time, many countries received less than five billion. The withdrawal of foreign investments in several countries was even larger than inward FDI (e.g., Brunei and Mongolia). As for the CIT rates, they range from 11% to 35%. Twenty countries have a CIT rate of lower than 25% (see Table 1). The results in Table 2 also indicate that GDP per capita and trade have relatively high standard deviations, suggesting large variances for the two variables.

Table 1. The profile of the selected economies in 2016

Country	Population (million)	GDP per capita (USD)	FDI (million USD)	Public goods provision (%)	CIT (%)
Australia	24.13	49755.32	42049.40	18.66	30.00
Bangladesh	162.95	1358.78	1908.27	5.89	25.00
Bhutan	0.80	2773.55	8.08	16.80	35.30
Brunei	0.42	26939.42	150.55	26.22	18.50
Cambodia	15.76	1269.91	2287.03	5.21	20.00
Mainland China	1378.67	8123.18	170556.53	14.39	25.00
Hong Kong	7.35	43740.99	117109.70	9.96	16.50
India	1324.17	1709.59	44458.57	10.31	30.00
Indonesia	261.12	3570.30	4142.20	9.53	25.00
Japan	127.00	38900.57	34904.74	19.88	23.40
Laos	6.76	2338.69	997.44	13.97	24.00
Macao	0.61	74017.18	310.52	10.41	12.00
Malaysia	31.19	9508.24	13515.80	12.57	24.00
Maldives	0.42	9875.28	448.01	36.05	15.00
Mongolia	3.03	3694.08	4156.41	14.63	24.70
Myanmar	52.89	1195.52	3278.10	18.95	25.00
Nepal	28.98	729.12	106.00	11.53	29.50
New Zealand	4.69	39412.16	1934.89	18.06	28.00
Pakistan	193.20	1443.63	2324.00	11.31	32.00
Papua New Guinea	8.08	2500.09	39.77	20.87	30.00
Philippines	103.32	2951.07	7979.57	11.19	30.00
South Korea	51.25	27538.81	10826.60	15.18	22.00
Sri Lanka	21.20	3909.99	898.08	8.46	28.00
Singapore	5.61	55243.00	61596.85	10.34	17.00
Taiwan	23.51	22561.00	8333.00	22.68	17.00
Thailand	68.86	5910.62	3063.24	16.94	20.00
Timor-Leste	1.27	1405.39	5.48	36.44	11.20
Vietnam	92.70	2170.65	12600.00	6.51	20.00

Note(s): GDP per capita and FDI are in constant 2010 US dollars

Table 2. Descriptive statistics of the variables

Variable	Mean	Std. dev	Min	Max
FDI inflows (billion USD)	14.49	35.83	28.02	272.33
CIT (%)	26.30	7.58	1.43	42.0
GDP per capita	13088.51	16812.90	346.77	72183.53
Public goods provision (%)	13.84	11.23	3.46	135.81
Population (million)	132.57	313.50	0.29	1378.67
Skilled labor (tertiary)	37.61	28.16	0.21	99.66
Skilled labor (secondary)	85.96	20.89	22.48	127.69
Cheap labor (rural population; %)	43.52	27.80	0	87.02
Trade openness (%)	91.99	82.39	0.17	442.62
The number of FTAs	6.36	6.26	0	35.00
Connectivity (air transport; log)	5.27	3.40	4.83	9.97
Connectivity (mobile cellular subscriptions; %)	78.64	58.13	0	345.32
Corruption control	0.05	1.06	1.67	2.39
Political stability	0.11	1.04	2.81	1.53
Democracy index	6.15	3.63	0	10.00

Model Estimation and Results

The empirical model. The gravity model is commonly employed by studies focusing on bilateral FDI (Eaton and Tamura, 1996). However, the gravity model may not be suitable since the present study mainly considers unilateral FDI inflows. Therefore, we build a semi-gravity type model following Ismail (2009) and Buch et al. (2003), focusing on host countries' pulling factors (location factors). The baseline model is specified as below:

$$FDI_{it} = \beta_0 + \beta_1 CIT_{it} + \beta_2 Control_{it} + \varepsilon_{it}$$

where i denotes country and t represents year.

Correlation among some of the control variables is found. For example, GDP per capita is highly correlated with two measures of skilled labor, political stability, and corruption (>.70), which suggests that multicollinearity may exist. To mitigate the multicollinearity concerns, variables with a Variance Inflation Factor (VIF) greater than five are entered separately in the regression.

Estimation results. The Hausman test is used to examine whether fixed-effects or random-effects models should be used in the present study (Greene, 2000). As shown in Table 3, the Hausman test suggests that the fixed-effects estimation is preferred. Nevertheless, the correlation between individual effects and the regressors also suggests the presence of an endogeneity problem. This may be because that many economic variables (e.g., GDP per capita, trade, infrastructure, and public goods provision) in our model are potentially endogenous. To address this issue, the System GMM (generalized method of moments) approach is adopted (Hsiao, 2002; Windmeijer, 2005). According to Arellano and Bond (1991), the System GMM approach fits the current study better since we have larger panel units than periods (compared to fixed-effects or random-effects estimators). In GMM estimation, lagged regressors are introduced into the model as instrumental variables to eliminate the reverse causality problem. One- to three- period lagged values of FDI are included as instruments (Wu, 2019; Wu and Lin, 2012) in the present study. The Sargan test is employed to examine the overidentifying restrictions and the Arellano-Bond test is employed to examine the autocorrelation problem.

The estimation results are presented in Table 3. The result of the Sargan test supports the instrument validity, while the Arellano-Bond test reveals that there is no autocorrelation (see Table 3). When comparing the results from the fixed-effect model and system GMM, the system GMM estimation approach produces efficiency gains (e.g., smaller standard errors are observed). Consequently, we focus only on the results of system GMM models in the analysis below.

The results in Column (4) to (6) show that: (1) Host countries' CIT has significant negative effects on their domestic FDI net inflows, which supports our hypothesis; (2) population, skilled labor with secondary education, trade openness, and transportation connectivity demonstrate significant positive effects on FDI inflows; (3) information connectivity and skilled labor with tertiary education are negatively and significantly associated with FDI net inflows; (4) the three measures of public governance and cheap labor are not significant; and (5) all the lagged values of FDI exhibit significant and positive signs.

Table 3. Fixed effects and GMM models: the impact of corporate income tax on FDI inflows

	(1)	(2)	(3)	(4)	(5)	(6)
Dependent variable: FDI	FE	FE	FE	GMM	GMM	GMM
CIT (%)	10.48*	26.61***	23.44***	13.08***	21.08***	4.24**
	(5.385)	(7.673)	(7.363)	(2.406)	(4.628)	(2.025)
Population (log)	108.70***	118.9***		6.75***	7.89***	
	(22.99)	(29.72)		(0.265)	(0.695)	
Connectivity (mobile)	0.19***	0.04	0.10**	0.11***	0.09***	0.06***
	(0.047)	(0.047)	(0.040)	(0.014)	(0.028)	(0.017)
Public goods provision	0.57**	3.33***	3.15***	0.15	0.18	0.10
(%)	(0.227)	(0.696)	(0.643)	(0.129)	(0.233)	(0.175)
Democracy index	0.05	0.76	0.21	0.04	0.02	0.002
	(0.186)	(0.742)	(0.197)	(0.044)	(0.153)	(0.060)
Trade openness (%)	0.21***	0.10	0.06	0.03***	0.04***	0.02
	(0.061)	(0.072)	(0.067)	(0.007)	(0.008)	(0.012)
FTAs	1.33***	1.51***	1.16***	1.20***	1.19***	1.09***
	(0.333)	(0.403)	(0.361)	(0.086)	(0.169)	(0.069)
Skilled labor (tertiary)		1.15***			0.43***	
		(0.250)			(0.044)	
Skilled labor		0.51***			0.56***	
(secondary)		(0.152)			(0.084)	

Corruption control		7.48			1.53	
		(7.398)			(0.971)	
GDP per capita (log)	75.10***			0.892		
	(8.311)			(1.393)		
Connectivity (air			2.12			2.39***
transport; log)			(1.297)			(0.662)
Cheap labor (rural			2.62***			0.05
population)			(0.470)			(0.086)
Political stability			2.09			1.85
			(2.873)			(1.687)
L.FDI				0.75***	0.72***	0.79***
				(0.003)	(0.014)	(0.008)
Constant	214.80**	373.20***	151.90***	46.81***	88.23***	18.53**
	(86.25)	(101.1)	(29.43)	(12.42)	(12.80)	(8.459)
Hausman test	65.48	39.87	28.69			
	0.000	0.000	0.000			
Sargan test				17.045	15.918	12.583
p-value				1.000	1.000	1.000
AR(2)				0.243	0.270	0.259
p-value				0.808	0.787	0.795
R-squared	0.322	0.288	0.282			
N	360	328	345	360	328	345

Note(s): *p < 0.10, **p < 0.05, ***p < 0.01; standard errors in parentheses; all the independent variables are lagged one period; results from RE are not included to save space; Sargan test is for over-restrictions (null hypothesis: overidentifying restrictions are valid); AR (2) is a second-order autocorrelation test (null hypothesis: no autocorrelation)

Robustness checks

As robustness checks, we consider five sets of additional analysis: (1) testing alternative tax measures; (2) including international tax policy variables; (3) adding various control variables about infrastructure and economic characteristics (e.g., different degree of economic reliance on

natural resources, or different levels of ICT development); (4) using various subsamples (e.g., a sample without tax havens); and (5) using more lagged terms of control variables (e.g., public goods provision and trade). To save space, we only report the results of fixed effects and system GMM estimations using the first baseline model in robustness checks. VIFs are checked for all models to address potential multicollinearity problems.

Alternative tax measures. Although we argue that FDI locations are more sensitive to statutory CIT changes, some existing studies indicate that effective tax rates may also make a difference (e.g., Devereux and Griffith, 1998; Devereux et al., 2008; Mistura and Roulet, 2019). We examined three alternative tax measures from the World Bank: total tax rate, the share of tax revenue in GDP, and profit tax. We use both fixed effects and GMM estimations. Except for column (1) from fixed effects estimation in Table 4 that supports a significant negative association between total tax rate and FDI, all tests between tax rates and FDI are nonsignificant. The results of other control variables are generally consistent with the main findings when they are significant. Therefore, the analysis supports our argument that investors may be more sensitive to host countries' statutory CIT changes. Although we argue that FDI locations are more sensitive to statutory CIT changes, some existing studies indicate that effective tax rates may also make a difference (e.g., Devereux and Griffith, 1998; Devereux et al., 2008; Mistura and Roulet, 2019). We examined three alternative tax measures from the World Bank: total tax rate, the share of tax revenue in GDP, and profit tax. We use both fixed effects and GMM estimations. Except for column (1) from fixed effects estimation in Table 4 that supports a significant negative association between total tax rate and FDI, all tests between tax rates and FDI are nonsignificant. The results of other control variables are generally consistent with the main findings when they are significant. Therefore, the analysis supports our argument that investors may be more sensitive to host countries' statutory CIT changes.

Table 4. Results using alternative tax measures

	(1)	(2)	(3)	(4)	(5)	(6)
Independent variable: Alternative tax measures	TTR	PTR	TR	TTR	PTR	TR
Dependent variable: FDI	FE	FE	FE	GMM	GMM	GMM
Tax rate	0.30***	0.06	0.17	0.02	0.12	0.79
	(0.083)	(0.153)	(0.478)	(0.041	(0.194)	(0.638)
GDP per capita (log)	9.63	11.21	24.18**	2.88	5.26***	24.01
	(9.117)	(8.423)	(10.78)	(2.419)	(1.934)	(17.19)
Population (log)	52.45	69.55**	24.73	8.615	16.98	5.57
	(31.87)	(29.20)	(24.73)	(16.63)	(47.34)	(4.253)
Connectivity (mobile)	0.04	0.03	0.02	0.07***	0.03	0.04
	(0.037)	(0.035)	(0.054)	(0.024)	(0.037)	(0.034)
Public goods provision (%)	0.52	0.22	0.42	0.25	0.015	1.79**
	(0.360)	(0.321)	(0.650)	(0.224)	(0.371)	(0.879)
Democracy index	0.05	0.04	0.01	0.02	0.03	0.01
	(0.110)	(0.100)	(0.176)	(0.045)	(0.150)	(0.037)
Trade openness (%)	0.02	0.002	0.09	0.05***	0.01	0.08***
	(0.056)	(0.051)	(0.066)	(0.006)	(0.016)	(0.023)
FTAs	0.12	0.01	0.78**	0.85*	0.62	1.25**
	(0.332)	(0.298)	(0.326)	(0.493)	(1.070)	(0.637)
L.FDI				0.64***	0.57***	0.70***
				(0.029)	(0.060)	(0.045)
Constant	39.72	89.69	90.79	1.85	80.76	227.80*
	(84.43)	(75.35)	(103.3)	(66.04)	(124.0)	(127.8)
Sargan test				12.683	14.242	8.880
p-value				1.000	1.000	1.000
AR(2)				1.479	1.258	0.312
p-value				0.139	0.209	0.755
R-squared	0.127	0.064	0.134			
N	198	190	286	198	190	286

Note(s): *p < 0.10, **p < 0.05, ***p < 0.01; TTR=Total tax rate; PTR=Profit tax rate; TR= Tax revenue; standard errors in parentheses; all the independent variables are lagged one period; Sargan test is for over-restrictions (null hypothesis: overidentifying restrictions are valid); AR (2) is a second-order autocorrelation test (null hypothesis: no autocorrelation)

International taxation policies. The impacts of international taxation policies such as double taxation treaties (DTTs) and the OECD/G20 Inclusive Framework on Base Erosion and Profit Shifting (IFBEPS) need to be examined. The empirical studies on the effects of DTTs on FDI show mixed results. Some studies support the positive effects of DTTs (e.g., Blonigen et al., 2014; Rohan and Moravec, 2017) while others show that DTTs may either have no significant impacts or decrease FDI inflows (Baker, 2014; Blonigen and Davies, 2004; Shah and Qayyum, 2015). Data on the accumulated number of DTTs entered in force by host countries are collected. Both bilateral and multilateral tax treaties are included.

The recent development of IFBEPS may impact FDI. Profit shifting to tax havens to avoid taxes by multinationals has been increasingly reported, which causes billions of tax revenue losses for higher tax economies. To tackle tax avoidance, OECD/G20 IFBEPS provides 15 actions for 135 countries and jurisdictions to ensure that profits are taxed where the profits are generated (Bradbury and O'Reilly, 2018). This variable is measured by a dummy that whether a host country participated in the IFBEPS by the end of a corresponding year (1= Yes and 0=No). The data are from the OECD website.

Results are shown in column (1) and (2) of Table 5: CIT is negative and significant in both models, which support the robustness of the main findings; DTTs has a significant positive association with FDI, and BEPS shows a significant negative sign. The positive effect of DTTs on FDI is understandable because the goal of DTTs is to eliminate double taxation and protect tax regime certainty for investors (Christians, 2006; Sachs and Sauvant, 2009). Regarding the BEPS project, as its principal goal is to promote tax revenues, the effective tax rates for multinationals may increase when a country adopts this project. Our finding is consistent with Laudage's (2020) argument that the BEPS framework may disincentivize FDI especially when it is introduced unilaterally.

Infrastructure and economic characteristics. We also demonstrate that our main findings are robust when accounting for additional infrastructure, economic characteristics, and public governance variables. Four variables about economic characteristics and infrastructure are included: (1) the total rents on natural resources captures the extent that an economy's GDP relies on earnings from natural resources (e.g., coal, forest, and oil), and economies with more natural resources income tend to have less need to attract FDI; (2) the share of ICT goods exports in total exports and energy use efficiency represent the technology advancement of a society, which are expected to influence FDI positively; and (3) the length of rail lines is included as an additional proxy of domestic infrastructure connectivity and a positive impact is expected. Column (3) to (6) of Table 5 presents the estimation results, which support the robustness of the main findings. The coefficient of CIT remains negative and significant across fixed effects and GMM models. The share of total rents on natural resources, ICT goods exports, and railway infrastructure show positive signs when significant. Energy use efficiency is not significant.

The autocracy index from Marshall et al. (2018) is also added to the model. The autocracy index captures the extent that the political system lacks "regularized political competition and political freedoms" (Marshall et al., 2018, p. 15). Autocracies tend to restrict or suppress competitive political participation. Corruption and a high degree of intervention on social and economic activities by political elites are common in autocratic countries. Therefore, the autocracy index may negatively impact FDI inflows. However, results from both FE and GMM in column (7) and (8) of Table 5 show that the autocracy index is not significant.

Column (9) and (10) of Table 5 present the results when the interaction term of CIT and public goods provision is included. Bénassy-Quéré and colleagues (2005) argue that the effects of high taxation on FDI may be compensated by public goods provision and thus the interaction between taxation and public goods provision may moderate the link between tax and FDI. The

coefficients of CIT are negative and significant in the GMM model, which is consistent with the main findings. The interaction term is significant, which supports the moderation effects.

Results using sub-samples. We further test the robustness of our baseline model results by using three different subsamples. The first subsample excludes tax havens such as Hong Kong and Singapore (see results from column 1 and 2 of Table 6). The rationale for doing so is that tax havens may not be representative when we test the general relationship between tax rate and FDI. The second subsample excludes mainland China, Hong Kong, Macao, Taiwan, and Singapore (column 3 and 4 of Table 6). The concern is that a round-tripping issue exists between these economies and may have inflated FDI (Xiao, 2004). The third subsample includes five member economies of the Asia Pacific Economic Cooperation (APEC) (e.g., Canada, Chile, Mexico, Peru, and the USA; see column 5 and 6 of Table 6). The reason for this additional test is that there are large amounts of intra-APEC FDI flows between countries in our sample. For example, the United States is the largest FDI country for many East and South Asian economies. At the same time, it receives the largest amount of FDI. Table 6 reports the results. Consistent with the previous evidence, the coefficients of the CIT are either negative or nonsignificant.

Results using more lagged terms of trade and public goods provision. Given the complex relationships between FDI, trade, and public spending (e.g., Ghosh, 2007; Tsaurai, 2015), one-period lagged GDP per capita and two-period lagged trade and public goods provision are introduced in the model to account for potential reverse causation and simultaneity problems. Results are shown in column (7) and (8) of Table 6: both two-period lagged variables are significant and positive in GMM models, and the results of CIT remain unchanged.

Table 5. Results with additional control variables

DV: FDI	(1) FE	(2) GMM	(3) FE	(4) GMM	(5) FE	(6) GMM	(7) FE	(8) GMM	(9) FE	(10) GMM
CIT (%)	-12.69**	-10.48**	-42.01***	-20.34***	-23.82***	-8.971***	-10.48*	-16.12***	-2.88	-9.63***
	(5.557)	(5.337)	(10.50)	(5.062)	(8.623)	(2.934)	(5.394)	(3.716)	(6.557)	(2.417)
GDP Per Capita (log)	88.48***	0.361	110.8***	0.787	89.86***	4.190***	75.10***	-0.289	73.27***	1.886**
	(9.186)	(1.804)	(12.12)	(2.949)	(13.40)	(0.778)	(8.324)	(1.835)	(8.358)	(0.838)
Connectivity (mobile)	-0.22***	-0.08***	-0.28***	-0.09	-0.32***	-0.04***	-0.19***	-0.08***	-0.19***	-0.12***
	(0.052)	(0.028)	(0.059)	(0.070)	(0.069)	(0.015)	(0.047)	(0.029)	(0.047)	(0.016)
Public goods provision (%)	0.88***	-0.0002	-1.98**	0.23	-1.93	-0.09	0.57**	0.12	0.87***	0.43***
	(0.244)	(0.214)	(0.895)	(0.308)	(1.438)	(0.181)	(0.228)	(0.134)	(0.268)	(0.132)
Democracy index	0.07	0.01	2.00**	-0.86*	0.56	-0.55	0.05	0.24	0.04	-0.02
	(0.187)	(0.095)	(0.918)	(0.448)	(1.037)	(0.457)	(0.191)	(0.249)	(0.185)	(0.045)
Trade openness (%)	-0.187***	0.02**	-0.31***	-0.005	-0.09	-0.05	-0.21***	0.04***	-0.21***	0.03***
	(0.063)	(0.009)	(0.080)	(0.019)	(0.101)	(0.034)	(0.061)	(0.010)	(0.061)	(0.007)
FTAs	0.79*	1.57***	1.75***	1.15	0.60	0.01	1.33***	1.15***	1.37***	1.11***
	(0.456)	(0.188)	(0.499)	(0.986)	(0.518)	(0.338)	(0.335)	(0.107)	(0.332)	(0.119)
Population (log)	-113.9***	4.76***	-171.6***	1.04			-193.5***	1.26	-103.4***	6.45***
	(24.16)	(0.804)	(33.75)	(2.900)			(38.87)	(1.276)	(23.22)	(0.483)
DTTs	0.22**	0.09***								
	(0.092)	(0.032)								
BEPS	-22.61***	-24.32***								
	(6.199)	(2.169)								
Natural resources rents (%)			1.716***	1.037***						
			(0.630)	(0.301)						
Energy use efficiency			-0.83	13.13						
			(13.35)	(10.97)						

ICT exports (%)			0.39	0.14*						
			(0.248)	(0.078)						
Total rail lines					-6.99	4.19***				
					(14.33)	(0.598)				
Autocracy index							0.0001	0.11		
							(0.186)	(0.122)		
CIT × public good provision									-3.84**	-1.55***
									(1.855)	(0.510)
L.FDI		0.75***		0.75***		0.78***		0.75***		0.75***
		(0.009)		(0.040)		(0.013)		(0.004)		(0.005)
Constant	-316.2***	-34.11	-248.6	-97.91***	-644.4***	-65.25***	-214.8**	-44.90***	-198.3**	-47.28***
	(101.3)	(20.76)	(192.3)	(23.57)	(152.6)	(9.074)	(86.67)	(12.92)	(86.29)	(9.290)
Sargan test		12.322		8.590		5.364		15.351		15.275
p-value		1.000		1.000		1.000		1.000		1.000
AR(2)		-0.481		-0.321		0.039		-0.240		-0.274
p-value		.630		.748		.969		.810		.784
R-squared	0.384		0.526		0.484		0.383		0.332	
N	328	328	259	259	225	225	206	206	359	359

Note(s): *p < 0.10, **p < 0.05, ***p < 0.01; standard errors in parentheses; all the independent variables are lagged one period; Sargan test is for over-restrictions (null hypothesis: overidentifying restrictions are valid); AR (2) is a second-order autocorrelation test (null hypothesis: no autocorrelation)

Table 6. Results using sub-samples

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dependent variable: FDI	FE	GMM	FE	GMM	FE	GMM	FE	GMM
CIT	9.03*	7.22***	2.31	13.02***	0.48	14.27***	12.91**	9.83***
	(5.368)	(1.847)	(3.087)	(0.572)	(2.462)	(0.269)	(5.847)	(3.662)
GDP per capita (log)	80.94***	2.80***	1.67	16.27***	40.06***	18.53***	69.49***	3.13**
	(8.476)	(0.893)	(6.049)	(0.816)	(11.41)	(0.344)	(8.646)	(1.489)
Population (log)	138.5***	4.81***	7.37	9.31***	57.75*	11.31***	88.82***	6.69***
	(24.40)	(0.363)	(14.38)	(0.641)	(32.10)	(0.611)	(25.05)	(0.341)
Connectivity (mobile)	0.16***	0.08***	0.03	0.05***	0.07	0.01	0.18***	0.12***
	(0.048)	(0.009)	(0.029)	(0.013)	(0.065)	(0.011)	(0.049)	(0.011)
Democracy index	0.10	0.04	0.02	0.01	0.04	0.05	0.04	0.03
	(0.185)	(0.076)	(0.105)	(0.042)	(0.191)	(0.039)	(0.189)	(0.047)
FTAs	0.96***	0.89***	0.51***	0.73***	1.50***	0.43***	1.19***	1.13***
	(0.347)	(0.169)	(0.194)	(0.196)	(0.408)	(0.111)	(0.353)	(0.079)
Public goods provision (%)	0.66***	0.12*	0.02	0.49***	0.03	0.69***		
	(0.228)	(0.0709)	(0.133)	(0.115)	(0.344)	(0.172)		
Total trade (%)	0.22***	0.03**	0.02	0.10***	0.09	0.13***		
	(0.067)	(0.011)	(0.037)	(0.014)	(0.085)	(0.010)		
Public goods provision (L2)							0.45***	0.03***

							(0.144)	(0.008)
Trade openness (L2)							0.14**	0.03***
							(0.0695)	(0.009)
L.FDI		0.78***		0.59***		0.60***		0.71***
		(0.004)		(0.001)		(0.001)		(0.012)
Constant	138.0	48.02***	34.54	173.9***	103.5	205.2***	247.2***	60.11***
	(89.52)	(9.248)	(48.42)	(7.117)	(123.4)	(6.432)	(95.16)	(11.44)
Sargan test		15.099		15.970		26.717		15.056
p-value		1.000		1.000		1.000		1.000
AR (2)		0.070		0.632		0.360		0.303
p-value		0.944		0.528		0.719		0.762
R-squared	0.328		0.149		0.118		0.284	
N	344	344	344	451	468	468	338	338

Note(s): $^{*}p < 0.10$, $^{**}p < 0.05$, $^{***}p < 0.01$; standard errors in parentheses; all the independent variables are lagged one period; Sargan test is for over-restrictions (null hypothesis: overidentifying restrictions are valid); AR (2) is a second-order autocorrelation test (null hypothesis: no autocorrelation

Findings and Implications

Main Findings

By using the data from the Asia-Pacific region, the present research provides evidence that a host country's CIT has a significant negative impact on its FDI inflows. The results explain why tax competition has been a widely used policy tool for countries to compete for investments. After comparing the results of various alternative tax measures, our results support the argument that the statutory CIT may be a better indicator to observe tax competition. We also examined other explanatory factors of FDI. The results demonstrate that countries with better air transportation connectivity have attracted more FDI inflows. However, indicators of skilled labor and labor cost exhibit mixed results. The enrolment ratio in tertiary education shows a significant and negative sign. One explanation may be that more highly educated labor usually means higher wage costs (Feenstra and Hanson, 1997), which may have negative effects on FDI from labor-intensive industries (Cheng and Kwan, 2000; G€org and G€orlich, 2015). Since a high proportion of the foreign investors in Asia are engaging in labor-intensive activities such as manufacturing, infrastructure, mining, and power, they may not require well-educated professionals (Bissinger, 2012; Baumgarten et al., 2013; Hoang et al., 2010; Li, 2013). The enrolment ratio in secondary education is significantly positively correlated with FDI and cheap labor measured by the rural population is nonsignificant. These may suggest that labor with a medium-skill level is preferred. Another interesting finding is that trade openness, measured by the share of total trade in GDP and the number of FTAs, has significantly positive associations with FDI, which is consistent with existing studies (e.g., De Mello and Fukasaku, 2000). Surprisingly, information connectivity measured by mobile cellular subscriptions shows a negative sign. One explanation is that information connectivity also means higher education level and income which tend to be negatively associated with labor-intensive investments.

Policy Implications

Our findings provide important policy implications for practitioners. First, pro-investment tax policies, such as lower CIT, are still found to be important. Tax cuts are often used as a policy instrument to boost investments. After the USA significantly cut its CIT rate in 2017, China, Australia, and several European countries also considered implementing tax incentives. For example, the total tax reduction in China was US$1.3 trillion in 2018 and will reach US$2 trillion in 2019 (Shen, 2019). Therefore, we can predict that the game of "racing to the bottom" is still ongoing.

Nevertheless, tax competition may have unequal influences on countries at different developmental stages. Countries with better infrastructure have an advantage in attracting FDI inflows. At the same time, transportation connectivity and information connectivity show different associations with FDI. Countries with a larger population also have an advantage in attracting FDI inflows. Foreign investments in the Asia-Pacific region may prefer labor with a medium skill level. The present study also confirms the positive association between trade openness and FDI inflows. Therefore, reducing trade barriers should be a policy priority.

The final point that merits discussion is that the uncertainty induced by the US-China trade tensions may accelerate future capital mobility in Asia. The present study shows that an open economy with fewer trade barriers tends to attract more FDI. However, ongoing trade tensions are accelerating trade barriers. During the past few years, mainland China and Hong Kong have been attracting the largest amount of investments in the Asia-Pacific region. After the US-China trade tensions began in early 2018, many manufacturers started to move their production away from China. As political instabilities have escalated since early 2019 in Hong Kong, investors may also consider shifting their investments out of the city. When large FDI recipients like mainland China and Hong Kong are facing critical challenges of increasing trade barriers or political instabilities that may lead to capital outflows (Reinicke, 2019), other

neighboring countries could capitalize on these opportunities. Our findings suggest that economies with a preferential tax regime and good social and physical infrastructure support may receive more FDI inflows than ever.

Conclusion

The present study contributes to the literature in several ways. Firstly, the current research adds important insights to the understanding of Asia-Pacific countries' political-economic dynamics, especially when cut-throat tax competition and slowing economic growth have been key challenges for global economies. The booming Asia-Pacific region has attracted increasing attention due to its impressive economic growth since the mid-1980s (Stone and Jeon, 2000). This study provides fresh research findings in the Asia-Pacific context that lower corporate income tax is expected to be one of the most important driving forces of capital inflows. Moreover, although the literature examining public governance is increasing (e.g., corruption), more studies investigating the effects of public governance on FDI in the Asia-Pacific region are needed. The present study examined the impacts of several public governance variables on host countries' inward FDI. However, all governance variables are not significant, which merits further investigation. The level of public goods provision is not significant as well. One understanding may be that, since the models above have controlled for the outcomes of public spending, such as education and infrastructure development, the larger the share of public expenditures in GDP, the less efficient a government may be. This may be a negative factor for FDI (Cole et al., 2009; Liberati, 2007; Wu and Lin, 2012).

The present study has a few limitations. Due to data limitation, we used the statutory CIT but not the effective tax rate to represent tax burdens. The study has not commented on what would be the impact of the preferential tax regime, state aid, or subsidies on FDI, and how taxation could influence the structuring and financing of FDI. This study also does not

examine FDI by sectors. Future studies may examine more closely the impact of tax on FDI specifically in service or high-tech sectors, and the possibility and extent of profit shifting especially for geographically mobile activities.

Notes

1. For example, in 2016, the GDP growth rate of Bangladesh was 7.11%; Bhutan, 7.99%; Cambodia, 6.95%; China, 6.69%; India, 7.11%; Indonesia, 5.02%; Laos, 7.02%; Maldives, 6.16%; Myanmar, 5.47%; Philippines, 6.92%; and Vietnam, 6.21%.
2. According to the statistics by the United Nations Conference on Trade and Development in 2012, South Asian countries are receiving an increasing amount of FDI from the East Asian and Pacific countries. World Bank statistics also show that South Asian exports to East Asia and the Pacific account for 22.28% of its total exports (World Bank, 2020).

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