The Effect of Foreign Direct Investment on Tax Revenue in Developing Countries

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Arif Widya Pratomo

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Members of the Examining Committee:

Elissaios Papyrakis (Supervisor)
Binyam Afewerk Demena (Reader)

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Abstract

The objective of this research paper is to study the effect of foreign direct investment (FDI) on tax revenue in developing countries. FDI net inflow, greenfield, and brownfield FDI are selected as the independent variable, and tax revenue and its types are chosen as the dependent variable. Using panel data analysis, this research finds that FDI net inflow has a positive correlation and statistically significant on total tax revenue, corporate tax revenue, individual tax revenue, and VAT revenue. However, the effect of FDI net inflow on property tax revenue is not statistically significant. The regression result from greenfield and brownfield FDI shows that the greenfield FDI has a beneficial effect and statistically significant on total tax revenue and individual tax revenue, while brownfield FDI brings a negative impact on individual tax revenue. Using interaction variable between FDI and GDP per-capita, this research also finds that in developing countries, the effect of greenfield FDI depends on the level of GDP per-capita. Where, the effect of greenfield FDI on revenue is increasing, but this effect is decreasing (increasing at decreasing rate) along with the increase of GDP per-capita or FDI.

To deal with endogeneity problems, this research uses "political stability and absence of violence" index as an instrumental variable and conducts a two-stage least square (2SLS) regression to estimate the parameter. The result shows that FDI has a positive correlation on total tax revenue, but not significant. However, the endogeneity test shows that the endogeneity problem is less likely to exist. Therefore, FDI and tax revenue tend to only have one direction effect from FDI to tax revenue.

Relevance to development studies

The contribution of FDI in the development of developing countries is increasing due to the lack of domestic funding. Nowadays, FDI is not only expected to fill the investment gap that not covered by domestic saving but also expected to bring greater spillover effect to the host country's economy. Many incentives are offered to attract investors and the tax incentive is preferable among the other.

On the other hand, recently, many countries are more dependent on tax revenue as the primary source of government revenue. A massive tax incentive and uneven competition might erode tax revenue. However, the presence of FDI also could increase tax revenue due to the spillover effect.

Considering the role of FDI and tax revenue in economic development is increasing, investigation on the effect of FDI on tax revenue might be important for further policy formulation. The result of this research is projected to help policymakers to decide which is better between policy for promoting or restricting FDI and which type of FDI that should be chosen.

Keywords
FDI, greenfield, brownfield, tax revenue, endogeneity

Chapter 1
Introduction

This chapter is divided into five subsections. The first subsection will present the background of the study. This subsection will be started with a recent historical perspective of Foreign Direct Investment (FDI) and followed by the role of taxation in recent years. The second subsection will explain the motivation for researching the topic and followed by the research objective and research question. The fourth subsection is the research contribution that is expected to be achieved and the last subsection of this chapter is the organization of the research paper.

1.1. Background

1.1.1. Foreign direct investment and development: A recent historical perspective

Since the early 1980s, the contribution of FDI in the development of developing countries has been increasing due to the lack of lending from commercial banks (Aitken and Harrison 1999: 605). As external funding, FDI can be seen as one of the solutions to fill the investment gap that is not covered by domestic saving. Many countries try to attract FDI by giving various incentives and minimize regulation that restricts FDI. However, attracting more FDI seem to have a "double-edged sword" effect on host countries. On the one hand, FDI is not only as external funding that fills the investment gap but also expected to bring a greater positive effect on the host country's economy through spillover effect (Demena and Bergeijk 2017:564). On the other side, there is a chance that the presence of the FDI erodes host country's productivity due to the uneven competition.

Nowadays, the role of FDI has evolved not only to fill the investment gap but is also expected to bring greater spillover effect to the economy of a host country. FDI is expected to increase productivity through technology transfer, create job opportunities, that in turn, will increase government revenue as well. The increasing function of FDI in the development of economic can be seen from the positive trend of policies towards FDI and the increase of the amount of FDI.

The policies regarding FDI are improving. Previously, the policy that related to FDI only focused on how to attract as much as possible FDI inflow to a host country by giving incentives. At present, the policy is also focusing on how FDI can bring a bigger benefit through the spillover effect for a host country. For example, by prioritizing the FDI in the manufacturing sector due to manufacturing sector is the engine of growth (Necmi 1999: 653), joint venture formation to acquire technology from advance country (Holmes et al. 2015: 1157), and increase the absorption level on a host country (Borensztein et al. 1998: 115).

In general, the policy of FDI that has been formulated by many countries can be classified into two contrasting policies such as liberalization or promotion to attract FDI and restriction regulation to avoid FDI. As shown in Figure 1.1, the promotion policy gradually increases from 2010 after a declining trend that starts in 2001. The increase of regulation in promotion of FDI corresponds with the world recovery from the global financial crisis 2008-2009 (UNCTAD 2018: 128). During the crisis, investors tend to withdraw their investment to avoid further loss. The huge capital flight might harm economic development. Therefore, the regulation is needed not only to promote FDI but also to protect domestic interest against capital flight. On the other hand, the regulation that restricts FDI decreases steadily from 32 percent in 2010 to 14 percent in 2017. However, the number of countries that concern in FDI by formulating policy shows a fluctuation

trend. As depicted in Figure 1.1, in 2014, the number of countries that made policy related to FDI increased significantly from 41 countries in 2014 to 65 countries in 2017. In other words, FDI becomes more favorable among the government of many countries.

Figure 1.1
Policy change on FDI
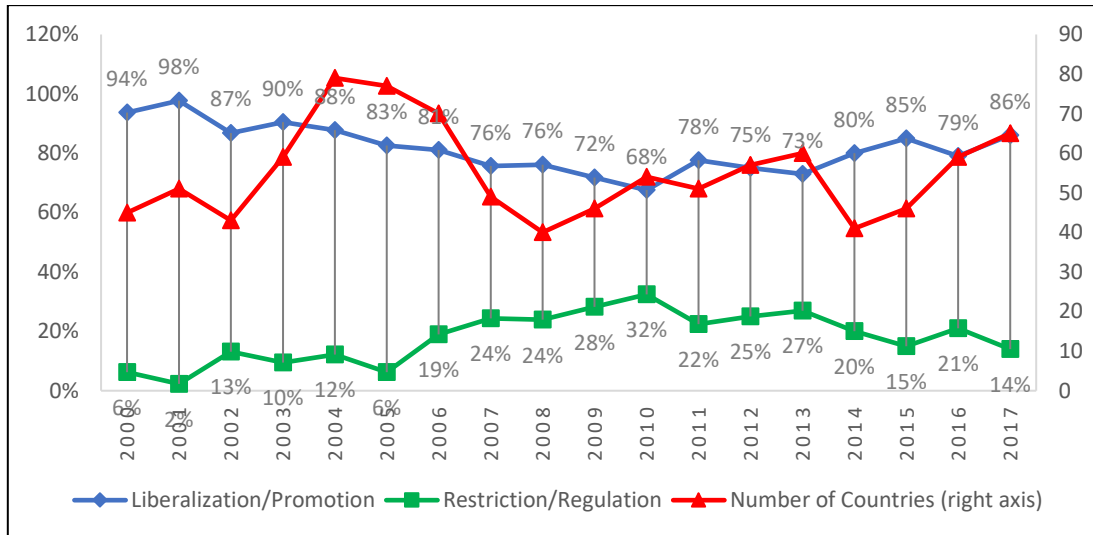
Source: (UNCTAD 2018: 80)

Figure 1.2
FDI net inflows by economy and region, 1990-2017
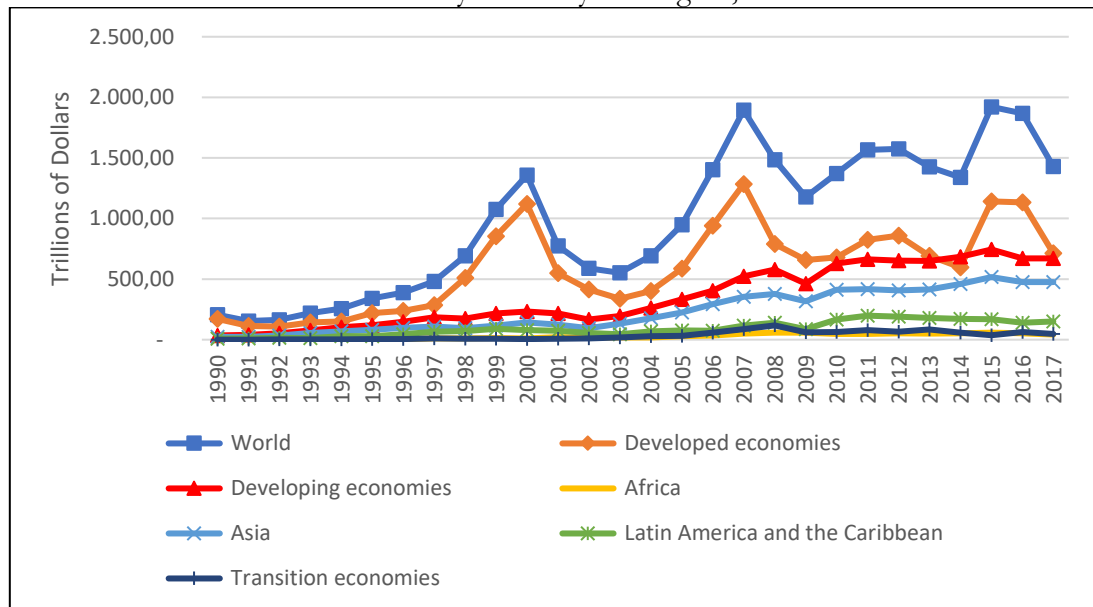
Source: (UNCTAD 2019)

As shown in Figure 1.2, the global trend of FDI inflow is still dominated by developed economies, followed by developing economies and transition economies. FDI inflow of developed economies experience some fluctuations. For example, during the 2008-2009 global financial crisis, FDI inflow in developed countries decrease sharply from US$ 1.284 trillion in 2007 to US$ 656 trillion in 2009. This amount continues to decrease until 2014, where FDI inflow reaches US$ 596 trillion. After a significant increase in 2015, the amount dropped to US$ 712 trillion in 2017 from US$ 1.141 trillion in 2015. This might be caused by the decline of FDI rate of return from the developed country from 6.2 percent in 2016 to 5.7 percent in 2017 (UNCTAD 2018: 3). Moreover, given that the USA has a significant contribution of FDI inflow for about 29 percent on average,

changes in the FDI inflow of the USA will affect the total amount of FDI inflow to developed countries (UNCTAD 2019).

On the other hand, developing economies experience a relatively stable increase in FDI inflow. As shown in Figure 1.2, starting in 2002, the amount of FDI inflow increases steadily. During the 2008-2009 global financial crisis, the amount of FDI decreases slightly from US$ 577 trillion in 2008 to US$ 461 trillion in 2009. However, shortly after the global financial crisis end, the amount of FDI inflow rebound and keep increasing until 2017.

Based on region, Asian countries are leading in obtaining FDI inflow followed by Latin and Caribbean countries and the last are African countries. Figure 1.2 shows that Asian countries experience a relative increase in FDI inflow except during the 2008-2009 global financial crisis. At the beginning of 1990, Asian countries obtained FDI inflow US$ 22 trillion. This amount continues to increase until 2008 when FDI reached US$ 378 trillion. This amount drops slightly to US$ 316 trillion during the 2008-2009 global financial crisis. Directly after the crisis, the amount of FDI increased drastically to US$ 412 trillion in 2010 and gradually increase and reach US$ 475 trillion in 2017. China still dominates the amount of FDI inflow of Asian countries by contributing 33.7 percent on average. Latin and Caribbean countries experience a little increase in FDI inflow from 2003 to 2008 and experience a sharp dropped from US$ 117 trillion in 2008 to US$ 61 trillion in 2009. The global financial crisis could be blamed for this decline. Immediately after the crisis ended, the amount of FDI inflow increased significantly in 2011. However, Latin and Caribbean countries cannot maintain the level of FDI inflow. Meanwhile, African countries contribute only 2.6 percent of world FDI inflow on average. At the beginning of 1990, African countries only receipt FDI inflow around US$ 2 trillion and slowly increase until reaching US$ 18 trillion in 2003. After that, FDI inflow increases significantly and reach a peak in 2008 for US$ 58 trillion. However, after 2008, the amount of FDI experience downward fluctuation and reach US$ 41 trillion at the end of 2017.

1.1.2. The role of taxation in recent years

Taxes can be seen as "a financial blood supply" to the economy to finance government expenditures. The presence of FDI could support the role of taxes as a revenue collector. FDI could bring positive effect due to the bigger scale of an economy that might increase tax revenue capacity. The studies that have been done shows that FDI positively affects tax revenue (Mahmood and Chaudhary 2013: 68, Aslam 2015: 250). However, aggressive tax incentives and transfer pricing motivation might deteriorate tax revenue performance. Moreover, among the various types of incentives, the tax incentive is the most preferable for a host country to attract FDI (UNCTAD 2018: 151). The study that has been done in Ethiopia shows that FDI negatively affects tax revenue due to massive tax incentives (Jeza et al. 2016: 171).

Recently, tax revenue has increasingly contributed to a larger share of GDP. There is a shift from countries that previously rely on non-tax revenue (natural resources, foreign aid) to taxes as alternative revenue. Low commodity prices lead many countries to broaden their tax bases. As depicted in Figure 1.3, the trend of tax ratio for all income groups are steadily increasing except for high-income economies. On average, the tax ratio of low-income countries increases from 9.89 percent in 2000 to 16.29 percent in 2016. The lower-middle-income countries also experience an increase in the tax ratio from 14.27 in 2000 to 33.11 in 2016. The upper-middle-income countries on average have tax ratio 18.26 percent in 2000 and increase steadily to 21.46 percent in 2016. On the other hand, high-income countries experience tax ratio fluctuation. During the global economic crisis, the tax ratio of OECD countries decreases slightly from 32.26 in 2007 to 31.13 in 2009 and increase sharply to 33.11 percent in 2016. Overall, the tax ratio increases globally.

Figure 1.3

Average of tax revenue as a percentage of GDP (tax ratio) per income category
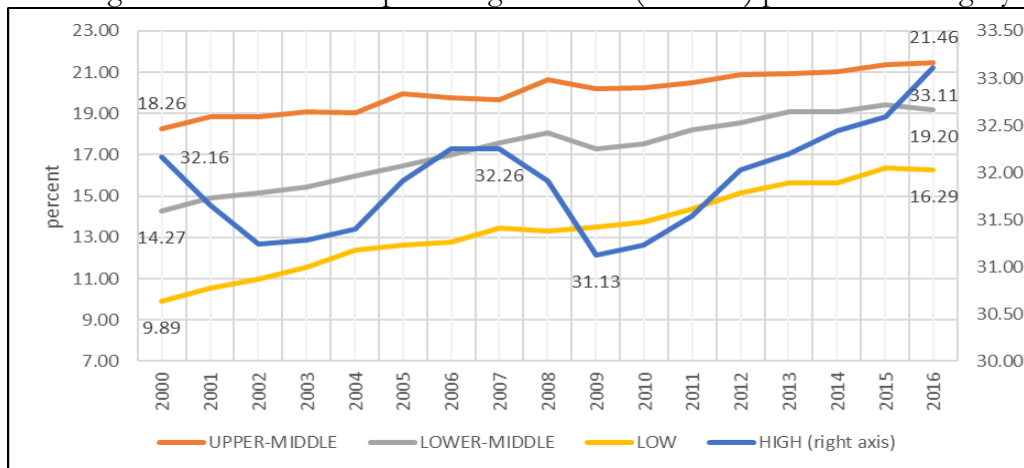
Source: OECD (2019a)

1.2. Motivation

Considering the increase of FDI's role in economic development and the increase of tax's role as the main source of government revenue, encourages author to explore whether the presence of FDI could elevate tax revenue. This research is also motivated by previous researches which mostly focuses on the tax as a regulatory function to promote FDI. A lower tax rate might attract more FDI (Cassou 1997: 1295). Moreover, the empirical evidence or research that investigates on the effect of FDI on tax revenue remains rare, for example: the effect of FDI on tax revenue at country-level in OECD countries (Bayar and Ozturk 2018: 38); in Pakistan (Mahmood and Chaudhary 2013: 68); in Ethiopia (Jeza et al. 2016: 171); in Sri Lanka (Aslam 2015: 250); and the effect of FDI on tax revenue at firm level in Turkey (Balıkçıoğlu et al. 2016: 780).

1.3. Research objective and question

The purpose of this research paper is to analyze the relationship between FDI and tax revenue. This research paper wishes to address the main question: what is the effect of FDI on tax revenue? To answer this question, this research paper will explore the possible channel on how FDI affect tax revenue and examine whether a different type of FDI will affect the different type of tax revenue in different ways. There are several types of FDI and tax revenue used in this research, such as FDI net inflow, greenfield and brownfield (Mergers and Acquisitions) FDI, total tax revenue, corporate tax revenue, individual tax revenue, VAT revenue, and property tax revenue.

1.4. Contribution

This research paper is expected to extend previous findings of the effect of FDI on tax revenue. This research paper could be the first empirical study that investigates the impact of FDI on tax revenue that uses several types of FDI, such as FDI net inflow, greenfield and brownfield FDI, and several types of tax revenue such as total tax revenue, corporate tax revenue, individual tax revenue, VAT revenue, and property tax revenue.

Investigating the effect of FDI on tax revenue is also projected to have an essential contribution to the policy formulation. If the result shows that FDI positively affects tax revenue, the government can maintain the FDI promotion policy. However, if FDI has a negative effect on tax revenue performance, the government should formulate policies to avoid tax revenue

degradation due to the presence of FDI, otherwise the government should consider gradually limiting FDI by reducing the incentives given to foreign investors.

1.5. Organization of the research paper

The organization of this research paper is divided into five chapters. The first chapter is the introduction. This subsection provides the background of the study, problem statement, motivation, research objective, research question, and the organization of the study. The second chapter will provide the theoretical framework and empirical evidence from previous researches. Chapter three will provide data, the definition of variables, proposed empirical model and hypothesis, methodology, and treatment on the endogeneity problem. Regression analysis will be delivered in chapter four and followed by the conclusion in the fifth chapter.

Chapter 2
Theoretical Framework and Empirical Evidence

This chapter is divided into two main subsections. The first subsection presents the theoretical framework, and the second subsection provides empirical evidence about the effect of FDI on tax revenue. In the theoretical framework, the research briefly discusses the definition of FDI, the role of FDI to economic growth, taxation, and the channel on how FDI might affect tax revenue. The empirical evidence subsection provides information from previous studies that show the effect of FDI on tax revenue at the country level and firm level.

2.1 Theoretical framework
2.1.1 FDI - Definitions

Definition of FDI can be simplified as an investment made by a company or individual from a home country to a host country. FDI can also be defined as "A process by which citizens of one home country obtain possession of resources to control the manufacturing, distribution and other operations of a company in the host country" (Moosa 2002).

From the given definitions, it is evident that FDI can be divided into several important components. First, FDI involves a company or individual from a home country who have the intention to expand their business abroad to maximize their profit. The profit can be obtained from a higher rate of return from lower production cost and bigger market size. In this case, globalization helps investors to get profit from abroad that give a higher rate of return. The second component of FDI is a host country. A host country is a place or country where foreign investors will put their money and start their business. The third component is the investment itself. Investment from foreign investors is not only in the form of money or capital flows but also in the form of transferable technology, knowledge, and management skills. The last component of FDI is the ability of the parent company or investor to control its subsidiary in the host country. The share of ownership is one proxy of the controlling ability from the parent company to the subsidiary. There is no standard limit of shareholding ownership, but commonly, 10 percent is the lowest share of the parent company to its subsidiary (OECD 2019b: 2, UNCTAD 2007: 245).

In general, there are two types of FDI based on how it comes into the host country. First, a parent company in a home country establishes a new subsidiary company in a host country. This activity includes building a production facility and office in a host country — this type of FDI named as a "greenfield" FDI. The second type of FDI flows into the host country through mergers with existing domestic companies or by acquiring ownership of domestic companies (the increase in the share of foreign investor ownership). This type of FDI named as a "brownfield" or "Merger and Acquisition (M&A)" FDI.

2.1.2 The role of FDI on economic growth

This research paper will focus on the role of FDI on tax revenue. However, this subsection will briefly discuss the role of FDI on economic growth from the perspective of the host country in order to bridge to the further discussion. The importance of FDI in economic growth will be discussed by disaggregating the impact into direct and indirect effect.

2.1.2.1 The direct effect of FDI on economic growth

Theoretically, the Harrold-Domar growth model posits that economic growth can be achieved from an investment that is acquired from saving at a linear movement. In this theory, economic growth is expected to increase along with the increase of saving. Solow improved this theory. He defines economic growth (Y) as a function of capital (K) and workforce (L) (Solow 1956). Under this theory, economic growth can be achieved from capital accumulation. The accumulation of capital will increase due to investment from saving and decrease due to depreciation and population growth. Since the level of investment is still determined by the level of saving, low in saving rate will lead to lower economic growth. In this case, FDI is expected to fill the gap between domestic savings and actual investment needs to achieve expected economic growth.

2.1.2.2 The indirect effect of FDI on economic growth

Solow growth model considers technology as a pivotal factor to induce economic growth. In his model, technological progress is categorized as an exogenous variable. On the other hand, Romer introduces a growth theory that treats technological progress as an endogenous variable (Romer 1990). Under this model, technological progress is generated through the production process. Learning by doing in the production process improves human capital accumulation that in turn, will improve technological progress. In addition, Romer also argues that the spillover effect from developed countries also generates a knowledge accumulation that important for technological progress. The spillover of technology can be obtained from developed countries through FDI (Zhu 2010: 178). FDI can be seen as one of the channels of technological progress (Romer 1990). FDI brings not only capital stock but also technology and managerial skill that benefit economic growth (Almfraji and Almsafir 2014: 207). Therefore, besides the direct effect of FDI to economic growth through capital accumulation, FDI is projected to stimulate economic development through a spillover effect on the economy of the host country.

Spillovers of FDI stimulate the increase of the output or productivity of domestic companies through a transfer of technology, knowledge, management, and entrepreneurial skill from foreign companies (Demena 2015). There are two major types of the spillover effect of FDI, namely the horizontal spillover effect and the vertical spillover effect (Blalock and Gertler 2005:77, Javorcik and Spatareanu 2005: 54).

The vertical spillover effect might occur in customer-supplier relation. In the customer-supplier relations, the impact of foreign companies goes backwards from the foreign company as a buyer to the domestic as a supplier or forward from the domestic supplier to the foreign buyer (Blalock and Gertler 2005). The vertical spillover enhances the productivity of the domestic supplier due to the effort of the domestic supplier to achieve a sufficient level that is required by a foreign company. However, the vertical spillover effect will not occur if a foreign company just "cherry-pick" the qualified domestic company (Javorcik and Spatareanu 2005: 57). Beside customer-supplier relations, the vertical FDI spillover might also occur between the parent company and its subsidiaries.

The horizontal spillover effect occurs when the presence of foreign company increases the productivity of domestic companies. The presence of foreign company might have two contrasting effects on domestic firms. First, the existence of foreign companies stimulates the productivity of domestic companies through technology and knowledge transfer (Javorcik and Spatareanu 2005: 65). This transfer occurs when a domestic company is observing and imitating the knowledge or technology that is used by a foreign company (Demena 2017: 35). The competition ambience might trigger domestic companies to adopt new technology and knowledge to increase productivity (Demena and Bergeijk 2019: 1). The movement of trained employees from a foreign company to a domestic firm also might trigger a technology transfer (Demena 2017: 35). Moreover,

the entry of foreign companies makes professional services provider such as accountants and consultants available for the domestic company (Blalock and Gertler 2005: 77). Second, the presence of foreign companies might degrade the existence of domestic companies. With a higher salary standard, a foreign company can easily hire talent from a domestic company. This movement will cause "brain drain" (Blalock and Gertler 2005: 77) that avoid domestic companies to develop. In addition, foreign companies seem to have the possibility to take over the market share of domestic companies due to the uneven competition (Demena and Murshed 2018: 704). Foreign companies with their advantages could easily produce on a large scale at lower unit cost.

2.1.3 Type of incentives

Since many countries realize that FDI could have a positive effect on their economy, they compete to attract FDI by giving incentives (Te Velde 2006). Basically, foreign investors are interested to invest in a country that has strong economic fundamentals, such as large market size, high-income, sufficient skill labour, reliable infrastructure, favourable trade policy, macroeconomic stability and political stability as well (Blomstrom 1991). However, incentives still play an essential role, especially if investors have several choices of countries with similarities.

Figure 2.1
Type of Investment incentives
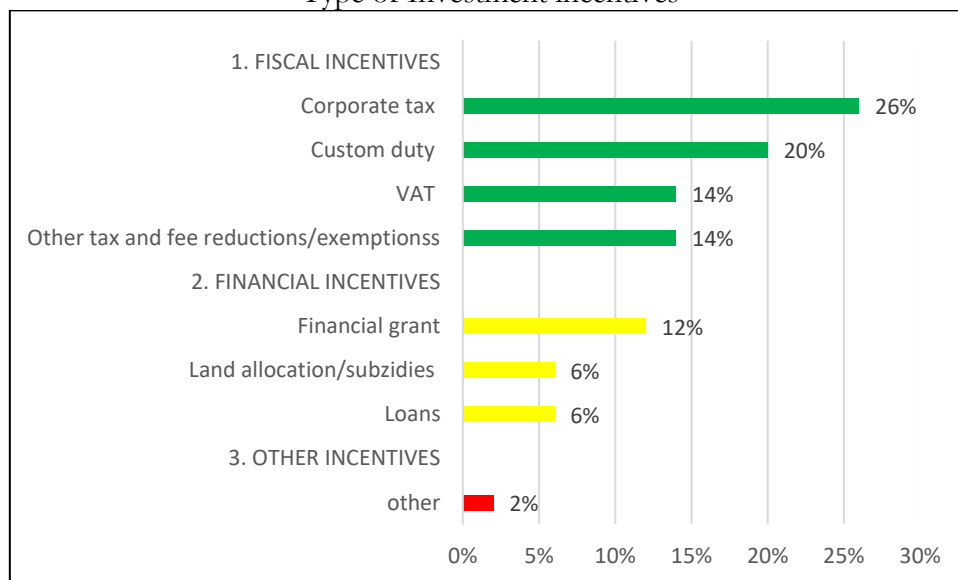
Source: (UNCTAD 2018: 151)

In general, there are three types of investment incentives. The first type is fiscal incentive. Fiscal incentives are given to investors by reducing the taxes that have to be paid to the government, such as tax holiday, tax cut, import tariff exception, and tax exemption for many kinds of taxes. Based on a survey that had been conducted in 50 countries by UNCTAD, as shown in Figure 2.1, fiscal incentives have the largest share for 74 percent of total incentives (UNCTAD 2018: 151). The second type of investment incentive is a financial incentive. Financial incentives are financial support that is given by the government to investors, such as loan or grant that is given to foreign investor with a special condition. As shown in Figure 2.1, financial incentives have a 24 percent share of total incentives. The third is another type of incentives. Other incentive is incentives other than fiscal and financial incentive such as some regulation on monopoly rights, concession, and a free trade zone (UNCTAD 1996: 180). As depicted in Figure 2.1, this type of incentive contributes 2 percent of the total incentive.

2.1.4 Taxation - Definitions

In general, taxes can be defined as a compulsory payment to the government that do not receive any compensation directly. From the definition, seems taxes only have a budget function. However, basically, taxation has not only a budget function but also a regulatory and income distribution function (Avi-Yonah 2011: 2).

As a budget function, tax is expected to carry out its role to collect revenue in order to run the government and finance public expenditure, such as infrastructure, public education, health care, etc. As an income distributor, tax policy should be designed as a redistributive instrument to finance pro-poor program in order to reduce horizontal disparities (Chu et al. 2000: 10). For example, cash or in-kind transfer program and subsidy. The third function of tax is as a regulatory function. The tax system might be used to influence the behaviour of people or company by giving incentives with lower tax rate or tax exemption in order to stimulate the emergence or the growth of favourable activities, or by providing disincentives by charging higher tax in order to inhibit unfavourable activities.

Taxes can be grouped into two types: direct tax and indirect tax. A direct tax is the type of tax paid by the taxpayer directly to the government, and it can be imposed by the government to the taxpayer. Corporate tax, individual tax, and property tax fall within this category. While the indirect tax is the type of tax collected through an intermediate entity from the customer. The indirect tax might increase the price of goods that have to be paid by the customer due to the shifting of the tax burden - for example, value-added tax (VAT), sales tax, and service tax.

2.1.5 How does FDI affect taxation?

One of the variables that could be affected by FDI in the host country is tax revenue. FDI could affect tax revenue directly or indirectly through a spillover effect. The net effect is depending on which effect is greater between positive and negative. In general, the channels of FDI affects tax revenue more or less similar to the channels on how FDI affects economic growth. The following subsection will discuss the possible channels on how FDI affects tax revenue for both direct and indirect and splitting the effects into positive and negative.

2.1.5.1 The positive effect of FDI on tax revenue

There are several channels of FDI directly affect tax revenue positively. First, a direct positive effect of FDI on tax revenue is revealed if the presence of FDI is followed by the establishment of a new multinational company (MNC). A new MNC will be registered as a new taxpayer. In this sense, the more taxpayers, the more potential amount of tax paid to the government as well. Second, the direct effect of FDI on tax revenue is also can be caused by the transfer of technology, knowledge and managerial skill from the backward spillover effect from the parent company in a home country to MNC as its subsidiary in a host country. The parent company might transfer knowledge, technology and managerial skill through training that is given to the selected supplier who fulfils initial qualifications to learn about multinational systems such as quality control, inventory and cost accounting (Blalock and Gertler 2005: 79). As a result, tax revenue might increase due to the increase of MNCs' profitability (MacDougall 1960: 208).

The positive and indirect effect of FDI on tax revenue occurs if tax revenue increases due to the larger scale of economies that are caused by horizontal spillover effects. The effect of FDI on tax revenue depends on the competition and spillovers of technology carried by MNCs that stimulate productivity (Nguyen et al. 2014: 28). Productivity spillover might occur when output increases due to technological transfer from MNCs to a domestic company. The atmosphere of competition also encourages domestic companies to adopt technology or knowledge to increase their productivity and efficiency (Demena and Bergeijk 2019). Domestic companies observe and imitate the knowledge or technology that is used by the foreign company to increase their

productivity. The movement of trained labour from MNCs to a domestic company also could stimulate the increase in productivity in a domestic company. Furthermore, the presence of FDI might trigger the increase in the number of domestic-own companies to support the operations of MNCs. In other words, every addition of FDI might stimulate the "crowding-in" effect for the host country (Borensztein et al. 1998: 117). Increasing the number of companies means increasing the number of taxpayers. Moreover, an increase in some domestic companies will be followed by the rise in labour demand. It implies that FDI also has a role in reducing the unemployment rate (Zeb et al. 2014: 15). Therefore, the increase in productivity, the increase in the number of companies, and the increase of employment would increase the tax paid to the government.

The presence of FDI might increase international trade from the host country to the home country (customer-supplier relationships). This increase was caused by the increase of imports of intermediate goods from the home country, and the increase of exports from final good products from host country (Safitriani 2014: 98). Therefore, the tax revenue that related to international trade might increase as well.

In addition, since FDI tends to affect economic growth and level of income positively, the increase in FDI might trigger the rise in the aggregate demand that might support the government to collect more taxes (Mahmood and Chaudhary 2013: 59), for example, value-added tax, property tax and the other types of indirect tax.

2.1.5.2 The negative effect of FDI on tax revenue

The presence of the FDI might erode tax revenue directly. Competition by lowering the tax rate to attract FDI is one of the reasons why FDI might decrease tax revenue (MacDougall 1960: 280, Nguyen et al. 2014: 28). Furthermore, the presence of FDI might negatively affect tax revenue directly if there is a "transfer pricing" motive from MNCs (Gropp and Kostial 2000: 1). The globalization and the significant differences in tax rate among countries create opportunities for MNCs to do profit shifting. As a result, the host country might not get the optimum tax revenue advantage from FDI, if the profit from MNCs is shifted to other countries that have a lower tax rate or tax heaven countries.

FDI might also bring a negative indirect effect on tax revenue. Competition between MNCs and domestic companies could shrink domestic company contribution to the economy. This is because, the domestic company commonly experience a lack of technology, knowledge and managerial skill that's why domestic companies tend to less productive compared to MNCs. Furthermore, the implementation of intellectual property right (IP) restricts a domestic company to catch-up with technological progress that is achieved by MNCs. As a result, the presence of FDI potentially to have a "crowding-out" effect for a domestic company. "Crowding-out" effect also might occur if MNCs easily recruit talented employees from the domestic company. The higher salary that is given by MNCs might stimulate talented employees to move to MNCs and prevent the domestic company from hiring talented employees (Long 2005: 333). This situation is worsened if there is an industrial monopoly from MNCs that avoid domestic companies to compete. As a result, the tax revenue contribution from the domestic company will decline due to uneven competition (Nguyen et al. 2014: 28).

From the possible channel above, the net effect of FDI depends on which is greater. If the positive effect is larger than the negative effect, the presence of FDI might potentially increase tax revenue and its type such as; corporate income tax, value-added tax, property tax, tax on international trade and other types of tax that are related to economic activity. Figure 2.2 summaries all the direct and indirect effect of FDI on tax revenue that discussed in subsections 2.1.5.1 and 2.1.5.2.

Figure 2.2
Summary of the channel on how FDI affect tax revenue.
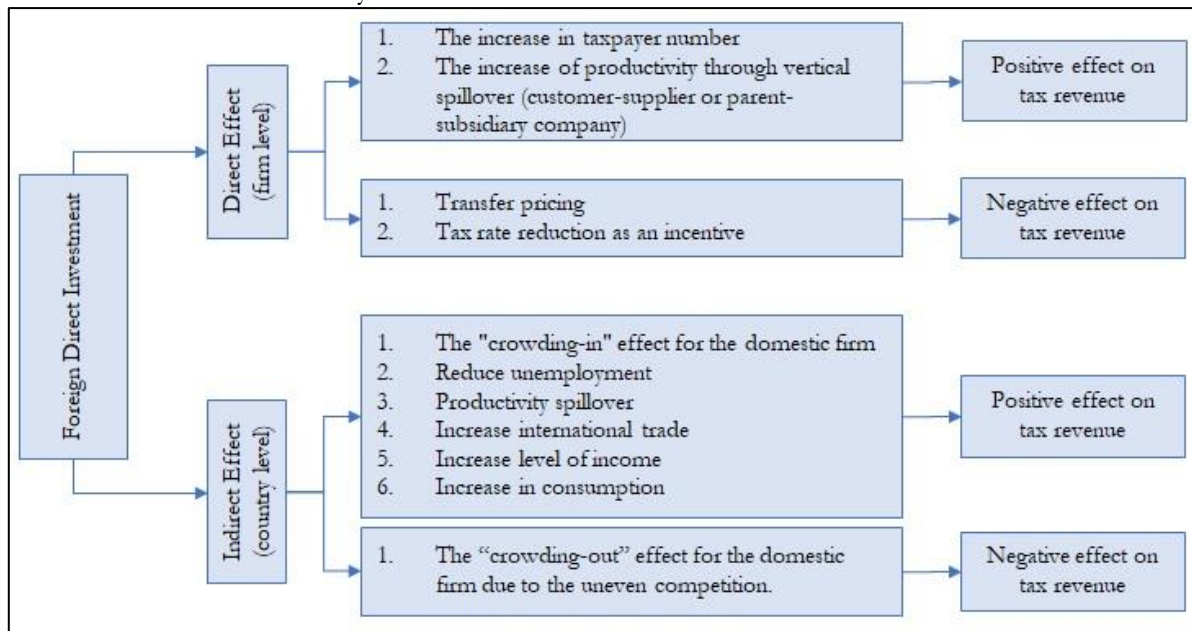
Source: Author compilation

2.2 Empirical evidence of the effect of FDI on tax revenue

Research on the effect of FDI on tax revenue can be categorized into firm-level using micro data from multinational companies, and country-level using macro data. In this subsection, this research paper will provide several researchers who discussed the effect of FDI on tax revenue. This subsection starts with the positive effect, the negative effect, and followed by mixed result.

Research conducted by Mahmood and Chaudhary (2013: 68) at the country-level using time series data from 1972 to 2010 in Pakistan concluded that an increase in FDI inflows would be followed by an increase in tax revenue (both as a percentage of GDP). To investigate the short run and the long-run relationship between the dependent variable and independent variable, they use the Auto Regressive Distributive Lag (ARDL) and Error Correction Model (ECM). The study that has been done at the country-level using time series data from 1990 to 2013 in Sri Lanka also posit that FDI has a positive contribution to tax revenue (Aslam 2015: 250). The causality test concludes that there is a one-way direction from FDI to tax revenue. Furthermore, the research at the country-level using panel data from 1996 to 2012 of European Transition Economy countries conclude that FDI inflow stimulates tax revenue (Odabaş 2016: 22). The research uses a causality test to find out the direction of the relationship between FDI inflow and tax revenue (as a percentage of GDP). The result shows that there is a single causality from FDI inflow to tax revenue.

In contrast, the study at the country level that had been done in Ethiopia shows that the impact of FDI on tax revenue mostly negative (Jeza et al. 2016: 171). The study uses time series data from 1974-2014 to study the impact of FDI to tax revenue in aggregate form and disaggregate form (based on the type of tax). They use tax revenue as the dependent variable and FDI net inflows (both as a percentage of GDP) as an independent variable. Using ADRL and ECM, the result shows that at the aggregate level, the effect of FDI inflow to tax revenue is negative and significant. In the disaggregated level, FDI also harms several types of taxes, such as indirect tax, corporate income tax, and personal income tax. However, the effect of FDI inflow to trade tax revenue is positively significant. The negative effect of FDI inflow on the tax revenue might be caused by the tax incentives that formulate to attract FDI.

On the other hand, study at the country level that has been conducted in OECD countries found that the effect of FDI on tax revenue (both as a percentage of GDP) has a mixed result (Bayar and Ozturk 2018: 38). The research used data from 33 OECD countries from 1995 to 2014 period. The variable dependent in this research is FDI inflow, and the independent variable is tax revenue. Using a causality test and panel-cointegration test, the research found that there is a one-way causality effect from FDI inflow to total tax revenue. However, there is no significant effect of FDI inflow on total tax revenue at the panel level. On the other hand, if the test is conducted for every OECD country, the results are varied. FDI gives benefits on tax revenue in the United States, United Kingdom, Iceland and Sweden. Conversely, the presence of FDI erodes tax revenue in Austria, Italy, Poland and France.

From the existing empirical evidence, can be summarized that the researches of the effect of FDI on tax revenue are still limited and inconclusive. Even though several studies use the difference econometric and methodological approach, the difference sample and period, the result still shows that FDI might positively or negatively affect tax revenue. The only convergence result from the previous studies is that FDI and tax revenue only have one-way direction causality from FDI to tax revenue. However, previous empirical studies mostly use data from a specific country and use the same measurement of tax revenue and FDI net inflows (both as a percentage of GDP). Therefore, this research will explore the effect of FDI on tax revenue in developing countries using several measurements (as a percentage of GDP and per-capita), several types of FDI (FDI net inflow, greenfield FDI, and brownfield FDI), and several types of taxes to extend the previous result by comparing the result with high-income countries.

Chapter 3
Data and Methodology

This chapter is split into five subsections. The first subsection explains the source of data, and how data were collected. The second subsection describes the definition of dependent variable, independent variable and control variable. The third subsection gives a summary of descriptive statistics. The fourth subsection explains the model and the hypotheses. The last subsection is the methodology and the treatment of the endogeneity problem.

3.1. Data source

This research uses secondary data at the country level. The data were obtained from official online sources. Data of FDI net inflow was collected from the open data of the World Bank (2019a). The greenfield and the brownfield FDI data were collected from the UNCTAD (2019), and data on tax revenue were obtained from the OECD (2019a). Since tax revenue data is very limited, the number of countries and observation were selected based on the availability of the data. Several data of control variables such as GDP per-capita, the share of agriculture in GDP, international trade, consumer price index, and the indicator of financial development were collected from the World Bank open data. Data corruption Perception Index as the proxy of government quality was obtained from the website of Transparency International (2019).

Table 3.1
Country Classification

Group by Income	Income (GNI) per-capita	Number of Countries	Research Classification
Low-income	$ 955 or Less	8	Developing Country
Lower-middle income	$ 956 to $ 3.895	18	Developing Country
Upper-middle income	$ 3.896 to $ 12.055	25	Developing Country
High-income	$ 12.056 or More	41	High-income Country
Total		92	

Source: World Bank

In this research, countries are classified into two groups high-income and developing countries based on income classification as presented in Table 3.1. Due to the unavailability of the data, this research uses unbalanced panel data that cover 92 countries over the period 2000 until 2016. The number of observations in each regression may differ depending on data availability.

3.2. Variables definition

3.2.1. Dependent variable

This research uses tax revenue as the dependent variable. Tax revenue will be divided into several types of taxes, such as total tax revenue, corporate tax revenue, individual tax revenue, VAT revenue, and property tax revenue.

By disaggregating tax revenue into several types of taxes, the impact of FDI will be more detailed. This is because various types of taxes may differ in response to the presence of FDI. For instance, corporate tax revenue should be more sensitive to FDI than individual tax revenue. This is because most FDI comes in the form of companies. Moreover, most of tax incentives are given

to reduce corporate tax rates. The negative effect of FDI on corporate tax might be caused by the effect of massive corporate tax incentive.

Unlike the corporate tax which shows the profitability of the company, VAT revenue shows how long the production chains spread from producers to consumers due to the presence of FDI. FDI is expected to stimulate the production process that involves more domestic industries. The more domestic industry involves, the better impact of FDI on VAT revenue. In addition, VAT revenue is also an indicator of demand or consumption, which might be caused by the rise of income due to the presence of FDI. The increase in demand or consumption will increase VAT revenue as well.

On the other hand, the increase in property tax might not be as sensitive as other types of tax. This is because the tax base for property tax is property ownership that does not experience many changes. However, the increase in income from the people due to the presence of FDI might increase property ownership. Tax revenue is measured as a percentage of GDP (Bayar and Ozturk 2018: 34, Odabaş 2016: 19, Mahmood and Chaudhary 2013: 61). In order to extend the previous finding, tax revenue will also be measured in per-capita.

3.2.2. Independent variables

This research uses FDI net inflow, greenfield and brownfield FDI as independent variables. So far, researches about FDI on tax revenue have never concluded which type of FDI that has a higher effect on tax revenue, whether it is greenfield or brownfield FDI. The greenfield FDI and brownfield FDI might have different effects on tax revenue. The establishment of greenfield FDI could be more expensive than brownfield FDI. This is due to the establishment of greenfield FDI (for example, new factories) must be started from the establishment of physical and non-physical installations. As a result, high costs erode corporate profits that in turn will reduce taxes to be paid to the government. Moreover, greenfield FDI will take a longer period to generate taxable income if there is compensation for losses brought to the following year. However, greenfield FDI might bring a positive effect on tax revenue. The increase in taxpayer number due to the company establishment and reducing unemployment might elevate the income of the country that eventually will increase tax revenue.

3.2.3. Control variables

This research uses several control variables such as GDP per-capita, international trade, the share of agriculture in GDP, government quality, inflation, and development of the financial sector. Control variables were chosen based on previous studies on the determinant variables of tax revenue.

GDP per-capita

GDP per-capita can be seen as a representation of economic development. The higher GDP per-capita, the larger economic scale of a country. The increase in GDP per-capita is associated with the rise in tax revenue (Gupta 2007: 31). Mahmood and Chaudhary (2013: 68) and Castro and Camarillo (2014: 55) also conclude the similar result for developing countries and OECD countries respectively. Therefore, GDP per-capita tend to have the same movement with tax revenue. This research uses GDP per-capita at purchasing power parity (PPP).

International trade

Trade liberalization that is reflected by the increase of international trade potentially increase the taxable capacity. The trade sector is easier to be administrated compared to the other subsistence of domestic economies. The implementation of tax or tariff on international trade will potentially increase tax revenue. However, massive tax incentives in international trade could erode the tax revenue capacity. Empirical evidence from Sub-Saharan Africa countries shows that international

trade has a significant effect to elevate tax revenue (Leuthold 1991: 184). International trade variable is the total of import and export of goods and services. International trade is predicted can boost tax revenue in a country.

The share of agriculture in GDP

Sectoral composition in GDP is important for determining a country's tax revenue. If the informal sector dominates the share of GDP, the tax revenue tends to be lower compared to a country that has a larger formal sector. Agriculture is dominated by informal or subsistence farmers and it is difficult to be taxed. Moreover, the willingness to impose a tax on the agriculture sector in developing countries is low due to political reason (Chelliah et al. 1975: 191). As a consequence, a country with a big share of agriculture tends to have a lower tax revenue (Castro and Camarillo 2014: 35, and Gupta 2007:11).

Government quality

The quality of government that is indicated by corruption level is vital in the tax collection process. Corruption tends to motivate a taxpayer to under-report their income; as a result, tax revenue from income tax will be lower from its actual capacity (Rosid et al. 2016: 387). The high level of corruption will encourage the entrepreneur to hide their business to minimize expenditure on corruption and bureaucracy (Friedman et al. 2000: 459). Moreover, corruption could hamper the potential for taxes due to slower economic growth. The higher the level of corruption in a country, the lower the country's economic performance (Treisman 2000: 430). Therefore, the low quality of government tends to deteriorate tax revenue. A study that has been done in 25 developing countries from 1990 to 2005 shows that good governance stimulates the increase of tax revenue while corruption will decrease tax revenue (Ajaz and Ahmad 2010: 414). The study that has been done in OECD and Latin America countries, also concludes that corruption has a negative effect on tax revenue (Huňady and Orviská 2015).

In this research, the level of corruption as a proxy of the quality of the government is measured by the Corruption Perception Index (CPI). This index ranges from 0 to 100. Zero means the country is corrupt, while 100 means clean. Corruption is predicted will deteriorate tax revenue. In other words, the higher the level of CPI, the more tax revenue can be collected.

Inflation

Inflation variable has a very close relationship with every economic variable. Inflation affects prices, which eventually affects supply and demand. Inflation also tends to affect tax revenue capacity. This is because taxes are imposed on the income of individuals and companies directly and indirectly based on monetary units of the country (QadirPatoli et. al 2012: 32). The fluctuation of the monetary unit will affect tax revenue capacity. Positive inflation is marked by the increase in prices might increase the tax base (Gaalya 2015: 237). However, the increase in price might deteriorate the purchasing power of the people, which in turn will decrease tax revenue. Moreover, the higher production cost such as the increase of interest rate and the price of production factor might decrease the production capacity and price competitiveness that in turn will lower tax revenue capacity (Agbeyegbe et. al 2006: 9).

The study that has been done in Pakistan conclude that inflation positively affects tax revenue. Movement inflation and tax revenue have a similar direction, but the magnitude is different (QadirPatoli et. al 2012: 39). The study that has been done in Albania also conclude that inflation positively affects tax revenue (Velaj and Prendi 2014: 528). In contrast, the study that has been done for Sub-Sahara African countries conclude that inflation has a negative effect on tax revenue (Agbeyegbe et. al 2006: 23). This might be caused by inflation in African countries erode purchasing power and economic development. In this research, inflation will be represented by the consumer price index (CPI) base year 2010. Since inflation could affect tax revenue positively or negatively, the expected effect of inflation on tax revenue is mixed.

Table 3.2
The Summary of variable definition

No	Variable	Code	Measurement	Expected sign	Source
Dependent Variable					
1.	Total tax revenue	TAXREV_GDP	percentage of GDP		OECD (2019a)
		lnTOTREVPC	Natural logarithm & per-capita		
2.	Corporate tax revenue	CORPTAX_GDP	percentage of GDP		OECD (2019a)
		lnCORPTPC	Natural logarithm & per-capita		
3.	Individual tax revenue	INDTAX_GDP	percentage of GDP		OECD (2019a)
		lnINDTXPC	Natural logarithm & per-capita		
4.	Value added tax revenue	VAT_GDP	percentage of GDP		OECD (2019a)
		lnVATPC	Natural logarithm & per-capita		
5.	Property tax revenue	PROPTAX_GDP	percentage of GDP		OECD (2019a)
		lnPROPTXPC	Natural logarithm & per-capita		
Independent variable					
6.	FDI net Inflow	FDINETIN_GDP	percentage of GDP	Positive	World Bank (2019a)
		lnFDIPC	Natural logarithm & per-capita		
7.	Greenfield FDI	FDIGRFIELD_GDP	percentage of GDP	Positive	UNCTAD (2019)
		lnFDIGRENPC	Natural logarithm & per-capita		
8.	Brownfield (M&A) FDI	FDIMNA_GDP	percentage of GDP	Positive	UNCTAD (2019)
		lnFDIMNAPC	Natural logarithm & per-capita		
Control Variables					
9.	GDP per-capita	lnGDPPC	Natural logarithm	Positive	World Bank (2019b)
10.	International trade	TRADE	percentage of GDP	Positive	World Bank (2019c)
11.	Share of Agriculture in GDP	AGRI_GDP	percentage of GDP	Negative	World Bank (2019d)
12.	Government quality	CPI	Corruption Perception Index (0-100)	Positive	Transparency International Organization (2019)
13.	Inflation	INF	Consumer Price Index base year-2010	Positive/ Negative	World Bank (2019e)
14.	Financial development	PCB	percentage of GDP	Positive	World Bank (2019f)

Source: Author's compilation

Financial sector development

Development in the financial sector could affect tax revenue through several channels. Firstly, development in the financial sector is expected to promote economic growth that eventually, will increase taxable economic activities. Secondly, the increase in economic activity due to financial development potentially followed by the increase in demand for goods or services. Third, development in financial development might avoid the spread of the shadow economy that hampers revenue collection. This might be caused by financial sector development need a valid data. The study that has been done in Nigeria conclude that development in the financial sector has a positive impact on tax revenue (Ebi 2018: 93). He uses several proxies of financial sector developments, such the proportion of bank credits that is given to the private sector to GDP in order to measure the depth of development of financial institutions, and the number of banks per 100,000 persons to measure access to the financial sector. Ilievski (2015: 5) examines data from the stock market as a proxy of development in the financial sector, conclude that stock market activity positively affects tax revenue. Due to the availability of the data, this research will use bank credits to the private sector in the portion of GDP as a proxy for development in the financial sector. Summary of variable definitions is presented in Table 3.2.

3.3. Descriptive statistics

This subsection provides descriptive statistics of several variables. In general, this research consists of time series data ranging from 2000 to 2016 and cross-section data from countries from all income categories. There are some missing data due to the unavailability of the data.

Table 3.3 shows the descriptive statistics for tax revenue that consists of total tax revenue and several types of taxes. High-income countries have the largest average of total revenue as a percentage of GDP about 32 percent followed by upper-middle and lower-middle-income countries. Total tax income varies from 10% to 51% as a proportion of high-income countries' GDP. On the other hand, low-income countries have the lowest of total tax revenue with a range from 0.57 percent to 22.2 percent of GDP. Corporate tax revenue for upper-middle-income countries is the highest that reach 3.65 percent of GDP. For individual tax revenue, high-income countries have the highest score with average 7.51 percent and followed by the other groups. For VAT revenue, high-income countries are the uppermost compared to the other countries for 6.57 percent of GDP. On the other hand, low-income countries able to earn 0.35 higher compared to lower-middle-income countries. Property tax gives a small contribution to the total tax revenue, from Table 3.3 number (21) until (25), it is shown that only high-income countries have average property tax revenue as a percentage of GDP more than zero.

Table 3.3
Descriptive statistics of the dependent variables

No	Variable	Category	Obs	Unit	Mean	Std. Dev.	Min	Max
1.	TAXREV_GDP	Whole sample	1,521	%	24.41	9.99	0.57	51.59
2.	TAXREV_GDP	High-income	697	%	31.90	8.18	10.06	51.59
3.	TAXREV_GDP	Upper-Middle	395	%	20.21	6.76	9.50	45.54
4.	TAXREV_GDP	Lower-Middle	293	%	17.34	5.12	4.30	30.93
5.	TAXREV_GDP	Low-income	136	%	13.42	4.06	0.57	22.22
6.	CORPTAX_GDP	Whole sample	1,421	%	3.19	2.06	0.12	20.24
7.	CORPTAX_GDP	High-income	680	%	3.27	2.26	0.53	20.24
8.	CORPTAX_GDP	Upper-Middle	333	%	3.65	2.08	0.25	13.40
9.	CORPTAX_GDP	Lower-Middle	291	%	3.12	1.57	0.81	11.61
10.	CORPTAX_GDP	Low-income	117	%	1.62	0.78	0.12	4.11
11.	INDTAX_GDP	Whole sample	1,433	%	4.80	4.24	0.01	26.35
12.	INDTAX_GDP	High-income	679	%	7.51	4.50	0.01	26.35

No	Variable	Category	Obs	Unit	Mean	Std. Dev.	Min	Max
13.	INDTAX_GDP	Upper-Middle	344	%	2.58	2.26	0.07	9.71
14.	INDTAX_GDP	Lower-Middle	274	%	2.49	1.52	0.04	6.56
15.	INDTAX_GDP	Low-income	136	%	1.59	0.87	0.08	3.81
16.	VAT_GDP	Whole sample	1,399	%	5.87	2.09	0.01	13.85
17.	VAT_GDP	High-income	665	%	6.57	2.06	0.51	11.02
18.	VAT_GDP	Upper-Middle	341	%	5.70	1.91	0.01	13.85
19.	VAT_GDP	Lower-Middle	270	%	4.72	1.88	1.50	9.10
20.	VAT_GDP	Low-income	123	%	5.07	1.61	2.41	9.72
21.	PROPTAX_GDP	Whole sample	1,420	%	1.11	1.13	0.00009	17.63
22.	PROPTAX_GDP	High-income	697	%	1.79	1.20	0.20	17.63
23.	PROPTAX_GDP	Upper-Middle	340	%	0.63	0.60	0.00009	2.81
24.	PROPTAX_GDP	Lower-Middle	274	%	0.37	0.38	0.001352	1.99
25.	PROPTAX_GDP	Low-income	109	%	0.16	0.17	0.000352	0.61

Source: Author's calculation

In Table 3.4, FDI is measured as a percentage of GDP. FDI net inflow for high-income countries leads with 6.21 percent on average. However, it shows the highest standard deviation about 13.77 percent. Range of FDI net inflow as a percentage of GDP for the high-income countries spread from -58.32 percent to 252.31 percent. On the other hand, the rest of income categories have average of FDI net inflow around 3.66, 3.56, and 3.26 percent of GDP respectively.

Table 3.4
Descriptive statistics of the independent variables

No	Variable	Category	Obs	Unit	Mean	Std. Dev.	Min	Max
1.	FDINETIN_GDP	Whole sample	1,507	%	4.78	9.82	-58.32	252.31
2.	FDINETIN_GDP	High-income	693	%	6.21	13.77	-58.32	252.31
3.	FDINETIN_GDP	Upper-Middle	372	%	3.66	2.98	-5.01	14.84
4.	FDINETIN_GDP	Lower-Middle	306	%	3.56	4.64	-4.84	50.02
5.	FDINETIN_GDP	Low-income	136	%	3.26	3.25	-1.30	18.82

Source: Author's calculation

In Table 3.5, the greenfield and brownfield (M&A) FDI are measured in millions of US Dollar. The greenfield and brownfield (M&A) FDI for the high-income countries are the highest for $7,576.22 million and $11,485.82 respectively.

For the upper-middle income countries, the average of the greenfield FDI reaches $5,217.92 million higher than brownfield (M&A) FDI in the upper-middle income countries. In the two lowest groups, greenfield FDI looks higher compare to brownfield FDI. In other words, it can be concluded that except for the high-income countries, the greenfield FDI is more favorable compare to the brownfield FDI. This might be caused by the cost of establishing a company in a developing country cheaper than a high-income country. Moreover, the rate of return from FDI in developing countries is higher compared to high-income countries (UNCTAD 2018).

Table 3.5
Descriptive statistics of the greenfield and brownfield (M&A) FDI

No	Variable	Category	Obs	Unit	Mean	Std. Dev.	Min	Max
1.	FDIGRFIELD	Whole sample	1,174	Million$	5742.83	10023.49	0.90	78200.02
2.	FDIGRFIELD	High-income	564	Million$	7,576.22	12,097.51	1.80	78,200.02
3.	FDIGRFIELD	Upper-Middle	299	Million$	5,217.92	8,104.88	0.90	45,466.89
4.	FDIGRFIELD	Lower-Middle	220	Million$	3,844.74	6,988.63	6.40	40,913.80
5.	FDIGRFIELD	Low-income	91	Million$	693.35	1,022.80	0.90	7,848.33
6.	FDIMNA	Whole sample	1,496	Million$	5264.45	22837.12	(101,502.20)	362,878.10
7.	FDIMNA	High-income	640	Million$	11,485.82	33,845.51	(101,502.20)	362,878.10

No	Variable	Category	Obs	Unit	Mean	Std. Dev.	Min	Max
8.	FDIMNA	Upper-Middle	390	Million$	1,096.27	3,045.02	(1,794.54)	21,027.45
9.	FDIMNA	Lower-Middle	275	Million$	349.84	1,512.24	(4,967.41)	18,902.72
10.	FDIMNA	Low-income	118	Million$	7.98	72.37	(456.54)	529.31

Source: Author's calculation

In Table 3.6, the greenfield and brownfield (M&A) FDI are presented as a percentage of GDP. The data were constructed by dividing the amount of FDI in Table 3.5 with the amount of GDP. The data shows that data the greenfield and brownfield (M&A) FDI as a percentage of GDP is very small.

Table 3.6
Descriptive statistics of the greenfield and brownfield (M&A) FDI (% GDP)

No	Variable	Category	Obs	Unit	Mean	Std. Dev.	Min	Max
1.	FDIGREEN_GDP	Whole sample	1,174	%	0.035061	0.1244877	0.0000883	3.904838
2.	FDIGREEN_GDP	High-income	564	%	0.018859	0.0239869	0.0001424	0.186747
3.	FDIGREEN_GDP	Upper-Middle	299	%	0.032333	0.0614563	0.0001781	0.743708
4.	FDIGREEN_GDP	Lower-Middle	220	%	0.069823	0.266196	0.0004602	3.904838
5.	FDIGREEN_GDP	Low-income	91	%	0.060345	0.0889837	0.0000883	0.590991
6.	FDIMNA_GDP	Whole sample	1,496	%	0.010384	0.0391125	-0.175111	0.693
7.	FDIMNA_GDP	High-income	640	%	0.012595	0.0353595	-0.175111	0.693
8.	FDIMNA_GDP	Upper-Middle	390	%	0.004833	0.0350859	-0.028091	0.679181
9.	FDIMNA_GDP	Lower-Middle	275	%	0.004847	0.037002	-0.062524	0.620548
10.	FDIMNA_GDP	Low-income	118	%	0.001364	0.0112592	-0.028155	0.121259

Source: Author's calculation

Table 3.7
Descriptive statistics of control variables

No	Variable	Category	Obs	Unit	Mean	Std. Dev.	Min	Max
1.	GDPPC	whole sample	1,528	$	18596.90	16756.03	442.52	102,517.10
2.	GDPPC	High-income	697	$	32,449.60	15,190.04	8,019.32	102,517.10
3.	GDPPC	Upper-Middle	389	$	10,664.52	4,896.43	3,428.78	27,700.29
4.	GDPPC	Lower-Middle	306	$	4,801.09	2,408.70	1,267.96	11,610.99
5.	GDPPC	Low-income	136	$	1,331.33	622.83	442.52	3,253.04
6.	TRADE	whole sample	1,496	%	88.42	54.87	19.80	441.60
7.	TRADE	High-income	680	%	100.87	69.79	19.80	441.60
8.	TRADE	Upper-Middle	387	%	80.64	40.13	22.11	220.41
9.	TRADE	Lower-Middle	293	%	84.76	29.43	30.25	170.41
10.	TRADE	Low-income	136	%	56.17	18.42	25.04	118.10
11.	AGRI_GDP	Whole sample	1,524	%	8.88	9.39	0.03	43.40
12.	AGRI_GDP	High-income	687	%	2.50	1.95	0.03	11.00
13.	AGRI_GDP	Upper-Middle	406	%	8.37	4.96	1.83	32.11
14.	AGRI_GDP	Lower-Middle	295	%	15.15	7.82	3.38	39.03
15.	AGRI_GDP	Low-income	136	%	29.05	8.11	11.98	43.40
16.	CPI	Whole sample	1,372		50.36	22.93	15	100
17.	CPI	High-income	661		68.34	18.95	25	100
18.	CPI	Upper-Middle	335		36.81	10.72	15	65
19.	CPI	Lower-Middle	265		30.78	8.86	17	60
20.	CPI	Low-income	111		30.95	7.37	20	54
21.	INFL	Whole sample	1,471	%	95.77	74.75	6.80	2740.27
22.	INFL	High-income	680	%	94.78	14.01	43.47	164.57

No	Variable	Category	Obs	Unit	Mean	Std. Dev.	Min	Max
23.	INFL	Upper-Middle	349	%	101.18	149.27	20.59	2740.27
24.	INFL	Lower-Middle	306	%	93.38	27.81	21.12	206.69
25.	INFL	Low-income	136	%	92.17	23.67	6.80	158.52
26.	PCB	Whole sample	1,488	%	55.60	41.80	0.33	263.27
27.	PCB	High-income	674	%	84.16	41.56	8.87	263.27
28.	PCB	Upper-Middle	373	%	40.64	26.26	8.07	120.07
29.	PCB	Lower-Middle	305	%	29.19	17.50	1.96	73.45
30.	PCB	Low-income	136	%	14.30	7.92	0.33	36.43

Source: Author's calculation

Table 3.7 provides descriptive statistics for control variables. The average of GDP per-capita for high-income countries is the highest, followed by the other income groups respectively. High-income countries also lead international trade. On average, the percentage of international trade to GDP for high-income countries is around 100.87 percent followed by lower-middle-income countries with 84.76 percent, upper-middle-income countries with 80.64 percent and the last low-income countries with the average of international trade to GDP is around 56.17 percent. The share of agriculture in the GDP is led by low-income countries with an average of the share of agriculture in GDP reach 29.05 percent. In contrast, high-income countries only have 2.5 percent agriculture sector on average. The government quality with the level of corruption as a proxy shows that on average high-income countries are cleaner compare to the other income levels with average of CPI index about 68.34. On the other hand, the other income groups have a low average of CPI around 36.81, 30,78 and 30.95 respectively. For inflation (CPI with the base year 2010), on average, upper-middle income has the highest CPI for about 101.18 followed by high-income country 94.78 and for lower-middle and low-income country respectively has average consumer price index around 93.38 and 92.17. The last control variable is private credit from the bank as a percentage of GDP as a proxy for the development of the financial sector. On average, high-income countries have the highest private credit for 84.16 percent from the GDP. In contrast, low-income countries only have 14.3 percent of the GDP. This also indicates that financial development in low-income countries is left behind high-income countries.

3.4. Empirical models and hypothesis

3.4.1. Empirical models

Empirical models are adopted and modified from previous researches that investigate tax revenue determinant (Castro and Camarillo 2014: 40, Chelliah et al. 1975: 204) and the research on the effect of liberalization on tax performance (Gaalya 2015: 235). This research paper suggested the following empirical models:

$$TaxRevenue_{it} = \alpha_i + \beta_1 FDI_{it} + \beta_2 lnGDPPC_{it} + \beta_3 TRADE_{it} + \beta_4 AGRI\_GDP_{it} + \beta_5 CPI_{it} + \beta_6(FDI_{it} * lnGDPPC_{it}) + \beta_7 INFL_{it} + \beta_8 PCB_{it} + \varepsilon_{it} \qquad (3.1)$$

$$lnTaxRevenue_{it} = \alpha_i + \beta_1 lnFDI_{it} + \beta_2 lnGDPPC_{it} + \beta_3 TRADE_{it} + \beta_4 AGRI\_GDP_{it} + \beta_5 CPI_{it} + \beta_6(lnFDI_{it} * lnGDPPC_{it}) + \beta_7 INFL_{it} + \beta_8 PCB_{it} + \varepsilon_{it} \qquad (3.2)$$

Tax revenue variable consists of total tax revenue and several types of taxes such as corporate tax revenue, individual tax revenue, VAT revenue and property tax revenue. While, FDI variable consists of FDI net inflow, greenfield FDI and brownfield FDI. In the empirical model (3.1), tax revenue and FDI are measured as a percentage of GDP. In the empirical model (3.2), tax revenue and FDI are measured in the natural logarithm of per-capita. The summary of empirical models (3.1) and (3.2) are presented in Table 3.8 and 3.9.

Table 3.8
Summary of the empirical model 1 (equation 3.1)

No	Left Hand Side	Right Hand Side	
		Independent Variable	Control Variable
Empirical Model (1.A)			
1.A.a.	Total tax revenue as a percentage of GDP	FDI net inflow as a percentage of GDP	1. Natural logarithm of GDP per-capita, 2. International trade, 3. Share of agriculture on GDP, 4. Corruption perception Index, 5. Inflation, 6. Financial sector development, 7. Interaction Natural logarithm of GDP per-capita and FDI net inflow as a percentage of GDP
1.A.b.	Corporate tax revenue as a percentage of GDP		
1.A.c.	Individual tax revenue as a percentage of GDP		
1.A.d.	VAT revenue as a percentage of GDP		
1.A.e.	Property tax revenue as a percentage of GDP		
Empirical Model (1.B)			
1.B.a.	Total tax revenue as a percentage of GDP	Greenfield FDI as a percentage of GDP	1. Natural logarithm of GDP per-capita, 2. International trade, 3. Share of agriculture on GDP, 4. Corruption perception Index, 5. Inflation, 6. Financial sector development, 7. Interaction Natural logarithm of GDP per-capita and Greenfield FDI as a percentage of GDP
1.B.b.	Corporate tax revenue as a percentage of GDP		
1.B.c.	Individual tax revenue as a percentage of GDP		
1.B.d.	VAT revenue as a percentage of GDP		
1.B.e.	Property tax revenue as a percentage of GDP		
Empirical Model (1.C)			
1.3.1.	Total tax revenue as a percentage of GDP	Brownfield FDI as a percentage of GDP	1. Natural logarithm of GDP per-capita, 2. International trade, 3. Share of agriculture on GDP, 4. Corruption perception Index, 5. Inflation, 6. Financial sector development, 7. Interaction Natural logarithm of GDP per-capita and Brownfield FDI as a percentage of GDP
1.3.2.	Corporate tax revenue as a percentage of GDP		
1.3.3.	Individual tax revenue as a percentage of GDP		
1.3.4.	VAT revenue as a percentage of GDP		
1.3.5.	Property tax revenue as a percentage of GDP		

Source: Author

Table 3.9
Summary of the empirical model 2 (equation 3.2)

No	Left Hand Side	Right Hand Side	
		Independent Variable	Control Variable
Empirical Model (2.A)			
2.A.a.	Natural logarithm of total tax revenue Per-capita	Natural logarithm of FDI net inflow Per-capita	1. Natural logarithm of GDP per-capita, 2. International trade, 3. Share of agriculture on GDP, 4. Corruption perception Index, 5. Inflation, 6. Financial sector development, 7. Interaction Natural logarithm of GDP per-capita and lnFDI per-capita
2.A.b.	Natural logarithm of Corporate tax revenue Per-capita		
2.A.c.	Natural logarithm of Individual tax revenue Per-capita		
2.A.d.	Natural logarithm of VAT revenue Per-capita		
2.A.e.	Natural logarithm of Property tax revenue Per-capita		
Empirical Model (2.B)			
2.B.a.	Natural logarithm of total tax revenue Per-capita	Natural logarithm of greenfield FDI per-capita	1. Natural logarithm of GDP per-capita, 2. International trade, 3. Share of agriculture on GDP, 4. Corruption perception Index, 5. Inflation, 6. Financial sector development, 7. Interaction Natural logarithm of GDP per-capita and lnFDI per-capita
2.B.b.	Natural logarithm of Corporate tax revenue Per-capita		
2.B.c.	Natural logarithm of Individual tax revenue Per-capita		
2.B.d.	Natural logarithm of VAT revenue Per-capita		
2.B.e.	Natural logarithm of Property tax revenue Per-capita		
Empirical Model (2.C)			
2.C.a.	Natural logarithm of total tax revenue Per-capita	Natural logarithm of brownfield FDI per-capita	1. Natural logarithm of GDP per-capita, 2. International trade, 3. Share of agriculture on GDP, 4. Corruption perception Index, 5. Inflation, 6. Financial sector development, 7. Interaction Natural logarithm of GDP per-capita and lnFDI per-capita
2.C.b.	Natural logarithm of Corporate tax revenue Per-capita		
2.C.c.	Natural logarithm of Individual tax revenue Per-capita		
2.C.d.	Natural logarithm of VAT revenue Per-capita		
2.C.e.	Natural logarithm of Property tax revenue Per-capita		

Source: Author

3.4.2. Hypothesis

This research paper would like to examine the research question: Is there any relationship between FDI and tax revenue? If the result shows $\beta_1 \neq 0$, means FDI influences tax revenue. The sign of coefficient (positive or negative) indicates the effect of FDI positively or negatively on tax revenue. In this research, FDI is expected to bring a positive effect on tax revenue. The hypothesis will be examined using several types of FDI and tax revenue.

The hypothesis:

Ho: FDI has no effect on tax revenue ($\beta_1 = 0$)

Ha: FDI has an effect on tax revenue ($\beta_1 \neq 0$)

3.5. Methodology

3.5.1. Panel data

Panel data is data consisting of combined cross-section (several countries) data and time series (several years) data. The combination of time series and cross-section will increase the observation number. Panel data could decrease the possibility of multicollinearity problem and keep away spurious regression (Wooldridge 2015). There are several panel data techniques to estimate parameters, such as pooled least square (PLS), fixed effect model (FEM), and random effect model (REM) (Nachrowi and Usman 2006: 311).

As shown in Figure 3.1, in order to find the best model among three techniques, several hypotheses and tests can be carried out such as: the Breusch and Pagan Lagrangian multiplier (LM) test, Hausman Test, and F-Test or Chow Test.

Figure 3.1
Panel Data Model Determining
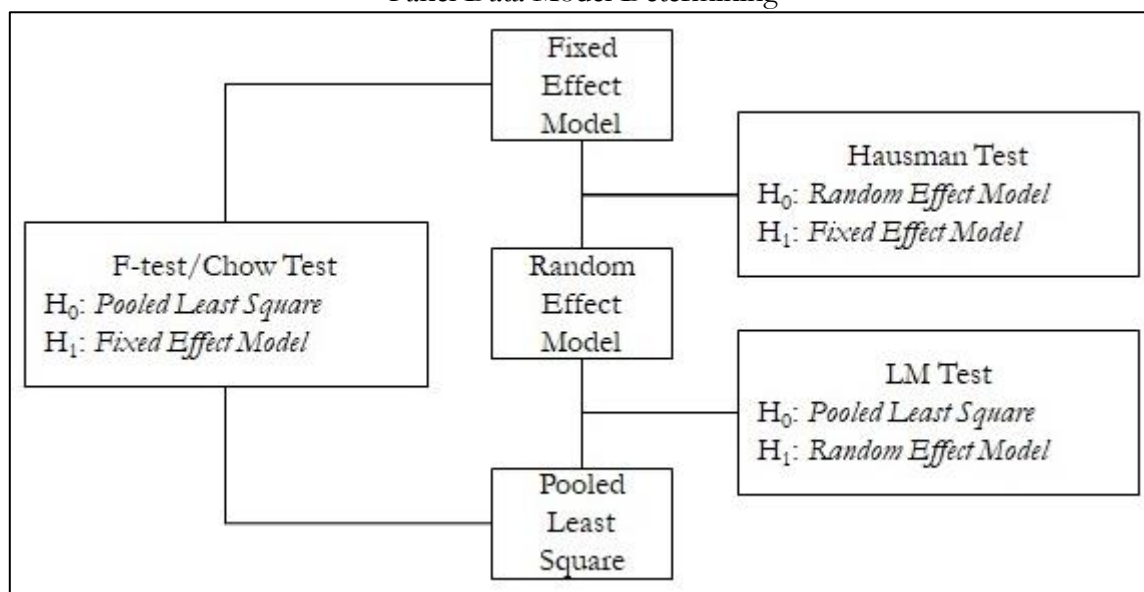
Source: (Nachrowi and Usman 2006: 318).

3.5.2. The treatment of the endogeneity problem

This research uses a panel data analysis to examine the effect of FDI on tax revenue with the assumption that FDI and tax revenue only have one-way causality (from FDI to tax revenue) and free from the endogeneity problem. The reasons behind the selection of this methodology are based on theoretical frameworks as discussed in chapter 2 that FDI affects tax revenue directly or indirectly through the spillover effect. The method selection was strengthened by the empirical evidences from the previous studies that conclude that FDI and tax revenue only have one-way causality from FDI to tax revenue (Aslam 2015: 250, Bayar and Ozturk 2018: 38, Odabaş 2016: 22).

On the other hand, there is also a possibility of two-way causality or reverse causality from tax revenue to FDI. There are two possible channels on how FDI is affected by tax revenue. Firstly, since the tax revenue is the result from the multiplication between the tax rate and the tax base, given the tax base and other variables are constant, tax revenue will depend on the tax rate only. The low tax rate will attract more investment. Studies on the impact of the tax rate and FDI conclude that the domestic tax rate has a negative and significant impact on FDI (Cassou 1997: 1295). However, given all the things constant, the low tax rate means a lower tax revenue as well.

Secondly, tax revenue is one of the economy's indices. The high tax revenue indicates the bigger size of the market and economy, good infrastructure and good public administration. These conditions are demanded by investors as a necessary condition to make an investment decision. Therefore, besides FDI could increase the tax revenue, tax revenue might also attract the FDI as well. In addition, the endogeneity problem might also emerge if there is an omitted variable that possibly affects both the independent and dependent variable (the error term).

The endogeneity problem causes the regression obtained a bias and inconsistent parameter estimator (β). One of the methods to solve the endogeneity problem is by choosing the Instrumental Variable (IV) that has a correlation with the independent variable (endogenous variable) but does not directly affect the dependent variable. Two-stage least square regression (2SLS) can be used to estimate the parameter in the model that is suspected has an endogeneity problem (Nachrowi and Usman 2006: 275, Wooldridge 2015). However, this method faces a challenge because the IV is hard to find. Moreover, there is no ideal IV for FDI (Borensztein et al. 1998: 133). Therefore, many researches only acknowledge that there is a possibility endogeneity problem without trying to solve the problem.

In this research paper, by assuming that there is an endogeneity issue between FDI and tax revenue, the research tries to solve the endogeneity problem by selecting Instrumental Variable (IV) and use two-stage least square (2SLS) regression to estimate the parameter. By adopting and modifying IV selection in the research that has been done by Lensink and Morrissey (2001: 15), this research paper uses the index of "Political stability and absence of violence" (POLSTAB) from the World Governance Indicators (WGI) as an IV. POLSTAB is an indicator reflecting the perception of political instability as a result of a country's unconstitutional process, violence and terrorism. The perception of the political environment is expected to affect investment decision but does not directly affect tax revenue. The perception of the political climate is considered as an essential factor by investors to make an investment decision. This is because a healthy political environment and a high degree of certainty will ensure investment sustainability (Lensink and Morrissey 2001: 15).

Basically, two stages least square (2SLS) regression consists of two-stage of regression. The first regression aims to get the estimation of the endogenous variable (FDIhat) by regressing IV with all exogenous variables. And the second stage aims to estimate the parameter using the estimated of the endogenous variable (FDIhat).

This research modified the equation (3.1) as the structural model but exclude interaction variable, as follows:

$$TAXREV\_GDP_{it} = \alpha_i + \beta_{11}FDI_{it} + \beta_{12}lnGDPPC_{it} + \beta_{13}TRADE_{it} + \beta_{14}AGRI\_GDP_{it} + \beta_{15}CPI_{it} + \beta_{16}INFL_{it} + \beta_{17}PCB_{it} + \varepsilon_{it} \tag{3.3}$$

The reduced model is developed with the assumption that FDI is the only endogenous variable in the right-hand side of the structural model. The reduced model is proposed in the equations (3.4).

$$FDI_{it} = \alpha_i + \beta_{11}POLSTAB_{it} + \beta_{22}lnGDPPC_{it} + \beta_{23}TRADE_{it} + \beta_{24}AGRI\_GDP_{it} + \beta_{25}CPI_{it} + \beta_{26}INFL_{it} + \beta_{27}PCB_{it} + \varepsilon_{it} \tag{3.4}$$

Chapter 4
Regression Analysis

This chapter will provide the regression analysis. Regressions are aimed to investigate the effect of FDI on tax revenue with several control variables. Preliminary tests related to the multicollinearity issue have been conducted to ensure that regression provides the unbiased estimators. From appendix 1 and 2, it can be seen that most of the correlation among variables are less than 0.7. In other words, the multicollinearity problem is less likely to exist. The research also conducts panel data selection test to find out which is better among PLS, FEM, or REM.

This chapter is split into four subsections. The first subsection provides the result of the model selection process. The second subsection provides the result of the regression of the dependent and the independent variable. In this subsection, the research will explain several regression results based on country categorization, the type of FDI, and the type of tax revenue. This subsection will be followed by the result of the regression for the control variable, and the last subsection is the treatment of the endogeneity problem.

4.1.   Panel data model selection

In order to find the best panel data model among PLS, FEM, and REM, this research conducted model selection test for the empirical model (1.A) as a sample. First, this research selects which is better between PLS and REM using Breusch and Pagan Lagrangian multiplier test. As presented in Table 4.1 column (4), the result of the test shows that p-value (Prob>F) is less than the significance level (10%, 5%, 1%). This means the null hypothesis is rejected. In other words, the REM is better than PLS. The second step is examining which is better between FEM or REM using the Hausman test. As shown in Table 4.1 column (5), the result of Hausman test shows that 11 (eleven) of the p-value (Prob>chi2) are less than the significance level and 4 (four) of the p-value (Prob>chi2) are greater than the significance level. In other words, 11 (eleven) models are better using FEM, while 4 (four) models are better using REM. The summary of the result is presented in Table 4.1 column (6).

Since most of the results show that FEM is better, for consistency reason, this section will present the regression result of FEM. While the regression results of REM are presented in appendix 3, 4, 5, 7, 9, and 11.

Table 4.1
Model selection

Group	No	Dependent Variables	H0: Pooled Least Square H1: Random Effect Model	H0: Random Effect Model H1: Fixed Effect Model	Result
			F-Test (Prob>F)	Hausman (Prob>chi2)	
(1)	(2)	(3)	(4)	(5)	(6)
ALL COUNTRIES	1.	TAXREV_GDP	0.0000	0.0000	FEM
	2.	CORPTAX_GDP	0.0000	0.0495	FEM
	3.	INDTAX_GDP	0.0000	0.0009	FEM
	4.	VAT_GDP	0.0000	0.0000	FEM
	5.	PROPTAX_GDP	0.0000	0.0000	FEM
HIGH INCOME COUNTRIES	1.	TAXREV_GDP	0.0000	0.8448	REM
	2.	CORPTAX_GDP	0.0000	0.8030	REM
	3.	INDTAX_GDP	0.0000	0.0000	FEM
	4.	VAT_GDP	0.0000	0.1678	REM
	5.	PROPTAX_GDP	0.0000	0.0000	FEM
DEVELOPING COUNTRIES	1.	TAXREV_GDP	0.0000	0.0000	FEM
	2.	CORPTAX_GDP	0.0000	0.0000	FEM
	3.	INDTAX_GDP	0.0000	0.8494	REM
	4.	VAT_GDP	0.0000	0.0000	FEM
	5.	PROPTAX_GDP	0.0000	0.0000	FEM

Source: Author's calculation

4.2. The regression result of the FDI on tax revenue

This research has two main empirical models. Empirical model 1 measured tax revenue and FDI as a percentage of GDP, and empirical model 2 presented tax revenue and FDI in per-capita form (log). Empirical model 2 will be presented in the appendix 6 until 11. Each empirical model will be tested using three different groups of data such as all countries (whole samples), high-income countries, and developing countries.

4.2.1. The effect of FDI net inflow on tax revenue

The effect of FDI net inflow on the government revenue from taxes for the empirical model (1.A) is presented in Table 4.2 column (5). In the group of all countries, FDI net inflow has a positive impact and statistically significant on government revenue from corporate tax, individual tax and VAT, but negatively affects revenue from property tax. In high-income economies, FDI brings a significant and negative effect on total tax revenue and property tax revenue. On the other hand, in developing countries, the effect of FDI on government revenue from taxes statistically meet the expectation that the presence of FDI is associated with the rise in all types of tax revenue except property tax revenue.

Although the evidence shows that the impact of FDI on tax revenue is mostly statistically significant to increase tax revenue, the effect is relatively small. In developing countries, every one percent rise in FDI net inflow (as a percentage of GDP) will increase total tax revenue 0.052 percent of GDP, corporate tax revenue 0.035 percent of GDP, and VAT revenue 0.037 percent

of GDP. The smallest positive effect of FDI net inflow is received by individual tax revenue. Every one percent increase in FDI net inflow only increases individual tax revenue about 0.012 percent of GDP. The positive impact of FDI on total tax revenue confirms the result from the previous researches that have been done by Aslam (2015: 250), Odabaş (2016: 22), and Mahmood and Chaudhary (2013: 68). On the other hand, FDI does not has a significant influence on property tax revenue. This might be caused by property tax only have a small contribution in total tax revenue. Moreover, nowadays, the economy gradually shifts from property-based to service-based due to the development of information and technology (Augustine 2009: 2).

Table 4.2
Regression result of FDI and tax revenue from the empirical model 1.A

Group	No	Dependent Variables	Model	FDINET IN_GDP	Interaction variable	Control Var+	Obs	R²	Number of countries
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
ALL COUNTRIES	1.	TAXREV_GDP	FEM	0.005	0.000	YES	1,208	16%	80
	2.	CORPTAX_GDP	FEM	0.010**	-0.001*	YES	1,146	8%	75
	3.	INDTAX_GDP	FEM	0.007**	-0.000	YES	1,144	4%	75
	4.	VAT_GDP	FEM	0.007**	-0.000	YES	1,176	16%	78
	5.	PROPTAX_GDP	FEM	-0.023***	0.002***	YES	1,166	13%	78
HIGH INCOME COUNTRIES	1.	TAXREV_GDP	FEM	-0.019*	0.003***	YES	591	7%	39
	2.	CORPTAX_GDP	FEM	0.003	-0.000	YES	585	11%	38
	3.	INDTAX_GDP	FEM	0.007	-0.000	YES	585	4%	38
	4.	VAT_GDP	FEM	0.000	0.000	YES	581	7%	38
	5.	PROPTAX_GDP	FEM	-0.034***	0.003***	YES	591	19%	39
DEVELOPING COUNTRIES	1.	TAXREV_GDP	FEM	0.052**	-0.003*	YES	610	47%	40
	2.	CORPTAX_GDP	FEM	0.035**	-0.001	YES	561	36%	37
	3.	INDTAX_GDP	FEM	0.012*	-0.000	YES	559	18%	37
	4.	VAT_GDP	FEM	0.037***	-0.000	YES	588	32%	39
	5.	PROPTAX_GDP	FEM	0.002	-0.000	YES	568	10%	38

*** $p<0.01$, ** $p<0.05$, * $p<0.1$
+ presented in the other subsection
Source: Author's calculation

As depicted in Figure 4.1, there is a different effect of FDI net inflow on total tax revenue (bar 1) in high-income countries and developing countries. FDI net inflow in high-income countries bring a negative effect on total tax revenue. The plausible explanation for this effect is because the proxy of FDI that is used in this study is FDI net inflow (FDI inflow minus FDI outflow) and the high-income countries might have more FDI outflow compare to developing countries. As a result, FDI net inflow from high-income countries might be decreasing due to FDI outflow to other country. As depicted in figure 1.2 in chapter 1, the trend of FDI net inflow from high-income countries experiences a fluctuation differ from developing countries that have a more stable upward trend. The negative effect of FDI in the high-income countries and OECD countries confirms the finding from the researches at the panel level that have been done by Castro and Camarillo (2014: 35) and Bayar and Ozturk (2018: 38). Conversely, Figure 4.1 shows that in developing countries most of FDI net inflow brings advantages for several types of tax revenue. The graph of the effect of FDI inflows on total tax revenue using REM is presented in Appendix 12 and the result looks similar.

The regression result from the effect of interaction variable between FDI net inflow and GDP per-capita on tax revenue are presented in Table 4.2 column (6). The coefficients of the interaction variable mostly show an insignificant effect. This means the effect of FDI does not depend on the level of GDP per-capita. However, the negative and significant sign of the interaction variable should be note even it is small. This is because, the positive effect of FDI might be decreasing along with the increase of GDP per-capita or FDI.

Figure 4.1
Graph of FDI coefficient on tax revenue as a percentage of GDP
for the empirical model 1.A (FEM)
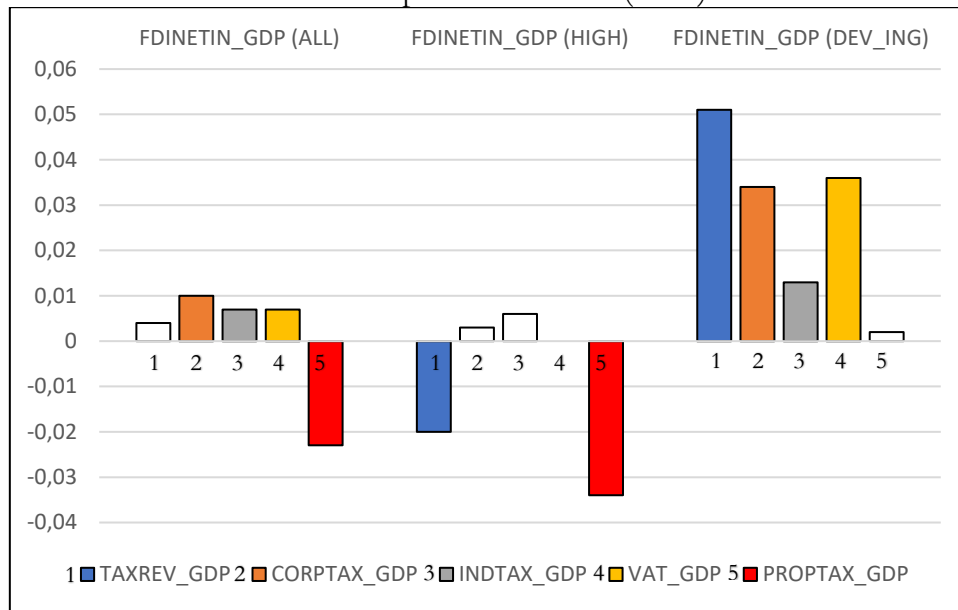
*The insignificant coefficients are presented in the colourless (unshaded) bar chart.
Source: Author's calculation

4.2.2. The effect of greenfield and brownfield FDI on tax revenue

The regression results of the greenfield and brownfield FDI on tax revenue from the empirical models (1.B) and (1.C) are shown in Table 4.3. The regression results of the greenfield FDI are presented in Table 4.3 column (5). For all samples, the greenfield FDI statistically brings a beneficial effect on total tax revenue and individual tax revenue. However, after splitting the sample into high-income and developing countries, the results are not the same. In high-income economies, the greenfield FDI has a mixed result, greenfield FDI positively affects individual tax revenue, but negatively affects corporate tax revenue. While, in developing countries, the greenfield FDI statistically has a significant and positive effect on total tax revenue and individual tax revenue. This might be caused by establishing a new investment in developing countries is cheaper compare to in high-income countries. Moreover, establishing a new investment in developing countries will increase the number of taxpayers and reduce unemployment that in the end will give advantages on tax revenue. The similar result is obtained when greenfield FDI are measured in per-capita form. As can be seen in appendix 8, greenfield FDI per-capita also positively affects individual tax revenue.

Table 4.3
The coefficient of the greenfield and brownfield FDI on tax revenue
from the empirical model 1.B and 1.C (FEM)

Group	No	Dependent Variables	Model	Greenfield FDI_GDP	Interaction variable FDI and GDPPC	Brownfield FDI_GDP	Interaction variable FDI and GDPPC
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
ALL COUNTRIES	1.	TAXREV_GDP	FEM	16.614**	-1.932**	39.879**	-3.937**
	2.	CORPTAX_GDP	FEM	0.740	-0.015	15.671*	-1.541*
	3.	INDTAX_GDP	FEM	18.116***	-1.828***	7.006	-0.581
	4.	VAT_GDP	FEM	-0.575	0.077	0.465	-0.171
	5.	PROPTAX_GDP	FEM	1.346	-0.160	-0.661	0.055
HIGH INCOME COUNTRIES	1.	TAXREV_GDP	FEM	5.103	-1.136	38.404**	-3.698**
	2.	CORPTAX_GDP	FEM	-37.115***	3.467**	11.469	-1.126
	3.	INDTAX_GDP	FEM	31.772**	-3.464**	10.737	-0.910
	4.	VAT_GDP	FEM	12.672	-1.149	0.657	-0.153
	5.	PROPTAX_GDP	FEM	8.733	-1.014	0.113	-0.006
DEVELOPING COUNTRIES	1.	TAXREV_GDP	FEM	14.782**	-1.733**	-8.555	1.299
	2.	CORPTAX_GDP	FEM	4.496	-0.470	43.710	-4.302
	3.	INDTAX_GDP	FEM	16.948***	-1.687***	-57.835**	6.291**
	4.	VAT_GDP	FEM	-1.078	0.129	-11.620	0.937
	5.	PROPTAX_GDP	FEM	-0.046	0.004	-14.661	1.471

*** $p<0.01$, ** $p<0.05$, * $p<0.1$
Source: Author's calculation

The results of the regression between brownfield FDI as a percentage of GDP on tax revenue are presented in Table 4.3 column (7). For whole samples, brownfield FDI statistically brings a benefit on total tax revenue and corporate tax revenue. In high-income economies, brownfield FDI has a beneficial effect only on total tax revenue. While in developing countries, brownfield FDI statistically could deteriorate individual tax revenue. This effect might be caused by merger and acquisition process tend to be followed by the improvement process for managerial and efficiency of the production process. Implementing a higher standard for employee and automation might replace a manual process that in turn would decrease individual income and individual tax revenue as well. The similar results emerge when brownfield FDI is measured in per-capita form. From appendix 10, it can be seen that in developing countries, brownfield FDI per-capita statistically brings a negative effect on total tax revenue and VAT revenue.

As can be seen in Figure 4.2, in developing countries, greenfield FDI positively affects total tax revenue and individual tax revenue. In contrast, brownfield FDI negatively affects individual tax revenue. As a result, greenfield FDI should be a better choice compared to brownfield FDI. The comparison bar chart between greenfield and brownfield FDI in per-capita form is presented in appendix 13. This chart also illustrates that the effect of greenfield FDI is better than brownfield FDI on tax revenue. On the other hand, in high-income countries, brownfield should be more favourable than greenfield FDI. This finding in line with descriptive statistics in Table 3.5, where in the high-income countries, the amount of brownfield FDI is larger than greenfield FDI.

In addition, from Table 4.3, we can see that the coefficient of greenfield and brownfield FDI looks larger than the coefficient in table 4.2. The large coefficient might be caused by data of greenfield and brownfield FDI as a percentage of GDP are very small. As depicted in Table 3.6 (chapter 3). Greenfield and brownfield FDI as a percentage of GDP for the whole samples have average 0.03 percent and 0.01 percent respectively. In other words, one percent increase in greenfield or brownfield FDI (as a percentage of GDP) need a huge change in the amount of greenfield or brownfield FDI.

Figure 4.2
The graph of coefficients of the greenfield and the brownfield FDI from the empirical model
1.B and 1.C (FEM)
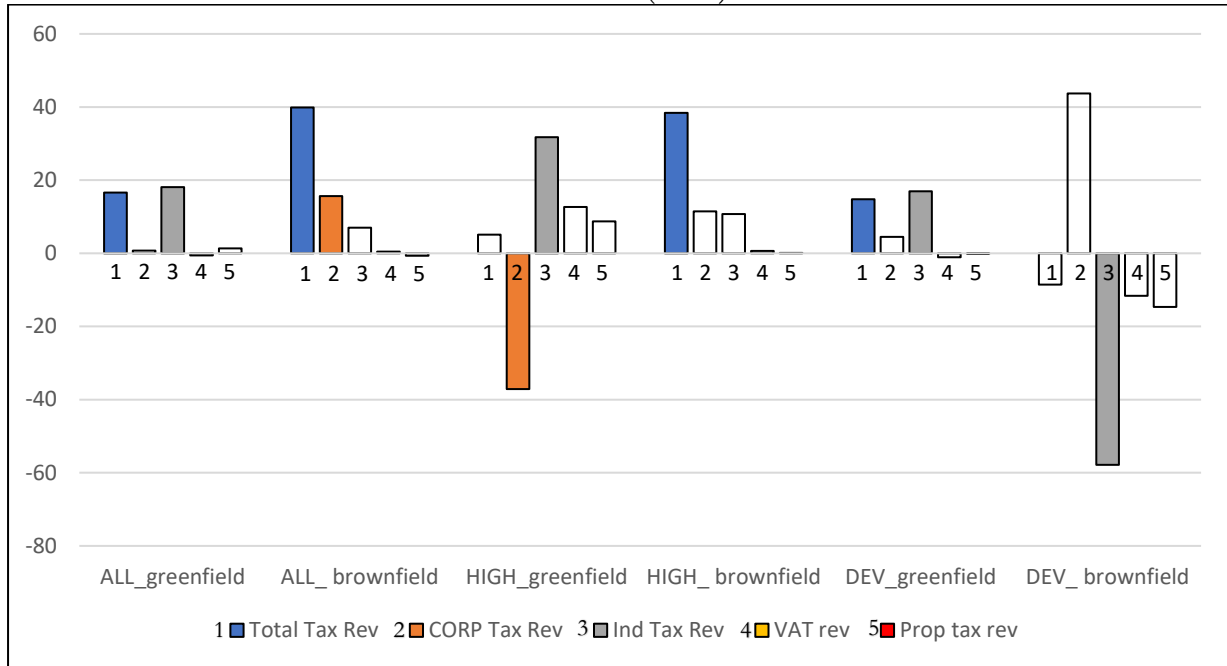
*The insignificant coefficients are presented in the colourless (unshaded) bar chart.
Source: Author's calculation

The coefficients of interaction variable between FDI (greenfield and brownfield) and GDP per-capita are presented in Table 4.3 column (6) and (8). In high-income countries, the coefficients of interaction variable between greenfield FDI and GDP per-capita show a mixed result. While in developing countries, interaction variable shows a negative coefficient and statistically significant for total tax revenue and individual tax revenue. The negative sign of interaction between greenfield FDI and GDP per-capita should be noted. This is because, if we hold per-capita income in developing countries constant, any additional FDI will increase tax revenue, but this effect is decreasing along with the increase of FDI. On the other hand, most of the coefficient of interaction variable between brownfield FDI and GDP per-capita on tax revenue show an insignificant effect.

4.3. Regression result of control variables

In this subsection will be discussed the result of regression for control variables from the empirical model (1.A). The results of the regression are provided in Table 4.4 and 4.5. The regression results for control variables from the other empirical models are provided in the appendix.

The coefficients of the natural logarithm of GDP per-capita (lnGDPPC) are shown in Table 4.5 column (5). In the whole samples, the high GDP per-capita is accompanying with the

high the all type of tax revenue except for individual tax revenue. In high-income countries, the coefficients of lnGDPPC are mixed, positive for VAT and property tax revenue and negative for individual tax revenue. However, in developing countries, the GDP per-capita positively affects tax revenue and its types. This means that the improvement of income per-capita is associated with the rise of tax revenue. The same result is obtained when tax revenue is measured in per-capita form (see appendix 6). The positive impact of GDP per-capita confirms the previous findings that have been done by Gupta (2007: 31), Mahmood and Chaudhary (2013: 68), and Castro and Camarillo (2014: 55).

Table 4.4
The coefficient of control variables from the empirical model 1.A (1)

Group	No	Dependent Variables	Model	lnGDPPC	CPI	AGRI_GDP
(1)	(2)	(3)	(4)	(5)	(6)	(7)
ALL COUNTRIES	1.	TAXREV_GDP	FEM	1.898***	0.021*	-0.087***
	2.	CORPTAX_GDP	FEM	0.735***	0.008	-0.059***
	3.	INDTAX_GDP	FEM	-0.122	0.004	0.002
	4.	VAT_GDP	FEM	0.673***	0.011**	-0.031***
	5.	PROPTAX_GDP	FEM	0.419***	-0.017***	-0.011
HIGH INCOME COUNTRIES	1.	TAXREV_GDP	FEM	-0.745	0.014	-0.338**
	2.	CORPTAX_GDP	FEM	-0.318	0.020***	-0.345***
	3.	INDTAX_GDP	FEM	-1.090***	0.005	0.019
	4.	VAT_GDP	FEM	0.481**	0.019***	-0.042
	5.	PROPTAX_GDP	FEM	0.523**	-0.024***	-0.014
DEVELOPING COUNTRIES	1.	TAXREV_GDP	FEM	4.384***	0.017	-0.122***
	2.	CORPTAX_GDP	FEM	1.976***	-0.021**	-0.067***
	3.	INDTAX_GDP	FEM	0.458***	-0.004	-0.010
	4.	VAT_GDP	FEM	1.510***	0.004	-0.050***
	5.	PROPTAX_GDP	FEM	0.219***	-0.005**	-0.005

*** $p<0.01$, ** $p<0.05$, * $p<0.1$
Source: Author's calculation

The coefficients of government quality with the Corruption Perception Index (CPI) as a proxy are presented in Table 4.4 column (6). Overall, the regression obtains mixed results. In the whole samples, CPI positively affects total tax revenue and VAT revenue, but negatively affects property tax revenue. In high-income economies, CPI has a significant and positive correlation with government revenue from corporate tax and VAT, and a negative correlation with revenue from property tax. In developing countries, CPI has a negative effect on government revenue from corporate tax and property tax. In other words, corporate tax revenue and property tax revenue will increase if the level of corruption increase (a decrease in CPI). This finding confirms that corruption might not only erode tax revenue due to the decline in economic development (sand the wheels' hypothesis), but also might increase tax revenue due to the increase of economic development (grease the wheels' hypothesis). This result is supported by the previous research that has been done in developing countries by Rock and Bonnett (2004: 1010). They conclude that there is an "Asian paradox" for the effects of corruption which explains that in developing

countries have a high level of economic development despite a high level of corruption. Corruption seems to be a way out for an inefficient and ineffective bureaucracy. This explanation could be one of the plausible reasons behind the negative effect between CPI and tax revenue.

The regression results of agriculture's share in GDP are presented in Table 4.4 column (7). For all three sample groups, agriculture's share in the GDP mostly has a negative effect on tax revenue. This result confirms that agriculture is one of the sectors that difficult to be taxed. In high-income economies, the share of agriculture in the GDP statistically brings a negative and significant impact on total tax revenue and corporate tax revenue. The share of agriculture in the GDP might also deteriorate total tax revenue, corporate tax revenue, and VAT revenue in developing countries. This means, the larger share of agriculture in GDP, the less tax revenue could be collected.

In addition, as depicted in Figure 4.3, the negative coefficients in high-income countries are higher compared to developing countries. This might be caused by the share of agriculture in high-income countries is less than the proportion of agriculture in GDP in developing countries as presented in Table 3.6 (descriptive statistics of control variables). As a result, every one percent increase in agriculture's share in GDP in high-income countries relatively has a higher marginal effect compare to developing countries. This finding confirms previous researches that the share of agriculture in GDP negatively affects tax revenue (Castro and Camarillo 2014: 55, Gupta 2007: 11).

Figure 4.3
The coefficients of Agriculture's share in GDP
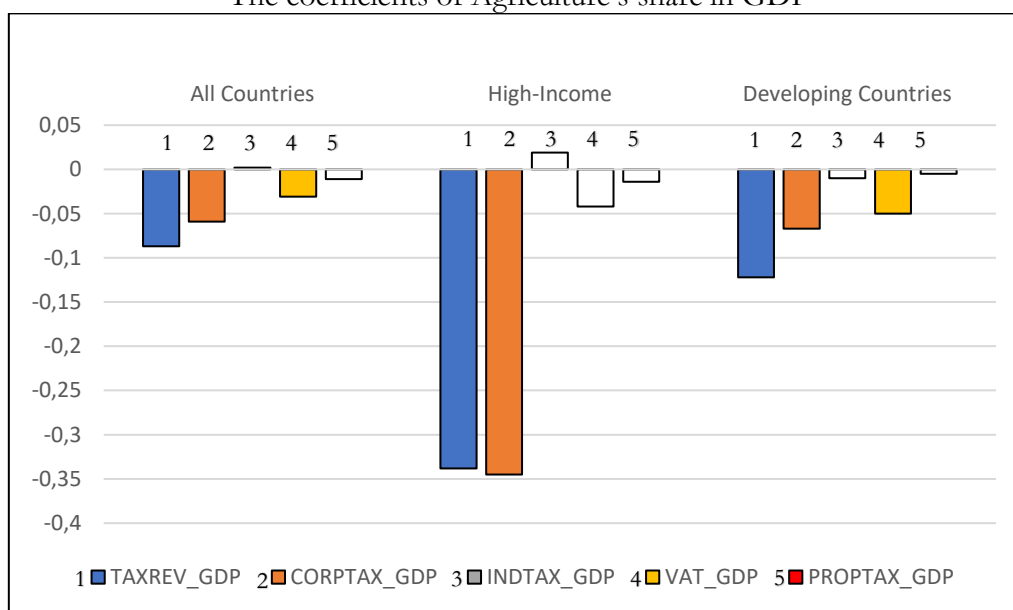
*The insignificant coefficients are presented in the colourless (unshaded) bar chart.
Source: Author's calculation

The coefficients of international trade are presented in Table 4.5 column (5). In whole samples, international trade positively affects corporate tax revenue. In high-income economies, international trade does not affect tax revenue. While in developing countries, international trade statistically has a benefit and significant impact on all types of tax revenue. The increase in international trade could be followed by the increase of tax revenue that could be collected by the government. This is because international trade is one of the activities that are easier to be administrated. Moreover, exporting domestic product and importing intermediate goods could trigger the economic activity in a host country. The positive influence of international trade on

government revenue from taxes confirms the previous study that has been done by Leuthold (1991: 184).

Table 4.5
The coefficient of control variables from the empirical model 1.A (2)

Group	No	Dependent Variables	Model	TRADE	INFL	PCB
(1)	(2)	(3)	(4)	(5)	(6)	(7)
ALL COUNTRIES	1.	TAXREV_GDP	FEM	0.006	0.011***	-0.008**
	2.	CORPTAX_GDP	FEM	0.004**	0.000	-0.007***
	3.	INDTAX_GDP	FEM	-0.002	0.006***	-0.001
	4.	VAT_GDP	FEM	0.002	0.003**	-0.001
	5.	PROPTAX_GDP	FEM	-0.000	0.001	-0.005***
HIGH INCOME COUNTRIES	1.	TAXREV_GDP	FEM	-0.008	0.027***	-0.010***
	2.	CORPTAX_GDP	FEM	-0.001	-0.005	-0.007***
	3.	INDTAX_GDP	FEM	-0.001	0.016***	-0.000
	4.	VAT_GDP	FEM	-0.002	0.000	0.000
	5.	PROPTAX_GDP	FEM	-0.003	0.003	-0.007***
DEVELOPING COUNTRIES	1.	TAXREV_GDP	FEM	0.052***	-0.005	0.027***
	2.	CORPTAX_GDP	FEM	0.028***	-0.003	0.007
	3.	INDTAX_GDP	FEM	0.003*	0.002	0.008***
	4.	VAT_GDP	FEM	0.012***	-0.003	-0.003
	5.	PROPTAX_GDP	FEM	0.001**	0.001	-0.002**

*** $p<0.01$, ** $p<0.05$, * $p<0.1$
Source: Author's calculation

The coefficients of inflation (consumer price index, 2010 as a base year) are presented in Table 4.5 column (6). In the whole samples, inflation positively affects total tax revenue, individual tax revenue, and VAT revenue. In high-income countries, inflation brings a positive effect on total tax revenue and individual tax revenue. The higher inflation, the more total tax revenue and individual tax revenue could be collected. However, in developing countries, inflation has no significant effect on tax revenue.

The last control variable is the development of the financial sector. This research uses credit to the private sector from banking (PCB) as a proxy. The regression results for PCB are presented in Table 4.5 column (7). In the whole samples, the PCB degrades total tax revenue, corporate tax revenue, and property tax revenue. Similarly, the statistical evidence for the high-income economies shows that PCB has a negative correlation with total tax revenue, corporate tax revenue, and property tax revenue. This might be caused by most of the credits provided by banks are used for consumption purposes. However, in developing countries, credit to the private sector brings a beneficial impact on total tax revenue and individual tax revenue, which means the bank credit to the private sector could stimulate economic development that later on will increase tax revenue as well. This finding supports the research that has been done by Ebi (2018: 93).

4.4. The treatment of the endogeneity problem

In this subsection, will be presented procedures corresponds to the assumption that tax revenue and FDI might have an endogeneity problem. Instrumental Variable (IV) and 2SLS regressions are the methods that are chosen to solve the problem as explained in chapter 3 section 3.5.2.

By adopting IV that has been used by Lensink and Morrissey (2001: 15), this research uses one of the world governance indicators as IV named "Political stability and absence of violence" (POLSTAB). POLSTAB is an index range from -2.5 to 2.5, where the former shows unfavorable condition and the letter shows favorable condition for investment. As an IV, POLSTAB should have a correlation with the suspected endogenous variable (FDI), but do not have a direct correlation with tax revenue. To examine this condition, this research conducts the first stage regression using the reduced model (equation 3.4). As shown in Table 4.7 column (1), (2), and (3), the first stage regression concludes that POLSTAB significantly affects FDI for the whole samples, high-income countries, and developing countries. In other words, POLSTAB is statistically meet the basic condition as an IV of FDI in three different groups of observation. At the first stage, the predicted value of FDI (FDIhat) can be obtained in order to conduct regression in the second stage. Error term in the first stage is also needed to conduct the endogeneity test in the further process.

Table 4.6
First stage, instrumental variable regression result

	Whole sampe	High-income	Developing country
	(1)	(2)	(3)
VARIABLES	FDINETIN_GDP	FDINETIN_GDP	FDINETIN_GDP
POLSTAB	4.378**	9.653**	1.392**
	(2.059)	(4.543)	(0.652)
Control Variables	YES	YES	YES
Observations	1,234	591	636
R-squared	0.014	0.023	0.069
Number of country1	81	39	41

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1
Source: Author's calculation

Table 4.7
Second stage, and endogeneity test

	All sample		High-income		developing	
	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	TAX REV_GDP	TAX REV_GDP	TAX REV_GDP	TAX REV_GDP	TAX REV_GDP	TAX REV_GDP
FDINETIN_GDP		6.369		0.270		0.229
		(8.020)		(0.191)		(0.515)
FDIhat (Predicted in the 1st stage)	6.082		0.255		0.237	
	(7.996)		(0.189)		(0.517)	
Error (Predicted in the 1st stage)		-6.363		-0.265		-0.176
		(8.020)		(0.192)		(0.516)
Control Variables	YES	YES	YES	YES	YES	YES
Observations	1,229	1,225	595	591	627	627
R-squared	0.157	0.159	0.059	0.061	0.459	0.464
Number of country1	81	81	39	39	41	41

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1
Source: Author's calculation

The second stage regression aims to estimate the parameter of the estimated endogenous variable (FDIhat) using the structural model in the equation (3.3). As shown in Table 4.8 column (1), (3), and (5), the results of the second stage regression show that predicted FDI (FDIhat) positively affects tax revenue in all sample groups, but the effect is not statistically significant.

However, the results from endogeneity test using predicted error term (omitted variables of FDI from the first stage regression) indicate that error term has an insignificant effect on the total tax revenue, as shown in Table 4.8 column (2), (4), and (6). In other words, there are no omitted variable of FDI in the first stage regression. Therefore, the endogeneity problem in this research is less likely to exist. This finding is consistent with previous researches that have been done by Bayar and Ozturk (2018: 38), Odabaş (2016: 22), and Aslam (2015: 250). Their researches conclude that FDI and tax revenue only have a single direction effect from FDI to tax revenue. This finding also confirms that data analysis in the previous subsection using the panel data method with the assumption of one-way causality from FDI to tax revenue is acceptable.

Chapter 5
Conclusion and Recommendation

This research paper has discussed the effect of FDI on tax revenue by exploring the possible channels on how FDI could affect tax revenue and examining the effect using econometric tools.

Economic growth theories stated that investment and technology are essential in economic development (Solow 1956). The presence of FDI is expected to fill the investment gap and bring technology development that in the end will accelerate economic development. In line with the theory, FDI is also projected to bring a benefit on tax revenue collection directly or indirectly. The increase of the number of taxpayers and the direct technical assistance from the parent company in the home country to the MNC in the host country are allegedly directly increases productivity and the amount of tax revenue as well. However, the transfer pricing motive (Gropp and Kostial 2000: 1) and massive tax incentives (Nguyen et al. 2014) might erode tax revenue that could be collected by a country. In addition, the indirect effect of FDI on tax revenue might occur due to the horizontal spillover effect of FDI. The increase in competition, imitation process and employee mobilization are the possible channels on how FDI affects productivity (Demena 2017: 35) that finally will increase tax revenue as well. Furthermore, the increase in productivity might be followed by the increase in the level of income that will increase demand and consumption, that in the end will increase tax revenue as well. However, the uneven competition will reduce the number of domestic companies and in turn, might deteriorate tax revenue (Nguyen et al. 2014: 28). The net effect is depending on which effect is greater between positive and negative effects.

5.1. Finding

The regression results show that in developing countries FDI has a positive effect and statistically significant on total tax revenue, corporate tax revenue, individual tax revenue, and VAT revenue, but it has no effect on property tax revenue. However, the real effect of FDI on tax revenue is relatively small. This information was obtained from the regression result that shows a small coefficient. The positive effect of FDI on total tax revenue confirms the previous researches that have been done by Aslam (2015: 250), Odabaş (2016: 22), and Mahmood and Chaudhary (2013: 68). The effect of FDI on corporate tax revenue, individual tax revenue, VAT and property tax revenue, are the new finding of this research. In contrast, in high-income countries, tax revenue is negatively affected by FDI. This finding supports the previous researches that have been done by Castro and Camarillo (2014: 55) and Bayar and Ozturk (2018: 38).

This research finds that in developing countries, the greenfield FDI is a better choice to increase tax revenue rather than brownfield FDI. In contrast, in high-income countries, the brownfield FDI is better than greenfield FDI to elevate tax revenue. However, the coefficient of the interaction variable between GDP per-capita and greenfield FDI in developing countries show a negative sign. In other words, the effect of greenfield FDI on tax revenue in developing countries is increasing, but this effect is decreasing (increasing at decreasing rate) along with the increase of GDP per-capita or greenfield FDI.

This research also confirms that the proportion of agriculture in GDP and GDP per-capita are the predictor for tax revenue in all samples' groups, while the other control variables have a mixed result.

To deal with the endogeneity problems, this study has chosen political stability and the absence of violence (POLSTAB) as an instrumental variable (IV). The results of the two-stage

least square (2SLS) regression show that FDI positively affects total tax revenue, but the effect is not significant. However, endogeneity tests prove that the endogeneity problem is less likely to exist. This finding is consistent with previous researches that have been done by Bayar and Ozturk (2018: 38), Odabaş (2016: 22), and Aslam (2015: 250) that conclude that FDI and tax revenue only have one direction effect from FDI to tax revenue.

5.2. Limitation

This research has limitations. First, data collection and sample selection are conducted based on the availability of the data, especially tax revenue data. Due to data limitations, the findings are limited to the countries that are included in this research. Furthermore, because of some missing data, this research used unbalance panel data which caused the number of observations might be different for each regression. Second, this research does not include the effect of time (time effect) on the tax revenue in the model. However, the use of macroeconomic indicators such as; GDP Per-capita, inflation, and trade as control variables might accommodate the impact of shocks in the economy such as economic crises.

5.3. Future research

Future research is expected to examine the FDI at sector-level to find which sector has the most significant effect on tax revenue and its types. Future research could use a dynamic model or the application of lagged independent variables to extend the analysis of the effects of FDI.

5.4. Policy recommendation

The finding shows that the effect of FDI on tax revenue in developing countries is positive, but this effect tends to decrease along with the increase of GDP per-capita or FDI. Based on that finding, the policymaker in the developing countries supposed not only focus on how to attract as much as FDI inflow to the country, but should make sure that FDI will not erode tax revenue due to transfer pricing, massive tax incentives, and the uneven competition with domestic companies. The policies that can be formulated such as: inviting FDI for industries that do not erode the host country's main products, selection of FDI that does not harm the development of domestic industries due to monopolies and formulates enforceable policy on technology transfer. With these policies, the sustainability of tax revenue would be guaranteed.

In addition, since in developing countries the effect of greenfield FDI on total tax revenue is greater compared to brownfield FDI, policymakers should focus on inviting a new investor to establish a new company. By attracting greenfield FDI, tax revenue is expected to increase due to an increase in the number of taxpayers, an increase in the country's productivity, and a reduction in unemployment. On the other hand, in high-income countries, the policymakers should open more opportunities for mergers and acquisition (brownfield FDI) or forming joint ventures with foreign companies in order to increase productivity that finally will increase tax revenue. This method might be useful in reducing the cost of establishing new companies in high-income countries.

Appendices

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Appendix 1
Correlation matrix empirical model 1

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	Dependent variables					Independent variables			Control variables					
	TAXREV_GDP	CORPTAX_GDP	INDTAX_GDP	VAT_GDP	PROPTAX_GDP	FDINETIN_GDP	FDIGREEN_GDP	FDIMNA_GDP	lnGDPPC	CPI	AGRI_GDP	TRADE	INFL2010	PCB
TAXREV_GDP	1													
CORPTAX_GDP	-0.01	1												
INDTAX_GDP	0.78	-0.03	1											
VAT_GDP	0.67	-0.12	0.44	1										
PROPTAX_GDP	0.47	0.02	0.42	0.14	1									
FDINETIN_GDP	0.06	0.07	0.03	0.00	0.07	1								
FDIGREEN_GDP	-0.33	0.04	-0.30	-0.14	-0.25	0.03	1							
FDIMNA_GDP	0.11	0.09	0.12	0.00	0.17	0.37	-0.08	1						
lnGDPPC	0.25	0.14	0.29	0.06	0.21	0.16	-0.06	0.19	1					
CPI	0.64	0.02	0.71	0.35	0.47	0.17	-0.29	0.20	0.26	1				
AGRI_GDP	-0.55	0.00	-0.44	-0.26	-0.40	-0.14	0.29	-0.14	-0.22	-0.61	1			
TRADE	0.05	0.01	0.03	-0.05	0.03	0.44	0.09	0.29	0.27	0.29	-0.27	1		
INFL2010	-0.01	-0.04	0.00	-0.03	0.02	-0.01	-0.01	-0.02	0.13	0.03	0.02	0.00	1	
PCB	0.50	0.00	0.66	0.19	0.46	0.08	-0.27	0.11	0.27	0.72	-0.51	0.14	0.06	1

Source: Author's calculation

Appendix 2
Correlation matrix empirical model 2

	Dependent variables					Independent variables			Control variables					
	InTOT REVPC	InCORP TPC	InIND TXPC	InVAT PC	InPROP TXPC	InFDI PC	InFDI GRENPC	InFDI MNAPC	InGDP PC	CPI	AGRI_GDP	TRADE	INFL2010	PCB
InTOTREVPC	1													
InCORPTPC	0.92	1												
InINDTXPC	0.93	0.85	1											
InVATPC	0.98	0.88	0.90	1										
InPROPTXPC	0.90	0.86	0.81	0.87	1									
InFDIPC	0.74	0.76	0.67	0.73	0.68	1								
InFDIGRENPC	0.51	0.53	0.48	0.50	0.46	0.65	1							
InFDIMNAPC	0.75	0.76	0.76	0.72	0.70	0.67	0.45	1						
InGDPPC	0.28	0.30	0.30	0.26	0.25	0.30	0.21	0.28	1					
CPI	0.84	0.81	0.81	0.83	0.73	0.70	0.49	0.70	0.27	1				
AGRI_GDP	-0.82	-0.78	-0.73	-0.81	-0.79	-0.67	-0.56	-0.63	-0.21	-0.61	1			
TRADE	0.24	0.30	0.22	0.23	0.20	0.53	0.46	0.29	0.29	0.31	-0.27	1		
INFL2010	-0.01	0.00	0.03	-0.01	-0.02	-0.02	-0.02	-0.04	0.14	0.01	0.03	-0.01	1	
PCB	0.68	0.65	0.71	0.65	0.64	0.49	0.35	0.60	0.30	0.71	-0.51	0.15	0.07	1

Source: Author's calculation

REM Regression result for empirical model 1.A (FDI net inflow as a percentage of GDP)

Group	No	Dependent Variables	FDINETIN_GDP	lnGDPPC	INT_FDIGDP_lnGDPPC	CPI	AGRI_GDP	TRADE	INFL	PCB	Constant	Obs	R²	Number of countries
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
ALL COUNTRIES	1.	TAXREV_GDP	0.004	1.561***	0.000	0.047***	-0.135***	0.006*	0.010***	-0.004	7.438***	1,208	0.15	80
	2.	CORPTAX_GDP	0.010**	0.347***	-0.001*	0.007	-0.037**	0.004***	0.004**	-0.005***	-0.621	1,146	0.072	75
	3.	INDTAX_GDP	0.007*	0.019	-0.000	0.017***	-0.018	-0.002*	0.003**	0.000	4.046***	1,144	0.026	75
	4.	VAT_GDP	0.006**	0.417***	-0.000	0.013***	-0.034***	0.002	0.004***	-0.000	0.918	1,176	0.154	78
	5.	PROPTAX_GDP	-0.023***	0.135**	0.002***	0.004	-0.038***	-0.000	0.000	-0.002*	0.057	1,166	0.082	78
HIGH INCOME COUNTRIES	1.	TAXREV_GDP	-0.019*	-0.410	0.003***	0.019	-0.339**	-0.010**	0.024***	-0.010***	35.229***	591	0.069	39
	2.	CORPTAX_GDP	0.003	-0.170	-0.000	0.023***	-0.310***	-0.001	-0.006**	-0.007***	5.113***	585	0.105	38
	3.	INDTAX_GDP	0.006	-0.490*	-0.000	0.013*	0.024	-0.004*	0.010**	-0.001	10.906***	585	0.03	38
	4.	VAT_GDP	0.001	0.171	0.000	0.018***	-0.021	-0.002	0.004	0.001	3.467**	581	0.066	38
	5.	PROPTAX_GDP	-0.034***	0.171	0.003***	-0.007	-0.016	-0.003*	0.006**	-0.004***	0.846	591	0.168	39
DEVELOPING COUNTRIES	1.	TAXREV_GDP	0.057**	3.316***	-0.002	0.017	-0.116***	0.049***	0.001	0.031***	-17.335***	610	0.459	40
	2.	CORPTAX_GDP	0.038***	1.072***	-0.001	-0.021**	-0.046***	0.025***	0.003	0.011***	-8.131***	561	0.346	37
	3.	INDTAX_GDP	0.013*	0.395***	-0.000	-0.003	-0.010	0.003*	0.002*	0.009***	-1.869*	559	0.181	37
	4.	VAT_GDP	0.037***	1.045***	-0.000	0.006	-0.047***	0.012***	0.000	-0.001	-5.208***	588	0.318	39
	5.	PROPTAX_GDP	0.002	0.136***	-0.000	-0.004**	-0.008**	0.001*	0.001*	-0.002*	-0.662*	568	0.097	38

*** $p<0.01$, ** $p<0.05$, * $p<0.1$
Source: Author's calculation

REM Regression result for empirical model 1.B (greenfield FDI as a percentage of GDP)

Group	No	Dependent Variables	FDIGREEN_GDP	lnGDPPC	INT_FGDIG RENGDP_l nGDPPC	CPI	AGRI_GD P	TRADE	INFL	PCB	Constant	Obs	R²	Number of countries
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
ALL COUNTRIES	1.	TAXREV_GDP	16.769**	2.024***	-1.950**	0.040***	-0.193***	0.008**	0.002	0.004	4.246	1,003	0.127	80
	2.	CORPTAX_GDP	0.874	0.264*	-0.032	0.009*	-0.037**	0.004**	-0.001	-0.005***	0.481	958	0.049	75
	3.	INDTAX_GDP	18.438***	0.449***	-1.855***	0.013**	-0.042***	-0.001	0.002	0.004**	0.205	950	0.062	75
	4.	VAT_GDP	-0.265	0.219*	0.040	0.011**	-0.033***	0.002*	0.003***	0.004***	2.793***	979	0.091	79
	5.	PROPTAX_GDP	1.108	0.186**	-0.133	0.006	-0.041***	-0.000	-0.000	-0.003**	-0.360	971	0.01	78
HIGH INCOME COUNTRIES	1.	TAXREV_GDP	12.309	0.727	-1.967	0.004	-0.730***	-0.008	0.005	-0.007	27.750***	487	0.08	39
	2.	CORPTAX_GDP	-34.802***	-0.068	3.271**	0.013**	-0.380***	-0.001	-0.019***	-0.009***	6.408***	482	0.174	38
	3.	INDTAX_GDP	31.050**	0.156	-3.386**	0.003	-0.212***	-0.003	0.003	0.001	6.543**	482	0.037	38
	4.	VAT_GDP	16.587	0.098	-1.554	0.014**	-0.083	-0.002	0.002	0.003**	4.531***	477	0.071	38
	5.	PROPTAX_GDP	6.198	0.215	-0.778	-0.003	0.008	-0.003	0.007**	-0.005***	-0.008	487	0.055	39
DEVELOPING COUNTRIES	1.	TAXREV_GDP	15.216**	3.199***	-1.782**	0.020	-0.139***	0.047***	-0.005	0.042***	-14.859***	509	0.382	40
	2.	CORPTAX_GDP	4.398	0.877***	-0.458	-0.010	-0.050***	0.027***	0.000	0.014***	-6.457***	476	0.271	37
	3.	INDTAX_GDP	17.040***	0.613***	-1.697***	-0.003	-0.011	0.004**	0.003**	0.009***	-4.079***	468	0.278	37
	4.	VAT_GDP	-0.815	0.862***	0.098	0.008	-0.042***	0.015***	-0.001	0.002	-3.714***	495	0.228	40
	5.	PROPTAX_GDP	-0.115	0.098**	0.012	-0.004**	-0.010**	0.000	0.000	0.000	-0.205	477	0.039	38

*** $p<0.01$, ** $p<0.05$, * $p<0.1$
Source: Author's calculation

Appendix 5
REM Regression result for empirical model 1.C (brownfield FDI as a percentage of GDP)

Group	No	Dependent Variables	FDIMNA_GDP	lnGDPPC	INT_FDI MNAGDP_lnGDPPC	CPI	AGRI_GDP	TRADE	INFL	PCB	Constant	Obs	R²	Number of countries
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
ALL COUNTRIES	1.	TAXREV_GDP	40.361**	1.258***	-3.961**	0.036***	-0.236***	0.008**	0.004	-0.002	12.364***	990	0.096	77
	2.	CORPTAX_GDP	15.487*	0.302**	-1.512*	0.007	-0.052***	0.003*	0.001	-0.006***	0.244	954	0.049	73
	3.	INDTAX_GDP	7.610	-0.016	-0.626	0.017***	-0.030	-0.003	0.002	0.002	4.508***	946	0.008	73
	4.	VAT_GDP	-0.052	0.510***	-0.121	0.013***	-0.044***	0.003**	0.000	0.000	0.397	969	0.13	76
	5.	PROPTAX_GDP	-0.948	0.159**	0.120	0.004	-0.048***	-0.001	0.001	-0.001	-0.097	969	0.008	75
HIGH INCOME COUNTRIES	1.	TAXREV_GDP	37.882**	-0.334	-3.646**	0.011	-0.373***	-0.007	0.022**	-0.009**	35.598***	569	0.055	37
	2.	CORPTAX_GDP	11.005	-0.142	-1.076	0.025***	-0.352***	-0.001	-0.009***	-0.007***	5.200***	569	0.13	37
	3.	INDTAX_GDP	10.474	-0.424	-0.883	0.008	0.003	-0.002	0.006	0.000	10.990***	568	0.015	37
	4.	VAT_GDP	0.478	0.232	-0.134	0.013***	-0.015	-0.001	0.004*	0.001	3.057**	563	0.08	36
	5.	PROPTAX_GDP	0.119	0.183	0.027	-0.008	-0.024	-0.003**	0.008***	-0.004**	0.582	569	0.055	37
DEVELOPING COUNTRIES	1.	TAXREV_GDP	-16.461	2.977***	2.110	0.008	-0.145***	0.060***	-0.000	0.035***	-13.592***	417	0.447	39
	2.	CORPTAX_GDP	46.181	1.153***	-4.623	-0.027**	-0.064***	0.031***	0.002	0.011**	-8.561***	385	0.334	36
	3.	INDTAX_GDP	-60.803**	0.268**	6.644**	-0.007	0.007	0.002	0.003**	0.011***	-0.980	378	0.207	36
	4.	VAT_GDP	-14.361	0.889***	1.170	0.017**	-0.051***	0.018***	-0.001	-0.003	-4.257***	402	0.303	39
	5.	PROPTAX_GDP	-15.352	0.123**	1.552	-0.002	-0.013**	0.002**	0.001	-0.001	-0.576	396	0.11	37

*** $p<0.01$, ** $p<0.05$, * $p<0.1$
Source: Author's calculation

Appendix 6
FEM Regression result for empirical model 2.A (FDI net inflow Per-capita)

Group	No	Dependent Variables	lnFDIPC	lnGDPPC	INT_lnFDIPC_lnGDPPC	CPI	AGRI_GDP	TRADE	INFL	PCB	Constant	Obs	R²	Number of countries
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
ALL COUNTRIES	1.	lnTOTREVPC	0.078***	0.492***	-0.006**	0.007***	-0.017***	0.000	0.002***	-0.000*	2.478***	1,171	0.724	81
	2.	lnCORPTPC	0.237***	0.657***	-0.019**	0.007***	-0.032***	0.002***	0.003***	-0.002***	-1.379**	1,110	0.413	76
	3.	lnINDTXPC	0.044	0.166	0.000	0.016***	-0.006	-0.002**	0.008***	-0.000	2.453***	1,107	0.283	76
	4.	lnVATPC	-0.081*	0.544***	0.012**	0.006***	-0.024***	-0.000	0.001***	-0.001***	0.780**	1,140	0.557	79
	5.	lnPROPTXPC	0.294**	0.763***	-0.029**	0.001	-0.032***	0.001	0.003***	-0.002***	-3.427***	1,130	0.205	79
HIGH INCOME COUNTRIES	1.	lnTOTREVPC	-0.026	0.164***	0.004*	0.009***	-0.062***	-0.001***	0.004***	-0.001***	6.728***	554	0.752	39
	2.	lnCORPTPC	-0.064	0.060	0.012	0.014***	-0.177***	-0.000	0.002	-0.003***	5.217***	548	0.291	38
	3.	lnINDTXPC	0.103	-0.735***	-0.005	0.027***	0.024	-0.005***	0.031***	-0.002*	9.937***	547	0.359	38
	4.	lnVATPC	-0.189***	0.197**	0.022***	0.009***	-0.155***	-0.001***	0.004***	-0.002***	5.202***	544	0.534	38
	5.	lnPROPTXPC	0.012	0.333***	-0.000	0.002	-0.019	-0.001	0.003***	-0.001**	2.556***	554	0.364	39
DEVELOPING COUNTRIES	1.	lnTOTREVPC	-0.096*	0.551***	0.011*	0.004***	-0.018***	0.003***	0.001***	0.004***	0.739**	611	0.800	41
	2.	lnCORPTPC	-0.156	0.892***	0.020	-0.004	-0.035***	0.009***	0.002***	0.003**	-4.362***	562	0.684	38
	3.	lnINDTXPC	-0.360**	0.130	0.043**	0.002	-0.016***	-0.001	0.003***	0.015***	1.747*	560	0.504	38
	4.	lnVATPC	-0.134*	0.604***	0.017**	0.002	-0.021***	0.002***	0.000	0.002**	-0.771*	590	0.716	40
	5.	lnPROPTXPC	0.090	0.827***	-0.010	0.000	-0.035***	0.011***	0.008***	-0.010***	-6.434***	570	0.295	39

*** $p<0.01$, ** $p<0.05$, * $p<0.1$
Source: Author's calculation

Appendix 7
REM Regression result for empirical model 2.A (FDI net inflow Per-capita)

Group (1)	No (2)	Dependent Variables (3)	lnFDIPC (4)	lnGDPPC (5)	INT_lnFDIPC_lnGDPPC (6)	CPI (7)	AGRI_GDP (8)	TRADE (9)	INFL (10)	PCB (11)	Constant (12)	Obs (13)	R^2 (14)	Number of countries (15)
ALL COUNTRIES	1.	lnTOTREVPC	0.071**	0.433***	-0.005	0.010***	-0.024***	0.000	0.002***	0.000	2.925***	1,171		81
	2.	lnCORPTPC	0.220***	0.405***	-0.016*	0.015***	-0.054***	0.003***	0.003***	-0.000	0.528	1,110		76
	3.	lnINDTXPC	-0.020	0.095	0.009	0.028***	-0.037***	-0.001	0.006***	0.001*	2.761***	1,107		76
	4.	lnVATPC	-0.077	0.353***	0.012**	0.011***	-0.039***	0.000	0.001***	-0.000	2.227***	1,140		79
	5.	lnPROPTXPC	0.202*	0.512***	-0.018	0.012***	-0.068***	0.002	0.003***	-0.001	-1.531	1,130		79
HIGH INCOME COUNTRIES	1.	lnTOTREVPC	-0.031	0.144***	0.005*	0.009***	-0.063***	-0.001***	0.004***	-0.001***	6.876***	554	0.751	39
	2.	lnCORPTPC	-0.144	-0.104	0.020**	0.020***	-0.176***	-0.000	0.004***	-0.002***	6.250***	548	0.283	38
	3.	lnINDTXPC	0.051	-0.053	0.000	0.031***	-0.033	-0.005***	0.021***	-0.003***	4.395***	547	0.326	38
	4.	lnVATPC	-0.211***	0.000	0.024***	0.011***	-0.148***	-0.001**	0.006***	-0.002***	6.629***	544	0.525	38
	5.	lnPROPTXPC	-0.006	0.275***	0.002	0.003**	-0.022*	-0.001*	0.003***	-0.001	3.021***	554	0.36	39
DEVELOPING COUNTRIES	1.	lnTOTREVPC	-0.038	0.462***	0.006	0.004***	-0.022***	0.003***	0.001***	0.004***	1.473***	611	0.792	41
	2.	lnCORPTPC	0.045	0.664***	0.000	-0.005*	-0.042***	0.009***	0.003***	0.005***	-2.431***	562	0.669	38
	3.	lnINDTXPC	-0.306*	0.060	0.038**	0.003	-0.020***	-0.000	0.004***	0.016***	2.376***	560	0.502	38
	4.	lnVATPC	-0.014	0.434***	0.005	0.002	-0.029***	0.003***	0.001***	0.003***	0.618	590	0.695	40
	5.	lnPROPTXPC	0.158	0.563***	-0.014	-0.001	-0.053***	0.009***	0.009***	-0.010***	-4.003**	570	0.287	39

*** $p<0.01$, ** $p<0.05$, * $p<0.1$
Source: Author's calculation

FEM Regression result for empirical model 2.B (greenfield FDI Per-capita)

Group	No	Dependent Variables	lnFDIGRENPC	lnGDPPC	INT_lnFDIGRENPC_lnGDPPC	CPI	AGRI_GDP	TRADE	INFL	PCB	Constant	Obs	R^2	Number of countries
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
ALL COUNTRIES	1.	lnTOTREVPC	0.054*	0.517***	-0.006*	0.007***	-0.022***	-0.000	0.001***	-0.000*	2.561***	1,003	0.667	80
	2.	lnCORPTPC	0.096	0.522***	-0.009	0.010***	-0.033***	0.001	0.002***	-0.003***	0.239	958	0.283	75
	3.	lnINDTXPC	0.333***	0.415***	-0.033**	0.014***	-0.028***	-0.002**	0.007***	0.000	0.659	950	0.264	75
	4.	lnVATPC	-0.037	0.501***	0.005	0.006***	-0.027***	-0.000	0.001***	-0.000	1.322***	979	0.483	79
	5.	lnPROPTXPC	-0.080	0.652***	0.008	0.003	-0.015	-0.000	0.001	-0.002*	-2.082*	971	0.129	78
HIGH INCOME COUNTRIES	1.	lnTOTREVPC	-0.058	0.240***	0.007	0.007***	-0.079***	-0.001***	0.003***	-0.001***	6.484***	487	0.682	39
	2.	lnCORPTPC	-0.192	0.169	0.023	0.011***	-0.194***	-0.001	-0.003*	-0.004***	5.371***	482	0.229	38
	3.	lnINDTXPC	0.433*	-0.471*	-0.042	0.023***	-0.173***	-0.004***	0.026***	-0.002	8.739***	482	0.352	38
	4.	lnVATPC	-0.168*	0.269***	0.021**	0.008***	-0.151***	-0.001***	0.002	-0.001***	4.675***	477	0.482	38
	5.	lnPROPTXPC	-0.110	0.359***	0.010	0.001	-0.012	-0.001	0.002**	-0.002***	2.705***	487	0.269	39
DEVELOPING COUNTRIES	1.	lnTOTREVPC	0.050	0.610***	-0.006	0.004***	-0.021***	0.003***	0.000	0.004***	0.362	509	0.778	40
	2.	lnCORPTPC	0.035	0.852***	-0.004	0.001	-0.032***	0.009***	0.002***	0.003**	-3.979***	476	0.586	37
	3.	lnINDTXPC	0.373***	0.416***	-0.037***	0.002	-0.025***	-0.001	0.003***	0.016***	-0.752	468	0.490	37
	4.	lnVATPC	0.011	0.612***	-0.001	0.003**	-0.022***	0.003***	0.000	0.003***	-0.835*	495	0.670	40
	5.	lnPROPTXPC	-0.203	0.585***	0.020	-0.001	-0.011	0.005**	0.005***	-0.001	-3.876**	477	0.169	38

*** $p<0.01$, ** $p<0.05$, * $p<0.1$
Source: Author's calculation

Group (1)	No (2)	Dependent Variables (3)	lnFDIGRENPC (4)	lnGDPPC (5)	INT_lnFDIGRENPC_lnGDPPC (6)	CPI (7)	AGRI_GDP (8)	TRADE (9)	INFL (10)	PCB (11)	Constant (12)	Obs (13)	R² (14)	Number of countries (15)
ALL COUNTRIES	1.	lnTOTREVPC	0.051	0.457***	-0.005	0.009***	-0.031***	0.000	0.001***	0.000	3.009***	1,003	0.655	80
	2.	lnCORPTPC	0.078	0.299***	-0.006	0.018***	-0.058***	0.002***	0.002***	-0.001	1.912***	958	0.251	75
	3.	lnINDTXPC	0.305**	0.340***	-0.028**	0.027***	-0.067***	-0.001	0.005***	0.002**	0.881	950	0.238	75
	4.	lnVATPC	-0.039	0.347***	0.006	0.010***	-0.044***	0.000	0.001***	0.001*	2.516***	979	0.45	79
	5.	lnPROPTXPC	-0.113	0.419***	0.013	0.010***	-0.062***	0.001	0.001	-0.000	-0.174	971	0.104	78
HIGH INCOME COUNTRIES	1.	lnTOTREVPC	-0.060	0.208***	0.007	0.007***	-0.078***	-0.001***	0.003***	-0.001***	6.703***	487	0.68	39
	2.	lnCORPTPC	-0.221	-0.031	0.026*	0.015***	-0.181***	-0.001	-0.001	-0.003***	6.648***	482	0.218	38
	3.	lnINDTXPC	0.430*	0.232	-0.040	0.029***	-0.227***	-0.005***	0.017***	-0.002	2.542	482	0.326	38
	4.	lnVATPC	-0.167*	0.092	0.021**	0.009***	-0.137***	-0.001***	0.004***	-0.001*	5.954***	477	0.472	38
	5.	lnPROPTXPC	-0.133	0.278***	0.012	0.002	-0.013	-0.001	0.003***	-0.002***	3.338***	487	0.265	39
DEVELOPING COUNTRIES	1.	lnTOTREVPC	0.056	0.488***	-0.006	0.004***	-0.026***	0.003***	0.001***	0.005***	1.408***	509	0.769	40
	2.	lnCORPTPC	0.065	0.453***	-0.006	0.001	-0.044***	0.009***	0.003***	0.007***	-0.483	476	0.554	37
	3.	lnINDTXPC	0.386***	0.292***	-0.038***	0.003	-0.031***	-0.000	0.004***	0.017***	0.344	468	0.487	37
	4.	lnVATPC	0.026	0.434***	-0.002	0.003**	-0.030***	0.003***	0.001**	0.004***	0.685	495	0.652	40
	5.	lnPROPTXPC	-0.190	0.286	0.019	-0.003	-0.039***	0.004**	0.006***	0.000	-0.965	477	0.158	38

*** p<0.01, ** p<0.05, * p<0.1
Source: Author's calculation

FEM Regression result for empirical model 2.C (brownfield FDI Per-capita)

Group	No	Dependent Variables	lnFDIMNAPC	lnGDPPC	INT_lnFDIMNAPC_lnGDPPC	CPI	AGRI_GDP	TRADE	INFL	PCB	Constant	Obs	R²	Number of countries
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
ALL COUNTRIES	1.	lnTOTREVPC	0.019	0.413***	-0.002	0.007***	-0.019***	-0.000	0.002***	-0.001**	3.740***	884	0.692	77
	2.	lnCORPTPC	0.106**	0.571***	-0.011*	0.011***	-0.042***	0.001	0.002***	-0.003***	0.097	853	0.312	73
	3.	lnINDTXPC	0.077	0.063	-0.006	0.016***	-0.012	-0.002*	0.010***	-0.000	3.968***	846	0.283	73
	4.	lnVATPC	0.001	0.647***	-0.000	0.007***	-0.030***	-0.001*	0.001	-0.002***	0.358	865	0.522	76
	5.	lnPROPTXPC	0.101	0.303***	-0.011	-0.001	-0.037***	0.002*	0.006***	-0.002*	1.330	867	0.236	75
HIGH INCOME COUNTRIES	1.	lnTOTREVPC	0.035*	0.240***	-0.003*	0.008***	-0.060***	-0.001**	0.004***	-0.001***	6.269***	521	0.723	37
	2.	lnCORPTPC	0.066	0.327***	-0.006	0.016***	-0.198***	-0.001	-0.002	-0.004***	3.455***	521	0.262	37
	3.	lnINDTXPC	0.178*	-0.617***	-0.014	0.023***	0.047	-0.004***	0.030***	-0.002*	9.267***	521	0.363	37
	4.	lnVATPC	0.065	0.456***	-0.007	0.007***	-0.153***	-0.001**	0.002**	-0.003***	3.112***	515	0.509	36
	5.	lnPROPTXPC	0.033	0.312***	-0.003	0.002	-0.027*	-0.001	0.003***	-0.001**	2.822***	521	0.350	37
DEVELOPING COUNTRIES	1.	lnTOTREVPC	-0.056**	0.592***	0.007**	0.004**	-0.015***	0.003***	0.001**	0.004***	0.677**	361	0.808	39
	2.	lnCORPTPC	-0.063	0.980***	0.008	-0.005	-0.031***	0.010***	0.002**	0.003*	-4.798***	332	0.664	36
	3.	lnINDTXPC	0.012	0.282**	-0.000	-0.004	-0.026**	-0.001	0.004***	0.016***	1.057	325	0.496	36
	4.	lnVATPC	-0.060*	0.736***	0.007*	0.005**	-0.018***	0.002***	-0.000	0.002**	-1.712***	348	0.720	39
	5.	lnPROPTXPC	-0.007	0.516***	0.001	-0.001	-0.028	0.012***	0.008***	-0.005	-3.499**	344	0.319	37

*** $p<0.01$, ** $p<0.05$, * $p<0.1$
Source: Author's calculation

REM Regression result for empirical model 2.C (brownfield FDI Per-capita)

| Group	No	Dependent Variables	lnFDIMNAPC	lnGDPPC	INT_lnFDIMNAPC_lnGDPPC	CPI	AGRI_GDP	TRADE	INFL	PCB	Constant	Obs	R²	Number of countries
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
ALL COUNTRIES	1.	lnTOTREVPC	0.008	0.348***	-0.000	0.011***	-0.040***	0.000	0.002***	-0.000	3.941***	884	0.664	77
	2.	lnCORPTPC	0.077	0.298***	-0.007	0.020***	-0.081***	0.002**	0.003***	-0.001**	1.984***	853	0.274	73
	3.	lnINDTXPC	0.045	0.102	-0.001	0.032***	-0.077***	-0.001	0.007***	0.001	2.946***	846	0.243	73
	4.	lnVATPC	-0.021	0.382***	0.003	0.013***	-0.065***	0.000	0.001***	-0.000	2.299***	865	0.469	76
	5.	lnPROPTXPC	0.066	0.247***	-0.007	0.007**	-0.088***	0.002*	0.005***	-0.001	1.382*	867	0.214	75
HIGH INCOME COUNTRIES	1.	lnTOTREVPC	0.032*	0.219***	-0.003	0.009***	-0.062***	-0.001***	0.004***	-0.001***	6.407***	521	0.722	37
	2.	lnCORPTPC	0.014	0.080	0.000	0.022***	-0.191***	-0.000	0.000	-0.003***	5.056***	521	0.248	37
	3.	lnINDTXPC	0.203*	0.068	-0.016	0.030***	-0.040	-0.004***	0.019***	-0.002**	3.485***	521	0.32	37
	4.	lnVATPC	0.044	0.259***	-0.004	0.010***	-0.146***	-0.001**	0.005***	-0.002***	4.568***	515	0.498	36
	5.	lnPROPTXPC	0.023	0.278***	-0.002	0.004**	-0.030**	-0.001*	0.004***	-0.001*	3.037***	521	0.346	37
DEVELOPING COUNTRIES	1.	lnTOTREVPC	-0.063**	0.461***	0.008**	0.004*	-0.027***	0.003***	0.001***	0.004***	1.642***	361	0.793	39
	2.	lnCORPTPC	-0.067	0.595***	0.009	-0.005	-0.054***	0.010***	0.004***	0.005***	-1.512**	332	0.633	36
	3.	lnINDTXPC	0.007	0.137	0.001	-0.003	-0.038***	-0.001	0.005***	0.016***	2.108**	325	0.49	36
	4.	lnVATPC	-0.062	0.439***	0.007*	0.005**	-0.036***	0.003***	0.001**	0.003***	0.694	348	0.681	39
	5.	lnPROPTXPC	-0.016	0.315*	0.002	-0.005	-0.064***	0.010***	0.009***	-0.005	-1.501	344	0.308	37

*** $p<0.01$, ** $p<0.05$, * $p<0.1$

Source: Author's calculation

Graph of FDI coefficient on tax revenue as a percentage of GDP for the empirical model 1.A (REM)
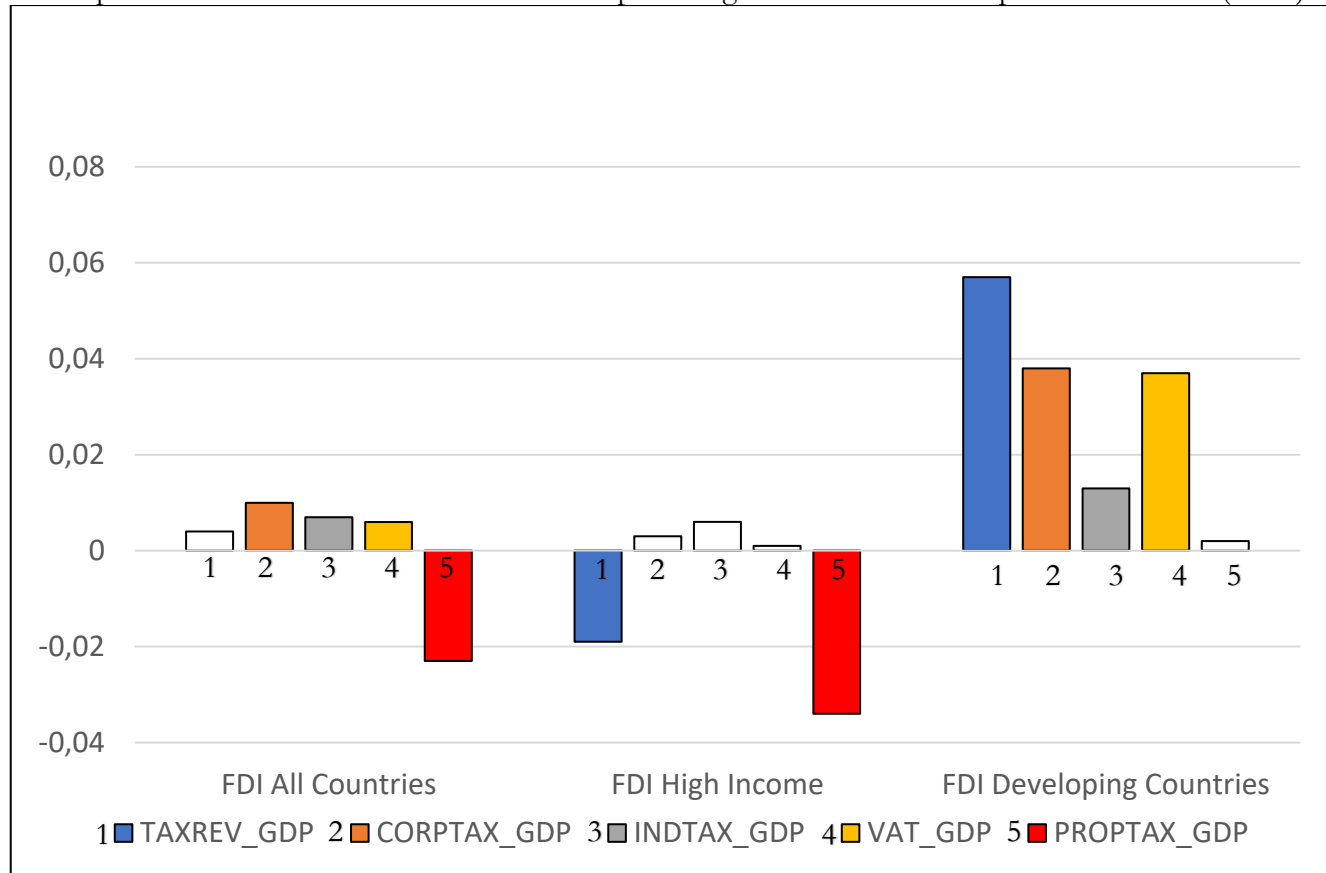
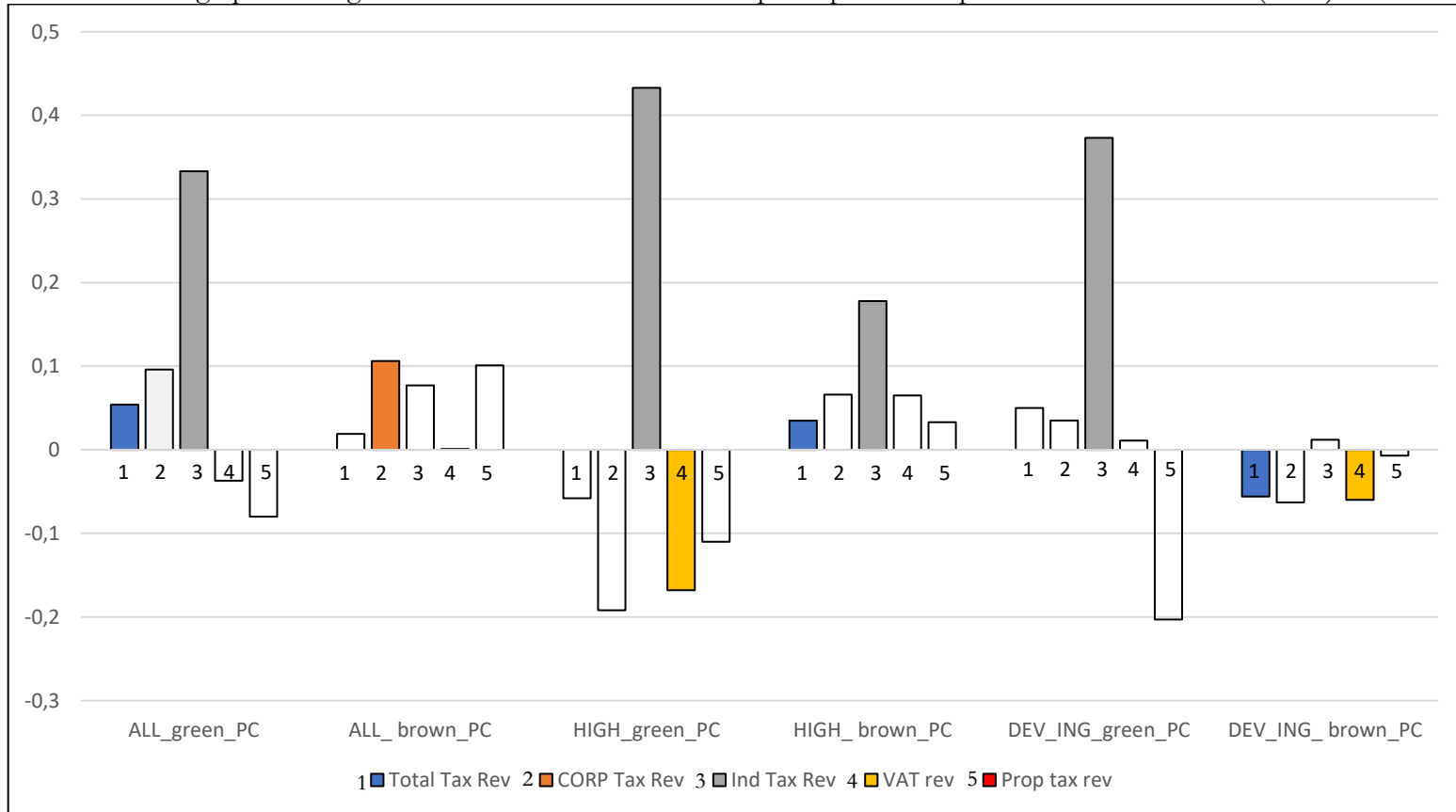*The insignificant coefficients are presented in the colourless (unshaded) bar chart.
Source: Author's calculation

The graph of the greenfield and the brownfield FDI per-capita for empirical model 2.B and 2C (FEM)

*The insignificant coefficients are presented in the colourless (unshaded) bar chart.

Source: Author's calculation

Appendix 14
Country list

No	Country Code	Income Category	No	Country Code	Income Category	No	Country Code	Income Category
1	ARG	HIGH	32	SGP	HIGH	63	THA	UPPER-MDDLE
2	AUS	HIGH	33	SVK	HIGH	64	TOK	UPPER-MDDLE
3	AUT	HIGH	34	SVN	HIGH	65	TUR	UPPER-MDDLE
4	BHS	HIGH	35	ESP	HIGH	66	VEN	UPPER-MDDLE
5	BRB	HIGH	36	SWE	HIGH	67	BOL	LOWER MIDDLE
6	BEL	HIGH	37	CHE	HIGH	68	CPV	LOWER MIDDLE
7	CAN	HIGH	38	TTO	HIGH	69	CMR	LOWER MIDDLE
8	CHL	HIGH	39	GBR	HIGH	70	COG	LOWER MIDDLE
9	CZE	HIGH	40	USA	HIGH	71	CIV	LOWER MIDDLE
10	DNK	HIGH	41	URY	HIGH	72	EGY	LOWER MIDDLE
11	EST	HIGH	42	BLZ	UPPER-MDDLE	73	SLV	LOWER MIDDLE
12	FIN	HIGH	43	BWA	UPPER-MDDLE	74	SWZ	LOWER MIDDLE
13	FRA	HIGH	44	BRA	UPPER-MDDLE	75	GHA	LOWER MIDDLE
14	DEU	HIGH	45	COL	UPPER-MDDLE	76	HND	LOWER MIDDLE
15	GRC	HIGH	46	COK	UPPER-MDDLE	77	IDN	LOWER MIDDLE
16	HUN	HIGH	47	CRI	UPPER-MDDLE	78	KEN	LOWER MIDDLE
17	ISL	HIGH	48	CUB	UPPER-MDDLE	79	MAR	LOWER MIDDLE
18	IRL	HIGH	49	DOM	UPPER-MDDLE	80	NIC	LOWER MIDDLE
19	ISR	HIGH	50	ECU	UPPER-MDDLE	81	PNG	LOWER MIDDLE
20	ITA	HIGH	51	FJI	UPPER-MDDLE	82	PHL	LOWER MIDDLE
21	JPN	HIGH	52	GTM	UPPER-MDDLE	83	SLB	LOWER MIDDLE
22	KOR	HIGH	53	GUY	UPPER-MDDLE	84	TUN	LOWER MIDDLE
23	LVA	HIGH	54	JAM	UPPER-MDDLE	85	BFA	LOW
24	LTU	HIGH	55	KAZ	UPPER-MDDLE	86	COD	LOW
25	LUX	HIGH	56	MYS	UPPER-MDDLE	87	MLI	LOW
26	NLD	HIGH	57	MUS	UPPER-MDDLE	88	NER	LOW
27	NZL	HIGH	58	MEX	UPPER-MDDLE	89	RWA	LOW
28	NOR	HIGH	59	PRY	UPPER-MDDLE	90	SEN	LOW
29	PAN	HIGH	60	PER	UPPER-MDDLE	91	TGO	LOW
30	POL	HIGH	61	WSM	UPPER-MDDLE	92	UGA	LOW
31	PRT	HIGH	62	ZAF	UPPER-MDDLE			

Source: Author's compilation

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