Effects of Aid for Trade on Extensive and Intensive Margins of Greenfield FDI[+]

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Keywords: FDI, greenfield, developing countries, Aid for Trade

Abstract

Using a panel dataset of 105 developing countries for the period 2003-2015, this paper assesses the effects of Aid for Trade (AfT) on greenfield FDI flows to the aid recipient countries. Particularly, this paper classifies the total dollar value of greenfield FDI flows to each recipient country in terms of four different layers: the extensive and intensive margins of projects as well as the extensive and intensive margins of source countries. Applying the system GMM estimator, this paper finds that AfT not only increases the dollar value of FDI flows to the recipient countries but also helps diversify the greenfield projects and source countries. In addition, this paper finds that AfT has a greater effect for greenfield FDI from donor (developed) countries than from non-donor (developing) countries. Among the three components of AfT, aid for trade-related infrastructure and aid for trade policy regulations are found to have positive links with greenfield FDI, irrespective of source country groups, yet their effects are larger for developed source countries. In contrast, aid for building productive capacity hinders greenfield FDI flows from non-donor countries, while it promotes greenfield FDI from donor countries. We offer some explanations for this finding.

[+] We thank the referee and the associate editor of this journal for very useful comments. This work was supported by the Ministry of Education of the Republic of Korea and the National Research Foundation of Korea (NRF-C1012970-01-01).

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1. Introduction

The World Trade Organization (WTO) member countries launched the Aid for Trade (AfT) Initiative at the Hong Kong Ministerial Conference in December 2005. Since then, AfT has become a major component of foreign aid distribution. The main objective of the AfT Initiative is to assist developing countries, and especially the Least Developed Countries (LDCs), to "build the supply-side capacity and trade-related infrastructure that they need to assist them to implement and benefit from WTO Agreements and more broadly expand their trade" (WTO, 2005, paragraph. 57).

Many researchers have proved that AfT is effective in promoting international trade. For example, Helble et al. (2012) find that total AfT increases both recipient exports and imports. Pettersson and Johansson (2013) also find that AfT is positively associated with both donor exports and recipient exports. A report by OECD/WTO (2013, Chapter 5) also provides empirical evidence that AfT is correlated with increases in trade, whilst increases in other aid (i.e. non-AfT) tend to dampen export performance. Some researchers find that only part of AfT is positively associated with trade. Cali and te Velde (2011) find that among the three components of AfT, aid for "economic infrastructure" is associated with greater recipient-country exports. Vijil and Wagner (2012) also find empirical evidence that infrastructure AfT promotes trade. Thus, most studies find positive effects of AfT on trade, particularly when AfT is in the form of aid for economic infrastructure.[3]

One country can raise the total value of its trade either by boosting its export diversification or by upgrading the quality of its exported products. Indeed, Gnangnon and Roberts (2017) find that AfT positively affects export diversification and export quality improvement.

Export diversification, increase in employment, and increase in foreign investment are the most desired targets of AfT by the recipient countries (OECD/WTO, 2015). In

[3] Some researchers have shown AfT reduce the trade costs facing aid recipients (for example, Tadesse et al., 2017). Some other researchers have assessed how the AfT has been allocated (for example, Gamberoni and Newfarmer, 2014 and Lee et al., 2015).

fact, AfT aims to promote not only international trade of the recipient countries but also FDI flows to these countries (World Bank, 2011).[4]

The investment climate can be enhanced as a result of improved infrastructure in developing countries. That is, AfT may encourage FDI flows to the recipient countries by improving the recipient country's economic infrastructure such as roads, communications, and electricity, thereby removing bottlenecks that would otherwise prevent FDI inflows. AfT to develop productive capacity may also promote FDI flows to the recipient countries by making the target industries more productive and more competitive internationally.

Selaya and Sunesen (2012) find that aid for economic (and social) infrastructure is associated with more FDI, while aid for building productive capacity deters investment. Donabauer et al. (2016) also find evidence that aid for economic infrastructure has a strong direct effect on FDI. However, Kimura and Todo (2010), considering five donor countries and 98 recipient countries during the period 1990-2002, find only a significant positive impact of Japanese infrastructure aid on Japanese investment in recipient countries. Kang et al. (2011) extend Kimura and Todo (2010) to show that not only aid from Japan but also aid from Korea promotes bilateral FDI during the period 1980-2003.

While none of these studies explicitly considers AfT, Lee and Ries (2016) provide empirical evidence more comprehensively on the effects of AfT on FDI. Using bilateral data for 25 donors and 120 recipient countries for the period 2004-2012, they estimate the effects of bilateral AfT on greenfield FDI, relying on a "structural" gravity model. They find a strong and significant effect of AfT on greenfield investment, particularly when the donors are among the top five donors. Among the three categories of AfT, both aid for infrastructure and that for building productive capacity are found to exert strong effects. Another unique finding of Lee and Ries (2016) is that AfT increases not only the total value of greenfield FDI but also the extensive margin of greenfield projects (i.e. number of greenfield projects).

[4] "An important dimension of AfT support spans measures to make countries more attractive to foreign direct investment (FDI)" (World Bank, 2011, page 13).

The main objective of this paper is to examine whether AfT not only increases the dollar value of FDI flows to developing countries but also whether it helps diversify FDI flows to these countries by increasing the counts of projects as well as the number of source countries. For this purpose, we classify the total dollar value of greenfield FDI flows into four layers: the extensive and intensive margins of projects (i.e. total counts of projects and average dollar value of each project) as well as the extensive and intensive margins of source countries (i.e. total number of source countries and average dollar value of FDI from each source country).

This paper further examines whether AfT from developed-donor countries increases FDI more from the like-minded developed countries than from developing countries. For this purpose, we also classify total greenfield FDI into FDI from DAC countries and from non-DAC countries.

Our dataset for regression analysis is a panel of 105 developing countries for the period 2003-2015. Applying the system GMM estimator, this paper finds that AfT not only increases the dollar value of FDI but also helps diversify the greenfield projects and source countries. In addition, this paper finds that AfT has a greater effect for greenfield FDI from donor (developed) countries than from non-donor (developing) countries. Among the three components of AfT, aid for trade-related infrastructure and aid for trade policy regulations are found to have positive links with greenfield FDI, irrespective of source country groups, yet their effects are larger for developed source countries. In contrast, aid for building productive capacity hinders greenfield FDI flows from non-donor countries, while it promotes greenfield FDI from donor countries. We offer some explanations for this finding.

This paper is organized as follows. In Section 2, we discuss the trends and patterns of greenfield FDI flows and AfT during the period 2003-2015. Section 3 explains empirical specifications. Section 4 offers the empirical results. Section 5 presents a summary and conclusions.

2. Descriptive Statistics

2.1. Aid for Trade

Data on disbursement of AfT in constant value (base year: 2016) were downloaded from the OECD Creditor Reporting System database. To begin with, our raw dataset downloaded from the OECD database included 176 countries.[5] All countries that received no AfT or greenfield FDI during the considered period are excluded from our dataset, leaving us with 135 countries.

AfT is classified into the following three main categories:

- *Aid for trade-related infrastructure (INF)*: transport and storage (210), communications (220), and energy generation and supply (230).
- *Aid for building productive capacity (BPC)*: banking and financial services (240), business and other services (250), agriculture (311), forestry (312), fishing (313), industry (321), mineral resources and mining (322), and tourism (332).
- *Aid for trade policy regulations and trade-related adjustment (TPR)*: trade policies and regulations (331).

Figure 1 shows the total value of AfT and its components provided by all donors including OECD's 30 Development Assistance Committee (DAC) members as well as multilateral donors.[6] During the period 2003-2015, overall AfT grew from US$ 10.3 billion to approximately US$ 32 billion. All of the three components of AfT increased during the period but, in terms of share, only the aid for INF increased. As of 2015, aid for INF accounted for the largest share, followed by aid for BPC. Aid for TPR had the smallest share.

[Figure 1]

AfT and its components to developing countries, 2003-2015

[5] We use data on disbursement of AfT because commitments may take a longer time to be disbursed to the recipients and not all commitments are actually disbursed.

[6] Of 135 developing countries, 30 countries are dropped in the regression analysis due to the unavailability of data on some explanatory variables.

Table 1 shows the top 20 recipient countries sorted by total value of AfT during the whole period 2003-2015. India and Viet Nam were the countries that received the largest amounts of AfT during the period, accounting for 7.7% and 7.5%, respectively, of total AfT disbursed to the 135 countries. The top 20 countries in the list accounted for 60.9 percent of total AfT disbursement.

[Table 1]

Top 20 AfT recipient countries, during 2003-2015

2.2. Greenfield FDI

Data on US$ current value and counts of greenfield FDI flows were acquired from fDi Intelligence (Financial Times Ltd.) for the period 2003-2015. The current value of FDI was then converted to the constant value using US Consumers Price Index (base year is 2016).

Figure 2 shows the overall trend of greenfield FDI flows to the 135 developing countries. Appendix Table 1 lists the 135 countries. The real line shows the trend of the total value of greenfield FDI (measured on the left vertical axis), whereas the dotted line shows the counts of greenfield FDI projects (measured on the right vertical axis). Both the dollar value and the counts of greenfield FDI flows reached their peaks in 2008, at US$ 825 billion and 6,637 projects, respectively. Since then the dollar value of greenfield FDI declined until 2012 but its counts briefly declined in 2009 and revived in 2010. In general, the dollar value appears more volatile than the counts.

[Figure 2]

Greenfield FDI flows to developing countries: Total value and number of projects, 2003-2015

Table 2 summarizes the top 20 host countries of greenfield FDI in terms of total dollar (Panel A), projects margin (Panel B), and source countries margin (Panel C) during

the period 2003-2015. As seen in Panel A, China, with US$ 1.4 trillion amount, was the largest host country accounting for almost 22 percent of total greenfield FDI flows to 135 developing countries during this period. India, Brazil, Mexico, and Indonesia were among the top five host countries.

Panel B displays the top 20 host countries of greenfield FDI in terms of the extensive and intensive project margins. As noted earlier, the extensive project margin refers to the number of greenfield projects, while the intensive project margin indicates the average value of each project. When calculating the intensive margin, we added 1 to both the value and the number of greenfield FDI projects so that we avoided "undefined" cases.

In terms of the extensive project margin, China ranked first (15,354 projects), followed by India, Brazil, Mexico, and Viet Nam. Thus, the dollar value and the number of greenfield FDI flows to developing countries show similar rankings. However, the country ranking based on intensive project margin is quite different: Timor-Leste ranked first (US$ 754.3 million per project), followed by Niger, Nicaragua, Antigua and Barbuda, and Cameroon. In fact, these countries are relatively small in terms of GDP and received small amounts of greenfield FDI in terms of dollar value and number of projects. For example, Timor-Leste received only S$ 7.5 billion amount of greenfield FDI in 9 projects during the whole period.

Panel C reports a different group of top 20 host countries of greenfield FDI sorted by extensive and intensive margins of source countries. The extensive source-country margin is the number of source countries while the intensive source-country margin is the average value of greenfield FDI flows from each source country. Based on the original bilateral data, we construct the extensive margin of source countries and calculate the intensive margin of source countries by dividing the total value of greenfield FDI by the total number of source countries.

In terms of extensive source-country margin, China ranked first, with total 95 source countries, United Arab Emirates is runner-up (81 source countries), and India ranks third (80 source countries). In terms of intensive source-country margin, China continues to be the leading country (US$ 14.4 billion per source country), followed by

India, Brazil, Mexico, and Indonesia. Looking at three panels in Table 2 together, we find that country rankings are similar, except for the intensive project margin.

[Table 2]

Top 20 host countries of greenfield FDI, in terms of total dollar value, projects margin, and source countries margin, during 2003-2015

3. Empirical specification

The aim of this study is to investigate the effects of AfT on various layers of greenfield FDI inflows to the recipient countries. To be more specific, the total value of greenfield FDI is disaggregated into the extensive and intensive margins of projects as well as source countries.

For this purpose, the constructed dataset is a panel with 105 developing countries during the period 2003-2015.[7] We estimate Equation (1) below:

$$(1) \quad \ln Gf\_FDI_{it} = \beta_0 + \beta_1 \ln Gf\_FDI_{it-1} + \beta_2 \ln AfT_{it} + \beta_3 \ln Non\_AfT_{it} + \beta_4 CV_{it} + \varepsilon_t + \varepsilon_{it},$$

$\ln Gf\_FDI_{it}$ is the logarithm of total value of greenfield FDI flows (or project extensive margin; project intensive margin; source country extensive margin; or source country intensive margin) to country i in year t. We note that there are a number of zero observations in our dataset: 5.6 percent (98/1,755 observations). In order to "save" zero observations from being dropped out of the sample, we add one to both value and number of FDI projects before taking logs and before calculating the intensive margins.

[7] Initially, there were 176 countries in the dataset downloaded from the OECD's Creditor Reporting System. We dropped 41 countries that received no AfT or greenfield FDI during the period 2003-2015, leaving the dataset with 135 countries. In the regression analysis, 30 countries are further dropped because of unavailability of data for some explanatory variable. Thus, there are 105 countries in the regression analysis.

The foreign investment in the previous period is often highly relevant for FDI decisions in the current period because of the agglomeration effect or clustering effect in investment (see, for example, Walsh and Yu, 2010). That is, a large amount of FDI inflows in the previous period can be regarded as a signal for a benign business climate to foreign investors. Also, investors may be tempted to benefit from the economy of scale by making additional investments in the presence of past investment decisions by other investors. Therefore, we include the lagged dependent variable, $\ln Gf\_FDI_{it-1}$, on the right hand side of the regression equation.

Our focus variable, $\ln AfT_{it}$, is the log of the aggregate value of AfT (or three AfT components) that country i received in year t. There are also some zero observations for AfT, particularly for AfT targeting TPR. Therefore, we also add one before taking logs. We also include the log of all other types of foreign aid, $\ln Non\_AfT_{it}$. Non-AfT incorporates not only humanitarian aid but also aid for education and health. Hence, through the development of human capital, non-AfT may also help increase FDI flows to the recipient countries.

ε_t represents year dummies and $\varepsilon_{it}$is the error term. In addition, we include various control variables, CV_{it}, as follows:

GDP per capita

GDP per capita reflects the consumer purchasing power or real wages. If FDI firms have a desire to target the local market (horizontal FDI), then one country will become more appealing to the investors as its GDP per capita increases. However, if FDI firms seek for cheap labor advantage (vertical FDI), then this variable may have a negative correlation with FDI flows. GDP per capita data were drawn from World Bank's World Development Indicators.

Population

Population reflects the size of labor force and market potential of host countries. Therefore we expect a positive association between population and FDI. Population data were also drawn from World Bank's World Development Indicators.

World Governance Indicators

Many studies have found that the quality of governance and institutions in developing countries does indeed matter for FDI flows to these countries (see, for example, Bénassy-Quéré, et al, 2007). In order to capture the quality of governance for an individual country, we utilize the World Bank's World Governance Indicators (WGI). WGI has six sub-indicators: Voice and Accountability, Political Stability and Absence of Violence, Government Effectiveness, Regulatory Quality, Rule of Law, and Control of Corruption. Each of the sub-indicators ranges from -2.5 to 2.5, where -2.5 indicates the worst, whereas 2.5 shows the best. For the purposes of this research, we produce the overall WGI by taking the average scores of the six WGI sub-indicators. Moreover, for readers' convenience, we have transformed WGI into scales of 10 by adding 2.5 and multiplying by 2.

Trade openness

As a means to measure the level of trade openness of host countries, we use the average of Mean tariff rate (4Aii) and Non-tariff trade barriers (4Bi) in Fraser Institute's Economic Freedom of the World Index. Scores range between 0 and 10, with higher scores meaning greater freedom in trade. The lower level of trade restrictions in developing countries may encourage MNEs to increase vertical FDI, by allocating labor-intensive production to these countries. In contrast, higher trade frictions may encourage MNEs to increase horizontal FDI by building similar plants in local markets—(Krugman, 1983; Horstmann and Markusen, 1992; and Brainard, 1993).

Capital movement freedom

This variable is drawn from Fraser Institute's Economic Freedom of the World Index (4Di) Foreign ownership/ Investment restrictions. This variable measures the costs for FDI firms to invest in a host country. Higher scores mean a freer investment environment. Thus, the degree of capital movement freedom is expected to have a positive connection with FDI inflows.

As explained above, we include the lagged value of the dependent variable, which may be correlated with the unobserved panel-level effects, making standard estimators inconsistent. In order to account for this problem, some authors (eg. Walsh

and Yu, 2010) employ the Generalized Method of Moments (GMM) dynamic estimator of the Arellano-Bond (1991) methodology. The usual Arellano-Bond estimator runs the regression using the first differences of the left- and right-hand side variables, while instrument variables are lagged levels of the inconsistent variables including the lagged dependent variable. In a sample of few periods with persistent variables which are likely to be endogenous, the usual Arellano-Bond estimator tends to perform poorly. Hence, Blundell and Bond (1998) developed a system GMM estimator that runs the regression in levels as well as in first differences and where lagged first differences are used as instrument variables in the levels equations and lagged levels are used as instruments in the first difference equations.

It should also be noted that our aid variables are likely to be endogenous. That is, foreign aid may be influenced by the future flows of FDI, because in an effort to make more FDI in a developing country, the source country may try to make the business environment of the developing country more favorable by providing it with a greater amount of foreign aid. Therefore we will employ the system GMM estimator and will treat aid variables as endogenous.[8]

4. Empirical results

4.1. Benchmark results

As noted previously, our regression results are obtained using a panel dataset for 105 countries for the period 2003-2015.[9] The benchmark results are reported in Table 3. Column (1) relates to the total value of greenfield FDI and Columns (2) and (3) to the

[8] Other variables such as trade openness, capital movement freedom and the institutional variables (Worldwide governance indicators) have often been considered as endogenous in the empirical literature. We also initially considered all of these variables as endogenous. We found similar results for the AfT variables. However, we realized that when we considered all of these variables as endogenous, the number of instruments was well greater than the number of countries and the endogenous variables might be overfitted, as shown in Roodman (2009). Therefore, we report the regression results with only the aid variables considered as endogenous in which the Sargan tests of over-identifying restrictions yield reasonable p-values and the number of instruments is smaller than the number of countries. The other results are available upon request.

[9] After collapsing dollar value of greenfield FDI flows and aid for trade for the entire period, we drew a graph of cross-plots between the log values of these two variables for 105 countries included in the regression analysis. As seen in Figure 3, there appears a positive relationship between these two variables and there seems no outlier in the sample, except for Bahrain (BHR). We re-estimated our results after excluding Bahrain and found almost the same results.

extensive and intensive margins of greenfield projects, respectively, while Columns (4) and (5) relate to the extensive and intensive margins of source countries, respectively.

[Table 3]

Effects of AfT on greenfield FDI – System GMMs

All regressions are made by running the System GMM two-step estimator, with aid variables treated as endogenous. The results of the diagnostic tests, Arellano-Bond test and Sargan test, are reported in the bottom of Table 3. All GMM specifications presented in the table pass the Arellano-Bond test of serial independence in the error terms and also the Sargan test of over-identification, which is a test of the validity of instrumental variables.[10] In conclusion, it can be deduced that system GMM is acceptable for empirical analysis.

The estimated coefficient for the AfT variable is positive and highly significant in all equations. In Column (1), the estimated coefficient indicates that a 10 percent increase in AfT results in a 17.6 percent increase in the value of greenfield FDI inflows. In contrast, an increase in other aid (i.e. non-AfT) appears to discourage foreign investment to the recipient countries. This finding is parallel with the finding of OECD/WTO (2013, Chapter 5) that AfT is positively correlated with trade, whilst other aid is negatively correlated with the exports of the recipient countries.

AfT increases the value of greenfield FDI inflows to the recipient countries because it increases not only number of greenfield projects (Column 2) but also average value of each project (Column 3). Specifically, a 10 percent increase in AfT results in a 1.9 percent increase in the number of projects and a 15.3 percent increase in the average value of each greenfield project.

With respect to source countries, both the number of source countries (Column 4) and the average dollar value of FDI from each source country (Column 5) also contribute

[10] In Arellano-Bond test, the p-value linked with AR(1) should be close to zero, while p-value of AR(2) should be insignificant, or higher than 0.1. All equations passed the Arellano-Bond test, indicating the consistency of the model. The Sargan tests for overidentifying restriction, whose p-value is higher than 0.1, suggest that the instruments are valid. Besides, in all equations, the number of instruments are lower than the number of countries.

to the upsizing of total value of FDI inflows. Specifically, every 10 percent rise in AfT leads to a 1.6 percent increase in the number of source countries and a 16 percent increase in the average value of greenfield FDI per each source country.

Thus, AfT increases the amount of FDI to developing countries and also helps diversify their projects and source countries. However, in terms of the size of the estimated coefficients for AfT, AfT appears to have a greater impact on the intensive margin than on the extensive margin, for both projects and source countries.[11]

Among the control variables, the lagged dependent variable has positive and highly significant coefficients in all equations, indicating the effects of agglomeration and economies of scale. GDP per capita, which proxies the level of economic development and wage rate of host countries is found to have a negative link with dollar value of greenfield FDI (Column 1). This indicates the attractiveness of cheap labor of developing countries to foreign investors. Nonetheless, GDP per capita has a positive and significant association with extensive margin of greenfield projects (Column 2). This is subject to further investigation. Population, which proxies the size of labor force and market size of the host country, appears to be positively and significantly associated with greenfield FDI flows in all equations.

The average value of the World Bank's Worldwide Governance Indicators, WGI, which measures the governance quality of the host country, is confirmed to be positive and significant for total value of greenfield FDI (Column 1). This finding is consistent with previous studies on FDI determinants (eg. Dellis et al., 2017 and Economou et al., 2017). Moreover, our results further suggest that the governance quality of host countries plays an inevitable role in diversifying greenfield FDI in terms of both the number of projects and the number of investing countries.

The trade openness variable is found to be negative with the intensive margins of projects as well as source countries. In contrast, capital movement freedom is found to

[11] As a comparison, we also ran fixed-effects regressions and report the results in Appendix Table 2. Qualitatively, the results are similar in the sense that AfT has a positive effect on FDI flows to the recipient countries, whereas non-AfT discourages FDI flows to the recipient countries. The positive effect of AfT on FDI is largely due to its positive effect on intensive margins of projects and source countries.

have a positive association with the total value of greenfield FDI inflows as well as with all layers of the total value except the extensive margin of projects.

We now turn to the effects of the three different categories of AfT on greenfield FDI flows to the recipient countries. Table 4 reports the results. As expected, the three categories of AfT enter with positive and significant coefficients in all equations. Among the three types of AfT, aid for building productive capacity (BPC) is found to have the strongest effect on total value of FDI inflows, followed by Aid for trade-related infrastructure (INF) and Aid for trade policy and regulations (TPR). This is somewhat different from the findings of Lee and Ries (2016) who find that aid for BPC and INF, but not aid for TPR, contribute to greenfield investment.

Among the different layers of greenfield FDI flows, aid for BPC has the strongest association with the intensive margins of projects and source countries. All of the three types of AfT have a greater impact on intensive margin than on extensive margin, for both projects and source countries.

[Table 4]

Effects of the three categories of AfT on greenfield FDI – System GMMs

4.2. DAC versus non-DAC investing countries

One may think that the positive effects of AfT on greenfield FDI flows to the recipient countries are largely due to the fact that donor countries increase their investments in their aid-recipient countries. Indeed, Kimura and Todo (2010) found evidence that foreign aid from Japan had such a vanguard effect. Kang et al. (2011) also found that not only aid from Japan but also that from Korea promoted bilateral FDI. Using bilateral data for 25 donors and 120 recipient countries for the period 2003-2013, Lee and Ries (2016) provide more general evidence that bilateral AfT promotes bilateral greenfield investment.

Motives and strategies of FDI from developed countries are presumed to be different from those of FDI from developing countries.[12] Therefore, one may also conjecture that AfT from developed donor countries is likely to increase FDI more from the like-minded developed countries than from developing countries.

This sub-section investigates whether the AfT-FDI linkage differs between aid-giving DAC members and other investing countries. Table 5 summarizes the value and counts of greenfield FDI conducted by these two groups of countries in 105 aid-recipient countries during the period 2003-2015. Considering both total value and counts of greenfield FDI, the amount of greenfield investment from aid-donor countries surpassed that from non-donor countries throughout the whole period. It is noted, however, that greenfield FDI from non-DAC countries increased more rapidly than that from DAC countries.

[Table 5]

Total values and counts of greenfield FDI conducted by DAC and non-DAC countries, 2003-2015

Tables 6 and 7 report the results when the dependent variable is greenfield FDI from DAC countries and from non-DAC countries, respectively. For the sake of easy reference, Table 8 summarizes the coefficients for AfT in different equations reported in Tables 3, 6 and 7. We find positive and highly significant coefficients for the AfT variable in all equations. Thus, we have strong evidence that AfT from DAC countries increases FDI not only from the aid-giving DAC countries but also from non-DAC countries. However, as summarized in Table 8, the magnitude of the coefficient for AfT is 2-3 times larger for DAC countries than for non-DAC countries. Thus, AfT has a greater impact on boosting greenfield FDI from aid-giving DAC member countries than from non-DAC countries.

[12] Our aid data were drawn from the OECD's Creditor Reporting System, which covers OECD's Development Assistance Committee (DAC) member countries only, which are all developed countries.

[Table 6]
Effects of AfT on FDI inflows from DAC countries

[Table 7]
Effects of AfT on FDI inflows from non-DAC countries

[Table 8]
Summary table: Effects of AfT on FDI inflows from all countries, DAC and non-DAC countries

Apart from the AfT effects on FDI, we also find that when source countries are non-DAC countries (Table 7), GDP per capita has marginally significant negative coefficients for the case of extensive margin projects (Column 2, Table 7), whereas it appears to have a significant positive association with extensive margins of greenfield FDI flows from DAC source countries (Column 1, Column 3, and Column 5, Table 6). This finding may suggest that MNEs of DAC countries mainly seek for the local markets, while the investors from non-DAC countries seek for cheap labor advantage.

Further, the governance quality variable, WGI, is found to have a significant and positive link with greenfield FDI from DAC countries for four layers, except extensive margin of source countries (Table 6). In contrast, when source countries are non-DAC countries, WGI is found to be significantly positive only in two equations: extensive margin of projects (Column 2 of Table 7) and extensive margin of source countries (Column 4 of Table 7). This finding confirms that, compared with developed source countries, developing source countries are less concerned with the governance quality of host countries. In addition, trade openness is found to have a negative association with intensive margins of projects and source countries when the source countries are DAC countries (Table 6), while it has a positive association with extensive margin of source countries when they are non-DAC countries (Table 7).

Taken together, these findings indicate that the motives and strategies of greenfield FDI are different between DAC and non-DAC source countries.

Turning back to the effects of AfT on FDI from two groups of source countries, we re-run the regressions with disaggregation of AfT into its three components. Table 9 summarizes the effects of the three components of AfT on different layers of greenfield FDI. Note that we do not report the estimated coefficients for all other variables, for the sake of brevity.

[Table 9]

Summary: Effects of AfT components on FDI flows from DAC and non-DAC countries

Panel A in the table summarizes the results reported in Table 4, where the dependent variable is greenfield FDI from all countries. Panels B and C summarize the results for the greenfield FDI from DAC countries and from non-DAC countries, respectively. The impact of aid for infrastructure (INF) on greenfield FDI inflow is positive and significant for both DAC and non-DAC source countries, but the impact appears larger for DAC source countries than for non-DAC source countries, except for extensive of source countries. In contrast, we find that with more aid in the BPC category, the recipient country receives more greenfield FDI from DAC countries but less from non-DAC countries.

Harms and Lutz (2006) explain that the "rent-seeking" behavior of local firms is a possible reason for the negative effects of aid on FDI. That is, the provision of foreign aid may encourage local firms to engage more in competition for rents from the aid and less in activities for improving their productivity. As a result, the recipient country's marginal product of capital decreases, causing foreign investors to reduce their investment in that country. However, such rent-seeking behaviors in the recipient country are not likely to be a cogent explanation for our result because aid for BPC has negative coefficients only when source countries are non-DAC countries.

Rather, when aid for BPC is given to a developing country, productivities of local firms will improve, which is the intended purpose of aid for BPC. As a result, the potential investing firms from other developing countries are likely to lose their competitive edge in that particular aid recipient country. Thus, aid for BPC

discourages the greenfield FDI flows from non-DAC countries, which are mostly developing countries. Meanwhile, MNEs of DAC countries may increase their investment in the recipient country because with large productivity gaps, they may take increasing productivities of local firms as a sign of a better business environment.

Lastly, we find that in the case of greenfield FDI flows from both DAC and non-DAC countries, aid for trade policy regulations (TPR) is positively associated with intensive margins of projects and source countries. In the case of non-DAC countries, TPR is also positively related with extensive margins of source countries.

5. Summary and concluding remarks

Aid for Trade (AfT) aims to help developing countries to build up their trade capacity and infrastructure so as to boost their trade and foreign investment to those countries. Indeed, many researchers have found that AfT has been successful in this regard.

This paper has extended previous research by splitting the total value of greenfield FDI flows into four layers: extensive and intensive margins of greenfield projects (total counts of projects and average value of each project) and extensive and intensive margins of source countries (total number of source countries and average value of greenfield investment from each source country).

By applying the system GMM estimator to the panel of 105 developing countries for the period 2003-2015, we have found that AfT increases all layers of greenfield investment to the recipient countries. Thus, Aid for Trade has been successful in promoting international investment to the developing countries, not only by increasing the dollar value but also by diversifying the greenfield projects and source countries. Our results are encouraging in the sense that the developing countries with more diversified FDI inflows are better placed to overcome the instabilities of certain foreign firms or source countries investing in these countries.

When AfT is disaggregated into its three components, we further find that aid for building productive capacity (BPC) is the most essential in promoting greenfield FDI

to the recipient countries, while aid for trade-related infrastructure (INF) stands in second place and aid for trade policy and regulations (TPR) contributes the least in attracting greenfield FDI.

Lastly, the paper offers cogent evidence of the "group-vanguard" effects of AfT on the greenfield FDI flows by disaggregating greenfield FDI into two flows: from DAC and non-DAC countries, respectively. In general, the fact that AfT has a supportive role for greenfield FDI is crucial in both flows. However, the effect is greater for greenfield FDI from DAC countries than from non-DAC countries.

Among the three components of AfT, aid for trade-related infrastructure and aid for trade policy regulations are found to have positive links with greenfield FDI, irrespective of source country groups, yet their effects are larger for the DAC country group. Somewhat surprisingly, however, aid for building productive capacity hinders greenfield FDI flows from non-DAC countries, while it promotes greenfield FDI from DAC countries. Our interpretation of this result is that when aid for building productive capacity is given to a developing country, productivities of local firms improve and as a result, the potential investing firms from other developing countries are likely to lose their competitive edge in that aid recipient country.

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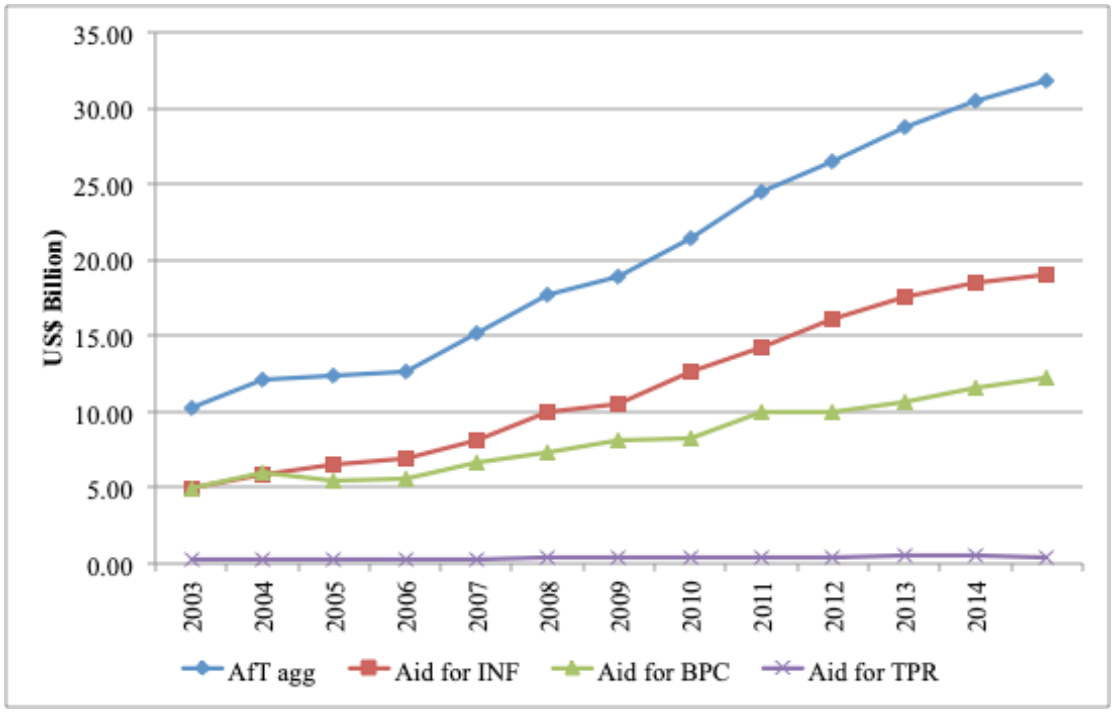
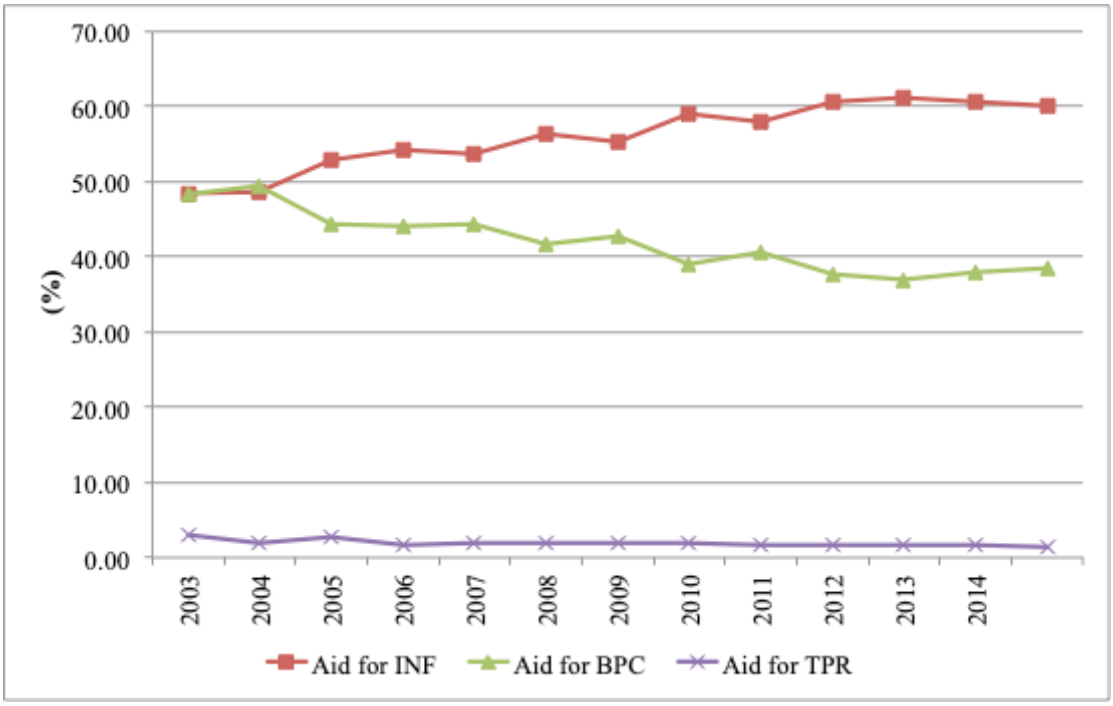
[Figure 1]

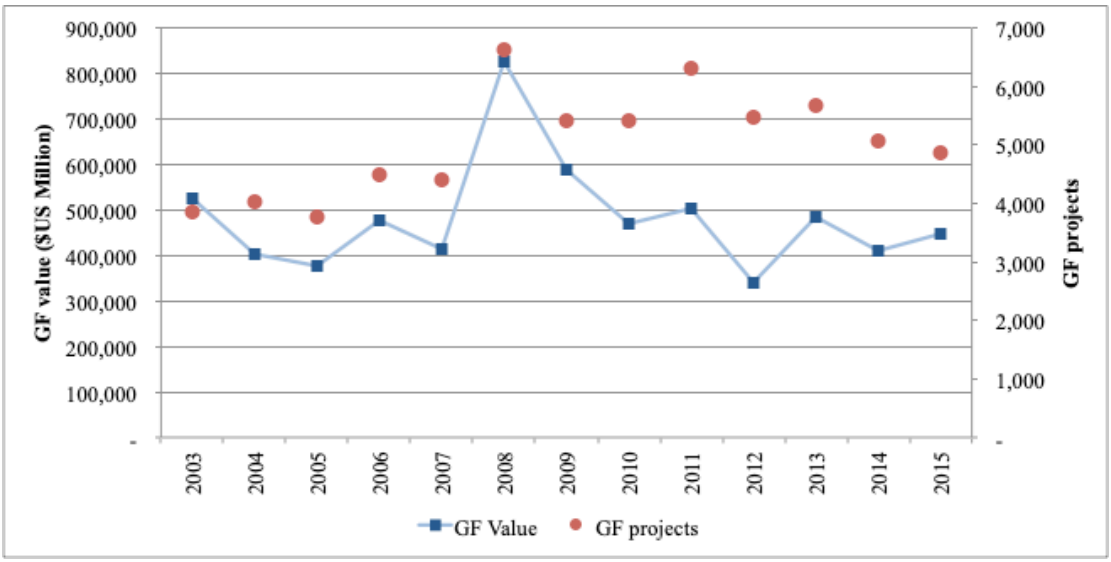
AfT and its components, 2003-2015 (US$ Billion, %)





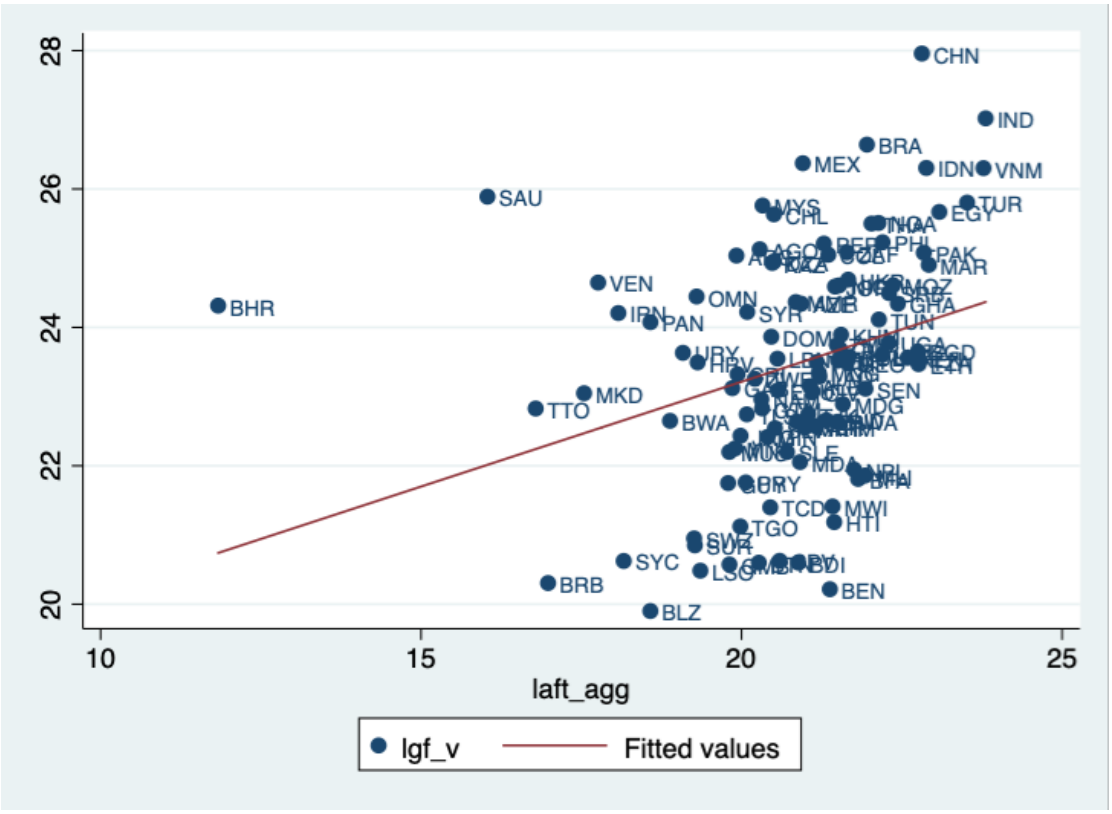
Source: Calculated by authors using AfT data, drawn from OECD Creditor Reporting System

[Figure 3]
Greenfield FDI flows to developing countries: Total value and number of projects, 2003-2015



Source: Calculated by authors using greenfield FDI data, acquired from fDi Intelligence (Financial Times Ltd.)

[Figure 2]
Cross-plots between the log of dollar value of greenfield FDI and log of Aid for Trade (collapsed for period 2003-2015)



[Table 1]

Top 20 AfT recipient countries, 2003-2015 (US$ Million)

Ranking	Country	AfT	INF	BPC	TPR	%
1	India	20,292.4	12,434.5	7,804.6	53.2	7.7
2	Viet Nam	19,704.3	14,627.2	4,865.4	211.7	7.5
3	Turkey	14,518.9	7,062.0	7,444.2	12.7	5.5
4	Egypt	10,250.4	4,821.0	4,652.7	776.7	3.9
5	Morocco	8,196.2	5,890.2	2,257.6	48.3	3.1
6	Pakistan	8,122.1	4,644.5	3,422.7	55.0	3.1
7	Indonesia	8,037.1	5,329.3	2,575.6	132.2	3.1
8	China (People's Republic of)	7,641.5	4,525.0	3,016.2	100.3	2.9
9	Tanzania	7,450.1	4,386.8	2,871.2	192.1	2.8
10	Bangladesh	7,331.8	4,599.8	2,638.8	93.3	2.8
11	Ethiopia	7,228.8	4,264.4	2,877.1	87.3	2.8
12	Kenya	6,019.6	4,047.7	1,902.7	69.2	2.3
13	Ghana	5,315.3	2,711.2	2,544.1	60.0	2.0
14	Mozambique	4,931.6	2,717.4	2,162.9	51.4	1.9
15	Uganda	4,518.5	2,470.5	1,955.4	92.6	1.7
16	Serbia	4,489.6	1,655.9	2,760.7	73.0	1.7
17	Philippines	4,182.3	2,825.5	1,292.6	64.1	1.6
18	Sri Lanka	4,060.1	2,955.6	1,087.4	17.1	1.5
19	Nigeria	3,835.8	1,832.4	1,930.2	73.3	1.5
20	Tunisia	3,731.3	2,072.9	1,646.2	12.1	1.4
	Top 20	*159,857.7*	*95,873.8*	*61,708.2*	*2,275.7*	*60.9*
	Whole sample	*262,590.9*	*150,926.1*	*106,895.8*	*4,769.0*	*100.0*

Source: Calculated by authors using AfT data, drawn from OECD Creditor Reporting System.

[Table 2]

Top 20 host countries of greenfield FDI, in terms of total dollar value, projects margin, and source countries margin

Ranking	A. Dollar value of greenfield			B. Projects margin				C. Source countries margin			
	Host country	Total value of greenfield FDI (US$ Million)	%	Host country	Extensive margin	Host country	Intensive margin (US$ Million)	Host country	Extensive margin	Host country	Intensive margin (US$ Million)
1	China PRC	1,386,646	22.11	China PRC	15,354	Timor-Leste	754.3	China PRC	95	China PRC	14,444.2
2	India	543,610	8.67	India	9,104	Niger	535.7	UAE	81	India	6,711.2
3	Brazil	371,856	5.93	Brazil	3,825	Nicaragua	528.2	India	80	Brazil	5,634.2
4	Mexico	284,205	4.53	Mexico	3,515	Antigua and Barbuda	455.8	Russian Federation	75	Mexico	4,986.1
5	Indonesia	265,332	4.23	Viet Nam	2,594	Cameroon	380.1	Brazil	65	Indonesia	4,497.1
6	Viet Nam	264,636	4.22	Thailand	2,141	Papua New Guinea	373.6	Viet Nam	62	Viet Nam	4,200.6
7	Saudi Arabia	175,321	2.80	Malaysia	1,994	Yemen	333.8	South Africa	62	Saudi Arabia	3,246.7
8	Turkey	160,893	2.57	Indonesia	1,545	Equatorial Guinea	296.0	Malaysia	61	Chile	2,950.8
9	Malaysia	154,187	2.46	Turkey	1,429	Liberia	270.6	Turkey	61	Turkey	2,595.1
10	Egypt	140,537	2.24	South Africa	1,352	Gabon	268.5	Indonesia	58	Malaysia	2,486.9
11	Chile	135,739	2.16	Philippines	1,297	Libya	263.3	Poland	58	Egypt	2,423.1
12	Nigeria	119,843	1.91	Argentina	1,038	Angola	256.1	Egypt	57	Nigeria	2,261.2
13	Thailand	118,769	1.89	Saudi Arabia	1,019	Nigeria	249.7	Mexico	56	Angola	2,215.0
14	Philippines	90,663	1.45	Colombia	959	Congo	245.4	Romania	56	Thailand	2,083.7
15	Peru	88,923	1.42	Ukraine	925	Venezuela	239.9	Thailand	56	Peru	1,892.0
16	Angola	81,955	1.31	Serbia	858	Iran	239.7	Bulgaria	55	Philippines	1,888.8
17	South Africa	78,388	1.25	Chile	836	Syrian Arab Republic	234.8	Kenya	55	Pakistan	1,856.1
18	Pakistan	77,958	1.24	Morocco	729	Samoa	230.8	Hungary	53	Nicaragua	1,799.8
19	Colombia	75,692	1.21	Egypt	699	Eritrea	213.5	Kazakhstan	53	Colombia	1,576.9
20	Argentina	74,788	1.19	Peru	559	Turkmenistan	*212.4*	Saudi Arabia	53	Algeria	1,433.2
Total	*Top 20*	*4,689,941*	*74.79*	*Top 20*	*51,772*	*Top 20*	*279.0*	*Top 20*	*N/A*	*Top 20*	*N/A*
	Whole sample	*6,271,134*	*100.00*	*Whole sample*	*65,389*	*Whole sample*	95.9	*Whole sample*	*N/A*	*Whole sample*	*N/A*

Source: Calculated by authors using greenfield FDI data, acquired from fDi Intelligence (Financial Times Ltd.).

[Table 3]
Effects of AfT on Greenfield FDI – benchmark results

	Value	GF Projects		GF Investors	
		Extensive margin	Intensive margin	Extensive margin	Intensive margin
	(1)	(2)	(3)	(4)	(5)
Lag of dep. variable	0.170***	0.386***	0.162***	0.299***	0.165***
	(0.009)	(0.026)	(0.007)	(0.022)	(0.007)
Aid for trade (in log)	1.760***	0.193***	1.533***	0.155***	1.611***
	(0.063)	(0.015)	(0.057)	(0.010)	(0.065)
Non-AfT (in log)	-1.917***	-0.235***	-1.629***	-0.188***	-1.718***
	(0.061)	(0.016)	(0.054)	(0.011)	(0.061)
GDP per capita (in log)	-0.278***	0.074***	-0.110	-0.039*	-0.148*
	(0.097)	(0.023)	(0.071)	(0.023)	(0.088)
Population (in log)	2.659***	0.536***	1.602***	0.464***	1.901***
	(0.114)	(0.036)	(0.131)	(0.029)	(0.129)
WGI	0.716***	0.229***	0.210	0.184***	0.335**
	(0.164)	(0.048)	(0.152)	(0.035)	(0.152)
Trade openness	-0.261	0.043	-0.414***	0.015	-0.314**
	(0.176)	(0.026)	(0.111)	(0.023)	(0.134)
Capital movement freedom	0.396***	0.026	0.409***	0.030**	0.405***
	(0.104)	(0.019)	(0.092)	(0.015)	(0.099)
_cons	-22.915***	-8.461***	-7.742***	-6.070***	-12.816***
	(2.466)	(0.782)	(2.397)	(0.669)	(2.180)
Year specific effects	Yes	Yes	Yes	Yes	Yes
Number of observations	964	964	964	964	964
Number of Countries	105	105	105	105	105
Number of Instruments	85	85	85	85	85
Arellano-Bond Test					
AR(1) p-value	0.0000	0.0000	0.0000	0.0000	0.0000
AR(2) p-value	0.9967	0.1267	0.7624	0.1857	0.9283
Over identification Test (Sargan)					
p-value	0.1774	0.2190	0.4308	0.2253	0.2575

Notes: All regressions are run with two-step System GMM estimator. AfT and non- AfT are treated as endogenous and are used as instruments with the maximum two lags. Two lags of dependent variable are also used as instruments and one lag of dependent variable is used as a covariate. Standard errors are in parenthesis. ***, **, and * indicate the significance levels of 1, 5, and 10 percent, respectively.

[Table 4]
Effects of Three Categories of AfT on Greenfield FDI

	Value	GF projects		GF investors	
		Extensive margin	Intensive margin	Extensive margin	Intensive margin
	(1)	(2)	(3)	(4)	(5)
Lag of dep. variable	0.203***	0.443***	0.194***	0.354***	0.199***
	(0.005)	(0.019)	(0.004)	(0.015)	(0.005)
Aid for INF (in log)	0.317***	0.054***	0.280***	0.031***	0.309***
	(0.028)	(0.007)	(0.032)	(0.005)	(0.031)
Aid for BPC (in log)	0.835***	0.035***	0.757***	0.021*	0.738***
	(0.040)	(0.013)	(0.037)	(0.011)	(0.043)
Aid for TPR (in log)	0.219***	0.005	0.189***	0.021***	0.207***
	(0.016)	(0.007)	(0.014)	(0.004)	(0.022)
Non-AfT (in log)	-1.307***	-0.107***	-1.137***	-0.086***	-1.180***
	(0.030)	(0.009)	(0.027)	(0.007)	(0.029)
GDP per capita (in log)	-0.038	0.035***	0.055	0.009	0.017
	(0.033)	(0.010)	(0.034)	(0.009)	(0.032)
Population (in log)	2.030***	0.385***	1.322***	0.346***	1.490***
	(0.052)	(0.030)	(0.055)	(0.015)	(0.065)
WGI	0.820***	0.162***	0.499***	0.164***	0.557***
	(0.093)	(0.038)	(0.086)	(0.018)	(0.096)
Trade openness	-0.047	0.092***	-0.207***	0.069***	-0.189***
	(0.057)	(0.018)	(0.061)	(0.016)	(0.059)
Capital movement freedom	0.357***	0.029*	0.318***	0.026**	0.325***
	(0.066)	(0.015)	(0.055)	(0.012)	(0.053)
_cons	-20.236***	-6.212***	-9.841***	-5.348***	-11.659***
	(1.410)	(0.585)	(1.596)	(0.280)	(1.823)
Year specific effects	Yes	Yes	Yes	Yes	Yes
Number of observations	964	964	964	964	964
Number of Countries	105	105	105	105	105
Number of Instruments	125	125	125	125	125
Arellano-Bond Test					
AR(1) p-value	0.0000	0.0000	0.0000	0.0000	0.0000
AR(2) p-value	0.8747	0.1218	0.6711	0.1349	0.8026
Over identification Test (Sargan)					
p-value	0.9596	0.8479	0.9114	0.7954	0.8968

Notes: All regressions are run with two-step System GMM estimator. AfT and non- AfT are treated as endogenous and are used as instruments with the maximum two lags. Two lags of dependent variable are also used as instruments and one lag of dependent variable is used as a covariate. Standard errors are in parenthesis. ***, **, and * indicate the significance levels of 1, 5, and 10 percent, respectively.

[Table 5]
Total values and counts of greenfield FDI conducted by DAC and Non-DAC countries, 2003-2015

	Value (US$ Billion)			Counts		
	All source countries	DAC source countries	Non-DAC source countries	All source countries	DAC source countries	Non-DAC source countries
2003	534.2	410.9	123.3	3,847	3,032	815
2004	411.3	301.3	110.0	4,030	3,295	735
2005	381.9	278.6	103.3	3,776	3,047	729
2006	482.5	302.3	180.2	4,489	3,416	1,073
2007	419.6	267.6	152.0	4,392	3,374	1,018
2008	819.4	547.1	272.2	6,637	4,992	1,645
2009	589.6	389.0	200.6	5,401	4,086	1,315
2010	470.0	324.9	145.1	5,417	4,095	1,322
2011	496.7	330.6	166.1	6,314	4,809	1,505
2012	335.7	224.8	110.9	5,467	4,122	1,345
2013	478.4	278.1	200.3	5,679	4,274	1,405
2014	406.2	281.0	125.2	5,074	3,697	1,377
2015	445.8	246.6	199.1	4,866	3,480	1,386
Total	6,271.1	4,182.7	2,088.4	*65,389*	*49,719*	*15,670*

Source: Calculated by authors using greenfield FDI data, acquired from fDi Intelligence (Financial Times Ltd.).

[Table 6]

Effects of AfT on greenfield FDI from DAC countries

DAC countries	Value	GF Projects		GF source countries	
		Extensive margin	Intensive margin	Extensive margin	Intensive margin
	(1)	(2)	(3)	(4)	(5)
Lag of dep. variable					
L1	0.064***	0.329***	0.048***	0.317***	0.055***
	(0.012)	(0.025)	(0.011)	(0.060)	(0.011)
L2				0.239***	
				(0.071)	
L3				0.125	
				(0.086)	
L4				-0.190	
				(0.122)	
L5				0.635***	
				(0.126)	
Aid for trade	2.305***	0.229***	2.062***	-0.020	2.129***
(in log)	(0.086)	(0.020)	(0.081)	(0.050)	(0.081)
Non-AfT (in log)	-2.569***	-0.274***	-2.277***	0.017	-2.346***
	(0.086)	(0.020)	(0.081)	(0.047)	(0.082)
GDP per capita (in log)	0.457***	0.010	0.411**	-0.048	0.456***
	(0.170)	(0.023)	(0.168)	(0.032)	(0.148)
Population (in log)	2.366***	0.578***	1.698***	0.003	1.926***
	(0.191)	(0.039)	(0.204)	(0.090)	(0.192)
WGI	1.401***	0.235***	1.143***	0.048	1.247***
	(0.335)	(0.055)	(0.304)	(0.092)	(0.313)
Trade openness	-0.792***	0.022	-0.944***	-0.004	-0.836***
	(0.206)	(0.031)	(0.171)	(0.044)	(0.188)
Capital movement freedom	0.834***	0.057**	0.743***	0.002	0.793***
	(0.120)	(0.024)	(0.093)	(0.037)	(0.106)
_cons	-25.384***	-8.562***	-14.046***	0.302	-19.270***
	(4.843)	(0.958)	(4.556)	(1.664)	(4.598)
Year specific effects	Yes	Yes	Yes	Yes	Yes
Number of observations	964	964	964	660	964
Number of Countries	105	105	105	104	105
Number of Instruments	85	85	85	57	85
Arellano-Bond Test					
AR(1) p-value	0.0000	0.0000	0.0000	0.0000	0.0000
AR(2) p-value	0.5444	0.1093	0.6417	0.5431	0.5935
Over identification Test (Sargan)					
p-value	0.3055	0.1398	0.3261	0.2680	0.3091

Notes: All regressions are run with two-step System GMM estimator. AfT and non- AfT are treated as endogenous and are used as instruments with the maximum two lags. Two lags of dependent variable are also used as instruments. Depending upon the Arellano-Bond Test, one lag or five lags of dependent variable are used as a covariate. Standard errors are in parenthesis. ***, **, and * indicate the significance levels of 1, 5, and 10 percent, respectively.

[Table 7] Effects of AfT on greenfield FDI inflows from non-DAC countries

Non-DAC countries	Value	GF Projects		GF source countries	
		Extensive margin	Intensive margin	Extensive margin	Intensive margin
	(1)	(2)	(3)	(4)	(5)
Lag of dep. variable					
L1	0.140***	0.114***	0.136***	0.224***	0.131***
	(0.024)	(0.023)	(0.024)	(0.019)	(0.024)
L2	-0.006		-0.010		-0.014
	(0.024)		(0.025)		(0.025)
L3	0.162***		0.151***		0.154***
	(0.027)		(0.029)		(0.028)
Aid for trade	0.891***	0.104***	0.810***	0.044**	0.796***
(in log)	(0.276)	(0.025)	(0.247)	(0.020)	(0.264)
Non-AfT (in log)	-1.118***	-0.142***	-1.018***	-0.052**	-1.013***
	(0.267)	(0.027)	(0.237)	(0.021)	(0.253)
GDP per capita (in log)	0.037	-0.054*	0.062	-0.043	0.087
	(0.170)	(0.031)	(0.162)	(0.026)	(0.164)
Population (in log)	3.105***	0.677***	2.560***	0.457***	2.795***
	(0.449)	(0.036)	(0.389)	(0.028)	(0.405)
WGI	0.290	0.257***	0.140	0.161***	0.285
	(0.500)	(0.063)	(0.412)	(0.039)	(0.440)
Trade openness	-0.328	0.002	-0.291	0.050***	-0.338
	(0.239)	(0.028)	(0.231)	(0.019)	(0.237)
Capital movement freedom	0.622***	0.042*	0.461**	0.018	0.481**
	(0.214)	(0.023)	(0.202)	(0.018)	(0.204)
_cons	-36.114***	-9.746***	-27.586***	-7.052***	-31.542***
	(9.278)	(0.941)	(7.979)	(0.587)	(8.329)
Year specific effects	Yes	Yes	Yes	Yes	Yes
Number of observations	822	964	822	964	822
Number of Countries	105	105	105	105	105
Number of Instruments	73	85	73	85	73
Arellano-Bond Test					
AR(1) p-value	0.0000	0.0000	0.0000	0.0000	0.0000
AR(2) p-value	0.1879	0.8263	0.1542	0.2237	0.1556
Over identification Test (Sargan)					
p-value	0.2537	0.3743	0.3951	0.4063	0.3708

Notes: All regressions are run with two-step System GMM estimator. AfT and non- AfT are treated as endogenous and are used as instruments with the maximum two lags. Two lags of dependent variable are also used as instruments. Depending upon the Arellano-Bond Test, one lag or three lags of dependent variable are used as a covariate. Standard errors are in parenthesis. ***, **, and * indicate the significance levels of 1, 5, and 10 percent, respectively.

[Table 8]
Summary: Effects of AfT on greenfield FDI inflows
from All countries, DAC and non-DAC countries

		Value	GF Projects		GF source countries	
			Extensive margin	Intensive margin	Extensive margin	Intensive margin
		(1)	(2)	(3)	(4)	(5)
A. GF from all countries	Aid for trade (in log)	1.760*** (0.063)	0.193*** (0.015)	1.533*** (0.057)	0.155*** (0.010)	1.611*** (0.065)
B. GF from DAC countries	Aid for trade (in log)	2.305*** (0.086)	0.229*** (0.020)	2.062*** (0.081)	-0.020 (0.050)	2.129*** (0.081)
C. GF from Non-DAC countries	Aid for trade (in log)	0.891*** (0.276)	0.104*** (0.025)	0.810*** (0.247)	0.044** (0.020)	0.796*** (0.264)

Notes: Shown in this table are the summary results of Tables 3, 6, and 7. All regressions are run with two-step System GMM estimator. AfT and non- AfT are treated as endogenous and are used as instruments with the maximum two lags. Two lags of dependent variable are also used as instruments. Depending upon the Arellano-Bond Test, one lag or three lags of dependent variable are used as a covariate. Standard errors are in parenthesis. ***, **, and * indicate the significance levels of 1, 5, and 10 percent, respectively.

[Table 9]
Summary: Effects of AfT components on FDI flows
from DAC and non-DAC countries

		Value	GF Projects		GF source countries	
			Extensive margin	Intensive margin	Extensive margin	Intensive margin
		(1)	(2)	(3)	(4)	(5)
A. GF from all countries	Aid for INF (in log)	0.317*** (0.028)	0.054*** (0.007)	0.280*** (0.032)	0.031*** (0.005)	0.309*** (0.031)
	Aid for BPC (in log)	0.835*** (0.040)	0.035*** (0.013)	0.757*** (0.037)	0.021* (0.011)	0.738*** (0.043)
	Aid for TPR (in log)	0.219*** (0.016)	0.005 (0.007)	0.189*** (0.014)	0.021*** (0.004)	0.207*** (0.022)
B. GF from DAC countries	Aid for INF (in log)	0.463*** (0.044)	0.054*** (0.005)	0.367*** (0.038)	0.022*** (0.003)	0.432*** (0.037)
	Aid for BPC (in log)	1.341*** (0.095)	0.058*** (0.013)	1.362*** (0.075)	0.062*** (0.006)	1.276*** (0.061)
	Aid for TPR (in log)	0.319*** (0.028)	-0.010* (0.006)	0.274*** (0.023)	0.001 (0.003)	0.296*** (0.027)
C. GF from Non-DAC countries	Aid for INF (in log)	0.209*** (0.053)	0.049*** (0.012)	0.173*** (0.047)	0.040*** (0.009)	0.183*** (0.049)
	Aid for BPC (in log)	-0.592*** (0.075)	-0.061*** (0.018)	-0.437*** (0.081)	-0.075*** (0.014)	-0.437*** (0.066)
	Aid for TPR (in log)	0.164*** (0.031)	0.003 (0.006)	0.112*** (0.028)	0.012*** (0.004)	0.141*** (0.028)

Notes: Shown in Panel (1) are the summary results of Table 4. Show in Panels (2) and (3) are the corresponding results when the dependent variable is divided into greenfield FDI from DAC countries and non-DAC countries, respectively. All regressions are run with two-step System GMM estimator. AfT and non- AfT are treated as endogenous and are used as instruments with the maximum two lags. Two lags of dependent variable are also used as instruments. Depending upon the Arellano-Bond Test, one lag or three lags of dependent variable are used as a covariate. Standard errors are in parenthesis. ***, **, and * indicate the significance levels of 1, 5, and 10 percent, respectively.

[Appendix Table 1] List of 135 countries that received Aid for Trade (AfT) and greenfield FDI during the period 2003-2015

List of countries included in the regression (105 countries)

Albania	Gambia	Niger
Algeria	Georgia	Nigeria
Angola	Ghana	Oman
Argentina	Guatemala	Pakistan
Armenia	Guinea	Panama
Azerbaijan	Guyana	Paraguay
Bahrain	Haiti	Peru
Bangladesh	Honduras	Philippines
Barbados	India	Rwanda
Belize	Indonesia	Saudi Arabia
Benin	Iran	Senegal
Bhutan	Jamaica	Serbia
Bolivia	Jordan	Seychelles
Bosnia and Herzegovina	Kazakhstan	Sierra Leone
Botswana	Kenya	South Africa
Brazil	Kyrgyzstan	Sri Lanka
Burkina Faso	Lao People's Democratic Republic	Suriname
Burundi	Lebanon	Swaziland
Cabo Verde	Lesotho	Syrian Arab Republic
Cambodia	Madagascar	Tajikistan
Cameroon	Malawi	Tanzania
Chad	Malaysia	Thailand
Chile	Mali	Timor-Leste
China (People's Republic of)	Mauritania	Togo
Colombia	Mauritius	Trinidad and Tobago
Costa Rica	Mexico	Tunisia
Croatia	Moldova	Turkey
Côte d'Ivoire	Mongolia	Uganda
Dominican Republic	Montenegro	Ukraine
Ecuador	Morocco	Uruguay
Egypt	Mozambique	Venezuela
El Salvador	Myanmar	Viet Nam
Ethiopia	Namibia	Yemen
Former Yugoslav Republic of Macedonia	Nepal	Zambia
Gabon	Nicaragua	Zimbabwe

List of countries dropped out during regression (30 countries)

Antigua and Barbuda	Fiji	Saint Vincent and the Grenadines
Belarus	Grenada	Samoa
Central African Republic	Guinea-Bissau	Sao Tome and Principe
Congo	Liberia	Solomon Islands
Cuba	Libya	Somalia
Democratic People's Republic of Korea	Maldives	South Sudan
Djibouti	Micronesia	Sudan
Dominica	Papua New Guinea	Turkmenistan
Equatorial Guinea	Saint Kitts and Nevis	Turks and Caicos Islands
Eritrea	Saint Lucia	Uzbekistan

[Appendix Table 2]
Effects of AfT on Greenfield FDI – Fixed-effects results

	Value	GF Projects		GF Investors	
		Extensive margin	Intensive margin	Extensive margin	Intensive margin
	(1)	(2)	(3)	(4)	(5)
Aid for trade (in log)	0.464***	0.068***	0.396***	0.042***	0.422***
	(0.159)	(0.020)	(0.149)	(0.015)	(0.150)
Non-AfT (in log)	-0.374**	-0.059***	-0.315**	-0.033**	-0.341**
	(0.155)	(0.019)	(0.145)	(0.015)	(0.146)
GDP per capita (in log)	-3.983**	0.530**	-4.513***	0.277*	-4.260***
	(1.710)	(0.212)	(1.603)	(0.165)	(1.612)
Population (in log)	10.402***	2.922***	7.480***	2.273***	8.129***
	(2.120)	(0.263)	(1.987)	(0.204)	(1.998)
WGI	1.804***	0.457***	1.347**	0.388***	1.416**
	(0.640)	(0.080)	(0.600)	(0.062)	(0.603)
Trade openess	-0.059	0.009	-0.068	0.012	-0.071
	(0.248)	(0.031)	(0.232)	(0.024)	(0.233)
Capital movement freedom	-0.504**	-0.059**	-0.445**	-0.046**	-0.458**
	(0.212)	(0.026)	(0.198)	(0.020)	(0.199)
_cons	-111.655***	-52.750***	-58.905*	-39.753***	-71.901**
	(37.409)	(4.645)	(35.065)	(3.600)	(35.258)
Year specific effects	Yes	Yes	Yes	Yes	Yes
Country specific effects	Yes	Yes	Yes	Yes	Yes
Number of observations	1024	1024	1024	1024	1024
R-square	0.074	0.240	0.055	0.231	0.060

Notes: All regressions are run with fixed-effects estimator. Standard errors are in parenthesis. ***, **, and * indicate the significance levels of 1, 5, and 10 percent, respectively.

[Appendix 3]

List of countries that were included in the OECD's Creditor Reporting System but received no AfT or Greenfield FDI during period 2003-2015

Aruba	Malta	Tuvalu
Bahamas	Netherlands Antilles	Palau
Bermuda	New Caledonia	Comoros
British Virgin Islands	Northern Mariana Islands	Montserrat
Brunei Darussalam	Qatar	Mayotte
Cayman Islands	Singapore	Kiribati
Chinese Taipei	Slovenia	Tonga
Cyprus	United Arab Emirates	Vanuatu
French Polynesia	Anguilla	Kosovo
Gibraltar	Niue	Saint Helena
Hong Kong, China	Tokelau	West Bank and Gaza Strip
Israel	Nauru	
Korea	Marshall Islands	
Kuwait	Cook Islands	
Macau, China	Wallis and Futuna	