# The effect of preferential trading arrangements on foreign direct investment activity

## Empirical evidence from the African, Caribbean and Pacific group

Gounder, Aruna; Falvey, Rodney; Rajaguru, Gulasekaran

# The Effects of Preferential Trade Agreements on Foreign Direct Investment: Evidence from the African Caribbean and Pacific group

Aruna Gounder[1], Rod Falvey[1] and Gulasekeran Rajaguru[1]*

[1]Bond University, Bond Business School,

Gold Coast, Queensland, Australia 4229

## Abstract

In this paper we add to a relatively small literature on FDI in the ACP group by focusing on the role of PTAs in attracting FDI. Our empirical analysis utilises panel data on bilateral FDI stocks from 34 OECD countries into 45 ACP countries over the period 2000-2012. This bilateral specification allows us to control for country pair policy variables such as the presence of a PTA, a double tax treaty or a bilateral investment treaty between the OECD source and ACP host country, along with other important explanatory variables identified in the literature. We conclude the prevalence of market seeking FDI in the ACP group, with an important role for regional integration in providing access to surrounding market potential. We find that in the Caribbean a PTA, with or without investment provisions, has no significant effect on FDI, regardless of whether a BIT is in place. In Africa, however, we find that a bilateral PTA with investment provisions, with or without a BIT, reduces FDI; and a bilateral PTA without investment provisions does the same, unless a bilateral BIT is in place, in which case FDI increases.

Key words: PTA, FDI, panel data

*Corresponding author: Gulasekaran Rajaguru, Email: rgulasek@bond.edu.au, Tel: +61 7 55952049.

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Key words: PTA, FDI, panel data


## 1. Introduction

In this study we extend the empirical analysis of Preferential Trading Arrangements (PTAs) beyond their trade effects to include their impact on Foreign Direct Investment (FDI). The motivation to explore PTA effects beyond trade arises from two distinct developments. The first development is the dramatic increase in the number and geographical spread of PTAs, despite the fall in average MFN tariff rates which has rendered preferential margins trivial in many cases. According to the World Trade Organisation (WTO), the total number of PTAs exceeded 300 at the end of 2013 with a noticeable acceleration from 1990 onwards. Alongside this, the average number of countries participating in each PTA has increased from just two in 1990 to twelve in 2010. The second development is the extension of coverage of PTAs to include 'deep integration' provisions. These provisions cover, for example, foreign investment, employment, services, competition policy, intellectual property rights, dispute settlement and standards. Such a changing landscape of PTAs indicates that the predominant drivers of these agreements extend well beyond trade objectives alone and thus motivates this study to explore their effects on FDI.

Our empirical focus is the African Caribbean Pacific (ACP) countries, a grouping created by the Georgetown Agreement of 1975. This grouping, which comprises 79 states, includes 40 of the 49 countries classified as 'least developed' - 33 in Africa, 1 in the Caribbean and 5 in the Pacific (UNCTAD, 2013). [1] Given the significant development constraints and challenges faced by this group[2], FDI provides an important development opportunity (Naude & Krugell 2007, Bankole & Adewuyi 2013) and is often cited as a fundamental non-trade driver for PTA membership (Buthe & Milner, 2014). Given low income levels and low domestic savings, the ACP groups' heavy reliance on funds from abroad is well recognised. While Official Development Assistance (ODA) addresses part of this deficiency, it has declined over the years (Amendolagine et al, 2013), which has prompted efforts to obtain a more stable and long term inflow in the form of FDI (Asiedu, 2002).

The potential benefits of FDI are widely acclaimed in the literature. FDI provides a means for creating direct, stable and long-lasting links between economies and, with the appropriate policy environment, can serve as an important catalyst for the development of local enterprise (OECD, 2002). It enables host countries to achieve investment levels beyond their own domestic saving and is an important means of transferring modern technology (Mina 2007,

[1] See Appendix Table A1for a full list of the ACP countries.
[2] Including high economic vulnerability, low income levels, rising population, sea/land lockedness, isolation from main markets, and weak institutional, regulatory and productive structures (UNCTAD, 2013).

Sichei & Kinyondo 2012). It can create employment, enhance productivity and managerial skills (Mina 2007, Asiedu 2004), increase competition and raise dynamic efficiency (Gastanaga et al, 1998). However, the capacity of a nation to attract and benefit from FDI hinges on many factors, including effective regional integration (African Economic Outlook, 2016) and strong linkages between foreign affiliates and domestic firms with the capacity to absorb these positive spillovers (Amendolagine et al 2013, Markusen & Venables 1999 and Ping & Saggi 2007).

PTAs can play a role in attracting FDI through a range of channels (Medvedev, 2011). The presence of investment provisions in the PTA itself provides a direct channel, while provisions in related areas, such as competition policy and product standards, can be indirect channels. The international locking-in of policy reforms via PTAs increases the credibility of government commitments to reform, thereby reducing investment risks in a host nation (Buthe & Milner 2014). Greater regional integration through PTAs creates larger markets that may attract market-seeking and export platform FDI.

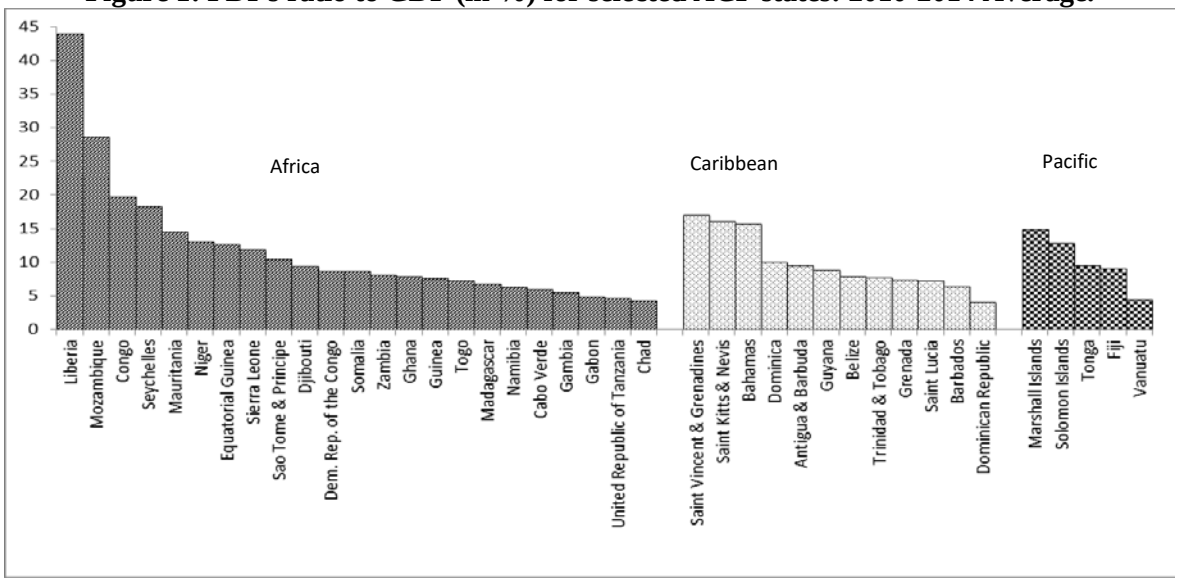
To date the ACP group's record in attracting foreign investment has been disappointing. In 2013, Africa attracted only 4 percent of global FDI, the Caribbean 0.9 percent and the Pacific region just 0.2 percent. Of the FDI inflows into developing countries in 2013, the ACP group accounted for only 9 percent (7.3, 1.6 and 0.4 percent, respectively)[3]. The ratio of FDI to GDP varies within and across the three major sub-groups of the ACP as shown in Figure 1. Nevertheless, FDI still constitutes an important source of foreign capital for this group, and international organisations (e.g. the IMF and the World Bank) have been active in advising policy makers to pursue market liberalisation and other reforms to attract more FDI (Tuman & Emmert, 2004).

When it comes to FDI in the ACP countries, particularly in Africa, the common perception is that it is largely attracted by natural resource endowments. Although this remains true for some countries, the predominant drivers of FDI to the African group have shifted into consumer oriented sectors. The extractive industries share has been dwarfed by growing investment into manufacturing (agro-processing, textiles, building materials, electronics), and services (telecommunications, finance, business services, hotels, restaurants). For example, cumulative

[3] Calculated using data from UNCTAD World Investment Report, 2014.

from 2009-2014, 44 percent of FDI projects were in the services sector, 32 percent in manufacturing and 24 percent in the primary sector (UNCTAD, 2014). The main

**Figure 1: FDI's ratio to GDP (in %) for selected ACP states: 2010-2014 Average.**




(Source: Compiled using data from UNCTADstat)

extra-regional investor into the African countries is Europe, followed by North America and Japan.

Although the primary sector remains important for FDI in the Caribbean countries, there are also significant investment inflows into manufacturing and services. Countries endowed with natural resources (such as gold, oil and gas) attract relatively higher FDI inflows, but sectors such as telecommunications, electricity, manufacturing and business financial services are also important. The main sources of FDI are the same as for the African countries.

For the Pacific Island countries, all three sectors (primary, manufacturing & services) are equally important for FDI. The main source countries are the US, EU, and Australia. Mining and quarrying and fisheries (specifically in Papua New Guinea and Fiji) are the main attractors in the primary sector. Garment and food processing are major FDI attractors in manufacturing while tourism, construction and business services dominate services.

While never a major recipient of FDI, the ACP group has been active in forming trade partnerships. According to the WTO (2011), the ACP had 85 PTAs in force in 2010. Of these the African subgroup had 55 PTAs, of which 24 are intra-regional and 31 are cross-regional. Around 78 percent of these PTAs are with other developing countries. Over the same time

period, the Caribbean subgroup accumulated 19 PTAs (mainly cross-regional), of which 16 are with other developing countries, while the Pacific Islands totalled 11 PTAs.

Since PTAs were conventionally designed to address trade barriers there exists an extensive empirical literature on the effects of PTAs on trade (recent examples include Kohl & Trojanowska 2015, Foster et al 2011, Hur et al 2010, Chen & Joshi 2010, Baier & Bergstrand 2009 and Carrere 2006). However, the deep integration provisions have received much less investigation. While various scholars (eg. Baltagi et al, 2008 and Blomstrom & Kokko 1997) have explored PTA effects on FDI in a number of regional agreements, the coverage of the ACP states has been limited. Most studies on individual ACP countries or sub-regional groups (eg. Bankole & Adewuyi 2013, Godfred et al 2015, Naude & Krugell 2007, Asiedu 2002, Asiedu & Gyimah-Brempong, 2008) have confined themselves to the traditional determinants of FDI and have focused on African countries.

Our work therefore adds to a relatively small literature on FDI in the ACP group. It does this by focusing on the role of PTAs in attracting FDI. Our empirical analysis utilises panel data on bilateral FDI stocks from 34 OECD countries into 45 ACP countries over the period 2000-2012. This bilateral specification allows us to control for country pair policy variables such as the presence of a PTA, a double tax treaty (DTT) or a bilateral investment treaty (BIT) between the OECD source and ACP host country, along with other important explanatory variables identified in the literature that we review in the next section. Our aim is to determine whether PTAs do in fact encourage FDI in the ACP countries viewed collectively. As we shall see there are good reasons for believing they might not. We then ask whether PTAs have the same implications for FDI in each of the three regional subgroups. We finish up by considering the interactions between BITs and PTAs and exploring the role of these two policies in more detail.

The rest of this paper is organised as follows: Section 2 reviews the relevant theoretical and empirical literature that explains the determinants of FDI; Section 3 explains our empirical estimation and the results are discussed in section 4; Section 5 concludes.

## 2: Explaining Bilateral FDI

There are two prominent theoretical frameworks on the determinants of FDI - the “eclectic or OLI paradigm” of Dunning (1980 and 2001) and the ‘knowledge-capital model’ of Markusen (1984 and 2002). The compatibility of the Dunning framework with any theory of comparative

advantage and its flexibility for analysis at both the micro or macro levels has added to its popularity (Gastanga et al, 1998). This framework is founded on the concept that firms invest abroad to exploit three advantages related to ownership (O), location (L), and internalisation (I). The ownership specific advantages arise due to property rights, management expertise and other intangible assets (brand name, patent etc.) of a firm that gives it a competitive advantage despite being foreign. The locational advantages are host country attributes such as resource endowments, availability of inputs at low cost and a large market size. Internalization advantages arise when the costs to the firm of outsourcing activity through product licensing or technical assistance more than offset the costs of engaging in production abroad itself. The OLI framework therefore provides firm specific motivations for FDI (ownership and internalization) and host-country specific attractions (location). The empirical literature has largely drawn on the implications of this framework in explaining the determinants of FDI, with market size claimed as the single most important factor (Chakarbarti, 2001). Navaretti & Venables (2013) emphasize the role of host industrial policy (such as state aid and corporate taxation) on foreign firms' location decisions. Furthermore, in later explanations of the knowledge-capital model, Markusen (2013) emphasized that the sources of locational advantages vary for horizontal and vertical multinationals, with high trade costs and large market size more important for horizontal multinationals, while low trade costs and large factor price differences are important for vertical multinationals.

The knowledge-capital model is grounded on three assumptions (Markusen, 1984). Firstly, the services of knowledge-based assets (including headquarter services such as research & development, marketing and management) are fragmented from production and can easily be supplied to separately located production plants. Secondly, knowledge-based assets are skilled labor intensive while production is unskilled labor intensive. These two assumptions imply incentives for vertical FDI, with firms locating activities based on their relative factor requirements and countries' relative factor endowments. Finally, knowledge-based services can be used simultaneously by separately located production facilities. This provides an incentive for horizontal FDI, with affiliate firms replicating production for sale in multiple hosts.

While the early theoretical work on FDI focussed on either vertical FDI (fragmented production process motivated by factor price differences) or horizontal FDI (replication of identical production process in another country), the more recent literature (for example Ekholm et al 2007, Helpman et al 2004, Raff 2004, Yeaple 2003, Grossman et al 2006, Markusen 2013) has

accentuated that the modes of supply of multinational firms are much more complex than these simple horizontal or vertical forms, and are defined by the presence of MNEs that are both horizontally and vertically integrated. Export-platform FDI involves an MNE producing goods in a host country and selling the output in the host country and in third-country markets.[4]

Many empirical studies have sought to determine the locational factors important for attracting FDI, with market size, relatively low resource costs, low business risks, and resource availability found to be significant. The limited empirical research that considers PTA effects on FDI can be grouped into case-studies that focus exclusively on large well known trade arrangements (e.g. NAFTA, MERCOSUR), and cross-country regression analyses.

Results from case-studies comparing FDI flows *pre* and *post* PTAs generally support an increase in FDI inflows following PTA formation. Blomstrom & Kokko (1997) found a modest increase in FDI into Canada following the formation of CUSFTA, an increase in FDI inflows into Mexico following NAFTA, and in Argentina and Brazil following MERCOSUR. Similarly Lim (2001) noted that FDI inflows more than doubled over the four years after the accession of Portugal and Spain to the EU.

In a panel data regression framework, Feils & Rahman (2008) found that NAFTA had significant effects on regional FDI inflows, with the US and Canada the main individual country beneficiaries. Naranjo (2002) finds a positive effect of NAFTA on US FDI into Mexico, but only during the first two to three years post-PTA. Likewise, Buckley et al (2000) concluded a positive impact of NAFTA and CUSFTA on Canada's FDI inflows from the US. Pain (1997) concluded that the EU Internal Market Program had significantly increased intra-EU FDI from UK firms, and found some weak evidence of declines in US-bound FDI. Though the studies discussed here provide useful insights on the PTA-FDI nexus, they caution that the effect is not automatic but also depends on concurrent policy reforms in host countries and specific agreement provisions. Since they do not control for other contemporaneous events, the effects of macroeconomic stabilisation and changes in FDI related policies undertaken around the same time cannot be disentangled. More importantly, empirical generalisations from such findings are severely limited since PTA contexts differ from each other.

[4] Markusen (2013) uses sales data on US manufacturing affiliates to provide evidence of the shift from MNEs exporting back to source countries to exporting to third countries.

Cross-country analysis using gravity model techniques also provide some support for a positive PTA-FDI link. Cardamone & Scoppola (2012) investigated the impact of all EU trade agreements on the investment of EU firms in all (173) non-EU countries over the period 1995-2005. They developed an empirical equation based on the knowledge-capital theory to assess the impact of both trade and deep integration provisions on the EU's outward FDI. They concluded that there was a negative impact of EU tariffs while the host country tariff effect differed across groups of partner countries. The deep integration provisions positively affected EU FDI.

Medvedev (2011) investigated the effect of PTAs on net FDI inflows using a panel of 153 countries from 1980-2004 and found that PTA membership is associated with increased FDI inflows. This is the most comprehensive study of PTA-FDI links because all PTAs are included. But the selection of net FDI inflows as the dependent variable is a drawback because it precludes the estimation of bilateral flows and the influence of explanatory variables of interest in such a context. Medvedev introduced two variables to capture potential PTA market effects; the sum of the GDPs of PTA members and the average distance between host and all PTA members. While both these variables were found to be significant with the expected signs, a preferred measure would include both the size and proximity of member markets.

Yeyati et al (2004) estimated an augmented gravity model on bilateral FDI flows from 20 OECD countries into 60 host nations during 1982-1999. Regional integration was captured by a dummy variable, with the GDPs of PTA members summed to capture the host's extended market and both these variables were significant in explaining FDI. Jaumotte (2004) also finds a significant and positive effect of the extended market size created by mainly South-South PTA on FDI inflows into a sample of 71 developing countries during 1980-1999. Likewise, Buthe & Milner (2008, 2014) found that trade agreements increased flows of FDI into 122 developing countries and that PTAs with investment clauses or dispute settlement mechanisms attract comparatively more FDI.

Adams et al (2003) and Dee & Gali (2005) use a gravity equation to estimate the effects of trade provisions and non-trade provisions of 18 PTAs on trade (among 116 countries from 1970-1997) and FDI inflows (among 77 countries from 1988-1997). They develop a Member Liberalisation Index designed to capture the breadth and depth of PTAs. While the use of subjective weights based on the authors' evaluations of the extent of liberalisation in each provision is a limitation of this index, this work does acknowledge the differences in breadth

and depth among different PTA's, an aspect largely ignored in approaches using binary dummy variables.

The bulk of the studies concentrating on the ACP group have focused on African countries or African economic sub-groups, although little of this work has considered the role of PTAs in generating FDI (Bankole & Adewayi, 2013). Most empirical work has focused on the effects of traditional host country characteristics such as market size, natural resources, infrastructure, governance and the investment environment (e.g. Bartels et al 2014, Godfred et al., 2015, Naude & Krugell, 2007, Asiedu, 2002 and 2006). In a sample of 16 West African countries, Bankole & Adewuyi (2013) find support for the role of BITs in attracting FDI, but find no such role for PTAs. From a micro-economic perspective, Kinda (2013) provides evidence using firm-level data for 30 SSA countries that horizontal FDI is encouraged by higher trade regulations and is sensitive to financial and human resource constraints, whereas vertical FDI is more responsive to infrastructure and institutional constraints.

In the Caribbean setting, Kolstad & Villanger (2008) conclude that FDI inflows are particularly sensitive to political instability and are encouraged by less stringent regulations, a finding they link to the presence of important tax havens in the Caribbean. Tuman & Emmert (2004) studied the determinants of US FDI into Latin American and Caribbean countries and found that stable, more open economies with higher growth and higher human capital attracted US FDI, while membership of a trade agreement had no effect. Gani & Clemes (2015) assess the factors attracting FDI into a panel of 9 Pacific Island countries, with particular emphasis on the business environment (cost of doing business, legal rights, and the time required in resolving insolvency and building a warehouse) which they conclude is important for FDI.

In the next section we draw on this review to select our variables and to anticipate the likely outcomes. While most of the variables that explain FDI elsewhere also explain FDI in the ACP countries, there are interesting differences as we shall see. It also turns out that there are differences across the African, Caribbean and Pacific subgroups.

## 3: Econometric Specification & Data

This study estimates an augmented gravity equation explaining bilateral FDI stocks between OECD sources and ACP hosts, using panel data from 2000-2012. While traditionally used for

explaining bilateral trade, the gravity equation works almost as well for bilateral FDI (Bergstrand & Egger, 2007). Our equation specification is as follows:

$$FDI_{ijt} = \beta_0 + \beta_1 ACPGDP_{jt} + \beta_2 OECDGDP_{it} + \beta_3 TO_{jt} + \beta_4 IR_{jt} + \beta_5 NRR_{jt} + \beta_6 LF_{jt} + \beta_7 SMP_{jt} + \beta_8 NPTA_{jt} + \beta_9 Dist_{ij} + \beta_{10} OH_{ij} + \beta_{11} BIT_{ijt} + \beta_{12} DTT_{ijt} + \beta_{13} PTA_{ijt} + \alpha_i + \alpha_j + \alpha_t + \varepsilon_{ijt} \quad (1)$$

The dependent variable is the FDI stock ($FDI_{ijt}$) from each of the 34 OECD source countries ($i$) in each of the ACP host countries ($j$) in year $t$. Altogether, there are 305 country pairs in our sample[5]. The bilateral stock, rather than the flow, of FDI is selected as the dependent variable as it allows more country pairs to be included. There is no consensus in the literature on the appropriateness of either measure, however, and both flow and stock data has been used. The FDI stocks do have the advantage of being a closer proxy for the level of activity of foreign firms in the host country (Stein & Daude, 2007), and are less sensitive to single large transactions that can arise from mergers and acquisitions.

When it comes to identifying the determinants of inward FDI, we have the challenges of dealing with both the different motivations for different forms of FDI and the many potential channels through which a PTA could affect the location of FDI. For example, the tariff-jumping motive for horizontal FDI could be eroded by a PTA which at the same time encouraged vertical FDI motivated by resource cost differences. Unfortunately the different forms of FDI – horizontal, vertical, export platform, and fragmented vertical - cannot be discerned from FDI data. Furthermore, the importance of the many determinants of FDI may differ across sectors (primary, industrial and services), which can only be disentangled with highly disaggregated data, which is unavailable. With these provisos in mind, we adopt a macroeconomic perspective and focus on the channels through which PTAs and FDI are connected.

Our explanatory variables are suggested by the theoretical and empirical literature and the UNCTAD's categorisation of FDI determinants in its World Investment Report (2011). Equation (1) contains variables that reflect characteristics of the host countries. These include market size ($ACPGDP_{jt}$); trade openness ($TO_{jt}$); investment risk ($IR_{jt}$); resource abundance, captured by natural resource rent ($NRR_{jt}$); human resource availability, captured by the labor force ($LF_{jt}$); surrounding market potential ($SMP_{jt}$); and the number of PTAs of which the host country is a member ($NPTA_{jt}$). Also included is the source country GDP ($OECDGDP_{it}$) and dummies denoting bilateral international treaties such as a BIT, a PTA or a DTT. Additionally

[5] See Tables A2 and A3 in the Appendix for the number of partners for each ACP and OECD country.

we control for the bilateral distance ($Dist_{ij}$) and time difference in the form of 'overlap in office hours' ($OH_{ij}$) between each country pair. $\alpha_i$, $\alpha_j$ and $\alpha_t$ are unobserved source, host and time specific effects, respectively, and $\varepsilon_{ijt}$ is the stochastic error term. The explanatory variables used in our model and their expected relation to FDI are summarised in Table 1.

**Table 1: Description and Source of Variables**

| Variable | Description | Source | |
|---|---|---|---|
| *Dependent Variable* | | | |
| FDI* | Foreign Direct Investment Stock of OECD country into ACP country, in millions of USD. | International Direct Investment Statistics database: OECD | |
| *Independent Variables* | | | *Expected Sign* |
| Host GDP* (*ACPGDP*) | ACP country GDP, PPP (constant 2011 international $) | WDI | + |
| Source GDP* (*OECDGDP*) | OECD country GDP, PPP (constant 2011 international $) | WDI | + |
| Host Labor Force* (*LF*) | Size of labor force of host country. | WDI | + |
| Host Trade Openness (*TO*) | Share of exports and imports of goods and services as a % of GDP of the ACP country | WDI | +/- |
| Host Natural resource rent* (*NRR*) | Sum of the natural resource (oil, natural gas, coal, mineral, forest) rents received by ACP country as a % of GDP | WDI | + |
| Host Investment risk* (*IR*) | A measure of economic freedom based on both quantitative and qualitative factors | Heritage Foundation | + |
| Bilateral PTA | Preferential Trade Agreement | WTO | +/- |
| Bilateral BIT | Bilateral Investment Treaty | UNCTAD | + |
| Bilateral DTT | Double Taxation Treaty | UNCTAD | + |
| Bilateral Distance* (*Dist*) | Bilateral Great circle distance (in kilometres) | CEPII | +/- |
| Bilateral Time difference (*OH*) | Overlap in office hours | www.timeanddate.com | + |
| Host Surrounding Market Potential* (*SMP*) | The sum of inverse-distance weighted GDPs of nearby markets. (See Appendix for details on calculation) | GDP Data from WDI Distance from CEPII | + |
| Host number of PTAs (*NPTA*) | The total number of PTAs of which the host is a member | WTO | +/- |

Note: * indicates variables transformed by logs.

The sizes of source and host economies, as captured by their GDPs, are the main explanatory variables of a gravity model. Market size has, by far, been the single most widely accepted variable as a significant positive determinant of FDI flows (Chakrabarti, 2001). Similarly, source country GDP may reflect its ability to invest abroad, although this is a weaker link.

A country's openness to international trade is deemed relevant to FDI location decisions because most investment projects are directed towards the tradeable sector (Chakrabarti, 2001)[6]. But trade openness can affect FDI in different ways. Lower import barriers may discourage tariff-jumping FDI by eroding the competitive advantage over other foreign producers. However they may stimulate vertical FDI by facilitating the imports of inputs and machinery. Lower export barriers tend to stimulate vertical FDI by facilitating the re-export of processed goods, and other non-tariff jumping horizontal FDI by expanding the effective market size. Openness is estimated by the ratio of total trade to GDP but our expectations on the sign of this variable are ambiguous.

Other things equal, the availability of labor is expected to significantly boost the locational advantage of the host country (Noorbuksh et al, 1999). But while we expect a positive relationship between FDI and the host labor force, we also note that this ignores the influence of differences in labor productivity, government interventions in the labor market and the strength of unions.

Several countries from the ACP group are resource-rich, and countries well-endowed with natural resources will attract resource-seeking FDI (Mina, 2007). The natural resource rent (as a percentage of GDP) is used to approximate for host relative resource endowment and is expected to be positively related to FDI.

Investment Risk reflects an additional cost of doing business in a foreign location, and poor legal protection, corruption and weak institutions generally in the host country are likely to diminish FDI activity (Blonigen et al, 2007). Like most studies we use an index to capture investment risk, in our case the 'economic freedom index' sourced from the Heritage Foundation database. A host with a lower value of this index contains greater risks which would discourage FDI.

A PTA is indicative of more liberal attitude towards economic interactions between countries. Here a dummy variable controls for whether the source and host country have a PTA in place. Strictly, its coefficient is ambiguous in sign, since a PTA acts oppositely on tariff jumping FDI

[6] As measured by their ratios of trade to GDP, the ACP countries are among the most open. According to the UNCTAD trade data, in 2010-14, the average share of exports to GDP was 25.6 for the ACP group (27.7 for Africa, 18.9 for the Caribbean and 37.1 for the Pacific); while import shares were 25.8 (25.3, 32.1 and 42.1).

and vertical FDI. Additionally, we control for the presence of a BIT or a DTT between the source and host countries. Their preambles indicate that BITs are intended to protect and promote foreign investment, perhaps by serving as a commitment device (Hallward-Driemeier, 2003). A positive coefficient is expected, though the empirical findings to date are mixed (Bellak, 2013). The popularity of DTTs has grown over time (Parikh et al, 2011) with a positive association with FDI inflows found by Barthel et al (2009) and Blonigen & Davies (2004) among others. A bilateral DTT dummy variable is included and is expected to have a positive sign.

Distance is the second pillar of the gravity model. Distance may encourage FDI as an alternative to exports due to higher transportation costs, but it may also reduce FDI prospects, if unfamiliar laws, institutions and culture are involved. As such, the expected sign on this variable is ambiguous. While the importance of geographical distance is well recognised in empirical models of FDI, less attention has been paid to the economic effects of time zone differences. Time zone differences matter for activities that are intensive in information and require frequent interaction and so can be highly relevant for FDI. While new communications technologies have reduced the financial cost of distant interaction, they cannot overcome the problem of time difference. Head et al (2009) refer to this as the 'synchronization effect', and Stein & Daude (2007) conclude that time difference has a significant negative effect on FDI location. But Head et al (2009) also highlight a 'continuity effect' that arises because branches operating in separate time zones allow an international company to be active over a longer part of the day. As the synchronization effect and the continuity effect oppose each other, this makes the link between time difference and FDI ambiguous. In order to differentiate these effects we include as our measure of time difference, the number of office hours (assumed to be from 9am to 5pm) that overlap between host and source country. A positive sign then indicates that the synchronization effect dominates, a negative sign that it is the continuity effect that prevails.

Additional variables introduced in the specification are measures of surrounding market potential and host overall involvement in PTAs. By promoting greater regional integration a PTA creates the possibility of an extended market, and Medvedev (2011), Blonigen et al (2007) and Redding & Venables (2004) found that countries with higher surrounding market potential attract more FDI. Our approach to calculating the surrounding market potential is a slight modification of Blonigen et al (2007). Their method defined surrounding market potential broadly as the sum of inverse-distance weighted GDPs of all other countries in their sample.

The exclusion of the host nation from this calculation allows for the identification of export-platform FDI. Here we define the inverse-distance weighted GDP of countries within a sub-regional grouping as the surrounding market, and expect this variable to have a positive relationship to FDI.

Most countries are now signatories to several PTAs. Buthe & Milner (2008) argue that policy reforms embodied in international agreements (e.g. PTAs) increase the credibility of the reform, relative to domestic policy changes which are easily reversible. We follow their lead and include cumulative PTAs as a signalling variable. But given that it signals increased openness to trade, its implications for FDI are ambiguous for the same reasons as the openness measure. Table 2 presents the summary statistics of all non-dummy variables used in our estimation.

**Table 2: Summary Statistics**

| Variable (in values) | Mean | St Deviation | Maximum | Minimum |
|---|---|---|---|---|
| FDI (US$M)* | 695.4 | 3263.6 | 59603 | -1459.8 |
| ACP GDP (PPP, $M)* | 50558 | 123174 | 893276 | 451 |
| OECD GDP (PPP, $M)* | 1418411 | 2750589 | 15878110 | 9448 |
| Trade Openness (%) | 79.6 | 37.8 | 351.1 | 21 |
| Investment Risk Index* | 55.3 | 9.3 | 77.0 | 21.4 |
| Natural Resource Rent (% of GDP)* | 15.2 | 19.7 | 100.4 | 0 |
| Labor force (millions)* | 6.24 | 9.25 | 53 | 0.04 |
| Number of PTAs | 2.5 | 0.85 | 5 | 0 |
| SMP* (PPP,$M)* | 134017 | 149147 | 941768 | 3991 |
| Distance* | 7559 | 3140 | 17615 | 1482 |
| Overlap in Office hours | 5.0 | 2.8 | 8.0 | 0 |

*Variables transformed into logs in all estimations. ACP GDP, trade openness, investment risk, natural resource rent, labor force size, surrounding market potential and number of PTAs are host country specific variables and are averaged over the host countries and not as country pair variables. A similar treatment applies to OECD GDP, while distance, office hour overlap and FDI are averaged as country pair variables.

## 3: Empirical Analysis: Results and Discussion.[7]

A natural starting point in a panel regression is pooled OLS which regresses the dependent variable on an intercept and the set of explanatory variables using both the cross-sectional and time variation in the data. But the ACP states consist of rather heterogeneous groups of

[7] An issue that arises with the use of macroeconomic time series data is that of stationarity, but as discussed in the Econometric Appendix we are able to rule out any concerns about spurious regressions here.

countries, suggesting the likelihood of unmeasured country-specific characteristics that are not captured by the explanatory variables in our model, in which case pooled OLS (which ignores these fixed effects) yields biased and inconsistent estimates (Egger, 2002; Baltagi, 2008). Country fixed effects were therefore introduced into our equation via a dummy variable for each host (ACP) and source (OECD) country[8] and it was estimated by OLS with robust standard errors. Empirical tests on the residuals from this OLS estimation revealed the presence of heteroscedasticity and autocorrelation, which are often of concern in panel data due to the inclusion of both time and cross-country information.[9] Furthermore, in line with the concerns in the literature on probable endogeneity (through two way causality) between the dependent and independent variables in an FDI equation[10], we tested for such possibilities for the variables ACPGDP and trade openness[11]. The results indicate that endogeneity should not be an issue in our sample[12].

Based on these findings, equation (1) is re-estimated using the feasible generalised least squares (FGLS) estimator, which allows us to simultaneously account for the presence of heteroscedasticity and autocorrelation (Medvedev, 2011), and Table 3 presents the results. Three alternative specifications of the BIT and PTA dummies are considered. Equation (1) includes single PTA and BIT dummies, while (2) includes separate PTA dummies by region (Africa, Caribbean or Pacific) and (3) does the same for the BIT dummy (Africa and Caribbean only).

[8] The F test on the significance of country fixed effects rejected the null hypothesis of no significant difference across countries (F = 20.76,, p=0.00) at the 5 percent level of significance, indicating that pooled OLS is not appropriate.

[9] The Breusch Pagan test results for heteroscedasticity ($\chi^2$ = 114.73,, p =0.00) rejected the null hypothesis of homoscedasticity at the 5 percent level of significance. The Woodridge test for autocorrelation indicated the presence of serially correlated residuals (F (1,262) = 58.5, p=0.00).

[10] This criticism mainly holds for market size which is measured using GDP. For example, it is argued that economies with a larger market provide more profitable opportunities for foreign firms. However, FDI also provides positive externalities that contribute to faster economic growth and higher GDP. There is empirical support for both these channels in the literature.

[11] A common problem in testing endogeneity is the identification of valid instruments for the endogenous variables. A valid instrument should be highly correlated with the endogenous explanatory variable but not with the error term, and we used a one period lag of the suspect endogenous variables as an instrument to test for possible endogeneity using the Durbin-Wu-Hausman test. The null hypothesis of exogenous variables was not rejected for host GDP or trade openness (see Table A8). Other variables that may give rise to endogeneity problems are PTA and BIT, but due to the difficulty in obtaining valid instruments for these variables and the inappropriateness of using their lagged forms, we do not test for their exogeneity here.

[12] As a further check we allowed for endogeneity and estimated a fixed effects model using instrumental variable regression. No coefficient changed sign and only one (on ACPGDP) became insignificant.

**Table 3: FGLS estimation: base model and decomposition of PTA and BIT by region**

| *Dependent variable Log (FDI)* | | | |
|---|---|---|---|
| **Regressors** | **(1)** | **(2)** | **(3)** |
| ACP GDP[1] | 0.391** | 0.252** | 0.397** |
| | (0.154) | (0.108) | (0.153) |
| OECD GDP[1] | 0.159 | 0.059 | 0.197 |
| | (0.276) | (0.278) | (0.277) |
| Trade Openness | -0.004*** | -0.004*** | -0.004*** |
| | (0.001) | (0.001) | (0.001) |
| Investment Risk[1] | 0.872*** | 1.056*** | 0.856*** |
| | (0.192) | (0.164) | (0.193) |
| Natural Resource Rent[1] | 0.024 | 0.043** | 0.019 |
| | (0.022) | (0.021) | (0.022) |
| Labor Force[1] | 0.591 | 0.962*** | 0.670* |
| | (0.365) | (0.331) | (0.356) |
| SMP[1] | 1.223*** | 1.170*** | 1.158*** |
| | (0.168) | (0.158) | (0.167) |
| Distance[1] | -1.105*** | -1.148*** | -1.247*** |
| | (0.241) | (0.270) | (0.260) |
| Overlap in office hours | 0.028 | 0.076** | 0.017 |
| | (0.037) | (0.037) | (0.039) |
| BIT | -0.031 | -0.042 | |
| | (0.065) | (0.068) | |
| DTT | 1.129*** | 1.173*** | 1.096*** |
| | (0.092) | (0.103) | (0.091) |
| PTA | -0.141 | | -0.131 |
| | (0.139) | | (0.138) |
| NPTA | -0.086*** | -0.050 | -0.049 |
| | (0.026) | (0.031) | (0.030) |
| PTA-African | | -0.538*** | |
| | | (0.149) | |
| PTA-Caribbean | | 1.015*** | |
| | | (0.261) | |
| PTA-Pacific | | 0.034 | |
| | | (0.521) | |
| BIT-African | | | -0.019 |
| | | | (0.103) |
| BIT-Caribbean | | | 0.232 |
| | | | (0.223) |
| Constant | -23.939*** | -27.128*** | -23.509*** |
| | (5.07) | (4.642) | (5.102) |

Significance levels: *10% **5% ***1%. [1]Control variables that are expressed in natural logarithms. The standard errors are in brackets.

All three regressions in Table 3 confirm the consensus in the literature that host economy size has a significant positive effect on FDI, and that the same is true of the size of the surrounding market. Greater investment risk (a lower value of the index), has a significant, negative effect

on FDI. The significant, negative coefficient on trade openness is consistent with the substitution of trade for FDI in more open economies. Likewise the negative coefficient on geographical distance suggests that FDI, like trade, is discouraged by unfamiliarity with the laws, institutions and cultures of more distant countries. In terms of resource endowments, both the natural resource rent and the availability of labor have the expected sign, but are not always significant. The overlap in office hours is positive, indicating the dominance of the synchronization effect noted earlier, but not always significant. Source country GDP is never significant[13].

Turning to the effects of international treaties, the presence of a DTT has a significant and positive effect as expected. The insignificant coefficient on the BIT dummy, which persists even when we introduce separate regional dummies for Africa and the Caribbean[14], is consistent with other results in the literature (Aisbett, 2009). Falvey & Foster-McGregor (2018) find that the significant impact of BITs is in establishing new bilateral FDI links rather than expanding existing relationships. However, given that BITs are widely used instruments for protecting and attracting FDI, we explore the relationship between BITs and FDI further below.

Host countries who are members of more PTAs tend to receive less FDI, other things equal, which is consistent with the result on openness. But this coefficient becomes insignificant when the PTA or BIT dummies are regionalised. The presence of a PTA between the parent and the host country has no impact on bilateral FDI, consistent with the ambiguity in our expectations on this variable. Trade can be a complement or substitute for FDI, depending on the motivation behind the FDI, and it is not implausible that a sample of countries as diverse as the ACP group embraces examples of both cases. To investigate if aggregation masks any significant sub-group PTA-FDI relationships, we regionalise our PTA variable, into African, Caribbean and Pacific PTA dummies, and re-estimate. While the estimated coefficients on the other variables are largely unaffected[15], regionalisation of the PTA variable reveals significant differences across the sub-groups. In Africa, the PTA variable is negative and significant, indicating that as African countries engage in more PTAs and open up their markets, source country firms prefer to trade rather than to invest. The opposite appears to be true in the Caribbean countries,

[13] Given the possibility of a lagged effect of GDP (host or parent) on current FDI, we included a one year lag of these variables and re-estimated our base model. Neither variable was significant, with very little change in the other coefficients.
[14] In the Pacific group, only one country (PNG) is signatory to a BIT.
[15] Except that natural resource rent, labor force size and overlap in office hours become significant.

where PTAs significantly encourage FDI. However, there is no evidence of any PTA-FDI relation for the Pacific region.

To further investigate any regional patterns masked by aggregation of a heterogeneous group of countries, Table 4 presents the results from estimating equation 1 on our regional sub-samples. Caution is warranted in drawing conclusions from these results because of the reduction in sample size, particularly for the Pacific.

**Table 4: FGLS estimation results: Decomposition of sample into specific regions**

| | *Dependent variable Log (FDI)* | | |
|---|---|---|---|
| Regressors | Africa | Caribbean | Pacific |
| ACP GDP[1] | 0.588*** | -0.612 | 1.704 |
| | (0.168) | (0.526) | (1.744) |
| OECD GDP[1] | 1.232*** | 0.273 | 3.061** |
| | (0.068) | (0.372) | (1.527) |
| Trade Openness[1] | -0.004*** | -0.010*** | 0.007 |
| | (0.001) | (0.004) | (0.006) |
| Investment Risk[1] | 0.881*** | 1.990*** | -1.872 |
| | (0.216) | (0.757) | (1.519) |
| Natural Resource Rent[1] | -0.052 | 0.072* | -0.531 |
| | (0.040) | (0.040) | (0.337) |
| Labor force[1] | -0.277 | 1.103 | 2.285 |
| | (0.492) | (1.042) | (2.356) |
| SMP[1] | 1.216*** | 1.386*** | -1.325 |
| | (0.196) | (0.524) | (1.351) |
| Distance[1] | -0.989*** | -0.496 | -15.066*** |
| | (0.309) | (0.927) | (1.794) |
| Overlap in office hours | 0.138*** | 0.589*** | 2.034*** |
| | (0.053) | (0.224) | (0.261) |
| NPTA | 0.054 | -0.041 | -0.085 |
| | (0.051) | (0.082) | (0.140) |
| BIT | 0.024 | 0.342* | |
| | (0.076) | (0.190) | |
| DTT | 0.939*** | 1.911*** | -12.978 |
| | (0.112) | (0.280) | (11.485) |
| PTA | -0.301* | 0.400 | -19.214* |
| | (0.176) | (0.430) | (11.532) |
| Constant | -24.911*** | -28.331** | 67.620** |
| | (6.115) | (14.809) | (34.009) |
| N | 1619 | 438 | 92 |

Significance levels: *10% **5% ***1%. [1]Control variables that are expressed in natural logarithms. The standard errors are in brackets.

Despite marginal changes in coefficient size, the estimates for the sub-sample of African countries (1619 observations on 212 country pairs) have the same signs and significance as in the base model, except that source country GDP now has a significant positive coefficient while

the number of PTAs is not significant. The PTA dummy in the African sub-sample is negative and significant, consistent with the findings on the African PTA dummy in Table 3. It seems that multinational firms from large economies may invest more in Africa, and that these investments are encouraged by a larger office hours overlap between host and source. A PTA between host and source discourages FDI.

The Caribbean sub-sample (438 observations on 57 country pairs) results show greater differences from the base estimation. Three of the control variables (host GDP, distance and the number of PTAs) that were significant are now insignificant. For these countries FDI is unaffected by their individual market sizes, distance, labor force size and willingness to grant preferential access, both bilaterally and in general. But FDI is attracted by their surrounding market potential, availability of natural resources and overlapping office hours. For these countries BITs are a significant determinant of FDI.

Finally, few of our control variables appear to have a significant relationship with FDI in the Pacific sub-sample (92 observations on 18 country pairs). Multinational firms from large OECD countries also like to invest in the Pacific, but are discouraged by distance and a small overlap in office hours. Like Africa, the coefficient on the PTA variable is negative and significant.

This mixed bag of results for both the BIT and PTA variables leads us to focus more closely on the interaction between the two, distinguishing between trade agreements that contained foreign investment and dispute settlement provisions (PTA+IP) from those that do not (PTA-IP). In the absence of multilateral protection of investment similar in scope to the WTO protections provided to trade in goods and services, BITs and investment provisions in trade agreements have been used to fill a policy void (Swenson, 2009, Bondietti, 2008). It is expected that PTA's that have these provisions should attract more FDI. We are also interested in how such provisions in a PTA relate to a BIT. Are the two substitutes or do they target different types of FDI? Again we estimate the equation for the full ACP sample and the regional sub-samples separately. The results are shown in Table 5.

The estimates for the full ACP group are consistent with the base model - neither PTA's with investment provisions nor PTAs without provisions impact on FDI. For the African sub-sample, PTA-IP has no significant effect, but rather perversely, PTA+IP has a significant negative effect on FDI. Perhaps the FDI encouraged by investment provisions in a PTA is

intended to facilitate trade and acts as a substitute for other FDI. Both coefficients are insignificant for the Caribbean and the Pacific groups.

**Table 5: FGLS estimation results: Decomposition of PTA variable by provision**

| | *Dependent variable Log (FDI)* | | | |
|---|---|---|---|---|
| Regressors | **ACP** | **Africa** | **Caribbean** | **Pacific** |
| ACP GDP [1] | 0.432*** | 0.654*** | -0.662 | -0.216 |
| | (0.156) | (0.176) | (0.440) | (2.399) |
| OECD GDP [1] | 0.019 | 1.222*** | -0.986 | 4.672** |
| | (0.279) | (0.071) | (0.810) | (1.957) |
| Trade Openness | -0.004*** | -0.004*** | -0.007*** | 0.003 |
| | (0.001) | (0.001) | (0.003) | (0.009) |
| Investment Risk [1] | 0.886*** | 0.833*** | 0.882 | -1.464 |
| | (0.194) | (0.219) | (0.608) | (1.959) |
| Natural Resource Rent [1] | 0.023 | -0.053 | 0.031 | -0.368 |
| | (0.022) | (0.040) | (0.044) | (0.448) |
| Labor force [1] | 0.537 | -0.399 | 4.512*** | 4.190 |
| | (0.366) | (0.498) | (0.781) | (3.491) |
| SMP [1] | 1.194*** | 1.220*** | 0.623* | -2.095 |
| | (0.169) | (0.198) | (0.353) | (1.707) |
| NPTA | -0.055* | 0.061 | -0.081 | -0.121 |
| | (0.030) | (0.050) | (0.070) | (0.183) |
| Distance [1] | -1.137*** | -0.909*** | -0.560 | -9.296*** |
| | (0.249) | (0.312) | (1.001) | (2.345) |
| Overlap in office hours | 0.027 | 0.125** | 0.862** | 0.851*** |
| | (0.038) | (0.057) | (0.341) | (0.235) |
| BIT | -0.035 | 0.036 | 0.309* | |
| | (0.066) | (0.076) | (0.171) | |
| DTT | 1.097*** | 0.964*** | 1.413*** | -13.644 |
| | (0.093) | (0.116) | (0.423) | (16.863) |
| PTA+IP | -0.077 | -0.716** | 0.077 | -19.692 |
| | (0.186) | (0.291) | (0.662) | (16.898) |
| PTA-IP | -0.160 | -0.259 | 1.067 | 0.113 |
| | (0.149) | (0.188) | (1.029) | (5.408) |
| Constant | -21.810*** | -24.254*** | -36.163** | -4.752 |
| | (5.199) | (6.203) | (16.314) | (46.326) |

Significance levels: *10% **5% ***1%. [1] Control variables that are expressed in natural logarithms. The standard errors are in brackets.

Given the popularity of BITs as a policy device for attracting investment and the mixed empirical findings on their effects both here and in the literature, we decided to broaden the investigation of BITs. Since there are few BITs in effect in the Pacific group and because the results in Table 5 show significant differences in the effects of BITs between the African and Caribbean groups, we confine attention to these two groups and consider them separately. The

signs and significance of the estimated coefficients on the control variables in Table 6 are consistent with those in Tables 4 and 5 for Africa. But there are some differences in the Caribbean results, where investment risk and natural resource rent become insignificant, while the labor force becomes positive and significant and source GDP becomes negative and significant. The number of PTAs now has a significant negative effect on FDI in the Caribbean, again implying that Caribbean countries which are more open to preferential trade are less attractive to FDI.

We first investigate the interactions between BITs and PTAs. Specifically we interact BIT separately with PTA-IP and PTA+IP, and include both PTA variables and these interactions in the regressions. None of these variables, including the interactions are found to be significant in the Caribbean group. But in Africa, we now see that the effect of a PTA on FDI depends on whether there is also a bilateral BIT in place and whether the PTA itself includes investment provisions. A PTA with investment provisions, with or without a BIT, reduces FDI. However, a PTA without investment provisions increases FDI if a bilateral BIT is also in place. In a region where trade and FDI appear to be substitutes, it seems that the investment provisions in a PTA are designed to facilitate trade-enhancing FDI at the expense of FDI more generally.

To this point we have considered a dummy variable indicating whether or not a BIT covered each bilateral FDI relationship. But it has been claimed that BITs, like PTAs, may also have signalling and commitment effects that affect other FDI relationships. That is, when a host country signs a BIT with a particular source, it may also signal a commitment to protect foreign investment in general (Neumayer & Spess, 2005, Buthe & Milner, 2008). In Table 6, we add a variable indicating the total number of BITs signed by the host country. The results indicate a significant positive relation with FDI in Africa, but no significant relationship in the Caribbean. BITs do have some signalling effect in African countries.

Given that the FDI sources in our sample are all OECD countries, regressions (3) and (6) allow us to examine if this signalling is confined to BITs with OECD countries or applies more generally. Our results reveal that only BITs concluded with OECD countries stimulated more FDI from OECD sources, and that this applies to both the African and Caribbean countries. Hence, our results provide support to the signalling effect of BITs to the extent that an increase the number of BITS with OECD countries provides greater confidence to OECD investors.

**Table 6: FGLS estimation results: Further analysis of the impact of BIT**

| Regressors | Africa | | | Caribbean | | |
|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) |
| ACP GDP[1] | 0.716*** | 0.631*** | 0.551*** | -0.278 | -0.382 | -0.769 |
| | (0.178) | (0.183) | (0.188) | (0.463) | (0.491) | (0.564) |
| OECD GDP[1] | 1.150*** | 1.147*** | 1.137*** | -2.197*** | -2.615*** | -2.162*** |
| | (0.083) | (0.081) | (0.081) | (0.834) | (0.771) | (0.807) |
| TO | -0.004*** | -0.004*** | -0.004*** | -0.007*** | -0.006*** | -0.005*** |
| | (0.001) | (0.001) | (0.001) | (0.002) | (0.001) | (0.002) |
| IR | 0.757*** | 0.802*** | 0.830*** | -0.301 | -0.323 | -0.383 |
| | (0.218) | (0.218) | (0.221) | (0.757) | (0.731) | (0.715) |
| NRR | -0.054 | -0.063 | -0.061 | 0.018 | 0.025 | 0.004 |
| | (0.041) | (0.042) | (0.042) | (0.057) | (0.056) | (0.058) |
| LF | -0.464 | -0.471 | -0.498 | 3.596*** | 3.468*** | 3.579*** |
| | (0.500) | (0.495) | (0.495) | (0.726) | (0.700) | (0.767) |
| SMP | 1.242*** | 1.029*** | 1.127*** | 1.171*** | 1.257*** | 1.140*** |
| | (0.203) | (0.215) | (0.224) | (0.390) | (0.387) | (0.396) |
| Dist[1] | -0.776*** | -0.793*** | -0.766*** | -1.211 | -1.164 | -0.767 |
| | (0.273) | (0.279) | (0.279) | (1.312) | (1.300) | (1.317) |
| OH | 0.107* | 0.107* | 0.104* | 1.210*** | 1.388*** | 1.326*** |
| | (0.061) | (0.061) | (0.062) | (0.377) | (0.365) | (0.388) |
| DTT | 0.911*** | 0.941*** | 0.961*** | 1.808*** | 1.741*** | 1.381*** |
| | (0.121) | (0.122) | (0.122) | (0.494) | (0.496) | (0.478) |
| PTA+IP | -0.802** | -0.770** | -0.817** | 0.367 | 0.428 | 0.502 |
| | (0.333) | (0.326) | (0.328) | (0.519) | (0.522) | (0.501) |
| PTA-IP | -0.663*** | -0.638*** | -0.645*** | 1.663 | 1.658 | 1.056 |
| | (0.195) | (0.191) | (0.191) | (1.107) | (1.121) | (1.143) |
| NPTA | 0.016 | -0.003 | 0.002 | -0.173** | -0.191** | -0.206*** |
| | (0.051) | (0.053) | (0.054) | (0.073) | (0.074) | (0.076) |
| BIT | -0.208 | -0.235 | -0.253* | -0.250 | -0.346 | 0.180 |
| | (0.152) | (0.150) | (0.150) | (0.900) | (0.922) | (0.947) |
| NBIT | | 0.020** | | | 0.019 | |
| | | (0.009) | | | (0.030) | |
| BIT*PTA+IP | 0.241 | 0.308 | 0.343 | 0.598 | 0.674 | 0.050 |
| | (0.279) | (0.276) | (0.276) | (0.917) | (0.940) | (0.962) |
| BIT*PTA-IP | 0.805*** | 0.773*** | 0.782*** | 0.166 | 0.100 | -0.425 |
| | (0.170) | (0.171) | (0.171) | (1.160) | (1.190) | (1.234) |
| N of OECD BITs | | | 0.042** | | | 0.098* |
| | | | (0.020) | | | (0.058) |
| N of non-OECD BITs | | | 0.012 | | | -0.051 |
| | | | (0.011) | | | (0.054) |
| BIT* NRR | -0.038 | -0.023 | -0.021 | -0.029 | -0.024 | -0.010 |
| | (0.035) | (0.035) | (0.035) | (0.089) | (0.090) | (0.090) |
| Constant | -23.858*** | -20.028*** | -20.238*** | -7.259 | -0.689 | -7.229 |
| | (6.163) | (6.200) | (6.211) | (17.641) | (16.688) | (17.132) |

Significance levels: *10% **5% ***1%. [1]Control variables that are expressed in natural logarithms. The standard errors are in brackets.

Finally, all the regressions in Table 6 explore whether BITs are of particular importance in the natural resources sector, where several authors have emphasised that the risk of expropriation may be higher (Aisbett 2009, Poulsen 2010, and Tobin & Busch 2010).[16] However other authors have noted that BITs may be irrelevant to this sector if hosts and foreign investors find alternative ways to protect their interests (Hajzler 2014).[17] To investigate whether BITs matter for FDI in natural resource abundant countries, we introduce an interaction variable (BIT*NRR). Since its coefficient is insignificant, we can offer no support for the general notion that BITs stimulate FDI in resource-abundant ACP countries.

## 5: Summary and Conclusions

This study examined the determinants of bilateral FDI from OECD source countries into ACP host countries, with a particular focus on the role of PTAs. Our estimating equation included the standard variables identified in the theoretical and empirical literature as important for explaining FDI, plus additional determinants including a measure of surrounding market potential and the office hours overlap between source and host.

Our empirical investigations confirmed the importance of domestic market size and surrounding market potential in attracting foreign investors, for the ACP overall and the African and Caribbean subsamples. This has two important implications. First, it indicates a prevalence of market-seeking FDI, so that FDI into the ACP is not just about natural resources. Second, it supports the importance of regional integration to unlock this market potential in this otherwise fragmented group of countries. FDI into the ACP group is sensitive to investment risks. The negative FDI-trade openness nexus suggests trade and FDI act as substitutes in the ACP, an interpretation supported by the negative coefficient on the variable capturing the number of PTAs signed by the host country. Both greater bilateral distance and smaller office hours overlap reduce FDI. The latter demonstrates that the synchronization effect dominates the continuity effect. The presence of a double tax treaty has a significant and positive impact on FDI in the ACP and each of its three subregions.

[16] In an investigation of the sectoral pattern of expropriation of FDI from 1993 to 2006, Hajzler (2012) revealed that most expropriation acts emanated from the resource based sectors (mainly mining and petroleum) and high resource output prices increased the likelihood of such acts.

[17] According to Swenson (2009) the natural resource investors have less flexibility in FDI decisions. They are constrained to locate in countries that have the natural resources regardless of whether a BIT exists. Yackee (2009) drew attention to the prevalence of sophisticated investment contracts which he claimed are more common in the natural resources and infrastructure concession sectors since they provide more deal-specific provisions than the ambiguous one-size-fits all BIT provisions.

A decomposition of the ACP group into its regional subsamples revealed differences in the patterns of significant explanatory variables. While the small sample sizes for the Caribbean and Pacific subgroups, particularly the latter, suggest caution in drawing inferences, it does suggest that foreign investors in the different regions may have quite different motivations. We can offer no support here for any notion that the ACP may benefit from developing a common approach towards and common policies for attracting FDI.

As noted, our primary objective in this paper was to examine the link between PTAs and FDI in the ACP countries. While encouraging FDI is not the premier aim of a preferential trading arrangement, it often appears to be a secondary objective, particularly when investment clauses are included in the agreement. We found no consistent evidence that bilateral PTAs, with or without investment provisions, encouraged FDI. On the contrary we found that PTAs of both types discouraged FDI in Africa. Perhaps these investment provisions are designed to attract small investments of a trade facilitating type which are insufficient in volume to offset the trade-substituting FDI that the PTA displaces. But resolving this awaits the availability of more disaggregated FDI data.

We included a dummy variable to capture the presence or absence of a bilateral investment treaty between the source and host as a control variable in our regressions. Consistent with the majority of studies in the literature, this variable turned out to be largely insignificant. We found no evidence that a bilateral BIT encouraged FDI in the full ACP sample or the African sub-sample, but there was positive and significant effect in the Caribbean. To explore further we interacted our bilateral BIT variable with our two variables denoting the presence of a bilateral PTA, with and without investment provisions. In the Caribbean a PTA of either type has no significant effect on FDI, regardless of whether a BIT is in place. In Africa, however, we found that a bilateral PTA with investment provisions, with or without a BIT, reduces FDI; and a bilateral PTA without investment provisions does the same, unless a bilateral BIT is in place in which case FDI increases. This reinforces the view that the investment provisions in a BIT and a PTA are somehow aimed at different types of investments.

A similar interaction between BITs and a host's resource rent earnings produced nothing of significance. What further analysis did reveal was a possible signalling role for BITs, but specifically BITs signed with OECD countries. BITs signed with non-OECD countries had no significant effect on FDI from OECD sources.

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## Data Appendix

**Table A1: List of ACP countries**

| |
|---|
| AFRICA: Angola, Cape Verde, Comoros, Benin, Botswana, Burkina Faso, Burundi, Cameroon, Central African Republic, Chad, Congo (Brazzaville), Congo (Kinshasa), Cote d'Ivoire, Djibouti, Eritrea, Ethiopia, Gabon, Gambia, Ghana, Republic of Guinea, Guinea-Bissau, Equatorial Guinea, Kenya, Lesotho, Liberia, Madagascar, Malawi, Mali, Mauritania, Mauritius, Mozambique, Namibia, Niger, Nigeria, Rwanda, Sao Tome and Principe, Senegal, Seychelles, Sierra Leone, Somalia, South Africa, Sudan, Swaziland, Tanzania, Togo, Uganda, Zambia, and Zimbabwe<br><br>CARIBBEAN: Antigua and Barbuda, Belize, Bahamas, Barbados, Cuba, Dominica, Dominican Republic, Grenada, Guyana, Haiti, Jamaica, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, Suriname, and Trinidad and Tobago<br><br>PACIFIC: Cook Islands, Fiji, Kiribati, Marshall Islands, Micronesia, Nauru, Niue, Palau, Papua New Guinea, Solomon Islands, Samoa, Timor Leste, Tonga, Tuvalu, and Vanuatu |

**Table A2: Number of ACP partners for each OECD country**

| **OECD Country (# ACP partners)** | | | |
|---|---|---|---|
| Australia (4) | Finland (1) | Japan (1) | Slovenia (4) |
| Austria (1) | France (38) | Korea (27) | Spain (3) |
| Belgium (4) | Germany (13) | Mexico (1) | SR (1) |
| Canada (8) | Greece (6) | Netherlands (38) | Sweden (5) |
| Chile (2) | Hungary (3) | Norway (26) | Switzerland (3) |
| Denmark (15) | Iceland (1) | NZ (3) | UK (18) |
| Estonia (3) | Italy (43) | Portugal (4) | US (28) |

**Table A3: Number of OECD partners for each ACP country**

| **ACP country (# OECD Partners)** | | | |
|---|---|---|---|
| Angola (10) | Dominican Rep. (15) | Mauritania (3) | St Lucia (4) |
| Bahamas (11) | Equatorial Guinea (5) | Mauritius (10) | St Vincent & Grenadines (3) |
| Barbados (8) | Ethiopia (7) | Mozambique (8) | Tanzania (9) |
| Belize (7) | Fiji (7) | Niger (4) | Togo (6) |
| Benin (6) | Gabon (6) | Nigeria (13) | Tonga (3) |
| Burkina Faso (4) | Gambia (3) | Papua New Guinea | Trinidad & Tobago (8) |
| Burundi (2) | Ghana (11) | Rwanda (3) | Uganda (9) |
| Cameroon (8) | Kenya (13) | Samoa (3) | Vanuatu (4) |
| Cent. African Rep. (3) | Liberia (10) | Senegal (5) | Zimbabwe (8) |
| Chad (3) | Madagascar (4) | Sierra Leone (6) | |
| Congo (5) | Malawi (6) | Solomon Is. (2) | |
| Cuba (4) | Mali (4) | South Africa (24) | |

*Calculation of Surrounding Market Potential*

Our approach is similar in spirit to the Blonigen et al (2007) measure of surrounding market potential except that we only include other countries within a specific sub-region, rather than all countries everywhere. The sub-regions are defined as the five economic groupings of the African countries (West Africa, Central Africa, Eastern & Southern Africa, Eastern African Countries), the Caribbean and the Pacific. The weights are calculated as a simple inverse function where the shortest bilateral distance within the sample is assigned weight of 1, and all other bilateral distances receive a weight that declines as per the equation below:

$$weight_{ij} = \text{shortest bilateral distance}_{kj} / \text{bilateral distance}_{ij}$$

where $distance_{ij}$ is the distance between country *i* and *j*. Hence the weight for country *i* in calculation of the surrounding market potential of country *j* is obtained by dividing the shortest bilateral distance that country *j* has in that sample (which is with country *k*) with the bilateral distance between *i* and *j*. This weight is then multiplied by the GDP (PPP) of country i. The inverse distance weighted GDP of all other countries (not including j) in the sub-region of country j are summed to give the surrounding market potential of country j.

## Econometric Appendix

*Tests for stationarity*

The Im-Pesaran-Shin (IPS) unit root test is used as it allows the autocorrelation coefficient to vary across cross-sections. It calculates a standardised t-bar test statistic based on the averaged augmented Dickey Fuller statistics for panels (Im et al, 2003). The results are summarised in Table A4, where the null hypothesis of a unit root is rejected for all variables except for ACP GDP, OECD GDP and SMP. With the dependent variable (FDI) as a stationary process, the inclusion of these three non-stationary variables does not raise concerns of spurious correlation[18]. Moreover, two of these non-stationary variables (ACP GDP and SMP) are also cointegrated (see Table A5), and the residuals from the FGLS estimation of equation 1 are stationary (see Table A6).

[18] We re-estimated our base model after a first-differenced transformation of the three non-stationary variables, and except for the coefficient size of two of the transformed variables (ACP GDP & OECD GDP), the magnitude and significance of all other variables show very little difference.

**Table A4: Panel Unit Root Test – Im, Pesaran and Shin**

| Variable | Statistic | Variable | Statistic |
|---|---|---|---|
| Log(FDI)[1] | -3.3949*** | Log Natural Resource Rent | -1.7604** |
| Log(ACP GDP) | -0.6478 | Trade Openness | -1.9361*** |
| Log(OECD GDP) | -1.3735 | Log Investment Risk | -3.3833*** |
| Log(LaborForce) | -2.8143*** | Log SMP | -0.0789 |

Significance levels: *10% **5% ***1%. [1] includes constant and trend. Automatic lag selection based on Schwarz Information Criterion.

**Table A5: Pedroni Residual Cointegration Test (ACP GDP and SMP)**

| | Panel Statistic | Group Statistic |
|---|---|---|
| Variance-Statistic | 3.241*** | |
| rho-Statistic | -1.531* | 1.924 |
| PP-Statistic | -3.342*** | -2.189** |
| ADF Statistic | -5.581*** | -6.589*** |

The Pedroni (1999) Residual Cointegration test employs 4 panel statistics and 3 group statistics, reported in table above. It tests the null hypothesis of no cointegration against the alternative hypothesis of cointegration. * denotes the significance level - * 10%, **5%, ***1%. The null of no cointegration is rejected in all the 4 panel statistics and two of the group statistics, providing evidence of cointegration between ACP GDP and surrounding market potential which as both host country variables, Because our dataset has country pair variables, we have treated these host country variables as host variables and not country pair variables.

**Table A6: Unit root test on residuals of base equation**

| Method | Statistic | Prob.** | sections | Obs |
|---|---|---|---|---|
| Null: Unit root (assumes common unit root process) | | | | |
| Levin, Lin & Chu t* | -51.6103 | 0.0000 | 242 | 1624 |
| | | | | |
| Null: Unit root (assumes individual unit root process) | | | | |
| Im, Pesaran and Shin W-stat | -18.3825 | 0.0000 | 207 | 1519 |

**Table A8: Endogeneity test results**

| Variable | Results |
|---|---|
| Host GDP | $\chi^2$ =0.90936 p=0.3402 |
| | F=0.889379 p=0.3458 |
| GDP Growth | $\chi^2$ =0.949046 p=0.3300 |
| | F=0.898179 p=0.3434 |
| Trade Openness | $\chi^2$ =0.556148 p=0.4558 |
| | F=0.556148 p=0.4687 |

*Fixed or Random effects?* The unobserved country specific factors can be incorporated into the estimation through a fixed effects model (FEM) or a random effects model (REM). In a FEM model, these unobserved characteristics are subsumed in the intercept and hence each country has a different intercept, while in a REM they are considered as part of the error term (Baltagi, 2008). The time invariant individual specific effects are allowed to be correlated with the regressors in a FEM whereas they are purely random in a REM. The Hausman specification test ($\chi^2$ = 90.86, p = 0.00) rejects the null hypothesis that a REM provides consistent estimates and hence, the FEM is selected. Year effects are jointly insignificant (F=0.83, p=0.62) at the 5% level and hence a one way Fixed Effects Model is estimated. Additionally, as noted in

Baltagi (2008), the FEM is an appropriate specification when the focus is on a specific set of countries making inference conditional on these observed countries.[19]

[19] There are different ways through which a FEM can be estimated. These include within-transformation, between-effects or LSDV approach. The latter is chosen as it allows time invariant variables to be included.