

# Relationships between foreign direct investment and official development assistance with trade-related illicit financial flows. Evidence from low- and middle-income countries

Illicit financial flows

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## Abstract

**Purpose** – This paper aims to analyse empirically the association between flows of foreign direct investment (FDI), net official development assistance (ODA) inflows and trade-related illicit financial outflows.

**Design/methodology/approach** – With this purpose, a linear model was estimated, using different panel-data estimators, and using a database for a sample of 49 countries spanning the period 2008–2017. The used measure of illicit financial outflows was based on the estimates by Global Financial Integrity of deliberate misinvoicing in merchandise trade.

**Findings** – Research findings show a significant and positive association between changes in both relative lagged net FDI flows and relative FDI outflows (as % of gross domestic product) and changes in the ratio of trade-related illicit capital outflows to total trade. However, these positive associations were only observed in the case of low-income countries. Also, the positive association of net ODA inflows on the IFFT outflows were restricted to the cluster of lower-middle-income countries.

**Originality/value** – To the best of the authors' knowledge, this is one of the first studies to empirically estimate the association between FDI and ODA flows and trade misinvoicing at a macroeconomic level. Research findings may contribute to substantiate the concerns expressed in previous research about the potential unintended effects of aid on illicit capital flight in the case of lower-middle-income countries. They also shown that FDI flows could be an additional conduit for trade-related illicit financial flows in these countries

**Keywords** Foreign direct investment, Illicit financial flows, Low- and middle-income countries, Official development assistance, Trade

**Paper type** Research paper

## 1. Introduction

The development economics literature has focussed on analysing capital inflows to low- and middle-income countries (L&MICs) because one of the most important obstacles to development has been the lack of domestic financial resources to catalyse growth and



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development. However, relatively less attention has been given to the existence of capital flows leaving L&MICs, despite these flows being a key component of the other side of the financial equation, and also crucial to achieving sustainable development. The studies by [Boyce \(1992\)](#) and [Ajayi \(1995\)](#), among others, represent the beginning of a new strand in the development economics literature and focus on the problem of massive capital flight from L&MICs, which was mainly promoted by the financial liberalisation processes ([Stiglitz, 2000](#)). This growing concern in the literature around the issue of capital flight, and the resulting draining of resources to which L&MICs are subject, has led researchers to focus on two related phenomena:

- (1) the existence of a growing *illicit* component in capital flight from L&MICs and the network of “enablers”; and
- (2) offshore financial centres which offer shelter to these financial flows ([Dharmapala and Hines, 2007](#)).

Illicit financial flows (IFFs) are a form of capital flight when money is illegally earned, used or moved across international borders. Their relevance has been highlighted in the 2008 Doha Declaration and, in particular, by the adoption of the Sustainable Development Goals (SDGs) in 2015 ([IMF, 2021](#)). According to [Baum et al. \(2017\)](#), low-income countries will need to increase their annual public expenditure up to 30% of the gross domestic product (GDP) to achieve SDGs. In addition, the magnitude of such illicit flows has surpassed US\$1tn per annum since 2011 and, in 2013, it reached a peak of \$1.1tn ([Kar and Spanjers, 2014](#)). Thus, on one hand, IFFs ultimately narrow the national tax base, which in turn impairs the ability of the State to fund the provision of essential public services and infrastructures for economic development and growth ([World Bank, 2021](#)). On the other hand, weak and unaccountable states are unlikely to have strong motives to build fiscal capacity ([Besley and Persson, 2014](#); [Johannesen et al., 2020](#)).

The literature has documented the main sources of IFFs: revenues from illegal activities, tax avoidance, abusive profit-shifting and trade misinvoicing ([Hermes and Lensink, 1992](#); [Reuter, 2017](#); [Collin, 2020](#)). Among these sources, trade-related illicit flows are the largest component of IFFs, with fraudulent misinvoicing of trade transactions accounting for more than 80% of total IFFs ([OECD, 2020](#)). Thus, given their magnitude and harmful effects, understanding the possible origins of trade-related IFFs in L&MICs is of paramount importance for analysts and policymakers. Governments affected by this issue typically suffer shortages of domestic resources. For this reason, they critically need inflows of foreign direct investment (FDI) and international aid, and are thus caught in a situation of external dependence.

In this context, this article aims to contribute to the current literature by highlighting a set of factors that might fuel trade misinvoicing from L&MICs. To our knowledge, this piece of work is the first to directly associate FDI flows and aid inflows to trade-related IFFs, using a database constructed for a sample of 49 L&MICs spanning the period 2008–2017. Research findings showed that there is an association between relative increases in FDI flows and net official development assistance (ODA) inflows and a statistically significant increase in trade-related illicit capital outflows as a percentage of total trade (IFFT). However, in the case of FDI flows, these positive associations were only observed in the low-income cluster of countries. This finding might indicate the existence of multinational companies (MNCs) promoting the employment of FDI flows as drivers of trade-related IFFs in these countries. Also, the positive association between relative ODA inflows and IFFT were only observed in the cluster of lower-middle-income countries.

The rest of the article is organised as follows. In Section 2, we review the literature on the drivers of IFFs and examine potential connections between FDI and aid and IFFs. Next, in Section 3, the data and methodology are presented. Finally, we provide the estimation results in Section 4 and discussion and conclusions in Section 5.

## 2. Literature review

The key determinants of IFFs from L&MICs are a well-known combination of institutional, political and economic factors (UNICRI, 2018). Among the institutional factors, the main drivers of IFFs are weak institutions, low regulatory quality and a poor business environment (Cerra *et al.*, 2008; Kar and Freitas, 2012). In addition, some of the existing varieties of corruption could be considered either as channels or sources of IFFs (Gathii, 2019). This is particularly relevant in resource-rich countries, where pervasive rent-seeking behaviour in contexts of extractive institutions can also stimulate capital flight in the form of IFFs (Rodrik *et al.*, 2002; Ndikumana and Boyce, 2011). Moreover, political instability and risks, such as unpredictable changes in laws and regulations, are also as factors fuelling capital flight in general and IFFs in particular (Everest-Phillips, 2012). Among the economic factors, the primary drivers of IFFs are mainly those addressed in “investment diversion theory” (Ajayi, 1995; Lensink *et al.*, 1998; Beja, 2006; Le and Rishi, 2006), which basically highlights the investors’ search for higher risk-adjusted returns to assets. Research on the determinants of IFFs has also focused on two areas, not well developed, that are especially relevant for L&MICs:

- (1) how FDI flows are related to illicit capital outflows (Perez *et al.*, 2012; Ndikumana and Sarr, 2019); and
- (2) possible links between development aid inflows and IFFs (Asongu, 2012; Asongu and Jellal, 2013; Steinkamp and Westermann, 2021; Ensminger and Leder-Luis, 2022).

On the one hand, the experiences of L&MICs show that the inflow of FDI is a key economic instrument for economic development. Much has been written on the potential benefits that FDI brings to countries (Jordaan *et al.*, 2020) and the role of MNCs as institutions for generating revenues and employment (Asiedu, 2002). The pull of FDI has become a paramount issue within the development strategies of most developing and emerging economies, replacing current controls and restrictions over the entry of foreign MNCs with new policies that are designed to encourage FDI. Unfortunately for national governments, these forms of investor-friendly policies may have downsides. The pervasiveness of tax incentives significantly undermines tax revenue in L&MICs. However, this process would be, to a large extent, a spillover reaction to policies pursued in other countries, leading to a tax competition process or a “race to the bottom” (IMF, 2014). In addition, MNCs operating in these areas may eventually undermine economic growth. Because of the proliferation of intragroup transactions conducted at doctored prices, high profits end up being recorded in subsidiaries where tax rates are low, and low profits in places where they are high (Hines and Rice, 1994). MNCs respond to international differences in tax rates, not primarily by moving their factories to low-tax places, but by shifting paper profits to tax havens. Profit-shifting exploits frailties in the legal system that governs the taxation of multinational firms (Saez and Zucman, 2019). Furthermore, some L&MICs are highly reliant on a few MNCs and face aggressive tax planning and transfer mispricing by these corporations in their attempt to minimise or eliminate their tax payments. It has been reported that close to 40% of multinational profits were artificially shifted to tax havens in 2015 (Muchhala, 2018; Tørsløv *et al.*, 2018). As a result, tax avoidance and tax evasion are widely believed to be relevant factors limiting domestic revenue mobilisation (Fuest *et al.*, 2011). Moreover, the FDI outflows from L&MICs may be accelerated by a surge in “conduit” flows. These are flows routed through an intermediate country, such as the Netherlands or Switzerland, on the way to another country that may be a “fiscal haven”, and other forms of FDI outflows, such as intra-firm flows and corporate restructuring (Perez *et al.*, 2012; Ndikumana and Sarr, 2019).

Thus, the possible FDI-fuelled illicit capital flight phenomenon in the form of trade misinvoicing can be explained in several ways, among which are the following:

- In the case of exports-oriented FDI inflows, it is important to consider that they could be aimed at employing natural-resource-rich countries as transits of capital towards offshore financial centres. In these cases, the combination of weak institutions and relatively easily broken customs controls may facilitate the employment of export underinvoicing by MNCs as a channel for illicit capital flight (Perez *et al.*, 2012; Ndikumana and Sarr, 2019).
- In the case of complex-vertical FDI strategies, which are another kind of non-market seeking FDI, these investments could be directly associated with exports of intermediate inputs to third countries for further processing. This aspect may also incentivise MNCs to engage in exports underinvoicing (Fugazza *et al.*, 2014; Gnangnon, 2018).
- The complexity of MNCs in relation to ownership structure and residence may also lead to FDI outflows and trade misinvoicing being driven by a common, perhaps parallel, process. In this case, shell companies engaged in international trade and intra-MNCs transactions may facilitate the outflow of trade-related illicit capital flight in conjunction with MNCs' exports and investment outflows (Inter-agency Task Force on Financing for Development, 2020).

On the other hand, the inflows of ODA are other key components of development policies. However, the literature has revealed the existence of “perverse effects” of aid (Quazi, 2004; Asongu, 2012; Ravetti *et al.*, 2018; Steinkamp and Westermann, 2021) as well as settings in which the ineffectiveness of development aid was evident (Dreher *et al.*, 2015; Minasyan *et al.*, 2017). Further evidence has recently been obtained of “aid in reverse”, which leads to aid-fuelled illicit capital flight from recipient countries. For example, Andersen *et al.* (2021) showed that in a sample of the most aid-dependent countries in the world, there was an association, in the same quarter, between disbursements of aid and increases in the value of bank deposits in fiscal havens (amounting to 5–7.5% of aid flows). By contrast, there was no increase in deposits held in non-havens. Thus, IFFs may be stimulated by the foreign exchange cash component of received international aid, given that this kind of inflow represents, in a great number of cases, a substantial share of the foreign exchange available to central governments in L&MICs (Reuter, 2012). For example, Steinkamp and Westermann (2021) found that development aid in Nepal in the form of foreign exchange may, as a side effect, drive trade-related IFFs by import overinvoicing.

In addition, different types of international aid could be playing an active role in promoting IFFs from L&MICs. We can mention the “Aid for Trade” (AfT) initiative, which was formalised at the Hong Kong World Trade Organization (WTO) Ministerial Conference in December 2005. This initiative was based on the premise that trade and development policies are complementary, and that L&MICs would not be able to exploit the expanded trade opportunities offered by greater market access to the developed markets unless they address their supply side constraints (OECD/WTO, 2019). These constraints can take the form of inadequate or defective infrastructures, weak institutional structures and cumbersome customs procedures, among others. The AfT initiative was therefore introduced to assist L&MICs to strengthen their trade-related infrastructures, build their productive capacity and enable them to formulate and implement appropriate trade policies and regulations, while relaxing border-related policies and customs procedures (Nathoo *et al.*, 2021). Thus, although this kind of AfT may enhance and contribute to the diversification of exports in recipient countries, it should be recognised that, at least, part of this aid may also create conditions that are conducive to subverting these trade flows to channel illicit outflows from these recipient countries in the form of misinvoicing (Hühne *et al.*, 2014).

Given this background, the main hypotheses underlying this empirical study are as follows:

- FDI inflows and outflows in L&MICs could be used as drivers of illicit capital flows channelled through trade misinvoicing.
- ODA inflows could be also subverted in the form of IFFs through the employment of misinvoicing in merchandise trade.

### 3. Data and methods

With the aim of empirically analysing the nexus between FDI flows, ODA inflows and trade-related IFFs, we constructed a database that was mainly based on the report by Global Financial Integrity (GFI) *Trade-Related Illicit Financial Flows in 135 Developing Countries: 2008–2017* [Global Financial Integrity (GFI), 2020]. This report included a number of methodological changes in the estimation of IFFs that affect comparisons with data before that year. For this reason, the time span considered in this article covered the period 2008–2017. In this regard, the GFI's earlier measures of IFFs stemmed from two sources:

- (1) deliberate misinvoicing in merchandise trade; and
- (2) leakages in the balance of payments.

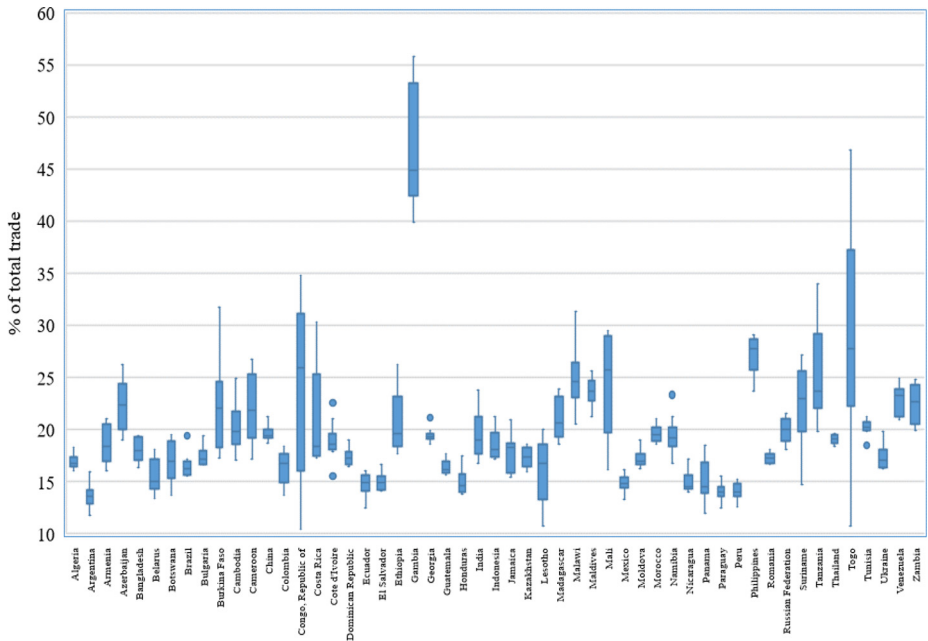
However, GFI recognised that of these two sources, trade misinvoicing is the primary measurable means for illicitly shifting funds in and out of L&MICs (i.e. it showed that more than 80% of illicit financial outflows were due to the misinvoicing of trade). As a result, trade misinvoicing was the only constituent of IFFs measured in our data.

The selection of countries included in the sample was determined by combining information available in GFI's report, the World Bank (WB) database (World Development Indicators), the UNCTADStat database and the Varieties of Democracy (V-Dem) Dataset. Thus, we selected a final sample of 49 L&MICs that included data on all the variables considered in the analysis. This sample allowed us to construct an unbalanced panel including the most populated countries, recently industrialised countries and many of the so-called emerging countries for which data were available on all the relevant variables under study.

Figures 1 and 2 show the evolution of the indicator of trade-related IFFs (IFFT) provided by GFI (2020) for the period 2008–2017 for both the individual countries included in the database constructed and the corresponding average for countries grouped by region.

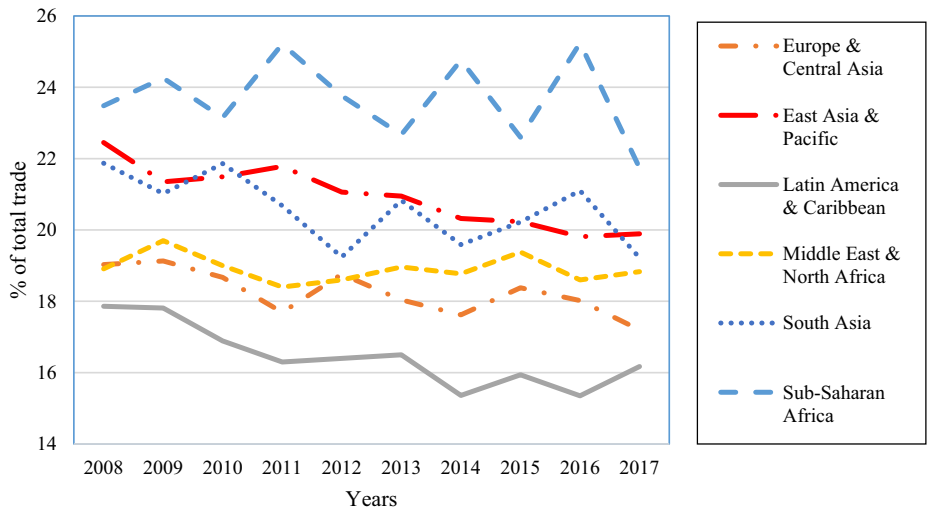
Figure 1 clearly shows that sub-Saharan (SSA) low-income countries like the Gambia, Togo and Mali were the countries hardest hit by huge trade-related IFFs within the period considered. Regarding the evolution of regional yearly averages (Figure 2), we also highlight the case of SSA, East Asia and Pacific (EAP) and South Asia (SA). Again, it is clear that illicit outflows of capital from L&MICs are concentrated in these three regions.

Figures 3–5 show the evolution by region of the yearly averages of net ODA inflows, net FDI inflows and net FDI outflows. Unfortunately, no disaggregate data for different kinds of ODA received was available for the countries in the sample for the entire period considered. Unsurprisingly, SSA countries, on average, exhibited the highest figures in net ODA inflows (as a percentage of gross national income (GNI), as reported by the World Bank) and net FDI inflows (as a percentage of the GDP, as reported by United Nations Conference on Trade and Development (UNCTAD)). Even more striking is the high value reached for the average ratio of net FDI outflows (also as a percentage of the GDP) in SSA countries, particularly in 2010 and 2012 (see Figure 5). In this regard, the case of Togo must be mentioned. Togo reached its peak in the relative size of FDI outflows in 2011, when it reached 32.7% of the GDP. In the period



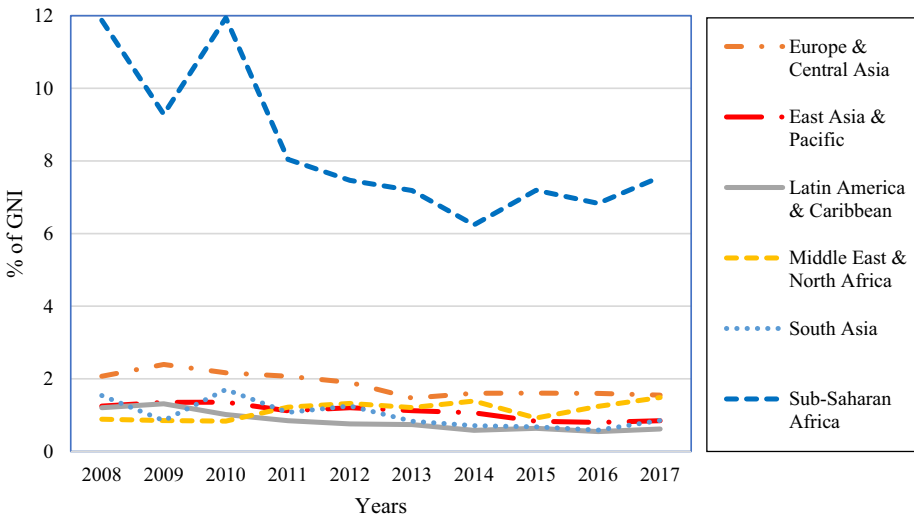
**Figure 1.**  
Trade-related illicit  
financial outflows

**Note:** Box-and-whisker plots for the period 2008–2017  
**Source:** Own work using data from GFI (2020)



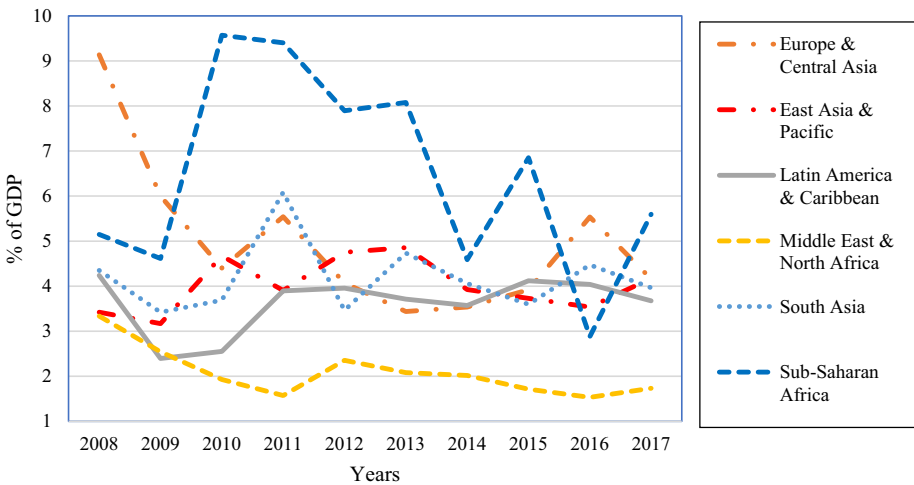
**Figure 2.**  
Trade-related illicit  
financial outflows

**Note:** Regional annual averages  
**Source:** Own work using data from GFI (2020)



**Note:** Regional annual averages  
**Source:** Own work using data from World Bank

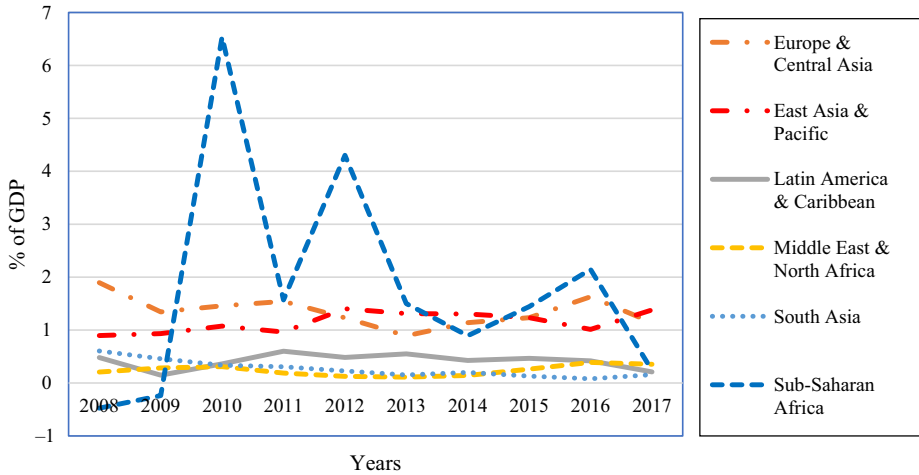
**Figure 3.**  
 Net ODA inflows



**Note:** Regional annual averages  
**Source:** Own work using data from UNCTAD

**Figure 4.**  
 Net FDI inflows

2011–2015, this figure oscillated between 8% and 11% of the GDP. These figures show that this country, which is known to be among the poorest and most vulnerable economies in the world, was actively exporting capital in the form of FDI outflows in these years. This information led us to look for the possible existence in some low-income countries of important drivers of FDI outflows not traditionally integrated in the theories of foreign investment or in optimal capital allocation models.



**Figure 5.**  
Net FDI outflows

**Note:** Regional annual averages  
**Source:** Own work using data from UNCTAD

To disentangle the possible association between trade misinvoicing (IFFT as a ratio of total trade) and net flows of ODA received (ODA as a ratio of the GNI), net inflows of FDI (FDI-in) and net outflows of FDI (FDI-out) as ratios of GDP, we propose the following empirical baseline model:

$$IFFT_{it} = \mu_i + \alpha ODA_{it} + \beta FDI - in_{it-1} + \gamma FDI - out_{it} + \delta_j X_{jit} + \varepsilon_{it} \quad (1)$$

where (t) are time periods and (i) are countries in the sample (see Table 1). All the variables in equation (1) are defined in Table 2. Note that the exact definition of each variable of interest in Model (1) is conditioned on the original data sources used (GFI, WB and UNCTAD). This explains differences in the set of variables used to relativize them.

A vector for unobserved country-specific effects ( $\mu_i$ ) was also included in equation (1) to control for the joint effect of any omitted time-invariant variables.  $X_{jit}$  represents a set of (j) control variables, which include the following, recognised in the literature as proxies for the main drivers of IFFs (UNICRI, 2018):  $OME_{it}$  (ores and metals exports as a ratio of total merchandise exports), which is a proxy for a country's overall dependence on resources;  $INF_{it}$  annual inflation rate, which is a proxy for the economic stability of a country; and  $Corruption_{it}$ , which is not only a proxy for overall political corruption in a country, but is also associated with other socioeconomic variables, such as the quality of governance and institutions and other institutional factors. Note that we have assumed a lagged effect of changes in relative FDI inflows on IFFT, assuming that it takes time (at least one year) before the change in FDI inflows may have an impact on the relative size of illicit financial outflows (i.e. it is assumed that it takes at least one year before FDI inflows may foster trade flows, which can be subsequently subverted in the form of illicit misinvoicing).

The estimation strategy used was as follows. Firstly, we used the fixed-effects (FE) estimator in equation (1). However, the FE estimator is consistent if the regressors are correlated with the country-level individual effects. Thus, the Breusch and Pagan Lagrangian multiplier test for random effects is used to test the appropriateness of random effects (RE). Nevertheless, it is important to remember that the FE estimation is inefficient, and could also be inconsistent

<i>Sub-Saharan Africa (SSA)</i>	<i>Latin America and Caribbean (LAC)</i>	<i>Europe and Central Asia (ECA)</i>	<i>East Asia and Pacific (EAP)</i>	<i>Middle East and North Africa (MENA)</i>	<i>South Asia (SA)</i>
Botswana (UM)	Argentina (UM)	Armenia (UM)	Cambodia (LM)	Algeria (LM)	Bangladesh (LM)
Burkina Faso (LI)	Brazil (UM)	Azerbaijan (UM)	China (UM)	Morocco (LM)	India (LM)
Cameroon (LM)	Colombia (UM)	Belarus (UM)	Indonesia (LM)	Tunisia (LM)	Maldives (UM)
Congo (LM)	Costa Rica (UM)	Georgia (UM)	Philippines (LM)		
Cote d'Ivoire (LM)	Dom. Rep. (UM)	Kazakhstan (UM)	Thailand (UM)		
Ethiopia (LI)	Ecuador (UM)	Moldova (UM)			
Gambia (LI)	El Salvador (LM)	Ukraine (LM)			
Lesotho (LM)	Guatemala (UM)				
Madagascar (LI)	Honduras (LM)				
Malawi (LI)	Jamaica (UM)				
Mali (LI)	Mexico (UM)				
Namibia (UM)	Nicaragua (LM)				
Tanzania (LM)	Panama (UM)				
Togo (LI)	Paraguay (UM)				
Zambia (LM)	Peru (UM)				
	Suriname (UM)				
	Venezuela (UM)				

**Notes:** (LI) indicates that the country belongs to World Bank's (WB) low-income cluster; (LM) refers to lower-middle-income countries; and (UM) refers to upper-middle-income countries. [United Nations \(2022\)](#), World Bank

**Source:** Table created by author

**Table 1.**  
Low- and middle-income countries in the sample

Variables	Mean	Max	Min
IFFT <sub>it</sub> (total value gaps in trade, % of total trade)	19.31	55.78	10.43
OME <sub>it</sub> (ores and metals exports, % of merchandise exports)	8.56	84.78	0.01
INF <sub>it</sub> (inflation rate %, annual)	6.67	75.28	-20.63
Corruption <sub>it</sub> [Index, from less corrupt (0) to more corrupt (1)]	0.61	0.96	0.10
LI <sub>i</sub> (= 1 for low-income countries; = 0 otherwise)	0.11	1	0
LM <sub>i</sub> (= 1 for lower-middle-income countries; = 0 otherwise)	0.35	1	0
UM <sub>i</sub> (= 1 for upper-middle-income countries; = 0 otherwise)	0.54	1	0
ODA <sub>it</sub> (net ODA received, % of GNI)	2.37	24.68	-0.48
ODA <sub>it</sub> (net ODA received, % of GNI) LI <sub>i</sub>	1.07	24.68	0
ODA <sub>it</sub> (net ODA received, % of GNI) LM <sub>i</sub>	0.84	14.56	-0.05
ODA <sub>it</sub> (net ODA received, % of GNI) UM <sub>i</sub>	0.46	7.40	-0.48
FDI <sub>in</sub> <sub>it-1</sub> (net inflows, % of GDP)	4.01	18.82	-6.55
FDI <sub>in</sub> <sub>it-1</sub> (net inflows, % of GDP) LI <sub>i</sub>	0.46	18.82	-1.03
FDI <sub>in</sub> <sub>it-1</sub> (net inflows, % of GDP) LM <sub>i</sub>	1.26	16.36	-0.61
FDI <sub>in</sub> <sub>it-1</sub> (net inflows, % of GDP) UM <sub>i</sub>	2.29	15.27	-6.55
FDI <sub>out</sub> <sub>it</sub> (net outflows, % of GDP)	0.77	32.70	-4.27
FDI <sub>out</sub> <sub>it</sub> (net outflows, % of GDP) LI <sub>i</sub>	0.17	32.70	-4.13
FDI <sub>out</sub> <sub>it</sub> (net outflows, % of GDP) LM <sub>i</sub>	0.18	9.10	-3.59
FDI <sub>out</sub> <sub>it</sub> (net outflows, % of GDP) UM <sub>i</sub>	0.42	6.80	-4.27

**Notes:** Data sources: (IFFT) [Global Financial Integrity \(2020\)](#); (OME) World Bank/World Development Indicators; (INF) World Bank/World Development Indicators; (Corruption) [Coppedge et al. \(2021\)](#); (ODA) World Bank/World Development Indicators; (FDI) UNCTADStat; [United Nations \(2022\)](#), World Bank  
**Source:** Table created by author (unbalanced panel, 49 countries over the period 2008–2017. # of observations: 405)

**Table 2.**  
Sample statistics of the variables

because of the existence of measurement errors in the explanatory variables and/or the possible correlation between regressors and the random disturbance term deriving from their potential endogenous character. In this instance, an alternative estimator is necessary. As proposed by [Griliches and Hausman \(1986\)](#), a consistent procedure to estimate coefficients in models in levels is to express variables in first differences and use instrumental variable estimators using instruments uncorrelated with the disturbance term but highly correlated with the regressors. Thus, to address potential endogeneity concerns, after the OLS estimation of [equation \(1\)](#) in first differences, the two-step generalised method of moments (GMM) estimator is finally used using the `ivreg2` routine in Stata ([Baum et al., 2006](#)). If the model is overidentified, the Hansen J test statistic for overidentifying restrictions is a test for the joint validity of the instruments set used.

#### 4. Results of the estimations

Firstly, the FE estimator was used to estimate [equation \(1\)](#). As shown in [Table 3](#) (column [1]), country-level effects were adequately modelled by the FE estimator against the alternative RE estimator (the null hypothesis was rejected at a 5% cutoff using the Breusch–Pagan Lagrangian test for random effects). In addition, no collinearity problem was suspected among independent variables in [equation \(1\)](#), given that the highest correlation coefficient computed was 0.28 in the case of variables FDI<sub>in</sub><sub>it</sub> and FDI<sub>out</sub><sub>it</sub>. All the remaining coefficients of correlation were lower than 0.18 in absolute values. Moreover, the [Belsley et al. \(1980\)](#) condition number obtained is not indicative of collinearity. Also, the estimation of the FE model in levels not suffers from the presence of serial correlation in the residuals (see statistics  $m_1$  and  $m_2$  in [Table 3](#)).

The results of the FE estimation suggest a positive association between the variables IFFT and lagged net FDI inflows and net FDI outflows. This means that an increase in any of these variables would be associated with an increase in the ratio of trade-related IFFs to total trade. In

Regressors (independent variables) and statistics	Levels		First differences		Levels		First differences	
	Fixed effects	OLS	Fixed effects	OLS	Fixed effects	OLS	Fixed effects	OLS
	Coefficient (p-value)	Coefficient (p-value)	Coefficient (p-value)	Coefficient (p-value)	Coefficient (p-value)	Coefficient (p-value)	Coefficient (p-value)	Coefficient (p-value)
	[1]	[2]	[3]	[4]	[5]	[6]		
$OME_{it}$	0.083 (0.220)	0.133** (0.020)	0.083* (0.073)	0.104** (0.048)	0.169** (0.009)	0.142** (0.009)		
$INF_{it}$	-0.016 (0.410)	-0.027 (0.163)	-0.007 (0.621)	-0.013 (0.520)	-0.025 (0.211)	-0.025 (0.152)		
<i>Corruption</i>	-1.567 (0.532)	-1.053 (0.732)	-1.778 (0.458)	-2.219 (0.396)	-1.708 (0.637)	-1.536 (0.653)		
$ODA_{it}$	0.278 (0.110)	0.468* (0.062)	0.390** (0.010)	-	-	-		
$(ODA \cdot LD)_{it}$	-	-	-	0.178 (0.356)	0.215 (0.328)	0.262 (0.191)		
$(ODA \cdot LM)_{it}$	-	-	-	0.478** (0.036)	0.924** (0.023)	0.972*** (0.000)		
$(ODA \cdot UM)_{it}$	-	-	-	0.383** (0.035)	0.168 (0.591)	0.156 (0.567)		
$FDI_{in,it-1}$	-	-	-	-	-	-		
$FDI_{in,LJ,it-1}$	0.277** (0.024)	0.182 (0.196)	0.260** (0.033)	0.697*** (0.000)	0.481** (0.019)	0.497** (0.004)		
$(FDI_{in} \cdot LM)_{it-1}$	-	-	-	0.177*** (0.001)	-0.046 (0.928)	0.102 (0.822)		
$(FDI_{in} \cdot UM)_{it-1}$	-	-	-	0.024 (0.746)	0.010 (0.911)	0.248 (0.734)		
$FDI_{out,it}$	0.514** (0.003)	0.496** (0.022)	0.391** (0.022)	-	-	-		
$(FDI_{out} \cdot LJ)_{it}$	-	-	-	0.623*** (0.000)	0.609*** (0.001)	0.521** (0.003)		
$(FDI_{out} \cdot LM)_{it}$	-	-	-	0.004 (0.986)	-0.281 (0.575)	-0.163 (0.566)		
$(FDI_{out} \cdot UM)_{it}$	-	-	-	0.122 (0.592)	0.484** (0.024)	0.552*** (0.001)		
$m_1$ (p-value)	-0.48 (0.631)	-2.54** (0.011)	-1.49 (0.135)	-1.01 (0.313)	-2.75** (0.006)	-1.74* (0.081)		
$m_2$ (p-value)	0.33 (0.741)	1.29 (0.198)	1.00 (0.316)	0.22 (0.825)	1.22 (0.221)	0.97 (0.330)		
CN	3.23	-	-	3.50	-	-		
Breusch-Pagan (p-value)	689.44*** (0.000)	-	-	695.46*** (0.000)	-	-		
Hansen J statistic (p-value)	-	-	9.61 (0.476)	-	-	6.91 (0.938)		
# Observations	405	351	341	405	351	348		

**Notes:** The dependent variable is  $IFFT_{it}$  (trade-related IFTs as a percentage of total trade). Period 2008–2017. Unbalanced panel. Maximum observations per country 9, minimum 1. Heteroskedasticity-Autocorrelation consistent standard errors, clustered at the country level.  $m_1$  and  $m_2$  are the Arellano-Bond autocorrelation tests of first and second order, respectively. The null is no autocorrelation. CN is the condition number (Belsley et al., 1980). Breusch-Pagan is the Lagrangian multiplier test for random effects. A rejection of the null hypothesis indicates that the fixed effects (FE) model is consistent. Hansen J statistic evaluates the validity of the instruments set, testing for over-identifying restrictions. In columns [3] and [6], the instruments used was lagged values of independent variables in levels and the first differences of the following variables: the log of per capita GDP and the Corruption Perception Index level. In addition, the first difference of the rate of total exports to GDP and total imports to GDP were also included as instruments in column [3]. \*Denotes significance at the 10% level, \*\*at the 5% level and \*\*\*at the 1% level

**Table 3.**  
Estimates of the regression models

other words, the possible positive effect of FDI flows on total trade would be outweighed in this case by the simultaneous escalating effect of these variables on trade-related IFFs. Also note that the estimated effect was concentrated in the year following the entry of FDI, and is thus consistent with a causal interpretation (i.e. FDI inflows cause higher IFFT, but not vice versa).

As mentioned, an alternative GMM estimator was used to provide robust estimates for [equation \(1\)](#). The corresponding test of overidentifying restrictions is not significant, i.e. the set of instruments used was valid. As shown in [Table 3](#) (column [3]), in the case of relative FDI flows, the estimated two-step GMM coefficients are quite similar to those presented in column [1]. However, in the case of relative net ODA received, in contrast with OLS estimates exhibited in column [1], a positive and significant association was detected between this variable and IFFT. Also, as expected, a significant and positive association between the variable measuring the importance of the variable ores and metals exports (as a percentage of merchandise exports) and IFFT was detected.

Nevertheless, it is important to remember that these findings are mean effects for the whole sample of countries. Furthermore, it is reasonable to assume that medium- and low-income countries do not have identically structured trade-related IFFs processes. For this reason, an alternative augmented specification of [equation \(1\)](#) was estimated, including the interaction effects between the variables of interest and a vector of dummies constructed based on the UN clustering criterion according to countries' income levels in 2022 (see [Tables 2](#) and [3](#), columns [4]–[6]). The two-step GMM results presented in [Table 3](#), column [6], suggest that the observed effects of net ODA inflows on the IFFT were restricted to the cluster of lower-middle-income countries. The estimation results also show that relative net FDI inflows also have a lagged effect on the IFFT, but only in the case of countries belonging to the low-income cluster. The estimations result also suggest a positive association between relative FDI outflows and the IFFT in the case of countries belonging to the upper-middle and low-income clusters.

Thus, research findings support that FDI flows (in- and out-flows), in the case of low-income countries, may have the potential side effect of triggering misinvoicing financial outflows, outweighing its potential impacts on total trade. This effect has been observed in countries belonging to the upper-middle-income cluster but only in the case of relative FDI outflows. No conclusive evidence was observed for a generalised effect of these variables on IFFs in the rest of countries in the sample.

## 5. Discussion and conclusions

The use of false invoicing in commercial operations may lead to conditions that are conducive to channelling illicit outflows from L&MICs. This aspect implies that there would be some downsides to some forms of trade and investor-friendly policies in L&MICs. Given that most of these unrecorded outflows take place through the international trade system, misinvoicing may set the stage for FDI flows to act as key conduits of IFFs, being misinvoicing a mass-scale channelling of illicit outflows into tax havens.

In this regard, the results suggest the existence in low-income countries of a positive association between FDI inflows in a given year and increases in the IFFT in the following year. The logic of this association relies on the fact that FDI inflows may enhance total trade; if so, they may also fuel trade-related IFFs over total trade. Little attention has been paid to the possibility that FDI flows from the periphery of the world economy could be a significant conduit of IFFs ([Perez et al., 2012](#)). Given this possible background, the results also suggest a positive association between FDI outflows and trade-related IFFs in low-income countries.

Although recognising that ODA is a critical factor in helping L&MICs achieve sustainable growth, the positive association found between ODA and the IFFT adds to the debate by raising the issue of the real effectiveness of foreign aid on development in the

cluster of middle-income countries (Dreher and Lohmann, 2015; OECD/WTO, 2019). In this case, it is relevant to consider the following points:

- AfT programmes represent a large share of net ODA received in L&MICs (about 30% of total ODA according to the OECD/WTO, 2019). Although it is important to recognise that the highest proportion of AfT refers to infrastructure and investments in productive capacity, part of this export-enhancing ODA could be also fuelling IFFs through the use of misinvoicing practices. Interestingly, Hühne *et al.* (2014) found that smallest subcategory of AfT (i.e. the “trade policy and regulations” subcategory) appears to be particularly effective: a doubling would be associated with a 10 % increase in recipient exports. This is in line with similar findings by Cali and TeVelde (2011) and Helble *et al.* (2012).
- More important indeed is to remark that there is evidence that development aid in the form of foreign exchange may, as a side effect, drive trade-related IFFs by import overinvoicing in Nepal, a lower-middle-income country according to UN (Steinkamp and Westermann, 2021).

Thus, a globalised economy, with its global corporations, global supply chains and global markets, provides an overarching context in which IFFs can take place. Under these circumstances, the achievement of sustainable growth critically hinges on the countries’ capacity for the mobilisation of domestic and external resources. However, the existence of cases in which the inflow of external resources was coincident with across-the-board increases of capital movement from recipient countries would suggest that these inflows of foreign capital would be fuelling outflows of capital, indeed acting as conduits of trade-related IFFs. On the light of research findings obtained in this article, this harmful effect is especially important in the low-income cluster of countries.

Given the foregoing, this article contributes to the current evidence in support of the notion that FDI flows could be related to IFFs from low-income countries, as suggested in other studies (Ndikumana and Sarr, 2019; Orkoh *et al.*, 2017). This possibility takes advantage of capital-starved environments to stimulate growth in these countries, which are especially vulnerable to profit shifting, prone to multinational tax planning activities and exposed to the role played by offshore investment hubs (Fuest *et al.*, 2011; UNCTAD, 2015).

In this regard, the structure of the incentives generated by current tax systems – which affect the operations of MNCs in low-income countries – would promote mitigating the tax burden in the MNCs’ home country through the employment of different practices and conduits, among which trade misinvoicing could be an option. Moreover, in the case of lower-middle-income countries, a significant association was found between foreign aid and IFFs, thus supporting the previous evidence on this issue for individual countries (Quazi, 2004; Steinkamp and Westermann, 2021). These findings may also substantiate the concerns expressed in previous research about the potential unintended effects of aid on capital flight from developing countries. In the light of this, it is crucial to further investigate the possible side effects of diverse kinds of ODA to better understand this link between IFFs and ODA. This issue warrants further study. Given that a serious limitation of macro studies is that disaggregate FDI and ODA data are not available for most L&MICs, further microevidence is needed to reveal the exact mechanisms which might explain the observed positive associations between FDI, ODA and trade-related illicit financial flows, especially in poorest countries.

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### Further reading

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