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Combatting money laundering: does implementing the Financial Action Task Force recommendations bite?

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Contents

Acronyms and abbreviations

AML/CFT	Anti-Money Laundering / Countering the Financing of Terrorism (also used for Combatting the Financing of Terrorism)
CIF	Cost Insurance, and Freight
FATF	Financial Action Task Force
FOB	Free On Board
IFF	Illicit Financial Flow
TBML	Trade Based Money Laundering
UN	United Nations
VAT	Value Added Tax

Summary

The Financial Action Task Force (FATF) focuses on combatting money laundering. In February 2012, it codified its recommendations, 'FATF Recommendations 2012', consisting of a framework of measures and international standards to combat money laundering and terrorist financing. Once a country agrees to follow the recommendations, it has to produce its anti-money laundering (AML) framework that FATF can assess. In this paper, we attempt to answer a simple question: is this working? We look at a group of eight countries in Africa and the Middle East that in the 2012–2020 period have voluntarily agreed to implement these recommendations. Using a 'difference in difference' methodology, we test whether suspected illicit financial flows (IFF), measured through the trade-gap methods, decline after the decision to implement FATF recommendations. Our results point to a reduction of the trade gap characterising tax avoidance through import under-invoicing and/or Trade Based Money Laundering (TBML) through export over-invoicing.

1. Introduction

The Financial Action Task Force (FATF) is an intergovernmental organisation that focuses on combatting money laundering and terrorist financing. Cross-border money laundering is of particular concern for governments and international agencies because it provides criminal organisations with the opportunity to expand beyond their domestic base (FATF, 2006). In February 2012, the FATF codified the 'FATF Recommendations 2012', consisting of a framework of measures and international standards to combat money laundering and terrorist financing (FATF, 2012–2021). Since the initial launch, the recommendations have been updated regularly.[1] Alongside this, the FATF also published a methodology for assessing compliance with the FATF recommendations and the effectiveness of Anti-Money Laundering / Countering the Financing of Terrorism (AFL/CFT) systems in each country. This methodology covers two main areas: the effectiveness of a country's framework in combatting money laundering; and technical compliance with the recommendations (FATF, 2013–2021). In order to demonstrate compliance, once a country agrees to follow the recommendations, it is required to establish an anti-money laundering (AML) framework that can be assessed by FATF in line with this methodology. Failing to demonstrate compliance can result in a country being blacklisted or grey-listed. Blacklisted countries, such as Iran and North Korea, face heavy consequences and are cut off from the global financial system.[2] Grey-listed countries might face difficulties when interacting with international institutions such as the International Monetary Fund (IMF) and the World Bank as well as some governments and the European Union (EU).[3,4]

Hence, the FATF recommendations represent one of the few coordinated defence systems against the internationalisation of organised crime and terrorist groups. This paper attempts to answer an essential question for policy-makers, international organisations and the wider communities interested in combatting money laundering: are these recommendations effective? We suggest that because of the nature of the recommendations and the methodology used to assess compliance, which increases the scrutiny of financial services overall, these recommendations have the potential to curb many kinds of illicit financial flows (IFF), not only the international money laundering that is their stated target. This is in line with the FATF recommendations that include tax

[1] The recommendations were last updated in October 2021.

[2] https://www.fatf-gafi.org/publications/high-risk-and-other-monitored-jurisdictions/?hf=10&b=0&s=desc(fatf_releasedate)

[3] https://www.fatf-gafi.org/publications/high-risk-and-other-monitored-jurisdictions/documents/increased-monitoring-march-2022.html

[4] As an example, the European Union Directive (EU) 2015/849 Article 29 stipulates: 'Member States should at least provide for enhanced customer due diligence measures to be applied by the obliged entities when dealing with natural persons or legal entities established in high-risk third countries identified by the Commission. Reliance on third parties established in such high-risk third countries should also be prohibited. Countries not included in the list should not be automatically considered to have effective AML/CFT systems and natural persons or legal entities established in such countries should be assessed on a risk-sensitive basis'. https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32015L0849

avoidance—a potentially large share of IFF—as predicates of money laundering (FATF 2012–2021). In 2016, following a public hearing of the European Parliament Committee of Inquiry into Money Laundering, Tax Avoidance and Tax Evasion, David Lewis, the FATF executive secretary at the time, wrote: 'Tax evasion is a predicate offence for money laundering …. That means that implementing the FATF standards supports effort to stop tax evasion'.[5]

In this paper, we measure IFF through what is called 'the trade gap method',[6] which has been increasingly used over the last 15 years for such purposes (Ferwerda et al., 2013; Cobham et al., 2021). In essence, the method compares the flow of goods reported by the exporting country and the importing country. When discrepancies appear, researchers strongly suspect the existence of underlying illegal activities related to trade, for example tax avoidance and/or trade-based money laundering (TBML) (Fisman & Wei, 2004). A positive trade gap, when the value of the recorded export is above the value of the recorded import, points to the under-valuation of import or the over-valuation of export, or both.[7] The under-valuation of import often originates in tariff avoidance; the over-valuation of export in abuse of a subsidies system or fraud related to value added tax (VAT) exemptions. Both can be related to TBML, a form of cross-border money laundering using trade flows to move financial assets from one country to another.[8] A negative trade gap, by convention when the value of the recorded import is above the value of the recorded export, points towards the over-valuation of import or the under-valuation of export, or both. The over-valuation of import can be related to abuse of a subsidies system and/or access to advantageous foreign exchange rates; the under-valuation of export to export-tax avoidance. Both can also be related to TBML (see FATF (2006) for case studies).

The hypothesis we test in this paper is: does the implementation of FATF recommendations reduce trade gaps? We test this using a 'difference-in-difference' methodology on a small number of African and Middle Eastern countries that have implemented FATF recommendations since 2012. The advantage of this methodology is to identify and measure causal effect. Essentially, it compares the trade gaps before and after the implementation of the recommendations (first difference) and between countries that have and have not implemented the recommendations (second difference). Essential to its validity are the assumptions of parallel trend and exogeneity of the event that might produce a change in our dependent variable (Cunningham, 2021). In our case, this means, first, that countries before adopting the reform should follow similar economic trends; and second, that the adoption of the FATF recommendations should not be influenced by the economic agents realising IFF. We discuss and test for these two elements in section 3.

[5] https://www.europarl.europa.eu/cmsdata/112269/Replies_FATF_en.pdf

[6] Also called mirror statistics methods.

[7] This convention was introduced in the seminal paper by Fisman & Wei (2004). We return in detail on the calculation of the trade gaps in discussing our data.

[8] Other forms of international or cross-border money laundering are by using the financial system or cash couriers (FATF, 2006).

Our paper contributes to two strands of literature. The first is concerned with the economics of financial crime, in particular money laundering (Masciandaro, 1999; Takáts, 2009; Zdanowicz, 2009; Ferwerda et al., 2020, Rossel et al., 2021). In this area, work by Ferwerda (2009) is the closest to our study. His research attempts to determine the impact of FATF recommendations on general crime data, and so is not limited to money laundering or terrorism financing. Key to his analysis is the potential for money laundering to facilitate other crimes, and he finds a positive relation between the implementation of FATF recommendations and a reduction of crime for a group of mainly advanced economies. This result is encouraging for researchers and others interested in the effectiveness of the measures despite some endogeneity issues, namely the possibility that other factors influence the reduction of crimes observed. We adopt a similar approach here where we test whether FATF recommendations have an impact on IFF beyond those targeted, though not because of a 'trickle-down effect, [9] as in the case Ferwerda presents, but rather because of the wide scope of some of the recommendations. Moreover, unlike Ferwerda (2009), we focus on low- and middle-income economies, and use a methodology that solves some of the endogeneity issues identified in his research.

Because our measurement of IFF is capturing international transactions related to tax avoidance, our research contributes to a second strand of the economics literature related to this phenomenon. International trade in developing economies, and particularly on the African continent and the Middle East, has been connected to widespread and consequent tariff avoidance, potentially representing a large part of the IFF emanating from these regions. Most research in this area has focused on the factors enabling this tax avoidance, from taxation policies to one-stop border crossing; however, none has looked at the impact of FATF recommendations in trying to curb it (see Bensassi & Siu (2021) for a short literature review).

Our paper is organised as follows: section 2 is dedicated to our data set, in particular we introduce a word of caution and explain why the trade gap method is an imprecise measure of TBML. Section 3 presents the methodology, followed by the results in section 4, including some robustness checks, before concluding in section 5 with a summary of our findings and some policy recommendations. Our results show that the FATF recommendations implemented by the importing country have a sizeable impact (-18%) on reducing trade gaps originating from either import under-invoicing and/or export over-invoicing. However, the effect does not seem to last beyond the first year in which the new AML systems are implemented. These results suggest that if tax avoidance is considered a more widespread phenomenon than TBML, a policy directed against a specific type of crime can have positive spill-over effects in related crimes. While we are confident that our research enables us to show a significant reduction of the trade gaps, it is worth underlining that our results are exploratory and should be treated with caution, particularly in view of the small number of countries in our sample.

[9] In Ferwerda (2006), the effect of the recommendations on crime in general is hypothesised to decline from the impact of the recommendations on crime financing. It 'trickles down' to general crime. Here, our focus is on the direct impact of the recommendations.

2. Data

2.1. The trade gaps

For this analysis, we collect data between 2014 and 2020 from eight countries in the Middle East and Africa: Botswana, Ethiopia, Ghana, Morocco, Senegal, Tunisia, Turkey, Zambia, and Zimbabwe. We compile trade gap data as outlined by Fisman and Wei (2004), explained below, using the UN Comtrade database.[10] We retrieve export and import data[11] based on the Harmonized System (HS) 6-digit 2012 classification of goods and compute the following:

$$Gap_{i,j,n,t} = log(export_{i,j,n,t}) - log(import_{j,i,n,t}) \quad (1)$$

where trade gap (Gap) of sector *n* between country *i* and *j* at period *t* is the difference between log export of sector *n* from country *i* to country *j* at period *t* reported by the exporting country and log import of sector *n* from country *i* to country *j* at period *t* reported by the importing country.

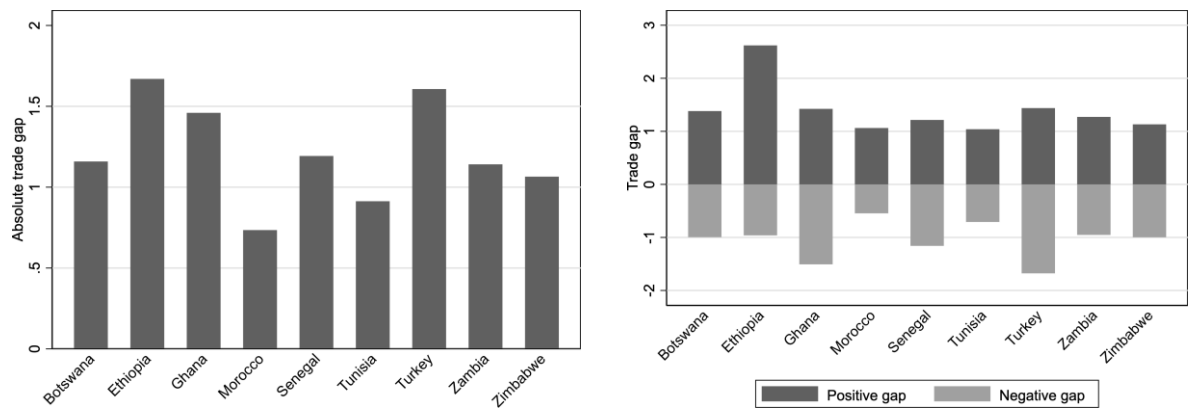
As shown in Fisman and Wei (2004), the trade gap calculated by equation (1) can result in either positive or negative figures depending on the over-estimation or under-estimation made by the exporting or the importing country. A positive gap is when country *i*'s export to country *j* reported by country *i* is larger than country *j*'s import from country *i* reported by country *j*. Hence, a higher positive gap can reflect, among other things, tariff evasion through the under-reporting of imports by the importing country or abuse of subsidies or VAT defrauding through the over-invoicing of export by the exporting county, or both. A negative gap is when country *i*'s export to country *j* reported by country *i* is smaller than country *j*'s import from country *i* reported by country *j*. In this case, a smaller negative gap (higher negative value) represents, among other things, capital flight through over-reporting of import or the under-reporting of export from country *i* to country *j*, for example if the export is taxed. In our analysis, we compute the absolute trade gap ($Gap_{absolute}$) to account for the overall trade gap caused by both countries. Then we disaggregate our trade-gap data into positive gap (*Gap+*) and negative gap *(Gap–)* to see which factor drives the evasion. All trade-gap variables are in the natural logarithm.[12]

[10] https://comtrade.un.org/

[11] We exclude re-import and re-export as the data is far less consistent for low- and middle-income countries (Golub, 2012).

[12] More precisely we are using the natural logarithm of the absolute value of the total trade gap, positive and negative.

Figure 1: Trade gap by country

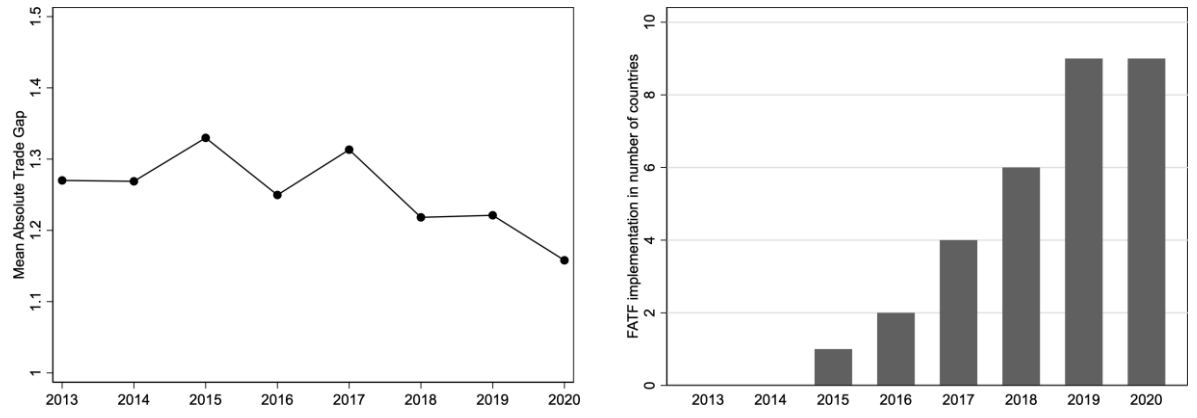


(a) Absolute gap (b) Positive and negative gap

Notes: The plots display the average trade gap data by country prior to the FATF implementation. Trade-gap data are computed using equation (1). Panel (a) compute the absolute value of trade-gap data, while Panel (b) disaggregate the data into positive and negative gaps.

Figure 1 illustrates the average trade-gap data by country prior to the FATF implementation. Panel (a) shows the absolute trade gap, while Panel (b) disaggregates the data into a positive and negative gap. On average, most countries in our dataset have a roughly similar magnitude of trade gap, although some countries (such as Ethiopia and Turkey) have slightly higher figures, while others (such as Morocco and Tunisia) have a slightly smaller trade gap. The pattern remains consistent when we disaggregate the data into positive and negative gaps. Ethiopia's positive trade gap as well as Turkey's negative trade gap stand out relative to other countries. On the other hand, Morocco and Tunisia have a smaller negative trade gap.

Figure 2: Trends of trade gap and FATF implementation



(a) Trade-gap trend (b) FATF implementation trend

Notes: The plot displays the trend of absolute trade gap (Panel a) and FATF implementation in number of countries (Panel b) between 2013 and 2020, respectively. Trade-gap data are computed using equation (1).

When we look at the trends, Panel (a) in Figure 2 shows an overall declining trend of trade gap between 2013 and 2020. If we compare this figure with Panel (b) in Figure 2, we can infer that the declining trend of trade gap coincides with the increasing number of countries implementing FATF recommendations in our sample. By 2020, Panel (b) in Figure 2 shows that all countries in our sample have implemented FATF regulations.

Our analysis also collects macroeconomic variables used as controls. These macroeconomic data—namely GDP growth, CPI inflation, current account balance and log income—are retrieved from the World Bank's World Development Indicators.[13] The initial dates of FATF implementation and the effectiveness of AML measures are collected from the FATF.[14]

2.2. A word of caution: why the trade-gap method imprecisely measures Trade Based Money Laundering

The aim of the FATF is to combat money laundering defined as 'the processing of the[se] criminal proceeds to disguise their illegal origin'. In its 2006 report on TBML, the FATF recognises the difficulty of addressing TBML and exemplifies the variety of schemes criminal organisations have deployed to transfer illegally earned assets from one country to another (FATF, 2006). FATF's 2020 and 2021 reports on TBML complete the 2006 report and summarise the main 'red flags' that the respective authorities can put in place to identify TBML (FATF, 2020; FATF, 2021).

A particular difficulty for researchers interested in measuring TBML arises from the fact that in most instances TBML requires cooperation between the two parties engaged in a cross-border transaction. For example, a criminal organisation is willing to transfer ill-gotten assets from country A to country B. It is connected to an exporter in country B and an importer in country A. One method the criminal organisation can use to transfer its illicit assets out of the country is for the importer to over-invoice by exaggerating the value of the goods imported or the quantity imported. The importer will pay for the over-valued good, transferring the sum agreed to the exporter in country B. In country B, the exporter pays its supplier the actual value of the goods and then transfers the remaining funds to the criminal organisation. An essential element from the perspective of trade data is that the exporter and the importer can report coherent quantities and values to their respective customs authority, i.e. with very little discrepancy. Unless the customs authority inspects the cargo linked to the specific transaction, this trade flow will not be revealed by the trade-gap methods we use in this paper.

This is a very different case from fraud related to tax avoidance at national borders that does not require collaboration between exporters and importers but relies on bribe payments to customs agents to record erroneous quantities or values at one end of the transaction (or record nothing at all). For example, positive trade gaps, defined by a value of exports superior to the value of imports for the same goods, can arise from under-valuation of imports in order to avoid tariff payment from the importer and/or

[13] https://databank.worldbank.org/source/world-development-indicators

[14] www.fatf-gafi.org

over-valuation of export to benefit from VAT exemption or export subsidies. Negative trade gaps may be expected and therefore not related to fraud if they have a limited value. This is because imports are recorded cost of freight and insurance included (CIF) while exports are reported free on board (FOB). However, large negative trade gaps might translate into the over-invoicing of imports, possibly to benefit from advantageous official exchange rates or, perhaps, under-invoicing of exports to avoid export tax. In all these cases, there is a transfer of financial value that is not related to the real value of the exchanged goods that could be used in connection with TBML. Again, it is important to note that the trade-gap method will not record all the instances of TBML, but might mainly capture operations related to tax avoidance as well as honest mistakes related to bad reporting of data. Hence, although we shed some light on the impact of FATF recommendations on tax avoidance and TBML, we cannot assert conclusively that our results apply to every kind of TBML flows.

Nonetheless, we suggest that the FATF recommendations might have an impact on the IFF captured through the trade-gap method even if tax avoidance is the main motivation for the discrepancies observed. In particular, the recommendations under the section on preventive measures in the FATF recommendation (section D in the 2012 report) in the sections related to customer due diligence and record keeping (sub-headings 10 and 11) correspondent banking (sub-heading 13), money or value transfer services (sub-heading 14) and wire transfer (sub-heading 15) might make financial transactions related to the observed discrepancies more suspicious (FATF 2012–2021). We test this hypothesis in the reminder of this paper.

3. Identification Strategies

3.1. Methodology

To examine the effect of regulation on TBML, we exploit the implementation of FATF recommendations in eight Middle East and African countries. This selection provides a set of counterfactuals for how a trade gap would have evolved in the absence of FATF implementation, allowing us to disentangle the effect of this regulation on trade gaps from other forces shaping this variable.

We use a 'difference-in-difference' estimation to isolate the causal effect of FATF implementation on trade gaps. The first difference corresponds to the within-sector country-pair transformation by demeaning the variables of interest. The second difference aims at removing any confounding factors by examining the difference between country-pairs that become subject to FATF recommendations and those that do not. Formally, we estimate:

$$Gap_{i,j,n,t} = \alpha + \beta 1 \cdot FATF_{i,t-1} + \gamma \cdot X_{i,t-1} + \delta \cdot Z_{j,t-1} + \varphi_{i,j,n} + \varphi_t + \mu_{i,j,n,t} \quad (2)$$

where i, j, n and t denote reporter country, partner country, sector, and relative period, respectively; $Gap_{i,j,n,t}$ denotes the trade gap of bilateral trade of sector n between country i and country j at period t; $FATF_{i,t-1}$ is an indicator variable, which is equal to one after the implementation of FATF in country i at period t and zero otherwise; $X_{i,t-1}$ and $Z_{j,t-1}$ are reporter and partner country's control variables, respectively, to account for unobservable heterogeneity and linear country trends; $\varphi_{i,j,n}$ and φ_t are sector country-pair and year fixed effects, respectively; and $\mu_{i,j,n,t}$ is the error term. The standard errors are clustered at sector country-pair level as suggested by Bertrand et al. (2004).

3.2. The exogeneity of FATF implementation

Equation (2) relies on the exogenous assumption in a difference-in-difference estimation setting.

We notice that although the FATF recommendations were announced in 2012 and the assessment methodology was published in 2013, countries' participation and implementation of the recommendations are mainly voluntary (FATF 2012–2021; FATF 2013–2021). By 2020, 105 countries had accepted the recommendations, increasing to 120 countries by 2021. This voluntary participation reduces the possibility of anticipation by the public (anticipation bias) and of changing their behaviour before the implementation of the recommendation. In many cases, FATF does not publish plans or events leading to the participation. Even when it makes some public statements prior to a country's participation, it does not mention any strict timeline regarding its participation. Therefore, it is difficult for the general public to predict when a country will finally agree to implement the FATF recommendations.

In addition to the unlikely anticipation effect, the choice of countries in our analysis focuses on countries in the Middle East and Africa that have relatively weak institutional strengths, reflected in high levels of corruption, slow bureaucracy, and less effective government, as measured by Transparency International[15] and the World Bank.[16] This institutional factor, combined with low income levels, provides incentives for traders to maximise their earnings. These countries are also relatively less integrated into global supply chains, thus maintaining little motivation for firms to enforce AML standards. Hence, the presence of FATF implementation acts as an exogenous shock that forces traders in these countries to follow the rules (Sharman, 2011). This is different in most advanced economies or those well integrated into global supply chains where the decision to avoid money laundering is usually endogenously determined by domestic traders in order to maintain their international reputations and to remain engaged in international transactions (Rossel et al., 2021; Menon, 2022).

Here, we formally check this assumption further by regressing the likelihood of FATF implementation on several regressors, namely trade-gap and macroeconomic factors. Table 1 reports the regression results. We find no evidence of a significant effect of a trade gap on FATF implementation, which diminishes the potential simultaneous relationship between trade gaps and FATF implementation. However, given that some macroeconomic factors are statistically significant and there is a linkage between macroeconomic factors and trade decisions, our sector country-pair-level difference-in-difference specifications control for observed variations in economic conditions in both reporting and partner countries.

Table 1: Determinants of FATF Implementation

	Absolute gap		Positive gap		Negative gap	
	(1)	(2)	(3)	(4)	(5)	(6)
Gap (t-1)	-0.0021	-0.0026	0.0017	0.0020	-0.0021	-0.0034
	(-0.57)	(-0.80)	(0.35)	(0.51)	(-0.47)	(-0.86)
Reporter's current account (t-1)		0.0221***		0.0243***		0.0210***
		(16.10)		(13.21)		(9.24)
Reporter's inflation (t-1)		-0.0019***		-0.0024***		-0.0015***
		(-18.23)		(-14.31)		(-8.69)
Reporter's GDP growth (t-1)		0.0403***		0.0370***		0.0439***
		(20.23)		(13.32)		(12.51)
Reporter's income (t-1)		-2.8346***		-3.7759***		-1.5530***
		(-17.47)		(-21.12)		(-4.67)
Partner's current account (t-1)		-0.0059***		-0.0063***		-0.0072***
		(-4.00)		(-2.66)		(-3.53)
Partner's inflation (t-1)		0.0007***		0.0007***		0.0008***
		(6.66)		(4.09)		(4.16)
Partner's GDP growth (t-1)		0.0170***		0.0209***		0.0149***
		(9.87)		(6.74)		(5.92)
Partner's income (t-1)		0.8809***		0.8362***		0.9605***
		(7.69)		(4.73)		(4.63)
Observations	7,405	7,405	3,643	3,643	3,762	3,762
R-squared	0.6321	0.7004	0.6188	0.7103	0.6374	0.6910
Sector country-pair FE	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES

Note: *** stands for significance at 1%, ** 5% and *10%

[15] https://www.transparency.org/en/cpi/2020

[16] https://govdata360.worldbank.org/indicators/h580f9aa5?country=BRA&indicator=388&viz=line_chart&years=1996,2020

3.3. Comparability of treated and control groups

Our empirical setting requires the comparability of the treated and control groups prior to the exogenous shock. In other words, it is important that the treated and the control groups exhibit similar characteristics prior to the FATF implementation since the analysis seeks to identify its causal effect. Panel A in Table 2 reports the summary statistics of all samples and pre-FATF samples as well as data sources. Panel B in Table 2 shows the descriptive statistics of each country prior to the FATF implementation. Several inferences can be drawn from these statistics. First, all countries except for Botswana had a negative current account balance prior to the FATF implementation. Most countries had single-digit negative figures that are close to the overall pre-FATF average of –4.10% of GDP. The majority of countries also had high single-digit inflation with average figure of 6.2%. The annual GDP growth of these countries ranged between 2% and 10% and the average pre-FATF growth was 4%. Finally, the natural logarithm of GDP per capita figures also looks very similar, between 7.187 and 11.240 with average of 9.706.

Table 2: Statistics: Treated and control group comparison

Panel A: Summary statistics and data sources

Variable	All sample				Pre-FATF sample				Source
	Mean	Std. Dev.	Min	Max	Mean	Std. Dev.	Min	Max	
Absolute gap	1.097	1.451	0.000	11.288	1.196	1.518	0.000	12.138	Comtrade
Positive gap	1.196	1.509	0.000	11.288	1.297	1.574	0.000	12.138	Comtrade
Negative gap	-1.003	1.386	-9.853	0.000	-1.096	1.454	-9.853	0.000	Comtrade
Reporter's current account	-4.004	4.955	-11.971	13.433	-4.104	4.318	-13.874	10.944	WDI
Reporter's inflation	23.154	84.077	-2.431	557.210	6.153	5.642	-2.431	17.870	WDI
Reporter's GDP growth	3.144	3.827	-8.493	10.392	4.104	2.642	-5.718	10.392	WDI
Reporter's income	9.682	1.778	7.082	13.603	9.706	1.735	7.175	13.587	WDI
Partner's current account	-3.606	4.376	-11.971	13.433	-4.273	4.283	-13.874	10.944	WDI
Partner's inflation	19.847	73.971	-2.431	557.210	9.305	26.155	-2.431	255.290	WDI
Partner's GDP growth	2.917	3.582	-8.493	10.392	4.003	2.848	-6.144	10.392	WDI
Partner's income	9.663	1.214	7.082	13.603	9.635	1.266	7.162	13.603	WDI

Panel B: Sample country comparison

Statistics	Botswana	Ethiopia	Ghana	Morocco	Senegal	Tunisia	Turkey	Zambia	Zimbabwe
Current account									
Mean	6.521	-11.165	-4.897	-3.713	-6.717	-8.280	-2.874	-1.528	-6.742
Median	5.592	-11.715	-5.042	-3.676	-7.269	-8.328	-3.109	-1.427	-7.998
Std. Dev	3.022	0.659	1.823	0.982	2.090	0.249	2.003	2.055	4.627
Inflation									
Mean	3.375	8.467	13.405	1.164	0.679	4.378	11.255	9.405	-0.422
Median	3.308	9.569	12.372	1.558	0.461	4.437	11.144	7.807	-0.198
Std. Dev	0.567	1.321	3.736	0.602	0.436	0.562	3.537	3.595	1.437
GDP growth									
Mean	2.543	10.337	5.019	3.080	6.573	1.854	4.343	3.628	2.510
Median	4.003	10.392	6.200	3.149	6.356	1.117	3.323	3.777	1.989
Std. Dev	4.604	0.067	2.291	1.217	0.477	1.026	2.429	1.329	1.453
Income									
Mean	11.240	9.532	8.494	10.179	13.535	8.985	9.913	8.976	7.187
Median	11.259	9.562	8.465	10.178	13.555	8.991	9.954	8.978	7.182
Std. Dev	0.028	0.035	0.044	0.024	0.042	0.010	0.060	0.011	0.012

Overall, there are many economic similarities between the countries in the sample, primarily due to their geographic proximity and comparable income level. Therefore, the patterns in the data indicate the conditions for drawing valid inferences are met.

4. Results

4.1. Baseline results

Table 3 reports the results of our main specification (equation 2). Column 1 reports the result without control variables and shows the negative and statistically significant effect of FATF on overall trade gap. Economically, it implies that for importing countries under the FATF regime, the absolute trade gap is reduced by 12% relative to the implied counterfactual. Next, we include control variables in equation 2. Column 2 presents the estimate and shows that FATF reduces the trade gap by 11.8%. The result is significant at the 5% level. This result is consistent with our 'no control' estimate and confirms that our findings are not due to a 'bad controls' phenomenon.[17] Overall, this evidence reflects a lower evasion gap under the FATF regime.

Table 3: Baseline trade gap and FATF implementation results

Dependent variable:	Absolute gap		Positive gap		Negative gap	
	(1)	(2)	(3)	(4)	(5)	(6)
FATF dummy (t-1)	-0.1130**	-0.1118**	-0.1628**	-0.1412*	0.0864	0.1072
	(-2.42)	(-2.36)	(-2.16)	(-1.89)	(1.22)	(1.42)
Reporter's current account (t-1)		0.0113**		0.0003		-0.0179**
		(2.08)		(0.04)		(-2.46)
Reporter's inflation (t-1)		0.0004		0.0026**		0.0009
		(0.58)		(2.20)		(0.99)
Reporter's GDP growth (t-1)		0.0054		0.0237		-0.0043
		(0.62)		(1.53)		(-0.33)
Reporter's income (t-1)		0.1958		0.4368		0.1797
		(0.33)		(0.37)		(0.22)
Partner's current account (t-1)		-0.0054		-0.0231**		-0.0138
		(-0.87)		(-2.25)		(-1.63)
Partner's inflation (t-1)		0.0010*		0.0028***		-0.0004
		(1.80)		(3.11)		(-0.45)
Partner's GDP growth (t-1)		0.0024		0.0125		-0.0032
		(0.28)		(0.99)		(-0.27)
Partner's income (t-1)		0.5431		0.3294		-1.1016
		(0.75)		(0.28)		(-0.96)
Observations	7,405	7,405	3,643	3,643	3,762	3,762
R-squared	0.0028	0.0047	0.0049	0.0129	0.0028	0.0074
Sector country-pair FE	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES

Note: *** stands for significance at 1%, ** 5% and *10%

[17] '…some variables when added to the regression equation, can produce unintended discrepancies between the regression coefficient and the effect that the coefficient is expected to represent. Such variables have become known as "bad controls", to be distinguished from "good controls" (also known as "confounders" or "deconfounders") which are variables that must be added to the regression equation to eliminate what came to be known as "omitted variable bias" (OVB)'. http://causality.cs.ucla.edu/blog/index.php/category/bad-control/#:~:text=If%20you%20were%20trained%20in,to%20the%20parameter%20of%20interest

Next, we turn our analysis to investigate whether the reduction of evasion gap under the FATF regime is driven by import under-reporting/export over-reporting (positive gap) or import over-reporting/export under-reporting (negative gap). Column 3 presents the estimate of positive gap regression without control variables. The result shows a negative and statistically significant effect of FATF on positive gaps. The result is confirmed further by the regression result in Column 4, which includes control variables. Economically, the estimates show 15%–18% less import under-reporting/export over-reporting after FATF implementation, while Columns 5 and 6 show the effect of FATF on import over-reporting/export under-reporting (negative gap). The results report a positive but statistically insignificant FATF effect on the outcome variable. Overall, our results imply that the reduction of the evasion gap after the implementation of FATF is only driven by import under-reporting/export over-reporting and not by import over-reporting/export under-reporting.

Among the control variable, we find the reporter's current account is positively correlated with an absolute gap but negatively correlated with a negative gap, while the reporter's inflation has a positive effect on positive gap. There is a negative association between the partner country's current account and a positive gap, while the partner country's inflation is positively correlated with a positive gap.

Recent econometric literature also points out the potential bias arising from event analysis study with staggered exogenous shocks (Sun & Abraham, 2021). To examine this problem, we complement our baseline analysis by conducting a non-parametric analysis using Sun and Abraham's (2021) interaction-weighted (IW) estimator and examine the effect of FATF on the absolute gap. This method relies on the weighted average of 'cohort-specific average treatment effects on the treated' for a particular event group and their relative time periods and is robust to heterogeneous treatment effects across cohorts. Hence, this approach is suitable for the staggered FATF implementation in our data, which may suffer potential bias due to the heterogeneity and differential timing of the FATF shock.

Table 4: Interaction-weighted estimator

Panel A: Estimated weights of individual cohorts

	Relative period (t)						
Year cohort	**-4**	**-3**	**-2**	**0**	**1**	**2**	**3**
2015				0.0819	0.0780	0.1501	0.2004
2016	0.1034	0.0723	0.0727	0.0995	0.1220	0.2354	0.3152
2017	0.1173	0.2025	0.2068	0.2002	0.2049	0.4060	0.4843
2018	0.1494	0.3176	0.3103	0.2646	0.3106	0.2085	
2019	0.6299	0.4077	0.4102	0.3538	0.2846		

Panel A: Interaction-weighted difference-in-difference estimates

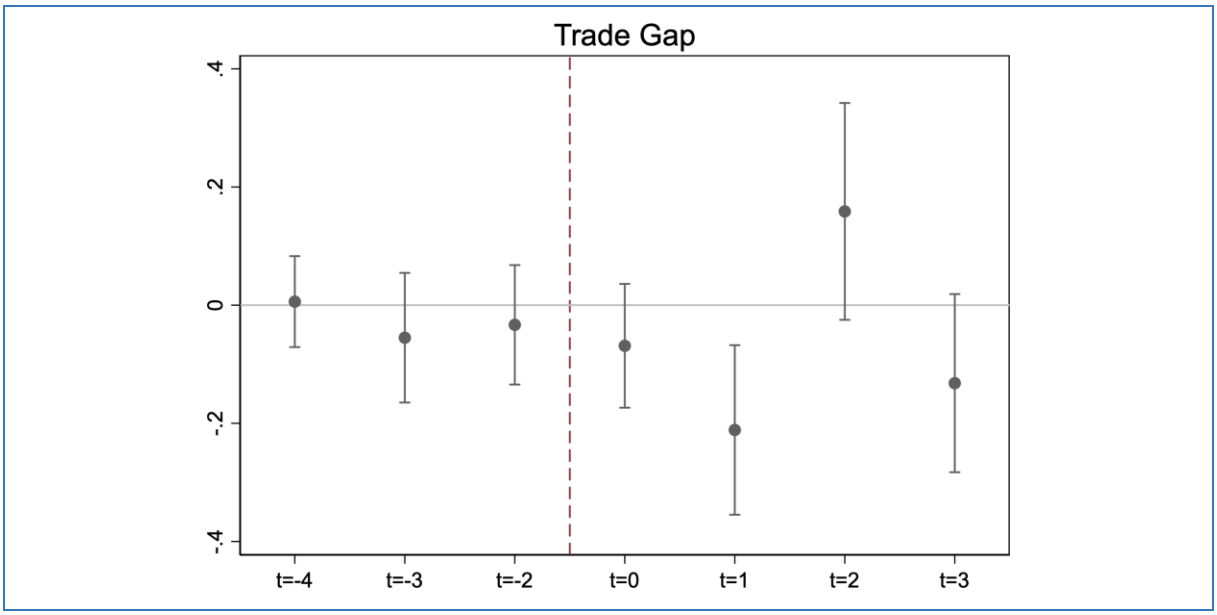
	Relative period (t)						
Statistics	**-4**	**-3**	**-2**	**0**	**1**	**2**	**3**
Dynamic coefficients	0.0060	-0.0551	-0.0333	-0.0688	-0.2112***	0.1587*	-0.1321*
t-values	(0.15)	(-0.98)	(-0.65)	(-1.29)	(-2.88)	(1.69)	(-1.72)

Note: *** stands for significance at 1%, ** 5% and *10%

Since our relative time period spans between t = −7 and t = 5, we bin the distant relative periods as suggested by Sun and Abraham (2021). Specifically, we trim observations where t < −4 and t > 3 and focus our analysis on the period −4 ≤ t ≤ 3. Nor do we include t = −1 in the model to avoid perfect multicollinearity. Panel A in Table 4 shows the estimated weights of individual cohorts. The contribution of each cohort in each relative period ranges between 7.3% and 62.3% with a mean of 24.1%. In particular, relative periods between t = −3 and t = 3 show our data are evenly distributed across cohorts.

These weights are then interacted with the FATF dummy estimated at cohort level to obtain the interaction-weighted difference-in-difference estimates. Panel B in Table 4 reports the results. The results show prior to the FATF implementation (t < 0), all dynamic coefficients are statistically insignificant. At t = 1, the coefficient has a negative value and is statistically significant at 5% level. Economically, the coefficient magnitude is similar to our baseline result, implying a 23.5% lower evasion gap after the FATF implementation. At t = 2, the coefficient becomes positive. However, the magnitude is smaller than that of t = 1 and the result is only significant at 10% level. At t = 3, the coefficient becomes negative again, even though is still significant at 10% level. Figure 3 illustrates the dynamic coefficients of our interaction-weighted difference-in-difference estimates.

Figure 3: Sun and Abraham (2021) interaction-weighted difference-in-difference



Notes: Non-parametric analysis using Sun and Abraham (2021) interaction-weighted difference-in-difference estimator. The results are reported in this figure at 95% level of confidence.

Overall, the effect of the implementation of the FATF recommendations seems to ebb after the first year of implementation. Figure 3 shows that at 95% level of confidence the effect is no more significant in years 2 and 3.

4.2. Effect by product

Fisman and Wei (2004) suggest evasion may take the forms of under-reporting the value of imports and reporting a higher-taxed product as a lower-taxed variety. Fisman and Wei (2004) further add that while high tax and duties tend to encourage evasion, the introduction of exemptions such as duty-free items or tax breaks lower the incentives for evasion. As a validation check, we examine whether FATF is more effective for higher-value products subject to higher duties and exempted goods are insensitive to the rule. To do this, we classify our evasion gap data based on their product category, namely: 1) chemicals and raw materials; 2) food and animal products; 3) machinery and transport; 4) manufactured goods; and 5) other miscellaneous goods. Then, we re-estimate equation (2) using these reclassified evasion gap variables as the dependent variables.

Table 5: FATF implementation and product type

Panel A: Effects of FATF implementation on trade gap by product type

Product type:	Chemicals and raw materials (1)	Food and animal products (2)	Machinery and transport (3)	Manufactured goods (4)	Others (5)
FATF dummy (t-1)	-0.1218	-0.0996	-0.2633*	-0.0125	-0.2520*
	(-1.20)	(-0.92)	(-1.67)	(-0.16)	(-1.80)
	(0.64)	(0.57)	(2.16)	(-1.07)	(0.40)
Observations	1,571	1,558	664	2,741	875
R-squared	0.0112	0.0200	0.0450	0.0083	0.0317
Sector country-pair FE	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES

Panel B: Average absolute trade gap by product type

Product type:	Chemicals and raw materials (1)	Food and animal products (2)	Machinery and transport (3)	Manufactured goods (4)	Others (5)
Before FATF	0.9636	1.0324	1.2641	1.2251	1.2623
After FATF	0.8250	0.9597	1.1646	1.1078	1.0938

Panel A in Table 5 reports the results. Column 1 shows a negative but insignificant correlation between FATF and evasion of chemicals and raw materials products. This insignificant correlation may be due to tariff exemptions implemented in several countries, such as Zambia (exemptions for pharmaceuticals, chemicals in bulk, and fertilisers), Turkey (reduced duties or exemptions for certain raw materials and intermediary inputs) and Morocco (reduced duties for raw materials that require local assembling).[18] Similarly, column 2 in Table 5 shows food and animal products that have lower value-added and relatively low import duties are also insignificantly correlated with FATF despite the negative sign. Turkey, for instance, imposes VAT between 1% and 8% only for most agricultural products.

[18] Online Appendix Table 10 provides the overview of trade regulations in each country. The rest of this sub-section refers to the information provided in this table.

The effect of FATF on the evasion in machinery and transport products is negative and statistically significant at 10% level (column 3). Economically, the evasion gap is reduced by 30.1% under the FATF regime. Most of this evasion may be driven by luxury automobiles, such as seen in Tunisia, which imposes up to 360% tax on luxury cars. This evidence further supports the findings of Fisman and Wei (2004) that products subject to higher duties and taxation tend to be exposed to evasion. Column 4 reports an insignificant negative effect of FATF on manufactured goods. This may also be explained by numerous exemptions given to this type of product (such as in Tunisia and Zambia). Finally, evasion in other miscellaneous items is lower by 28.7% after the implementation of FATF and the result is significant at 5% level.

In summary, our results show that FATF tends to be more effective in sectors subject to higher duties and taxation that are more prone to evasion. Conversely, FATF is less sensitive where the incentives for evasion are already low. Panel B of Table 5 confirms these findings further, where the absolute gaps of chemicals and raw materials, food and animal products, and manufactured goods are lower than those of machinery and transport as well as other miscellaneous items.

4.3. FATF implementation in the partner country

So far, our empirical evidence shows the significant effect of FATF on a country's evasion gap. In particular, our results show lower level of import under-reporting/export over-reporting after the implementation of FATF in the reporting country. Now, our discussion moves to the potential effect of FATF on the partner country. If FATF has a significant effect on the partner country, it shows FATF not only benefits the adopting country, but also its trade partners. If this is the case, then FATF has multiplier effect in combatting tax evasion. To test this potential, we invert our identification strategy by assigning FATF dummy where a country's partner implements FATF. For example, in the previous case, FATF is equal to one where country *i* adopts FATF at date. Now, FATF is equal to one where country *j*, which is country *i*'s trading partner, adopts FATF at date instead.

Table 6: FATF implementation from partner perspective

Dependent variable:	Absolute gap (1)	Positive gap (2)	Negative gap (3)
FATF dummy	0.0009	0.0500	0.1302
	(0.01)	(0.47)	(1.38)
Observations	7,006	3,449	3,557
R-squared	0.0033	0.0114	0.0082
Sector country-pair FE	YES	YES	YES
Year FE	YES	YES	YES

Table 6 reports the results of this test. The results show the FATF dummy has insignificant effects on absolute gap, positive gap, and negative gap, respectively. This evidence implies no FATF effect on a country's trading partner and confirms the absence of a FATF multiplier effect in combating tax evasion.

4.4. Does FATF discourage trade?

The literature shows that institutional reforms to reduce tax evasion can have unintended consequences (e.g. Cremer & Gahvari, 2000; Javorcik & Narciso, 2017). Similarly, the effort to reduce evasion through FATF compliance may adversely affect and discourage the conduct of international trade. So far, our empirical evidence suggests the negative effect of FATF on an evasion gap. To test the potential unintended consequences of FATF on international tests, we regress total exports and imports on the regressors defined by equation (2).

Table 7: Effects on trade

Dependent variable:	Import (1)	Export (2)
FATF dummy	0.0378	0.0480
	(0.64)	(0.84)
Observations	6,967	6,969
R-squared	0.0132	0.0082
Sector country-pair FE	YES	YES
Year FE	YES	YES

Table 7 reports the results. Column 1 shows no evidence of lower imports after the implementation of FATF. Similarly, column 2 reports no adverse effect of FATF on exports. Together, these findings confirm that, despite its effectiveness in reducing tax evasion, FATF has no unintended consequences on international trade.

5. Robustness

This section provides sensitivity checks to rule out potential threats to identification and alternative explanations. First, it is possible that tax evaders anticipated the introduction of the FATF recommendations. In this case, they may have begun reducing their evasion before the FATF recommendations were officially implemented. This would make it more difficult to reject the null hypothesis and bias downward our estimates. To inspect whether anticipation is present in the data, we construct a placebo dummy equal to 1 at t = −1 or one year prior to the FATF implementation in each country. Table 8 presents estimates of equation (2) using the placebo dummy instead of the FATF dummy variable. Overall, we find little evidence of anticipatory behaviour as the placebo interactions are insignificant in all regressions.

Table 8: Anticipation effects

Dependent variable:	Absolute gap (1)	Positive gap (2)	Negative gap (3)
Placebo dummy	-0.0542	-0.0960	0.0061
	(-1.45)	(-1.53)	(0.10)
Observations	7,405	3,643	3,762
R-squared	0.0041	0.0125	0.0064
Sector country-pair FE	YES	YES	YES
Year FE	YES	YES	YES

When analysing bilateral country relationships, Baltagi et al. (2003) suggest using country-pair fixed effects as the best specification. Country-pair fixed effects capture the heterogeneity of each bilateral trade pair, while country-level fixed effects capture the heterogeneity only of either the reporting or the partner country. Nevertheless, we conduct additional tests to examine whether our results still hold when using these alternative specifications. Specifically, we estimate equation (2) with both reporting and partner country fixed effects. The results show evidence of negative and significant effect of FATF on both absolute gap and positive gap.

Table 9: Alternative specifications

Dependent variable:	Absolute gap	Reporter FE Positive gap	Negative gap	Absolute gap	Partner FE Positive gap	Negative gap
	(1)	(2)	(3)	(4)	(5)	(6)
FATF dummy (t-1)	-0.0662**	-0.1392	0.0497	-0.0693	-0.2217**	0.0112
	(-2.55)	(-1.31)	(0.34)	(-1.53)	(-2.52)	(0.15)
Reporter's current account (t-1)	-0.0053	0.0025	0.0065	-0.0008	0.0128	-0.0020
	(-0.88)	(0.17)	(0.51)	(-0.12)	(0.73)	(-0.16)
Reporter's inflation (t-1)	0.0013*	0.0021	-0.0025*	0.0013	0.0021	-0.0026
	(2.24)	(1.44)	(-2.05)	(1.28)	(1.83)	(-1.07)
Reporter's GDP growth (t-1)	0.0061	0.0035	-0.0229	0.0085	-0.0186*	-0.0327
	(0.39)	(0.16)	(-0.73)	(1.15)	(-2.06)	(-1.50)
Reporter's income (t-1)	1.9104	-0.7307	0.7616	1.1444*	2.8598	1.9125
	(0.96)	(-0.17)	(0.16)	(2.21)	(1.58)	(0.89)
Partner's current account (t-1)	-0.0072	0.0011	-0.0128	-0.0069	0.0076	-0.0161
	(-1.16)	(0.06)	(-1.09)	(-0.92)	(0.43)	(-1.21)
Partner's inflation (t-1)	0.0007	0.0013	-0.0021**	0.0005	0.0016*	-0.0028***
	(1.61)	(0.87)	(-2.54)	(1.12)	(1.92)	(-4.31)
Partner's GDP growth (t-1)	0.0017	0.0103	0.0235	0.0071	0.0219	0.0047
	(0.15)	(0.75)	(1.28)	(0.96)	(1.24)	(0.15)
Partner's income (t-1)	0.4716	2.0487	-6.8821**	-0.6138	-0.6905	-2.9378
	(0.46)	(1.09)	(-2.44)	(-0.37)	(-0.30)	(-0.52)
Observations	5,548	2,776	2,770	5,548	2,776	2,770
R-squared	0.0049	0.0316	0.0325	0.0036	0.0265	0.0220
Partner FE	YES	YES	YES	NO	NO	NO
Reporter FE	NO	NO	NO	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES

6. Conclusion

This paper aimed to determine the impact of FATF implementation on IFF in the context of eight countries in Africa and the Middle East. We found that the implementation of the FATF recommendations reduces positive trade gaps, by either importer under-invoicing and/or exporter over-invoicing. This impact could be related to the wide scope of the FATF recommendations, in particular the preventive measures might make tax avoidance or evasion more difficult by forcing exporters and importers to present financial information coherent with the information they report to the respective customs authority. As mentioned in the introduction, this is in line with the 2012 recommendations (FATF 2012–2021) that see tax crimes as predicates for money laundering. To the best of our knowledge, our paper is the first to show the impact of the FATF recommendations on tax avoidance. While our results need to be seen as exploratory and treated with caution, given the limited sample of countries studied, the findings are promising.

In our context, we suspect importer under-invoicing is a more important vector of IFF, as this phenomenon is well known to regularly occur in these two regions (Golub, 2012). We cannot, however, confirm this through our study and further research is needed to clarify this point. The fact that the impact of the implementation is potentially short-lived shows that fraudulent firms and fraudulent financial institutions might have adapted to the new rules. Further research is also required to understand how they adapt and whether institutional monitoring is effective.

In terms of recommendations, this research supports an expansion of the number of countries adopting the FATF recommendations despite the controversies concerning the source of the regulatory drive towards anti-money laundering (Menon, 2022). Moreover, continuous collaboration in the process of implementation of the recommendations between countries having more resilient AML systems and countries in the process of building theirs might help sustain the positive impact of the adoption of the FATF recommendations we observe.

References

Baltagi, B. H., Egger, P., & Pfaffermayr, M. (2003). A generalized design for bilateral trade flow models. *Economics Letters*, *80*(3), 391–397. https://doi.org/10.1016/S0165-1765(03)00115-0

Bensassi, S., & Siu, J. (2021). Quantifying missing and hidden trade: An economic perspective. In M. Gallien, & F. Weigand (Eds.), *The Routledge handbook of smuggling* (1st edn., pp. 61–76).

Bertrand, M., Duflo, E., & Mullainathan, S. (2004). How much should we trust differences-in-differences estimates? *The Quarterly Journal of Economics*, *119*(1), 249–275. https://doi.org/10.1162/003355304772839588

Cobham, A., Jansky, P., & Mares, J. (2021). *Illicit financial flows and trade mispricing: Decomposing the trade reporting gap* (Working Papers IES 2021/26). Charles University Prague, Faculty of Social Sciences, Institute of Economic Studies.

Cremer, H., & Gahvari, F. (2000). Tax evasion, fiscal competition and economic integration. *European Economic Review*, *44*(9), 1633–1657. https://doi.org/10.1016/S0014-2921(99)00025-2

Cunningham, S. (2021). *Causal inference: the mix tape*. Yale University Press.

FATF. (2006). *Trade based money laundering*. Financial Action Task Force.

FATF – Egmont Group. (2020). *Trade-based money laundering: Trends and developments*. Financial Action Task Force.

FATF – Egmont Group. (2021). *Trade-based money laundering: Risk indicators*. Financial Action Task Force.

FATF (2013–2020). *Methodology for assessing technical compliance with the FATF recommendations and the effectiveness of AML/CFT systems*. Financial Action Task Force.

FATF (2012–2021). *International standards on combating money laundering and the financing of terrorism & proliferation*. Financial Action Task Force.

Ferwerda, J. (2009). The economics of crime and money laundering: Does anti-money laundering policy reduce crime?. *Review of Law & Economics*, *5*(2), 903–929. https://doi.org/10.2202/1555-5879.1421

Ferwerda, J., Kattenberg, M., Chang, H.-H., Unger, B., Groot, L., & Bikker, J. A. (2013). Gravity models of trade-based money laundering. *Applied Economics*, *45*(22), 3170–3182. https://doi.org/10.1080/00036846.2012.699190

Ferwerda, J., van Saase, A., Unger, B., & Getzner, M. (2020). Estimating money laundering flows with a gravity model-based simulation. *Scientific Reports*, *10*, Article 18552. https://doi.org/10.1038/s41598-020-75653-x

Fisman, R., & Wei, S. (2004). Tax rates and tax evasion: Evidence from 'missing imports' in China. *Journal of Political Economy*, *112*(2), 471–496. https://doi.org/10.1086/381476

Golub, S.S. (2012). Entrepôt trade and smuggling in West Africa: Benin, Togo and Nigeria. *The World Economy*, *35*, 1139–1161. https://doi.org/10.1111/j.1467-9701.2012.01469.x

Javorcik, B. S., & Narciso, G. (2017). WTO accession and tariff evasion. *Journal of Development Economics*, *125*, 59–71. https://doi.org/10.1016/j.jdeveco.2016.11.001

Masciandaro, D. (1999). Money laundering: the economics of regulation. *European Journal of Law and Economics*, *7*(3), 225–240. https://doi.org/10.1023/A:1008776629651

Menon, R.E. (2022). From crime prevention to norm compliance: Anti-money laundering (AML) policy adoption in Singapore from 1989–2021. *Journal of Money Laundering Control*, Vol. ahead-of-print No. ahead-of-print. https://doi.org/10.1108/JMLC-12-2021-0134

Rossel, L., Unger, B., & Ferwerda, J. (2021). Shedding light inside the black box of implementation: Tax crimes as a predicate crime for money laundering. *Regulation & Governance*. Early view. https://doi.org/10.1111/rego.12407

Sharman, J.C. (2011). *The money laundry: Regulating criminal finance in the global economy*. Cornell University Press.

Sun, L., & Abraham, S. (2021). Estimating dynamic treatment effects in event studies with heterogeneous treatment effects. *Journal of Econometrics*, *225*(2), 175–199. https://doi.org/10.1016/j.jeconom.2020.09.006

Takáts, E. (2007). *A theory of 'crying wolf': The economics of money laundering enforcement (April 2007)* (IMF Working Paper No. 07/81). International Monetary Fund.

Appendix

Country	Overview of imports and duties
Botswana	Goods imported into Botswana from outside the Southern African Customs Union (SACU)—Botswana, Lesotho, Namibia, South Africa, and Eswatini—are subject to customs duties at rates outlined in the Customs Tariff Book. Customs duties are paid against a prescribed declaration form (SAD 500), formally known as a bill of entry.
Ethiopia	Ethiopia imposes both VAT and excise taxes on imports. The supply of goods and services by registered persons is subject to 15% VAT for all goods and services.
Ghana	Goods arriving in Ghana may be subject to import duty, VAT, special tax and import excise duty. Most goods, however, are subject to import duty and VAT. VAT is calculated on the duty-inclusive value of the goods at rates contained in the HS manual. There are some sector-specific exemptions and duties such as those for extractive industries.
Morocco	Imported goods are subject to import duties and VAT, which varies from 0% to 20%. Morocco also has import duties. However, some unfinished products that require processing or assembly in Morocco may have reduced duties.
Senegal	Senegal requires the preliminary declaration of import (DPI) on values higher than or equal to FCFA 1 000 000 (USD 2,000).
Tunisia	Tunisia's basic VAT rates are 19%, 13%, and 7%, but applies tariff exemption such as chassis for buses and trucks, oil motors, parts for boilers, gas generators, steam and hydraulic turbines, pumps and compressors, and dry-cleaning machines. In addition, a consumption tax is applicable to certain imported items, mostly ranging between 10% and 150%, although luxury automobiles can be up to 360%.
Turkey	Turkey applies the CET to industrial goods, and its Most-Favoured Nation (MFN) tariffs on non-agricultural products, on average 5%. VAT for most agricultural products (basic food) ranges from 1% to 8% and can reach up to 18% for certain processed products. Turkey also has a 'suspension list' that enables manufacturers to import certain raw materials and intermediary inputs at low or duty-exempt rates.
Zambia	Zambia has three tariff bands: 0–5% (Capital Equipment and Raw Materials); 15% (Intermediate Goods); or 25% (Finished Goods). Duty-free items include medicines, pharmaceuticals, veterinary supplies, medical equipment, computer parts, chemicals in bulk, fertilisers, and seeds.
Zimbabwe	Zimbabwe charges higher import duties on finished goods than on raw materials and intermediate goods. The country has three different types of payments: import duty, surtax, and VAT. Most imported goods are subject to surtax and VAT.