3. FTZs and trade in fakes: Empirical evidence

Free Trade Zones can provide a range of advantages to countries that host them and to businesses that operate in these zones. However, light regulation applied to zones' operations can attract parties engaged in illegal and criminal activities. Existing governance gaps can provide rogue operators with a relatively safe environment in which to carry out their illicit activities. Consequently, FTZs can facilitate trade in counterfeit and pirated products, as well as smuggling and money laundering.

This chapter is intended to shed light on whether there is evidence to indicate that the existence of FTZs may result in a higher rate of counterfeiting activities and piracy. In other words, it aims to estimate the extent to which the existence, number and size of FTZs increase the value of counterfeit and pirated products exported by a given economy. While relevant, this exercise is particularly challenging.

Firstly, precise data on FTZs and counterfeiting and piracy by economy are scarce. This study, however, takes advantage of recent major advances in research on these two respective areas. Data on FTZs are mainly extracted from the World FTZ Database (2014), which brings together data from hundreds of academic resources, published papers and books, reports by international organisations, and documents on specific regions, countries and zones (Yücer, Siroën and Archanskaia, 2014[38]). Data on counterfeiting and piracy is based on the recent OECD-EUIPO (2016) study, which employed an innovative methodology that made it possible to gauge the value of global counterfeit and pirated trade by provenance economy worldwide (OECD/EUIPO, 2016[39]). Both sources are presented in detail in the following subsections.

Secondly, factors other than FTZs may encourage traffickers to engage in counterfeiting and smuggling activities. Reliable estimates of the extent to which the existence and/or the size of FTZs affect the export value of counterfeit and pirated products can be obtained only by neutralising the impact of these external factors (i.e. "all other things being equal"). For this purpose, a proper econometric methodology has to be developed. The chapter will therefore first present the data and the required methodology before turning to the results.

3.1. Data on FTZs and counterfeiting activities

3.1.1. Data on FTZs

Information on national FTZ policy and activity was extracted from two different sources. The first one is the World FTZ database (Yücer, Siroën and Archanskaia, 2014[38]), which contains detailed information on the number and size of FTZs across economies worldwide. The second source is the PRONTO database (PRONTO, 2017[40]), which, as compared to the first one, do not include such detailed information but allows instead distinguishing between the different types of EPZs that are "pure" export processing zones (EPZs), export and import processing zones (EMPZs) and special economic zones (SEZs).

World FTZ database

The primarily source for data on FTZ is the World FTZ Database (Yücer, Siroën and Archanskaia, 2014[38]), which synthesises information about FTZ programs in 158 countries. The definition of FTZs is quite restrictive, as limited specifically to EPZs.

In this database, EPZs are defined as zones with an export processing activity, which are (i) based on a transformation of imported inputs and, (ii) benefit from tariff exemptions under specific conditions that differentiate beneficiary firms from non-beneficiary firms. For example, free ports, transit zones, "duty free" zones and zones eligible for other incentives excluding tariff exemptions were excluded.

In an individual file made available for each economy, the World FTZ database presents the countries' number of EPZs, characteristics, locations, years of implementation, size, fiscal regulations, industrial specialisations etc.

These data were initially informed by both the WTO Trade Policy Reviews, written by the WTO Secretariat, and by the Investment Climate Statements published by the US Department of State (Yücer, Siroën and Archanskaia, 2014[38]). These two resources indeed systematically provide information on national FTZ policy and activities. The database also draws from academic resources, published papers and books, reports by international organisations such as the United Nations and the World Bank, and information on specific regions, countries and zones.

In order to enhance the robustness of the results obtained in the following empirical exercise, this study has also called upon information from an alternative data source on FTZs, the PRONTO database (PRONTO, 2017[40]). While the World FTZ database does indeed provide very rich information on the size of FTZs (i.e. number of firms, value of exports, or employment), many countries observed in this database are associated with at least one EPZ. If the existence of EPZs is treated as a dummy variable only, this could potentially cause a lack of variance in the data.

The advantage of the PRONTO (2017)[40] database is that it distinguishes between three types of EPZs. The first of these are "pure" EPZs defined as designated areas where firms can import goods duty free for further processing and re-export (PRONTO, 2015[41]). In those EPZs, firms can also export to the domestic market, but in this case they must also pay import duties on the goods sold domestically.

A second set of free trade zones are export and import processing zones (EMPZs), which allow for preferential (even duty free) sale to the domestic market from inside designated areas that otherwise function like EPZs.

A final set of zones are special economic zones (SEZs) that, while not focused specifically on exports, nonetheless provide a mix of preferential tax treatment, lower regulatory burdens and preferred access to infrastructure services. Such zones are sometimes designed to attract foreign investment or encourage domestic investment in certain regions or sectors.

Under the hypothesis that economies with dominant "pure" EPZs as defined in the PRONTO database may be more prone to ship fakes, since customs officials there have fewer incentives to check goods which are less likely to end up in their own territories, it would stand to reason that economies registered as having EPZs would tend to exhibit greater values of counterfeit and pirated exports.

Overview of FTZ data

The unified database on FTZ created from the World FTZ and PRONTO databases covers 134 economies worldwide (Table 3.1). Among them, 101 economies (75%) are reported as having at least one EPZ in the World FTZ database, while 85 economies (56%) are reported as having at least one "pure" EPZ, SEZ or EMPZ in the PRONTO database.

One of the important insights of Table 3.1 is that FTZs are found throughout the world and are present in both developed and developing economies. In addition, "pure" EPZs are the most widespread type of zones in all continents, as compared to EMPZs and SEZs.

Table 3.1. Number of economies with at least one FTZ (EPZ, SEZ and EMPZ)

Number of economies with at least one:	EPZ[2] (World FTZ database)	EPZ[3], SEZ[4] or EMPZ[5] (PRONTO)	EPZ (PRONTO)	EMPZ (PRONTO)	SEZ (PRONTO)
Africa (31)[1]	23	19	16	3	4
Asia (23)	17	15	13	2	8
Middle East (11)	9	7	6	2	1
North America and Caribbean (10)	7	7	5	1	1
Central America (7)	7	7	7	0	2
South America (11)	8	10	8	2	0
Europe (37)	27	7	4	0	4
Oceania (4)	3	3	2	0	1
World (134)	101	75	61	10	21

Notes: 1) Figures in parenthesis are the total number of economies for each at least one information about FTZ activities is reported in the database by continent. 2) The World FTZ database defines EPZs as zones with export processing activities, which are (i) based on a transformation of imported inputs and, (ii) benefit from tariff exemptions under specific conditions that differentiate beneficiary firms from non-beneficiary firms. 3) In the PRONTO database, EPZs are defined as designated areas where firms can import goods duty free for further processing and re-export. 4) In the PRONTO database, EMPZs are defined as free trade zones that allow for preferential (even duty free) sale to the domestic market from inside designated areas, that otherwise function like EPZs. 5) In the PRONTO database, SEZs are defined as zones that provide a mix of preferential tax treatment, lower regulatory burdens and preferred access to infrastructure services while not focused specifically on production for export.

Sources: (Yücer, Siroën and Archanskaia, 2014[38]; PRONTO, 2015[41]; PRONTO, 2017[40]).A detailed analysis of the data provided by the World FTZ database reveals that 1843 FTZs can be found worldwide, and that almost half of these zones are located in Asia (Table 3.2). The number of zones reported at the global level is less important than more cited references (>3000) for two main reasons. First, not all countries are covered by the database. Second, given the restrictive definition of FTZs within the database (only EPZs) some zones, such as zones only devoted to transit, storage and transhipment, were excluded.

The global value of exports from EPZs is USD 3500 billion, which represent 29% of total exports of economies included in the World FTZ database. Exporting more than USD 2400 billion from EPZs, around 42% of their total exports, Asian economies are clearly the front runners. They are followed by Middle East economies (USD 552 billion, 55% of exports) and South American economies (USD 284 billion, 55% of exports). The value of exports from EPZs is lower for African and Central American economies (USD 64 and

10 billion, respectively), but their intensity is still quite high (this corresponds to 24% and 29% of their total exports, respectively). Finally and importantly, these statistics show a number of outliers – economies for which a large number of zones does not necessarily translate in a large volumes and/or intensity of exports from EPZs. This is the case for Europe, North America and Caribbean, as well as Oceania.

Comprising 70%, 9% and 6% of the 21 million of employees working in EPZs throughout the world, Asia, Central America and Middle East, respectively, appear also as front runners in terms of employment within EPZs, This is consistent with the recent findings of ILO (2014)[6], although the total number of employees in FTZs estimated in ILO's report is larger (35 millions). As for the case of exports, this is related to differences in country coverage, and in definition of FTZs (see above).

Table 3.2. Summary statistics on FTZs

Continent	Number of zones	Exports from EPZs[1] (in USD bn)	Share of exports from EPZ[2]	Number of employees in EPZs (in thousand)	Number of firms in EPZs
Africa	154	64	24.0%	1650	8274
Asia	802	2400	42.4%	14956	68637
Middle-East	123	522	55.1%	1083	17159
Europe	122	179	6.9%	716	17558
North America and Caribbean	335	39	2.5%	523	3878
Central America	246	10	29.0%	1893	7502
South America	46	284	54.8%	386	9640
Oceania	15	1	0.2%	34	301
World	1843	3500	28.9%	21241	132889

Notes: 1) EPZs are defined here as zones with export processing activities, which are (i) based on a transformation of imported inputs and, (ii) benefit from tariff exemptions under specific conditions that differentiate beneficiary firms from non-beneficiary firms. 2) The shares of exports from EPZs were calculated only over the total exports of economies for which information on FTZ activity was available in the database.
Source: Authors' own calculations based on the World FTZ database Yücer, Siroën and Archanskaia, 2014[38]

3.1.2. Data on counterfeit and pirated trade

All information concerning counterfeit and pirated trade comes from the OECD-EUIPO (2016) database on customs seizures. This resource brings together data from three separate datasets from the WCO, the DG TAXUD of the European Commission and the US Department of Homeland Security (OECD/EUIPO, 2016[39]). The database includes detailed information on seizures of IPR-infringing goods made by customs officers in 99 economies around the world between 2011 and 2013. For each year, there are more than 100 000 observations in the database; in most cases, each individual observation corresponds to one customs seizure.

The database contains a wealth of information about the IPR-infringing goods, data that can be used for quantitative and qualitative analysis. In most cases, for each seizure the database details: the date of seizure, the mode of transport of the fake products, the departure and destination economies, the general statistical category of the goods seized and a detailed description of the goods, the name of legitimate brand owner, the number of products seized and their approximate value[1].

Based on this database on customs seizures of IP-infringing products, the OECD-EUIPO (2016) study developed a methodology, the General Trade-Related Index of Counterfeiting (GTRIC), which made it possible to measure the value of global trade in counterfeit and pirated goods (OECD/EUIPO, 2016[39]). The GTRIC methodology has also made it possible both to identify the key provenance economies for counterfeit imports around the world and to produce estimates as to the ceiling values of counterfeit and pirated products globally imported from those economies.

Table 3.3 below reports the (estimated) value of counterfeit and pirated exports by continent for 2013, and in reports these values in detail by provenance economy for the period 2011-2013. As mentioned in OECD/EUIPO (2016)[39], international trade in counterfeit and pirated products represented up to 2.5% of world trade in 2013, or as much as USD 461 billion. Asian economies are the largest exporter of counterfeit and pirated goods in terms of value, with USD 310 billion of fake exports (Table 3.3).

In relative terms, Asian, Middle East and African economies are the largest exporters of counterfeit and pirated products. The estimated share of world exports of fake goods in provenance of Asia is indeed the highest (5.3%), followed by those in provenance of Middle East (2.4%) and Africa (1.6%).

Table 3.3. Exports of counterfeit and pirated goods, by continents, 2013

Continent	Value in USD billion	Share of exports*
Africa	6	1.6%
Asia	310	5.3%
Middle-East	29	2.4%
Europe	83	1.2%
North America and Caribbean	23	1.1%
Central America	5	1.1%
South America	5	0.9%
Oceania	1	0.4%
World	461	2.5%

Note: *Share of counterfeit and pirated exports were calculated over the total value exports from economies for which information on the value of counterfeit and pirated trade was available.
Source: Authors' own calculations based on OECD/EUIPO (2016).

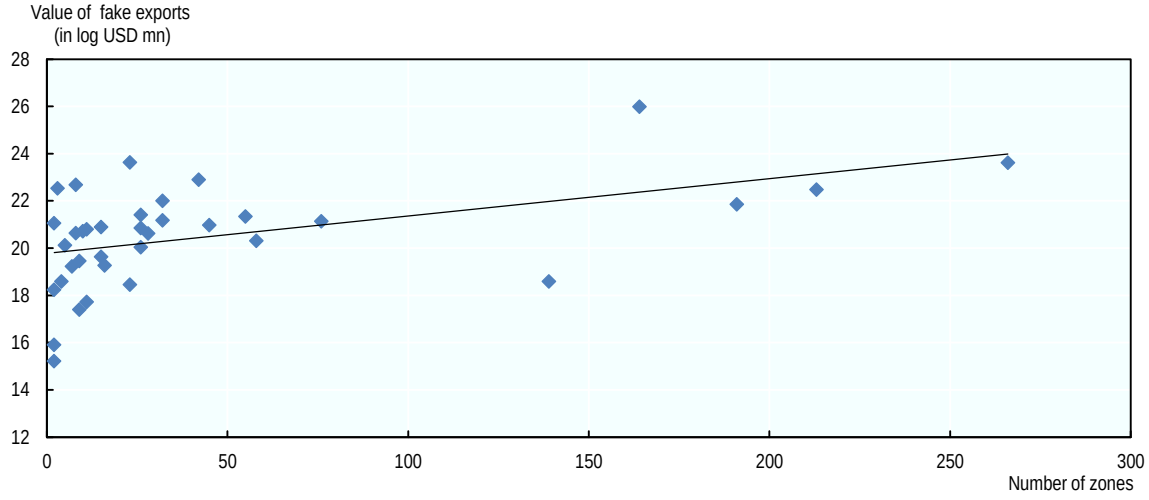
Two factors are especially worth bearing in mind when considering these figures. First, the term "ceiling value" is crucial in this context, as it refers to the upper boundary of counterfeit imports from each of these economies. Second, these amounts do not include (i) domestically produced and consumed counterfeit and pirated products or (ii) digital piracy via the Internet.

3.1.3. Simple correlations between FTZs and counterfeiting activities

A first look at correlations between the estimated value of counterfeit and pirated products exported from each provenance economy and FTZs-related variables provides interesting insights. Firstly, the number of FTZs within an economy (as reported in the World FTZ database) seem to be correlated with the value of its exports of counterfeit and pirated products, even though there is a number of outliers – economies for which a large number of zones does not necessarily translate into large volumes of fake exports (Figure 3.1). This finding shows a large variability in zones performance in terms of trade in fake goods.

It also follows the basic fact that FTZs tend to differ to a large scale among themselves, which manifests in different degrees of oversight and compliance with enforcement authorities. A relevant example is the United States, where a large number of zones does not result in a large flow of fake goods, partially due to a sound compliance and oversight systems (see Box 3.1).

Figure 3.1. Number of FTZs and value of counterfeit and pirated exports, 2013



Sources: (OECD/EUIPO, 2016[39]); (Yücer, Siroën and Archanskaia, 2014[38])

Box 3.1. Free Trade Zones in the United States

The US FTZ program was established in 1934. It provides tariff benefits and facilitated customs-entry procedures to promote investment, US manufacturing and distribution, employment, and exports. Today it comprises over 230 zones and nearly 400 subzones in all 50 US States and Puerto Rico. The main industries active in zones include automotive, pharmaceuticals and ICTs. Remarkably, these industries are prone to counterfeiting, as demonstrated by the OECD-EUIPO (2016) study.

The FTZs system in the US was designed to support effective controls of activities and flows to FTZs and improve collection, storage, and access to reliable and comprehensive customs statistics on incoming or outgoing goods and on production of goods and services inside them. It does so by imposing higher compliance requirements on zone operators than regular importers and closer and more frequent interaction with the US Customs and Border Protection agency (CBP).

For example, before production in a zone can be approved for activation, an operator must file with CBP an Application for Activation and Procedures and Operations Manual describing internal compliance processes and goods moving through the zone or subzone. CBP must then approve the Application and Manual. It conducts a physical review of the facilities, undertakes a background check of key employees, and reviews activities to be conducted in the zone. CBP's oversight of FTZ operations is done on a risk-based, audit-inspection system rather than through on-site supervision by CBP personnel. Compliance is assured through compliance reviews (i.e. audits) and spot checks.

Source: US National Association of Foreign-Trade Zones (NAFTZ)

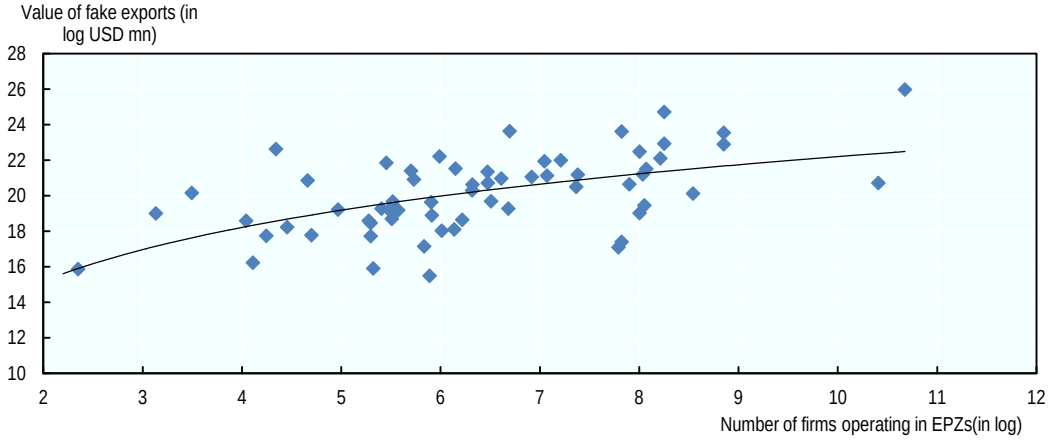
Not only the number but also the total size of FTZs within an economy seems to be correlated with the value of its exports of counterfeit and pirated products. To illustrate this, Figure 3.2 plots the relationship between the value of fakes exported from each provenance economy in 2013 and their respective (a) number of firms operating in EPZs; (b) number of employees working in EPZs; and (c) value of exports made from EPZs.

Clearly, the larger the number of firms and employees in a country's EPZs, and the greater the value of exports from the zones, the larger the value of counterfeit and pirated products exported from the country's economy. In other words, the larger the size of EPZs within an economy, the more this economy appears to be a potential source of counterfeit and pirated products in global trade.

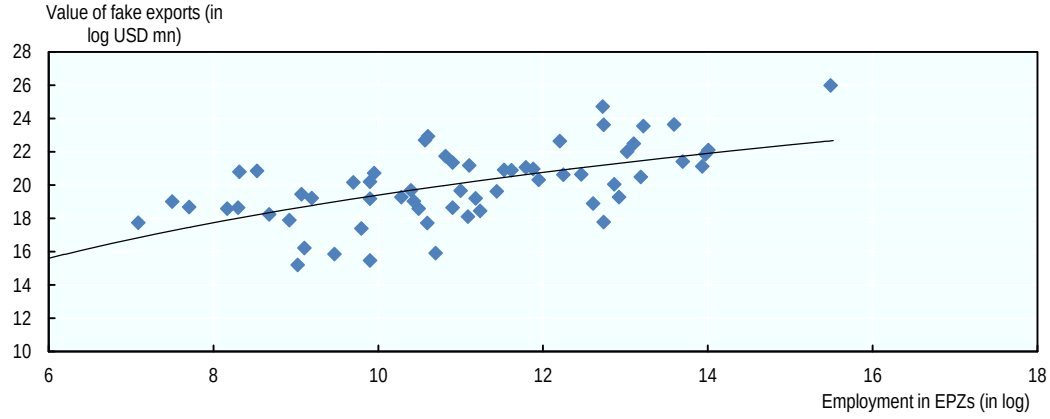
The relationship between FTZ-related variables and counterfeiting activities plotted in Figure 3.2 is even more striking considering that the two types of data come from two completely different sources (see Sections 3.1.1 and Section 3.1.2). In order to confirm these correlations and to provide a robust quantitative analysis, the following subsection sets out an econometric model that makes it possible to come to an accurate estimate of how the existence, size or number of FTZs affect the value of counterfeit and pirated exports from a given economy, taking other relevant factors into account as well.

Figure 3.2. Size of FTZs and value of fake exports by provenance economy, 2013

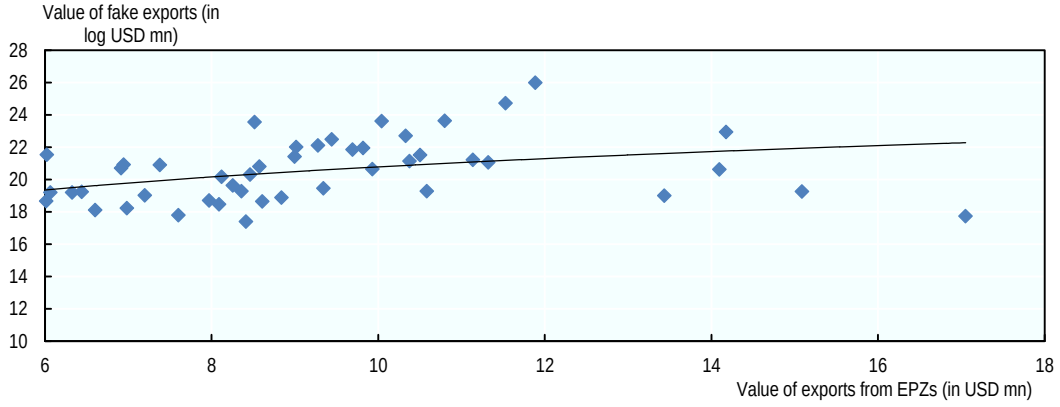
(a) Number of firms operating in EPZs



(b) Employment in EPZs



(c) Exports from EPZs



Sources: (OECD/EUIPO, 2016[39]); (Yücer, Siroën and Archanskaia, 2014[38])

3.2. FTZs and trade in counterfeit and pirated goods: Methodology

3.2.1. Factors influencing trade in counterfeit and pirated goods

The purpose of this exercise is to determine whether FTZs encourage traffickers to engage into counterfeiting and piracy. More precisely, the aim here is to estimate the extent to which the existence, number and size of FTZs increase the value of counterfeit and pirated products exported by a given economy. However, other factors also encourage traffickers to export counterfeit and pirated products, so other control variables should be used in this equation.

The first control variable used for the purposes of this study is the ***GDP per capita*** of the provenance economies (in current USD), data taken from the World Bank (2017)[42] database. The OECD/EUIPO (2016)[39] study provided a strong indication that the propensity of an economy to be the source of counterfeit and pirated goods in international trade was related to its income level.

More specifically, there seems to be a relationship between the propensity of economies to export counterfeit and pirated products to the global market and their GDP per capita, with the association taking the form of an inverted U shape. Low-income economies generally lack the capital and technological capacity to produce a wide range of products, which also limits their capability to produce infringing goods. As economies develop and grow richer, so do their productive and technological capabilities, which affects the possibility for higher scale infringement activities. Institutional developments (including the adoption of IP-related legislation and enforcement practices) tend to lag behind economic development, which creates favourable conditions for infringement activities. As economies grow still richer and become more knowledge-based, greater emphasis is placed on the role of IP, and legislation and enforcement in these areas is tightened through improved public governance.

In light of the differences observed between countries in terms of their governance structure, this study also used as a control variable the scores on a perception-based index rating the ***control of corruption*** within each provenance economy. This indicator is provided by the World Bank (Kaufmann, Kraay and Mastruzzi, 2010[42]) and is based on several hundred individual variables measuring perceptions of corruptions drawn from 31 separate data sources constructed by 25 different organizations. The particular aspect of corruption measured by the various sources differs somewhat, ranging from the frequency of "additional payments to get things done", to the effects of corruption on the business environment. Estimate gives the country's score on the aggregate indicator, in units of a standard normal distribution, i.e. ranging from approximately -2.5 to 2.5, with higher scores corresponding to better outcomes. Therefore, if a higher level of corruption do create a favourable conditions for infringements activities, it would be expected that the value of world imports of counterfeit and pirated products from a given provenance economy would decrease as a function of its control of corruption indicator.

A country's capacity to export fakes is also expected to vary according to the economy's overall export capacity. ***Export volumes*** from each provenance economy are therefore also used as additional control variables. The data are taken from the well-known UN Comtrade database (United Nations Statistics Division, 2017[43]). Finally, and with the same reasoning, the average ***time to export*** (in days) for each economy also serves as additional dependant variable. These data were extracted from the CEPII (2017)[44] Gravity Database.

3.2.2. Model

An econometric specification is used to calculate whether the existence, the number or the size of FTZs in a given economy significantly increase the value of counterfeit and pirated goods exported from that economy. For this purpose, a linear econometric model, which expresses the value of counterfeit and pirated goods exported from each economy as a function of FTZ-related variables and other control variables, is used as follows:

$$\ln C_{it} = \alpha + \ln X_i + \ln Z_{it} + \delta_t + \varepsilon_{it} \qquad \textbf{Equation 3.1}$$

In Equation 3.1, C_{it} is the estimated value of fakes exported from each provenance economy i in year t (see Section 3.1.2). These data are available from 2011 to 2013. X_i represents the FTZ-related variables for each provenance economy. They include: a dummy variable for the existence of EPZs, which equals 1 when the provenance economy has at least one EPZ in its territory, and 0 otherwise; the number of EPZs in the provenance economy; the value of exports via EPZs from each provenance economy; and the number of people employed in those EPZs. All these data are observable once and come from the Dauphine's World FTZ database (see Section 3.1.1).

Z_{it} represents the control variables that also influence the capacity of an economy to export fake products. They include: the provenance economy's GDP per capita, the governance indicator measure its control of corruption; the country's export volume; and the average time to export (see Section 3.2.1).

δ_t are time fixed-effect terms to control for common factors between all provenance economies that might influence global trade in counterfeit and pirated products each year. This could refer to, for example, the overall condition of the global economy in a given year that in turn impacts the volumes of trade, including trade in fakes. Finally, α is a constant and ε_{it} are the residuals of Equation 3.1.

In order to not exclude observations with zero, and thus to avoid any biases, variables were only log-transformed when their value was larger than 0; while 0 was assigned to all cases where the variables were equal to 0 in level. In addition, "robust" standard errors were used to obtain unbiased standard errors of coefficients in Equation 3.1, as heteroscedasticity was suspected. Note that results commented in the following subsection are also robust to the clustering of observations at the country level.

Finally, endogeneity tests were performed for each specification whose results are displayed in the following section. In the case analysed here, endogeneity could have occurred as a result of measurement errors, simultaneous causality[2] or omitted variables in Equation 3.1. However, endogeneity tests were performed for each FTZs-related variable and all concluded that there is no problem of endogeneity in the model. The results commented below are therefore robust.

3.3. Results

In order to statistically verify the relationship between FTZs and fake exports presented in Figure 3.2, Equation 3.1 was run over the full sample of provenance economies for the period 2011-2013. The results are displayed in Table 3.4 and Table 3.5 below, using alternative independent FTZ-related variables. Given the existence of some outliers in the sample for which the value of exports counterfeit and pirated of products is very large as compared to other economies, Equation 3.1 was also run leaving China and Hong Kong

(China) out of the analysis. Results are displayed in Table A.2 and in the annex and confirm that the outcomes commented below are robust to the exclusion of outliers.

3.3.1. Existence, number and type of FTZs and trade in fake goods

Columns (1) and (2) of display the results of the estimations using dummies of EPZs as independent variables (column (1) is based on the World FTZ database, column (2) on the PRONTO database; see Section 3.1.1). Clearly, the existence of at least one EPZ within an economy significantly increases the value of counterfeit and pirated products exported from that economy.

Column (3) tests the same relationship using dummies for the different types of FTZs available in the PRONTO database ("pure" EPZs, EMPZs, SEZs; see Section 3.1.1). Note that each provenance economy can be recorded as having none, only one, two or the three types of zones within its territory. Interestingly, the results show that only "pure" EPZs are significantly associated with a larger value of counterfeit and pirated exports. This result follows the fact that, compared to EMPZs and SEZs, "pure" EPZs are more prone to ship fakes, as customs officials there have fewer incentives to check goods which are less likely to end up in their own territories. It then naturally stands to reason that economies registered as having EPZs exhibit greater values of counterfeit and pirated exports.

Moving beyond the existence and type of EPZs, column (4) tests whether the number of EPZs is a significant determinant of the value of counterfeit and pirated goods exported by an economy. It shows that an additional EPZ within an economy is associated with, on average, a significant increase of 5.9% in the value of fake goods exported from that economy. This means that the larger the number of EPZs within an economy, the more likely it is to be a provenance economy for counterfeit and pirated products in global trade.

Table 3.4. Existence, number of FTZs and exports of counterfeit and pirated products, 2011-2013

	Dependant variable: value of counterfeit and pirated exports (in log) by economy and year			
	(1)	(2)	(3)	(4)
Export value (in log)	0.825***	0.782***	0.789***	0.829***
	(0.098)	(0.090)	(0.090)	(0.083)
GDP per capita (in log)	15.446***	15.629***	15.296***	10.370*
	(5.207)	(5.137)	(5.137)	(5.272)
GDP per capita^2 (in log)	-0.729**	-0.732***	-0.709**	-0.507*
	(0.286)	(0.281)	(0.281)	(0.297)
Control of corruption index	-1.231***	-0.967**	-1.032**	-1.134**
	(0.454)	(0.465)	(0.474)	(0.421)
Time to exports (in days)	-0.131**	-0.143***	-0.143***	-0.189***
	(0.057)	(0.050)	(0.051)	(0.055)
Dummy for EPZ (World FTZ database)	2.505***			
	(0.821)			
Dummy for EPZ (PRONTO)		1.401*		
		(0.761)		
Dummy for pure EPZ (PRONTO)			1.466*	
			(0.783)	

Dummy for SEZ (PRONTO)			0.703	
			(0.657)	
Dummy for EMPZ (PRONTO)			-0.059	
			(0.680)	
Number of EPZs				0.059**
				(0.025)
_cons	-82.042***	-81.259***	-80.316***	-51.163*
	(23.952)	(23.520)	(23.496)	(26.728)
Observations	336	336	336	258
Adjusted R^2	0.590***	0.573***	0.573***	0.562***
F statistic	39.176 (df= 8; 327)	38.501 (df= 8; 327)	31.051 (df= 10; 325)	30.827 (df= 8; 249)

Notes: Robust standard errors in parentheses. *p<0.1; **p<0.05; ***p<0.01. Estimates are results of Equation 3.1 for the period 2011-2013.

3.3.2. Size of FTZs and trade in fake goods

Moving beyond the existence, the types and the number of EPZs, Table 3.5 tests whether the size of FTZs significantly affects the value of fakes exported from each provenance economy. Column (1) shows that a 1% increase in the value of exports from EPZs within an economy is associated with a significant increase in the value of counterfeit and pirated products exported from that economy, in the amount of 0.28%.

Columns (2) to (3) show that a 1% increase in the number of firms operating in EPZs and in the number of employees working in EPZs within an economy raises the value of counterfeit and pirated exports by 0.29% and 0.21%, respectively. Finally, column (4) shows that an increase of 1% in the value of investments in EPZs raises the value of fake exports by 0.17%.

All these results can lead to the conclusion that the larger the size of the EPZs in an economy, the greater the value of fake products the economy exports globally. This prevails for all types of measures of zones' size available, that is, value of exports from EPZs, employment, investment and number of firms operating in EPZs,

.

Table 3.5. Size of FTZs and exports of counterfeit and pirated products, 2011-2013

	Dependant variable: value of counterfeit and pirated exports (in log) by economy and year			
	(1)	(2)	(3)	(4)
Export value (in log)	0.919***	0.885***	0.903***	0.886***
	(0.085)	(0.099)	(0.103)	(0.110)
GDP per capita (in log)	1.264	14.736**	10.545	3.822
	(7.805)	(7.408)	(7.832)	(7.912)
GDP per capita^2 (in log)	-0.086	-0.733*	-0.520	-0.183
	(0.434)	(0.404)	(0.429)	(0.439)
Control of corruption index	-0.909*	-1.157**	-1.032*	-1.654***
	(0.522)	(0.575)	(0.622)	(0.613)
Time to exports (in days)	-0.300***	-0.197***	-0.217***	-0.326***
	(0.077)	(0.062)	(0.059)	(0.067)
Value of exports from EPZs (in log)	0.284***			
	(0.087)			
Number of firms operating in EPZs (in log)		0.288**		
		(0.141)		
Number of employees in EPZs (in log)			0.205**	
			(0.096)	
Value of investment in EPZs (in log)				0.172***
				(0.057)
_cons	-5.617	-75.106**	-55.038	-18.936
	(34.789)	(34.036)	(35.667)	(35.963)
Observations	183	219	219	180
Adjusted R^2	0.600***	0.547***	0.551***	0.595***
F statistic	29.361 (df= 8; 174)	25.16 (df= 8; 210)	24.394 (df= 8; 210)	22.365 (df= 8; 171)

Notes: Robust standard errors in parentheses. *p<0.1; **p<0.05; ***p<0.01. Estimates are results of Equation 4.1 for the period 2011-2013. All EPZ-related variables are extracted from the World FTZ database (see Section 3.1).

To summarise, the results displayed in and Table 3.5 show a clear relationship between the FTZs in a given economy and trade in counterfeit and pirated goods from that economy. The findings were established taking into account not only the presence of zones, but also their number, type and their size. In all analysed cases zones significantly intensify an economy's counterfeiting activities, notably "pure" EPZs. Their presence in a given economy is likely to result in higher volumes of trade in fakes departing from that economy.

These results are statistically robust, which means they take into account other possible factors that could impact the volumes of trade in counterfeit and pirated goods, such as the overall level of economic development in a given economy, the control of corruption, overall volumes of trade, etc. With all these additional factors taken into consideration, the results remain robust and statistically significant; they indicate that Free Trade Zones have become a useful tool for counterfeiters, who regularly misuse them in their operations

Notes

[1] Concerning valuation of seized goods, there are two principles for reporting the value of counterfeit and pirated goods: 1) declared value (value indicated on customs declarations), which corresponds to values reported in the general trade statistics; and 2) replacement value (price of original goods). The structured interviews with customs officials and the descriptive analysis of values of selected products conducted in OECD-EUIPO (2016) revealed that the declared values are reported in most cases.

[2] Simultaneously bias could have occurred here if the intensity of counterfeiting activities and piracy within an economy led to the creation of FTZs. As mentioned in the main text, endogeneity tests were performed for each FTZs-related variable. They all led to the conclusion that FTZs-related variables were not endogenous, so that there is no problem of reverse causality in the model performed in Section 3.

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