

# Regional implications of the tobacco value chain in Paraguay

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## ABSTRACT

**Background** Paraguay is a major supplier of illicit cigarettes for the Latin American region and beyond. In July 2022, Paraguay ratified the FCTC Protocol. This is an opportunity and a challenge for neighboring countries to implement coordinated actions. This is the first analysis of the foreign trade data for cigarettes and their inputs using Paraguayan data to contextualise the illicit trade problem in Latin America and globally.

**Methods** Combining publicly available Paraguayan databases, this research constructs a database to analyse imported cigarette inputs, particularly by identifying the companies and their national origins.

**Results** A complex multinational supply chain perpetuates a flow of inputs into Paraguay that contributes to the production and export of illicit tobacco products. Brazil is a relevant legal supplier of intermediate goods for the Paraguayan tobacco industry yet is not a significant destination of the legal exports of cigarettes produced in Paraguay. Yet, Paraguayan cigarettes are widely available in the Brazilian market, almost all of them illicit. Trade data also show the role of other countries in the region as major cigarette input exporters to Paraguay. Evidence also supports that high volumes of legal exports from Paraguay to third countries (including Bolivia, Suriname, Aruba and Curacao) may be fuelling illicit trade through triangulation to other countries.

**Conclusions** The oversupply—that is, more supply than necessary for domestic consumption and legal exports—of cigarette inputs likely divert illegally back to the countries exporting these inputs and others. Thus, the responsibility for illicit trade in cigarettes falls not only on Paraguayan companies but also on companies exporting inputs to Paraguay to producing these illicit goods. Furthermore, Paraguay is not only exporting illicitly directly to Brazil and Argentina, but also appears to oversupply other countries in South America and the Caribbean that cannot legally absorb this trade through domestic consumption and/or legal re-export.

## INTRODUCTION

One key challenge in the effort to improve tobacco excise taxes in Paraguay and Brazil is the illicit trade problem. Brazil's government echoes Brazilian manufacturers' claims that illicit trade is mostly a problem with roots in Paraguay. Concomitantly, Paraguayan companies involved in tobacco production argue against any excise tax reform in Paraguay. These companies also claim that the illicit flow of Paraguayan cigarettes is due to structural problems in the destination countries, including Brazil, though what those problems are precisely is not clearly articulated. Paraguayan manufacturers

## WHAT IS ALREADY KNOWN ON THIS TOPIC

⇒ International illicit trade in tobacco products poses a serious threat to public health because it increases the accessibility and affordability of tobacco products, undermining tobacco control policies. International researchers have used foreign trade data to describe and estimate the size of cigarette production in Paraguay and the illicit trade problem and demonstrate that Paraguayan net imports of cigarette inputs seem to be abnormally high. A recent report published in 2021 estimated the Paraguayan excess supply of cigarettes would reach 2500 million packs per year on average for the period 2008–2019. However, it did not identify the links across the companies that fuel illicit trade.

## WHAT THIS STUDY ADDS

⇒ This study details two inter-related dynamics that need to be identified because both represent serious threats to public health in not only Latin America but also globally. First, Paraguay's cigarette overproduction is fuelling illicit trade. Paraguay is not only exporting illicitly directly to Brazil and Argentina, but they appear to also be oversupplying other markets of other countries in South America and the Caribbean that cannot realistically absorb the declared legal exports.

## HOW THIS STUDY MIGHT AFFECT RESEARCH, PRACTICE OR POLICY

⇒ This study showed countries' interconnections as suppliers of cigarette inputs, hubs for illicit re-exports or final destinations of cigarettes. This re-emphasises the broader argument stated in the Protocol to Eliminate Illicit Trade in Tobacco Products that international collaboration and cooperation are key to fighting illicit trade. To combat the illicit cigarette trade successfully, there must be close attention paid to and interventions along the transborder tobacco supply and value chains.

also affirm that they comply with all local tax obligations. Indeed, the situation is complex with multinational—though predominantly regional—supply and value chains that help to perpetuate a flow of necessary inputs into Paraguay that then contribute to the outward flow of illicit tobacco products.

Evidence consistently shows significant levels of illicit trade of cigarettes from Paraguay to neighbouring countries, especially Brazil. According to



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several major studies over the last decade, there are historical reasons for Brazil being the main market, which is the fact that the Paraguayan industry was developed in the 90s to complement Brazilian companies, and then, after 1998, to fill the supply gap created by the Brazilian export tax. For example, Ramos,<sup>1</sup> Biz,<sup>2</sup> Ribeiro and Pinto,<sup>3</sup> Gomis *et al*<sup>4</sup> and Iglesias *et al*,<sup>5</sup> among others, show that production and consumption of tobacco products in Paraguay and Brazil have become closely linked in multiple ways in recent decades. Moreover, whereas Paraguay is the principal illicit manufacturing centre, Brazil<sup>1–5</sup> and Argentina<sup>6,7</sup> are among the principal suppliers of raw materials and inputs as well as the main consumer of mostly illicit tobacco products from Paraguay. Firms from other countries in the region are also major exporters of key inputs to manufacture cigarettes.

Based on surveys of Paraguayan smokers to estimate domestic consumption and production reports to tax authorities, Masi *et al*<sup>7</sup> calculate that Paraguay's oversupply of cigarettes between 2008 and 2019 is close to 2.5 billion packs (of 20 cigarettes) on average per year. Considering the consistently high estimates of overall illicit trade in Brazil and clear evidence that most of it originates in Paraguay,<sup>8</sup> this oversupply of Paraguayan cigarettes is almost certainly directly related to what experts observe in the Brazilian illicit cigarette market. Moreover, the relationship is plausible too because this estimated oversupply is larger than the estimated volume of illicit Paraguayan cigarettes in Brazil.

Despite clear evidence of a Brazil–Paraguay tobacco illicit trade nexus, there is little research on the role of the supply and value chains of Paraguayan tobacco manufacturing firms and the links between Brazil's and Paraguay's cigarette industries. To understand the links between the two countries' markets, a deeper analysis of cigarette producers in Paraguay that potentially sell illicit cigarettes in Brazil is required because it provides valuable information on the companies involved in the value chain of the region's cigarettes.

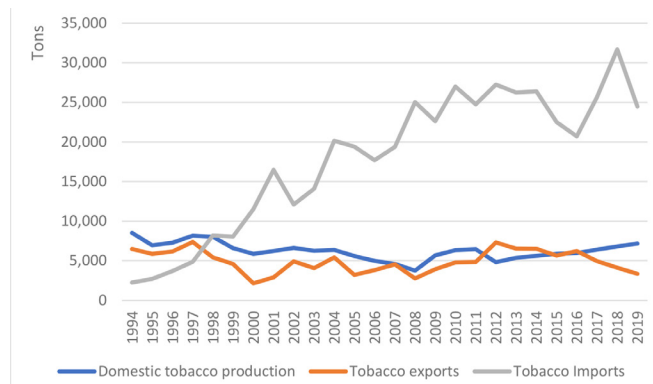
A better understanding of the mechanics of how illicit trade occurs in the region is vital to more efficient tax administration on both sides of the border and beyond, resulting in increased revenue collection and higher prices that are likely to lead to lower consumption.

Accordingly, this research gathers and analyses data on the global value chain of cigarettes produced in Paraguay focusing on both inputs and outputs, including imports and suppliers of inputs and raw materials for manufacturing cigarettes, and destination markets of manufactured cigarettes produced in Paraguay. This analysis is feasible partly because the supply/value chain for cigarettes is relatively straightforward. There are only a small number of constituent parts—cured tobacco leaf, specialised filters and special paper for rolling—and these inputs are generally not used to make other products lending extra precision to analyses based on them. The outputs—cigarettes—manufactured from these inputs are also a relatively homogeneous product class, which helps to facilitate accurate destination tracking.

## METHODOLOGY AND DATA SOURCES

This research constructs and then uses a database to describe and analyse imported quantities of inputs and raw materials according to the main importing companies and international suppliers. It also collects and analyses cigarette import and export data to help identify key actors and their linkages in the production and consumption chain.

The data sources used to identify the global exporters of cigarette inputs purchased by Paraguayan firms and the Paraguayan



**Figure 1** Domestic production, imports and exports of tobacco raw materials (tons).

Source: production data from MAG's statistical synthesis, Central Bank of Paraguay and Penta Transactions using data from the Paraguay Customs Office. MAG, Ministry of Agriculture and Livestock.

exporters of the manufactured cigarettes include publicly available databases from the Paraguay Customs Office, the Central Bank of Paraguay data and Penta Transactions data, a platform of commercial intelligence that obtains data from customs offices of different countries in the world.<sup>9</sup> The principal data points include unprocessed tobacco raw materials (Mercosur Tariff Nomenclatures NCM 2401.10, 2401.20 and 2401.30), imports of manufactured tobacco (NCM 2403), imports of papers for cigarettes (NCM 4813) and imports of cigarette filters (NCM 5502).

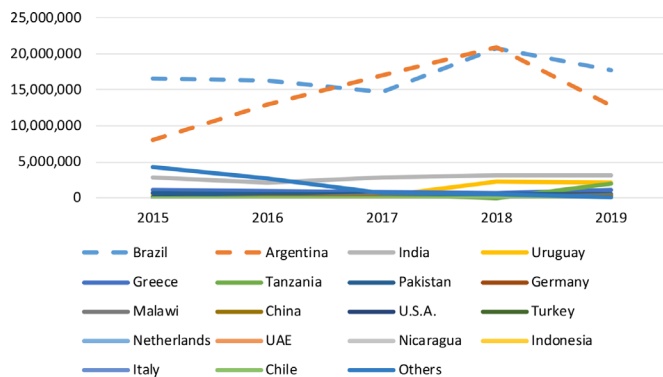
Other data sources include the Ministry of Agriculture and Livestock (MAG) for volumes of tobacco raw materials produced domestically and trade data from the Exporting Single Windows and the Importing Single Windows of the Ministry of Industry and Commerce.

## DOMESTIC PRODUCTION AND SUPPLIERS TO THE PARAGUAYAN MARKET

### Tobacco raw materials

Raw tobacco (also known as non-processed tobacco or unmanufactured tobacco) refers to tobacco leaf with some degree of processing or manufacturing (compared with green tobacco). Raw tobacco is almost exclusively used for the production of cigarettes. The first step is to combine domestic raw tobacco production and net imports (NCM 2401.10 and NCM 2401.20). **Figure 1** shows domestic tobacco production and imports in addition to tobacco exports (tons).

Between 1994 and 2019, average domestic tobacco production was 6243 tons, with a clear decrease in the 1994–2008 period (from 8519 to 3761 tons) and a steady increase after 2012 (4830 tons in 2012 and 7175 tons in 2019). Between 1994 and 2019, Paraguay exported a mean of 4921 tons of tobacco. Except for 3 years, domestic production exceeded tobacco exports. Unmanufactured tobacco imports show a clear increasing pattern. Between 1994 and 2018 (the maximum amount imported in the series), Paraguay increased its tobacco imports more than 1300% (from 2257 to 31690 tons), an annual average of 20.77%. The overall tobacco produced in Paraguay plus the imported raw tobacco minus the unmanufactured tobacco exported by Paraguayan companies was the tobacco available in the country for



**Figure 2** Imports of tobacco raw materials by country (kg). Note: Others refers to non-identified countries are included. Source: Penta Transactions using data from the Paraguay Customs Office. UAE, United Arab Emirates.

producing tobacco products. The total available supply of non-processed tobacco increased significantly from 4302 to 28321 tons from 1994 and 2018, a 699% increase.

Figure 2 demonstrates that Argentinian and Brazilian companies are the main exporters of raw tobacco to Paraguay, comprising 79.4% of the average total during the 2015–2019 period. Around 31 million kg of raw tobacco were imported from Argentina and Brazil compared with 8 million kg from the rest of the supplier countries.

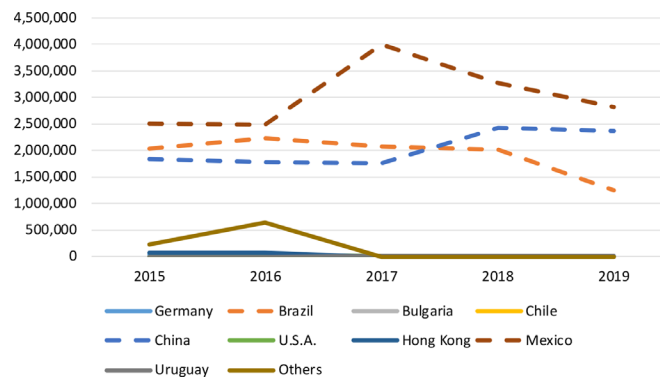
The suppliers are economically concentrated with more than 50% of all tobacco raw materials imported by Paraguay coming from a small pool of tobacco companies. Brasfumo Industria Brasileira de Fumo (Brazil) and Cooperativa de Productores de Tabacaleros de Salta (Argentina) provided 29.4% of the total volume imported by Paraguay in 2019. These two suppliers also maintained a strong share in providing raw tobacco to Paraguay in all the period. Notably, Brasfumo is both the leading exporter of raw tobacco from Brazil to Paraguay and the relevant import company in Paraguay.

There are also supplier companies that show significant increases in their shipments to Paraguay in some specific years. For example, Alliance One International of Tanzania, a large multinational tobacco leaf buying company, that supplies raw materials to Paraguay from its branches in both Argentina and Tanzania. This company registered remarkable growth in its shipments to Paraguay in 2019, while its branch in Argentina disclosed relevant export volumes to Paraguay throughout the 2015–2019 period. Similarly, Compañía de Tabacos Monte Paz, from Uruguay, reported significant increases in exports of tobacco raw materials to Paraguay in 2018 and in 2019. The jump in the share of suppliers of raw tobacco to Paraguay by this company is striking and suspicious because tobacco crops in Uruguay are scarce (online supplemental table 1 lists all companies that export raw tobacco to the Paraguayan market).

### Filters for cigarettes

Filters are an essential part of manufactured cigarettes. Filters are manufactured from cellulose cables, filaments or simply acetate. Data obtained from the Single Window of Imports (Ventanilla Única de Importaciones) of the Ministry of Industry and Commerce show there is no domestic production of filters for cigarettes.

Figure 3 shows the list of countries that supply cigarette filters to Paraguayan cigarette manufacturers. Mexico was the main supplier during the 2015–2019 period. Brazil was the second



**Figure 3** Relevance of Mexico, Brazil and China in supplying filters for cigarettes (kg). Note: Others refers to non-identified countries are included. Source: Penta Transactions using data from the Paraguay Customs Office.

most important supplier until 2017, but in 2018 it was overtaken by China. On average, aggregate imports from Mexico, Brazil and China represent 96.9% of the total imports of this input for 2015–2019.

Only three companies were the main providers of filters for cigarettes in the 2015–2019 period. Grupo Celanese from Mexico, Jinan Acetate Chemical from China and Rhodia Acetow from Brazil represented more than 90% of the total volume of filters imported by Paraguay in 2019. The fourth largest supplier of filters is from Uruguay. Online supplemental table 2 lists companies that provide cigarette filters to the Paraguayan market.

### Paper for cigarettes

Paper for cigarettes (NCM 4813) is another key input. Data obtained from the Single Window of Imports (Ventanilla Única de Importaciones) of the Ministry of Industry and Commerce show there is no domestic production of paper for cigarettes.<sup>7</sup>

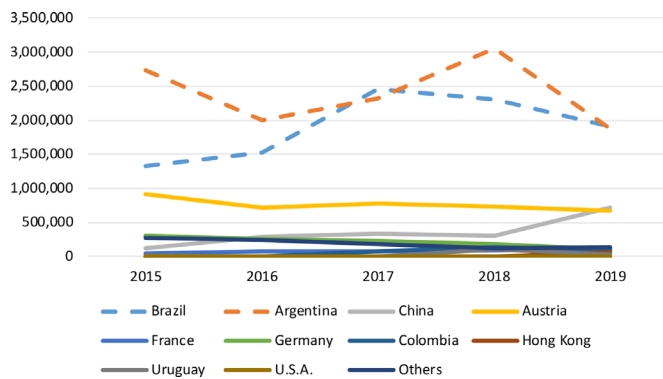
Argentina and Brazil supply most of the paper for cigarettes produced in Paraguay (figure 4), representing 71.6% of the total average imports for 2015–2019. In volume, imports from companies in Argentina and Brazil amount to 4.3 million kg compared with 1.7 million from companies from other countries.

The main supplier company of paper for cigarettes to Paraguay in 2015–2019 was Miquel y Costas & Miquel. Though this is a Spanish company, exports to Paraguay are conducted mainly by its Argentinian subsidiary. In 2019, paper for cigarettes exported by Miquel y Costas & Miquel to Paraguay represented 32.5% of the total volume imported.

The second most important supplier is Schweitzer Mauduit (SWM) do Brasil, a Brazilian subsidiary of SWM Engineered for Tomorrow, a company that has branches in several countries (for instance, SWM International is a US corporation with SWM Engineered for Tomorrow being a Brazilian subsidiary). This company also supplies paper for cigarettes to Paraguay from the USA and China. The Brazilian branch is the main supplier to Paraguay with a share of 28% of all imports of this input in 2019.

While regional suppliers have dominated recently, it is important to notice that Mudanjiang Hengfend Paper Co (China) significantly increased its shipments of this input to Paraguay over the 4 years (by 501.6%) as well as between 2018 and 2019 (by 221%). Online supplemental table 3 reports the main suppliers of paper for cigarettes.



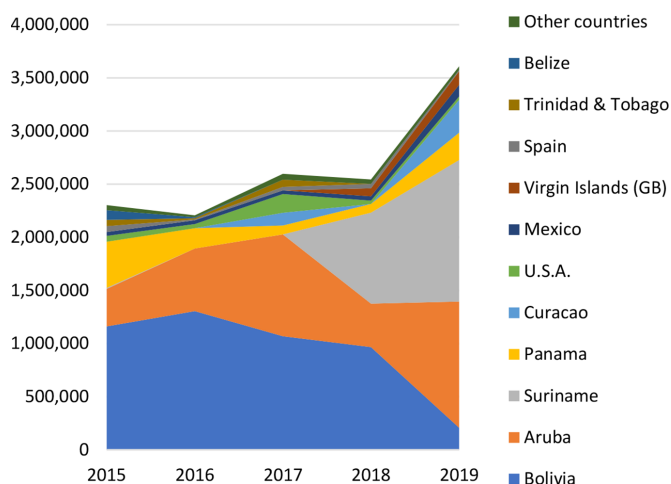


**Figure 4** Cigarette paper supply by exporting country (kg). Note: In the case of Argentina, the firm Miquel y Costas & Miquel is regarded with origin in that country. Others refers to non-identified countries. Source: Penta Transactions using data from the Paraguay Customs Office.

### MARKET DESTINATIONS OF CIGARETTES LEGALLY EXPORTED FROM PARAGUAY

For the 2015–2019 period, Paraguayan cigarette companies legally exported only to a small group of countries (figure 5). From 2015 to 2018, Bolivia accounted for 45% of total Paraguayan cigarette exports. In the same period, other principal market destinations were Suriname, Aruba, Curacao and Panama (Suriname and Aruba together comprised 33% of all brands exported legally from Paraguay). In 2019, exports to Bolivia sharply decreased to 6% of total Paraguayan exports; while Suriname and Aruba together comprised 70% of all brands exported legally from Paraguay.

Though legal exports comprise only a small share of total cigarette production in Paraguay—typically less than 10% annually according to Masi *et al*<sup>7</sup>—these exports are creating market distortions. They typically end up in countries that cannot absorb



**Figure 5** Paraguay: market destinations of legal exports. Source: Penta Transactions using data from the Paraguay Customs Office.

Note: other countries include jurisdictions accounting for less than 100 000 kilos adding all the exports for the period 2015–2019. That includes Togo, Venezuela, Uruguay, Chile, Senegal, Libya, Granada, Peru, Costa Rica, India and other non-declared.

them, and the ultimate destinations are either dubious in the case of the Bolivia–Brazil connection or unclear.

Some studies<sup>10</sup> indicate that most of Brazil's illicit cigarettes enter through the extensive land border with Paraguay and Bolivia, which is difficult to control. It may be that a portion of these exports legally exported to Bolivia could be destined for other markets, legally and illegally. Considering the porous borders shared by the three countries, one of these final destinations could be Brazil. This domestic cigarette market in Bolivia cannot absorb all the cigarettes imported from Paraguay and evidence suggests that many of these same brands have been found in Brazil without paying Brazilian taxes.

For example, in 2017, Paraguay exported 1.07 million kg of cigarettes to Bolivia. Considering the Organisation for Economic Co-operation and Development (OECD) grams-to-cigarettes conversion ratio (that assumes that 1 stick is equal to 1 g), Paraguay exported to Bolivia approximately 53 million packs of cigarettes. That amount is about 52% of what Bolivia consumed that year. This percentage, however, is unrealistically high considering that Compañía Industrial de Tabacos SA (CITSA), the main tobacco manufacturer in Bolivia, commercialises most of the brands sold in Bolivia. The evidence shows that CITSA's own brands plus Philip Morris International brands commercialised by CITSA accounted for 85% of the brand share in Bolivia in 2017.<sup>11</sup> According to Euromonitor, a significant number of cigarettes imported by Bolivia are not consumed in that country but diverted to neighbouring countries. Among the cigarette brands that have shown growing import volumes between 2013 and 2018 are Carnival, Fox, Jailsalmer and Pine. These brands do not have a visible presence in internal distribution and marketing channels in Bolivia. Carnival and Fox are two brands legally exported by Paraguay. Whereas the export volume of Carnival is low, Fox demonstrates a significant export volume from Paraguay to Bolivia as of 2015, decreasing only in 2019.

Notably, the main brand of Paraguayan cigarettes exported to Bolivia, Fox, experienced a dramatic drop in its exports to that country between 2018 and 2019. In 2018, the Bolivian government had changed the excise tax on cigarettes from an ad valorem tax on the selling price to a specific tax. The government made this change to discourage tax evasion and to impede the illicit diversion of cigarettes to neighbouring countries.<sup>11</sup> As a result, the price difference with neighbouring countries has been reduced and a reduction of smuggling to these countries was expected. In fact, the prices of cigarettes increased in Bolivia though it affected imported brands more than on local ones. It is likely that Bolivia's tax decision was intended to reduce the country's role as a transit point for illicit cigarettes.

Similarly, Aruba and Suriname are too small to absorb the quantities of cigarettes recently exported by Paraguay (100 000 and 350 000 kg in 2019), suggesting that they could be transit countries for cigarettes to other larger markets. Considering the OECD 1:1 gram-to-cigarette conversion ratio, the 1332 995 kilos of cigarettes exported by Paraguay would be 1333 million sticks, which would mean that Paraguay would be exporting to Suriname almost twice the total consumed by that country in 1995, the last year for which consumption volume data are available.<sup>12</sup> The dynamic is similar for Aruba where imports dwarf estimated consumption. This results in those markets as potential transit points for Paraguayan cigarette production that may result in legal or illegal exports to third countries. Notably, recent re-export data for these countries from Comtrade do not indicate that large quantities of these cigarettes are re-exported. More research on Aruba's and Suriname's capacities to absorb Paraguay's exports for use in their domestic markets

and re-exportation would help to elucidate these complexities further.

## CONCLUSIONS

Paraguay has been identified as a major supplier of illicit cigarettes for the Latin American region and perhaps beyond.<sup>13</sup> International researchers have used foreign trade data to describe and estimate the size of cigarette production in Paraguay and the illicit trade problem and agree that Paraguayan net imports of cigarette inputs seem to be abnormally high, but no official data on cigarette consumption were available to compare supply and demand. Despite the lack of local data, a recent study<sup>7</sup> rigorously estimates the demand of cigarettes in Paraguay and also—using the method of technical coefficients on tobacco raw material and inputs—estimates cigarette production in Paraguay. Paraguay's excess supply of cigarettes likely exceeds 2500 million packs per year on average for the period 2008–2019.

Trade data show a significant concentration of imports of raw materials and inputs for manufacturing cigarettes from only a few countries and companies, largely from the region. For example, companies based in Brazil are among the main exporters of cigarette inputs to the Paraguayan industry. Brazil is a relevant legal supplier of intermediate goods for the Paraguayan tobacco industry yet is not a destination of the legal exports of cigarettes produced in Paraguay. Despite this, evidence shows that Paraguayan cigarettes are widely available in the Brazilian market, almost all of them illicit and comprising a significant share of the overall cigarette market and the overwhelming share of the illicit market. Independent studies estimating the amount of illicit cigarette consumption in Brazil found that most of the illicit brands were produced in Paraguay.<sup>8</sup> There are historical reasons for Brazil being the main market for illicit brands, including that the Paraguayan industry was largely developed in the 1990s by Brazilian companies as part of their business strategy, and then, after 1998, to fill the supply gap created by the Brazilian export tax. Trade data also show the role of other countries in the region as major cigarette input exporters to Paraguay. For instance, Argentina and Uruguay comprise a significant share of exports to Paraguay, and just their input exports exceed the amount needed to produce for Paraguayan domestic cigarette consumption and legal exports combined.

Recent evidence also shows illicit Paraguayan cigarettes are widely available in Argentina, where some cities close to the Paraguayan border have presented up to 64% illicit tobacco trade.<sup>6</sup> Another key dynamic is the major destinations for registered or legal exports of cigarettes from Paraguay, such as Bolivia, Suriname, Aruba and Curacao, do not have domestic markets large enough to absorb these influxes of imports, casting suspicion on the eventual destination of these goods. Linking this information with the above-mentioned evidence that no records of legal exports of cigarettes from Paraguay to Brazil indicates that potentially most of the illicit traffic of Paraguayan-manufactured cigarettes into Brazil occurs through the borders with Paraguay and Bolivia.

International illicit trade in tobacco products poses a serious threat to public health because it increases the accessibility and affordability of tobacco products, fuelling the tobacco epidemic and undermining tobacco control policies. But also, international illicit trade causes substantial losses in government revenues, and at the same time contributes to the funding of transnational criminal activities. This analysis details two inter-related dynamics that need to be examined closely by governments and other key stakeholders in the region to address this threat.

The global treaty, the Protocol to Eliminate Illicit Trade in Tobacco Products, aims to secure the supply chain of tobacco products. This requires tracking and tracing not only nationally but also better coordination of managing regional and global flows across the tobacco supply chain. Illicit trade is a global challenge, and countries' interconnection as suppliers of cigarette inputs, hubs for illicit re-exports or final destinations of cigarettes re-emphasises the broader argument stated in the Protocol. International collaboration and cooperation including information sharing, technical and law enforcement cooperation, mutual legal and administrative assistance, and extradition-related coordination are key to fight illicit trade. Neighbouring governments should also consider seriously how to encourage private firm responsibility. A very important step to encourage responsibility is to have accurate information on imports and exports. These data should be obtained and created as part of coordination and cooperation among countries. In the region, Argentina has not ratified the Framework Convention on Tobacco Control (FCTC), and only Uruguay and Brazil have ratified the Protocol. In July 2022, Paraguay ratified the FCTC Protocol. This is an opportunity and a challenge for neighbouring countries to implement coordinated actions. If governments really want to address the illicit trade problem, countries need to encourage each other to ratify the FCTC and/or the Protocol to provide the foundation for sharing this information regionally and globally, and some guidelines to encourage responsibilities among firms. Once cooperation becomes the norm, there may be additional ways that governments can consider how to stem the flow of both illicit cigarettes and their constituent inputs.

This study presents some limitations. Penta Transactions may misreport import volumes of inputs and or exports. Other studies<sup>3,14</sup> using alternative sources of data, for example, Comtrade, have found huge differences in the volumes imported and exported between different countries. Additional efforts combining different sources of data may be able to reduce potential inconsistencies and provide more evidence to identify trends on illicit trade in inputs.

In the region, Argentina has not ratified the Framework Convention on Tobacco Control (FCTC), and only Uruguay and Brazil have ratified the Protocol. In July 2022, Paraguay ratified the FCTC Protocol. This is an opportunity and a challenge for neighboring countries to implement coordinated actions. The findings of this study provide new evidence of the linkages between Brazil, Argentina and other countries and Paraguay in producing and trading tobacco products. The evidence overwhelmingly demonstrates that the oversupply of cigarette inputs may divert illegally back to the countries exporting inputs to Paraguay in the form of manufactured cigarettes. The challenge here is not isolated to Paraguay because there is a clear responsibility of the Brazilian, Argentinian and Uruguayan companies in exporting inputs for producing illicit cigarettes. Findings also show that even a relatively large percentage of legal exports may be triangulated to other countries, where companies from Aruba and Suriname, among others, may also be implicated in these complexities. Although it seems to have diminished recently, there is evidence that Bolivia has also played an important role in the supply chain, which merits further study.

These findings suggest that eliminating cigarette illicit trade would require coordinated actions between Paraguay and Brazil, but also involving others, as there is a larger set of countries with responsibilities on the cigarette illicit trade. More controls along the transborder tobacco supply chain, but also actions targeted to ensure the formalisation of bilateral trade, would be critical for mitigating illicit activity that is undermining tax collection

and promoting crime and poor public health. The FCTC and the Protocol, as well as regional institutions such as Mercosur, bring opportunities to involve government from the region to define specific actions to tackle illicit trade between Paraguay and Brazil.

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**Contributors** FM and GR-I collaborated on defining the objectives and the main variables to analyse. FM, GR-I and JD conceived and designed the study, conducted the document search, read and analysed documents. FM and GR-I analysed the data. GR-I advised on the search, read and analysed the documents. FM and GR-I revised the manuscript and edited the paper. JD advised on the search, read and analysed documents, and edited the paper.

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