Trade at the margins:
hidden commercial patterns between China and Latin America, 1980-2020

Songlin Wang

The paper is still in progress. The author welcomes all constructive comments and critiques.

Abstract

At the margins of the great tide of transpacific globalization between China and Latin America since 1980s, there exist informal local economic activities and cross-border illicit trade. This paper addresses the smuggling in Bolivia's imports of Chinese products via Chile. It provides a macroeconomic perspective to illustrate the informal trade that has emerged in Latin America's economic periphery. To this end, we conduct a mirror analysis by comparing Bolivia's import data with export data of China and Chile. Our analysis identifies substantial over-reporting in Bolivia's declaration of imports from China and under-reporting in Bolivia's declaration of imports from Chile. The results also indicate that the largest discrepancies appear in the products of textile yarn, fabrics, made-up articles, rubber manufactures, road vehicles, telecommunications equipment, electrical machinery, articles of footwear, apparel and clothing accessories. These findings suggest that Bolivia has imported these Chinese products through re-exportation from other transit countries. Additionally, Chile is an important entrepôt country for Bolivia's imports and part of this transit trade occurs through unofficial or illegal channels.

Keywords: foreign trade data, smuggling, China, Latin America

1. Introduction

After World War II, trade between Asia and Latin America underwent significant transformation due to shifting geopolitical dynamics, economic policies, and regional development strategies. Initially, trade between these regions was limited as both primarily engaged with the United States and Europe. However, from 1960s onwards, rapid industrialization in Asian economies, particularly Japan, the Four Asian Tigers (Hong Kong, Singapore, South Korea, and Taiwan) and later China, led to an expansion in trade relations between Asia and Latin America (Dosch and Jacob 2010). This trade relationship was further facilitated by multilateral trade agreements and regional cooperation frameworks that sought to diversify trade and reduce dependency on traditional markets (Hosono 2019).

China's "Go Global" economic policy, which aimed at expanding shares in emerging markets, has reoriented the center of gravity of the world economy from the saturated markets of the United States and Europe to developing countries (Tassi et al. 2012). With the economic and commercial opening of China since 1978 and its subsequent rise as a global manufacturing factory, the trade relations between China and Latin America further intensified, making China one of Latin America's largest trading partners (Devlin, Estevadeordal, and Rodríguez-Clare 2006; Fornes and Mendez 2018; Peters 2005).

Globalization encompasses not only large-scale international trade but also small-scale activities in the informal economy. This phenomenon, which includes grassroots-level economies, has opened spaces for individuals to seek opportunities and participate on their own terms (Galemba 2008; Muñoz Valenzuela 2023; Shefner and Fernández-Kelly 2011). This can be observed broadly in the context of illicit trade, particularly under the neoliberal economic policies and the growing economic relationships between China and South America since the second half of the 20th century (Muñoz Valenzuela 2023).

The illicit trade has been a persistent problem throughout Latin America, which accounts for around 80% of global smuggling (Baspineiro 2024). Due to its geographical landlocked position and its lax controls on irregular trade, Bolivia has proven to be particularly fertile ground for contraband (Baspineiro 2024). Following the intensification of rural-urban migration in Bolivia after the 1952 revolution, and the country's debt crisis and structural adjustment in the mid-1980s, small-scale economic activities with self-employment, unprotected and hardly taxed by the state, has continued to increase and these urban informal markets and cross-border trade sustain hundreds of thousands of Bolivian lives (Müller 2017; Tassi et al. 2012).

The increase in small-scale trading activities in Bolivia since 1980s can also be attributed to the resurgence of native commerce as traders and service providers because of the increasing tradeable goods from East Asia (Müller 2017). The influence of the Chinese economy on the daily lives of Bolivians began in the 1980s, with Chinese-manufactured goods becoming widely consumed across all social strata and ethnic backgrounds (Müller 2018). Before larger Chinese electronics and telecommunication enterprises officially entered the Bolivian market, Chinese electronic goods and household appliances were sourced through social networks linking China with Bolivia via import–export firms in free trade zones such as Iquique (Chile) and Colón (Panama) (Müller 2018). In this way, Bolivia's local economy has actively engaged with the global market through

strategic international alliances, fostering and creating a "globalization from below" (Ribeiro 2012).

This "globalization from below" is driven by networks and social dynamics that surpass institutions and challenge the supremacy of traditional elites who have historically defined the national economy (Tassi et al. 2012). Indigenous groups play a central role in these local trade circuits, utilizing their local and familial ties to integrate and supply markets (López Guerrero 2018; Muñoz Valenzuela 2023). For instance, Aymara popular traders negotiate within the global economy's interstices, drawing on their history and relational forms to grow significant economic spaces within Bolivia's national economy (Tassi et al., 2012). According to Fernanda Wanderley, senior researcher at the Bolivian Catholic University, the Aymara and Quechua populations have long tradition of trade from colonial period and this knowledge is passed down from generation to generation (Baspineiro 2024).

Based on strong family and community ties, this local ethnic circuits and exchange dynamics, including popular economies, smuggling, and retail, satisfied the changing daily demand in this landlocked country. Products ranged from radios, black-and-white TVs, record players, and tape recorders in 1980s, color TVs, stereos, and household appliances such as refrigerators and computers in 1990s, to laptops, mobile phones, and tablets in 2000s (Müller, 2017; Muñoz Valenzuela, 2023; Tassi et al., 2012).

In these local commercial circuits, it is worth mentioning the trade in the Bolivia-Chile border area. In the last decades, stores aimed at satisfying the growing demand for electronic articles in the Atacama-Lípez border area have grown steadily and intensely. The cross-border economy in the border area of Atacama-Lípez between Bolivia and Chile dates to the early 20th century, shaped by the nitrate economic cycle and the later copper mining. The contemporary economic opening of Bolivia and Chile through the signing of international free trade agreements, as well as the operation of international mining companies in this region contributed to the emergence of free trade zones, such as those located in Bolivia (Oruro Free Trade Zone), Chile (Iquique Free Trade Zone or ZOFRI) and Peru (Tacna Free Trade Zone or ZOFRATACNA) (Muñoz and Garcés 2022). It is worth mentioning that these cross border commercial activities linked to the economic expansion cycles have been intertwined and strengthened from the beginning by smuggling practices (Laurent 2014; Muñoz Valenzuela 2023; Platt 2016; Rosemblitt 2013).

Since the last decades of the 20th century, the emergence of the East Asian Region, and specifically China in the global trade, has significantly impacted the Bolivia-Chile border area (Durán Lima and Pellandra 2017). The cross-border trade and the circulation of goods and imitations in Bolivian markets was substantially supplied by the intense traffic of electronic goods from Chilean cities like Iquique and Calama (Muñoz and Garcés 2022). In the port enclaves of the South Pacific, especially considering the Free Trade Zone of Iquique, the economic interrelation between China and the region increased its annual commercial flows by 3%, which for the decade 1990-2000 showed an annual increase rate of more than 20%, both in exports and imports (Durán Lima and Pellandra 2017; Muñoz and Garcés 2022).

At the beginning of the 21st century, this trade flow intensified, and the cross-border circulation was strengthened with the consolidated increase in Chile's imports from China which have reached a growth of more than 30% in electronics and optics items, more than 300% in machinery and equipment, and more than 700% in terms of motor vehicles and their parts from the first to the second decade of the 21st century (Muñoz and Garcés 2022; Muñoz Valenzuela 2023).

In the shadow of this great tide of transpacific globalization between China and Latin America, there exist informal spaces of "ant trade", smuggling, imitation of major brands or exploitation of market niches, which represent a significant part of the global economy and contribute to shaping it (Tassi et al. 2012). Therefore, it's not sufficient to understand the globalization solely through official trade statistics and there is a hidden part of the globalization folded in the foreign trade data. How was this China-centered commodity network in the cross-border trade between Chile and Bolivia? What were the main products in this trade flow? How many of these products went to Bolivian market through the smuggling?

This paper addresses the smuggling in Bolivia's re-imports of Chinese products via Chile, providing a macroeconomic perspective to shed light on the contraband trade that has emerged from Bolivia's economic periphery. To this end, we conduct a mirror analysis by comparing Latin American countries' import data with Asian countries' export data. By adopting this methodology, we contribute to the predominantly anthropological literature on smuggling activities in Bolivia.

The mirror analysis results show that from 1995 to 2020, Bolivia's import data from China is much higher than China's export data to Bolivia, and Bolivia reports much lower volume of imports from Chile than the export data to Bolivia reported by Chile. These discrepancies exceed the acceptable range of bilateral trade data differences that can be attributed to transport and

transaction costs. The findings suggest substantial overreporting of Bolivian imports from China and underreporting of imports from Chile. This implies that Bolivia may be importing Chinese products through re-import from other transit countries. Furthermore, Chile serves as a significant entrepôt for Bolivia's imports, with a portion of this transit trade probably occurring through unofficial or illegal channels.

We further conduct a detailed mirror analysis of trade data between Bolivia, China, and Chile, using the Standard International Trade Classification (SITC) categories. The results indicate that the largest discrepancies appear in the categories of textile yarn, fabrics, made-up articles, rubber manufactures, road vehicles, telecommunications equipment, electrical machinery, articles of footwear, apparel and clothing accessories, part of which are likely being imported to Bolivia via Chile through smuggling.

The paper is organized as follows. Section 2 introduces the long-term evolution of the trade relationships between Asia and Latin America, as well as Bolivia's foreign trade and cross-border trade in the free trade zone of Iquique (ZOFRI). Section 3 outlines the methodology of foreign trade data mirror analysis. Section 4 presents the detailed mirror analysis results of trade data discrepancies between Bolivia's import data and the export data to Bolivia recorded by China and Chile, followed by a review of the effects of smuggling in Bolivia. Section 5 concludes.

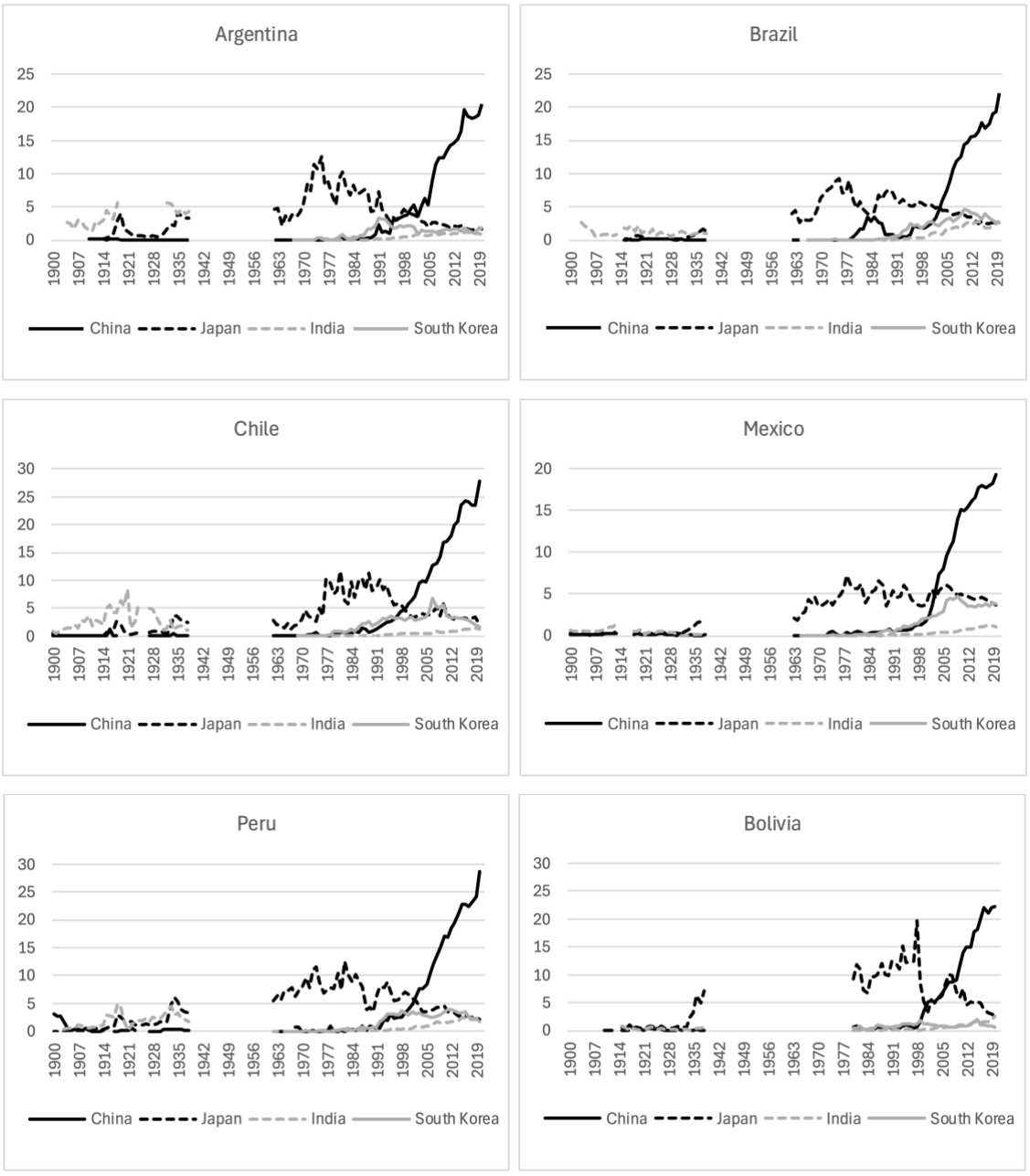
2. Long-term trade between Asia and Latin America

2.1 Asia in Latin America's foreign trade, 1900-2020

In this section, we provide an overview of the long-term changes in Asia's importance in Latin America's foreign trade. **Figure 1** illustrates the share of four Asian countries (China, Japan, India, and South Korea) in the total import value of six Latin American nations (Argentina, Brazil, Chile, Mexico, Peru, and Bolivia) from 1900 to 2020. In most of the years between 1900 and 1938, the share of each Asian countries in Latin American import remained below 5%. India and Japan played a relatively more significant role in Latin America's import basket, while China presented the lowest percentage in this trade flow. In the 1970s and 1980s, Japan emerged as the leading Asian exporter to Latin America, accounting for approximately 5% to 10% of the region's imports. However, from the late 1980s onward, Japan's share began to decline across most Latin American countries, while the shares of the other three Asian nations, particularly South Korea and China, increased. From the 2000s onward, China became the dominant Asian exporter to Latin America.

By 2020, China accounted for about 20% of the imports of Argentina, Brazil, Bolivia, and Mexico, and nearly 30% of the imports of Peru and Chile. In contrast, Japan, South Korea, and India each contributed around 2% to Latin America's total imports.

Figure 1: Percentages of Asia in Latin America's import, 1900-2020

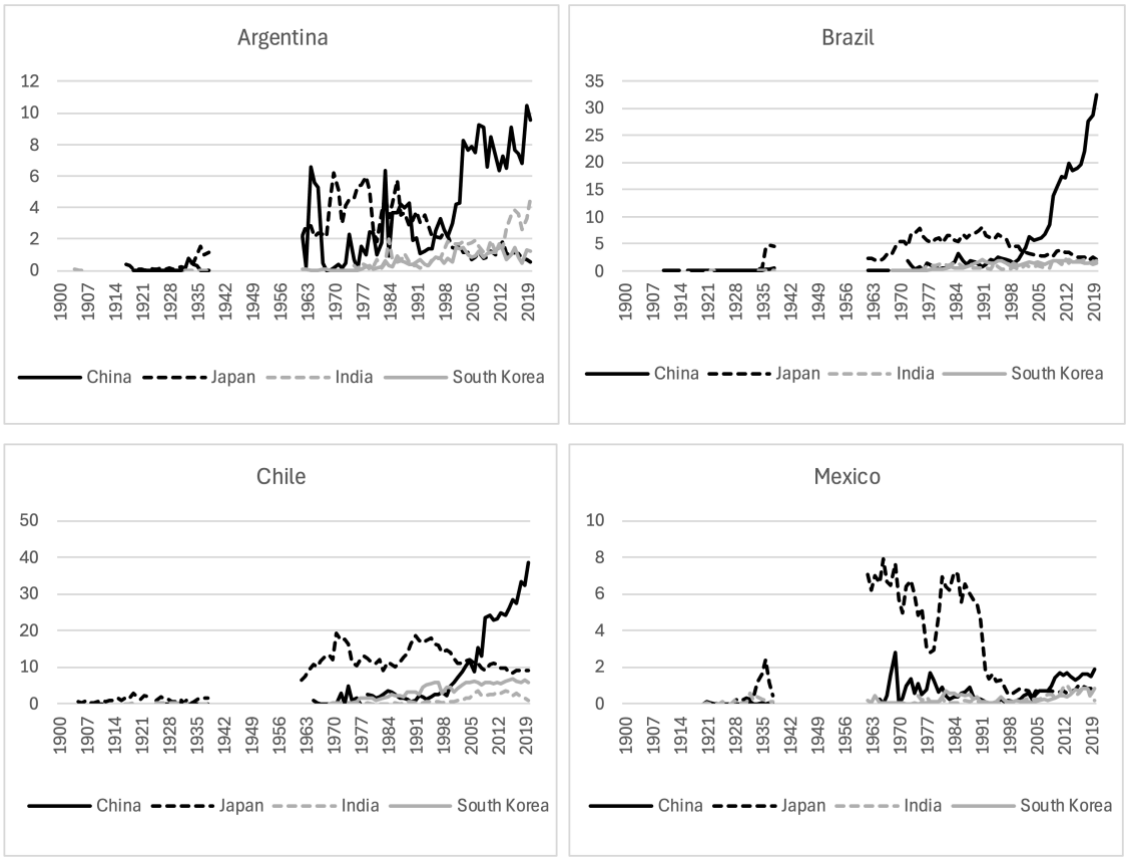


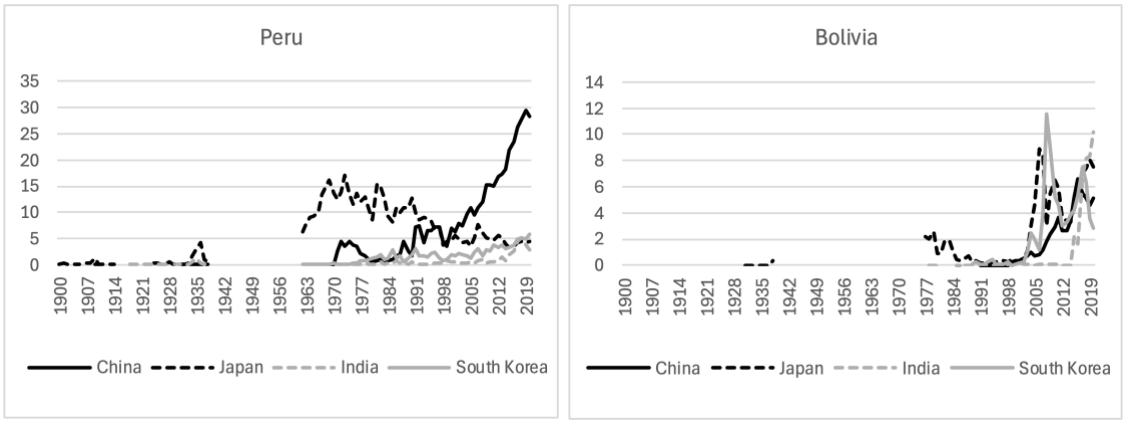
Source: Latin American countries' historical foreign trade yearbook, UN Comtrade data

Regarding Latin America's exports to Asia, **Figure 2** shows the share of the four Asian countries in the total export value of the Latin American countries from 1900 to 2020. Between 1900 and

1938, the shares of China, Japan, and India in Latin American exports were generally under 3%, with Japan holding the largest share during this period. From the 1960s to the 1980s, Japan accounted for a higher percentage of Latin American exports, but this began to decline in the 1990s. Meanwhile, the importance of India, South Korea, and especially China as destinations for Latin American exports increased. By 2020, China accounted for around 10% of Argentina's exports, approximately 30% of Brazil and Peru's exports, and nearly 40% of Chile's exports. Mexico, however, was an exception, with each of the three Asian countries contributing less than 2% to its total exports in 2020.

Figure 2: Percentages of Asia in Latin America's export, 1900-2020



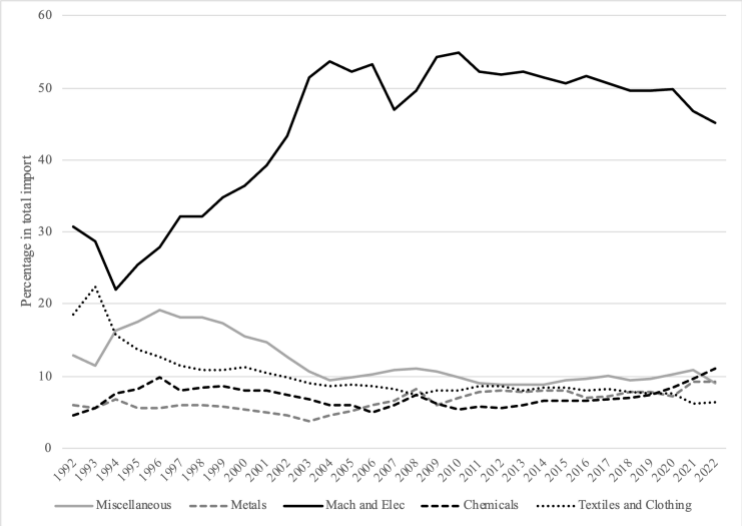


Source: Latin American countries' historical foreign trade yearbook, UN Comtrade data

Bolivia's export patterns diverged somewhat from those of other Latin American countries. The percentage of exports to Japan and South Korea increased in the 2000s but exhibited high volatility. Meanwhile, Bolivia's exports to China showed a more stable growth trajectory, although China did not become Bolivia's dominant export destination. The most notable change occurred with India, whose share of Bolivia's exports surged dramatically after 2014. By 2020, India had become the largest Asian destination for Bolivian exports, accounting for over 10% of the total. This shift could be related to the cyclical nature of Bolivia's raw material exports, where Japan and South Korea were initially prominent, followed by China and, more recently, India.

Regarding the composition of products in the trade between Latin American and Caribbean countries and China, according to WITS data from 1992 to 2022, machinery and electronics have consistently dominated the imports of Latin American and Caribbean countries from China (see Figure 3). This category increased rapidly during the 1990s, and in most years of the 21st century, it accounted for more than 50% of these imports. In contrast, textiles and clothing, which represented more than 10% of imports in the 1990s, have seen a declining share in the 21st century.

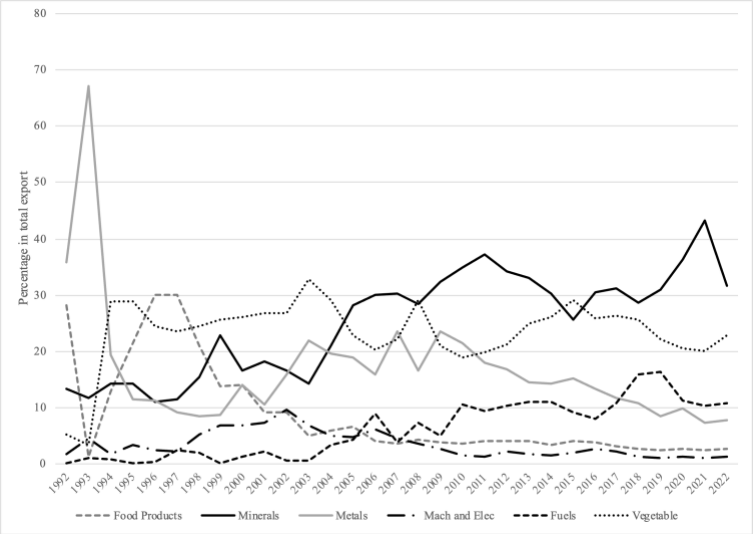
Figure 3: Latin America & Caribbean import from China by products, 1992-2022



Source: WITS

On the export side, Latin American and Caribbean countries have exhibited an increasing trend in exporting minerals and fuels to China from 1992 to 2022 (see Figure 4). Since 2005, minerals have accounted for more than 30% of exports in many years, while fuels have risen to around 10%. Metals have also maintained a significant presence, accounting for more than 10% of exports throughout most of this period and reaching around 20% during the 2000s. Vegetable products have consistently occupied between 20% and 30% of exports. Conversely, food products have shown a decreasing trend, accounting for less than 5% in the 21st century. Exports of machinery and electronics remained minimal, contributing less than 3% during the 2010s. The trade relationship between Latin America and the Caribbean and China over the past three decades has been characterized by Latin America's importation of manufactured goods, particularly machinery and electronics, and the exportation of raw materials such as minerals, fuels, and metals. This reflects a pattern where Latin America and the Caribbean serve as suppliers of primary commodities while importing high-value manufactured products from China.

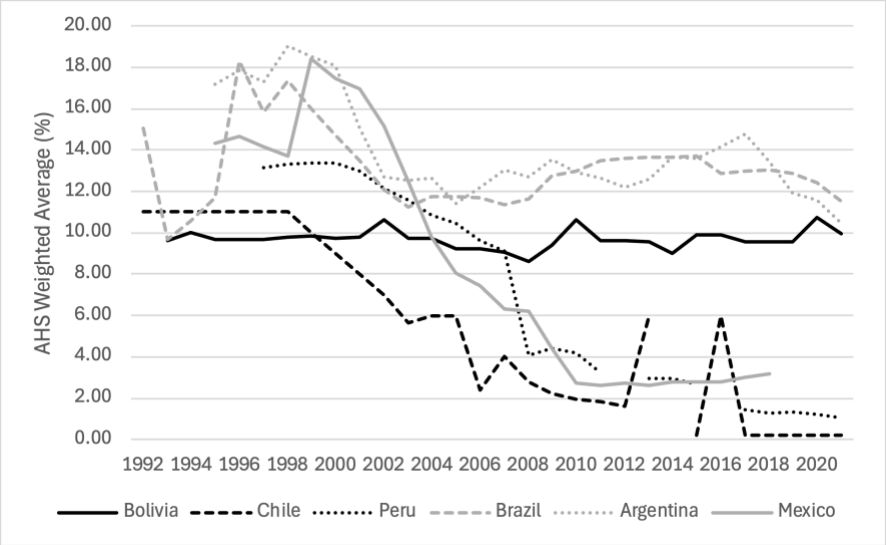
Figure 4: Latin America & Caribbean export to China by products, 1992-2022



Source: WITS

In summary, from the 2000s onward, China became the dominant Asian commercial partner for Latin American countries, especially for Latin America's import. This shift could be related to China's entry into the World Trade Organization and changes in Latin American countries' tariffs on imports from China. **Figure 5** shows the Applied Tariff Weighted Average rates imposed by several Latin American countries (Bolivia, Chile, Peru, Brazil, Argentina, and Mexico) on imports from China between 1992 and 2021. The evolution of these tariffs reflects the varying trade policies and economic strategies of each country over this period. In 1990s, most of the countries exhibited high tariff rates, with Brazil, Argentina, and Mexico imposing particularly high tariffs, often exceeding 15%. However, from mid-1990s onwards, there is a clear trend toward tariff reduction on the import from China in Latin America, especially in Chile, Peru and Mexico. By 2005, Chile's import tariff on China fell to 6% and from 2017 on the tariffs were near zero, reflecting a strong commitment to trade liberalization and the enhancement in the trade relationship with China. Peru and Mexico also showed similar trend and by 2020 Peru's tariff rate applied on import from China was around 1%.

Figure 5: Latin American countries' applied tariffs on imports from China, 1993-2021 (AHS Weighted Average %)



Sources: WITS

Conversely, Brazil and Argentina maintained relatively high tariffs of around 12% to 14% on import from China throughout much of the 21st century, despite some reductions in the early 2000s. This reflects a protectionist trade approach, likely aimed at protecting domestic industries from foreign competition. Bolivia also maintained tariffs on import from China of about 9% to 10%. However, from 2004 onwards, Bolivia began liberalizing its trade regime, especially with South American neighbors like Brazil, Argentina, and Peru. Its applied tariffs on imports from these countries dropped to less than 2%, even reaching near-zero levels by 2006. Although tariffs imposed on Chile ranged between 4% and 7%—higher than those for other South American neighbors—they were still lower than Bolivia's tariffs on imports from China, which were around 10%.

In summary, Bolivia's tariffs on import from China were higher than Chile's tariffs on imports from China. Additionally, Bolivia's tariffs on import from China were higher than its tariffs on import from Chile. This significant tariff difference may have encouraged Bolivian importers to bring in goods through Chile, where Chinese products could be "nationalized" and then re-exported to Bolivia at a lower cost.

2.2 Bolivia's foreign trade, 1980-2020

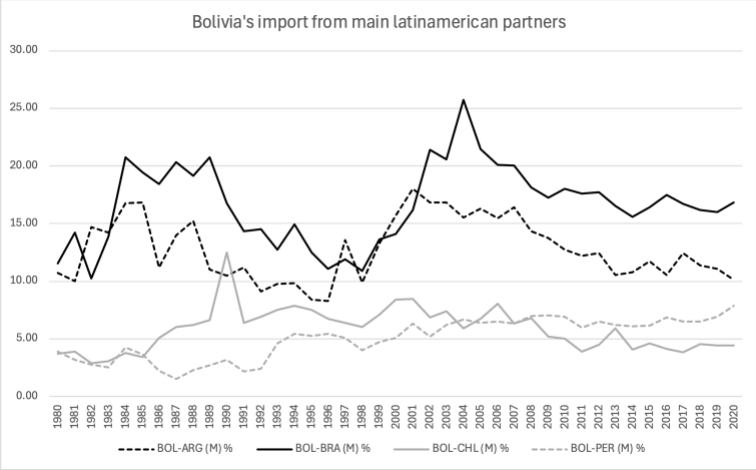
Focusing on Bolivia's foreign trade from 1980 to 2020, **Table 1** presents the changing rankings of the top 10 countries in Bolivia's imports over this period, and **Figure 6** illustrates the evolving shares of Bolivia's main trading partners. From 1980 to 2000, the United States was Bolivia's most significant trading partner, consistently accounting for over 20% of the country's imports. However, over the following two decades, the U.S.'s share gradually declined, dropping below 10% by 2020. Other traditionally important trading partners, such as the United Kingdom and Germany, also saw declines in their shares of Bolivia's imports. In 1980, Germany accounted for 9% of Bolivia's imports, but by 2020, this share had decreased to 2%. Similarly, the United Kingdom's share fell from 6% in 1980 to around 1% from the 1990s onward.

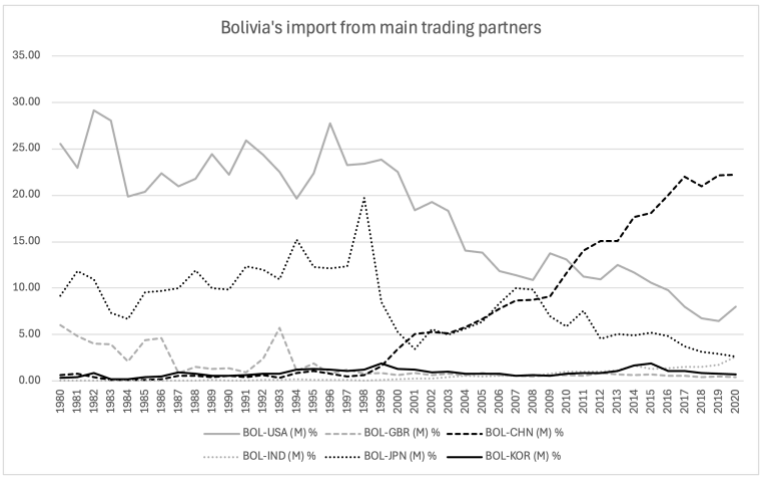
Table 1: Percentages of TOP 10 countries in Bolivia's import

1980		**1990**		**2000**		**2010**		**2020**	
USA	26%	USA	22%	USA	22%	Brazil	18%	China	22%
Brazil	12%	Brazil	17%	Argentina	16%	USA	13%	Brazil	17%
Argentina	11%	Chile	12%	Brazil	14%	Argentina	13%	Argentina	10%
Germany F. R.	9%	Argentina	10%	Chile	8%	China	12%	USA	8%
Japan	9%	Japan	10%	Japan	5%	Peru	7%	Peru	8%
United Kingdom	6%	Germany F. R.	8%	Peru	5%	Japan	6%	Chile	4%
Peru	4%	Peru	3%	China	3%	Venezuela	6%	Japan	3%
Chile	4%	Italy	2%	Spain	3%	Chile	5%	India	3%
Panama	2%	United Kingdom	1%	Mexico	2%	Mexico	2%	Mexico	2%
Netherlands	2%	Sweden	1%	Colombia	2%	Colombia	2%	Germany	2%

Source: UN Comtrade data

Figure 6: Percentages of main trading partners in Bolivia's import, 1980-2020





Source: UN Comtrade data

On the other hand, China emerged as a major trading partner beginning in the 2000s, with its share in Bolivia's imports increasing significantly. From 2014 onwards, China surpassed the U.S. and other traditional partners, establishing itself as the leading source of imports for Bolivia, accounting for over 20% of the country's total imports. When examining other Asian countries' roles in Bolivia's imports, Japan showed a steady increase in its share from around 10% in the 1980s to nearly 20% by 1998. However, this was followed by a sharp decline to 5% at the start of the 21st century. Despite a slight recovery between 2006 and 2008, Japan's share in Bolivia's imports remained around 5%, with a slight decrease from 2016 to 2020. South Korea's share grew modestly during the 1990s but remained below 3%. India exhibited an upward trend starting in the 2010s, reaching 3% of Bolivia's imports by 2020, matching Japan's share.

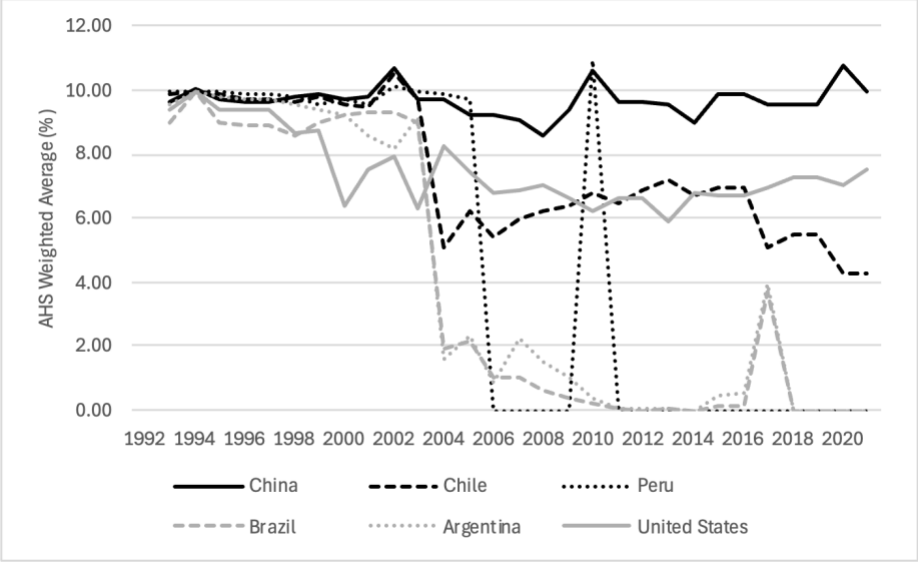
Bolivia has maintained strong trade relationships with its South American neighbors from the first half of the 20th century (Carreras-Marín, Badia-Miró, and Peres Cajías 2013). From 1980 to 2020, Brazil has consistently been Bolivia's most important Latin American partner. During the 1980s, Brazil's share of Bolivia's imports grew, accounting for approximately 20% of Bolivia's total imports. Although this share gradually declined in the 1990s, it began to rise again in 1998, peaking at 25% in 2004. Although Brazil's share declined somewhat after this peak, it remained Bolivia's largest Latin American supplier, holding more than 15% of Bolivia's imports through 2020.

Argentina has been Bolivia's second most important import partner, following a similar pattern to Brazil. In the early 1980s, Argentina had a significant share of around 15%, but this declined in the late 1980s and 1990s. It later increased and stabilized at around 10% to 15% in the 2000s, before declining after 2006. By 2020, Argentina still accounted for 10% of Bolivia's total imports.

Chile's role in Bolivia's imports has been relatively stable. After an upward trend in the 1980s, Chile's share stabilized above 5%. Although there was a slight decline to around 5% in the 2010s, Chile's contribution to Bolivia's imports remained significant. Peru, meanwhile, showed consistent growth throughout this period, increasing from below 5% in the 1980s to 8% in 2020.

Figure 7 presents Bolivia's import applied tariff weighted average in 1993-2021 for six trading partners (China, Chile, Peru, Brazil, Argentina, and the United States). Initially, Bolivia maintained relatively high and stable tariff rates across all partners, with rates around 9-10% until the early 2000s. However, from 2004 onwards, Bolivia embarked on a significant liberalization of its trade regime, particularly with South American neighbors like Brazil, Argentina and Peru, where tariffs plummeted to near-zero levels by 2006. The sharp decline in tariffs with these countries reflects regional integration efforts, such as participation in the South American trade bloc of Southern Common Market (Mercosur) trade agreements, as well as the "complementary agreement" with Chile, which enhanced the economic cooperation and market access within the region. The tariffs imposed for Chile were relatively stable until 2004 when they significantly dropped. After 2006, tariffs generally stayed between 4% and 7%.

Figure 7: Bolivia's import applied tariffs, 1993-2021 (AHS Weighted Average %)



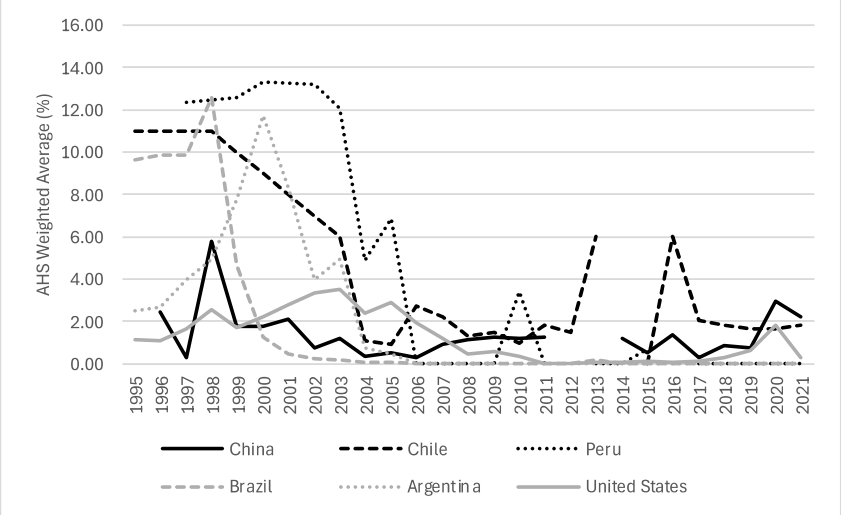
Sources: WITS

As for China and United States, the tariffs imposed to U.S. had varied tariffs, starting at around 9%, then dropping significantly around 2000, and stabilizing between 6% and 7%. Bolivia's import tariffs with China remained relatively higher, though they also experienced a gradual decline from

2002 to 2008, the tariffs stabilized around 10%. This indicates a more cautious approach to liberalization with these global economic powers. By 2021, while tariffs with China and the United States settled at relatively higher levels, Bolivia maintained lower tariffs with its regional partners, especially Brazil, Argentina and Peru, which could increase the possibility of Bolivia's re-importing Chinese or American products via its neighboring countries.

Is Bolivia's relatively higher tariff on imports from China and the United States a response to high tariffs imposed by these countries on Bolivian exports? **Figure 8** presents the weighted average applied import tariffs of Bolivia's six trading partners—China, Chile, Peru, Brazil, Argentina, and the United States—on imports from Bolivia between 1995 and 2021. The data show that from 2000 to 2019, China's applied tariffs on imports from Bolivia ranged between 0% and 2%. Between 2000 and 2005, the United States' applied tariffs were between 2% and 4%, but since 2006, they have been below 2%, dropping to under 1% in many years after 2008. In contrast, in the second half of 1990s, Bolivia's Latin American counterparts—particularly Peru, Argentina, and Chile—imposed relatively higher tariffs on imports from Bolivia. Starting in the 2000s, these tariffs decreased, although Chile's tariffs remained comparatively higher. Therefore, the data indicate that Bolivia's relatively higher tariffs on imports from China (around 10%) and the United States (between 6% and 8%) are unlikely to be a direct response to high tariffs from these countries, as both have maintained low tariffs on Bolivian imports during this period. Possible reasons for Bolivia's higher tariffs on imports from China and the United States include efforts to protect domestic industries from foreign competition, especially in sectors susceptible to cheaper imported goods. Political and strategic considerations, such as fostering regional trade or enhancing economic independence, could also play a role in maintaining elevated tariff levels on imports from these countries.

Figure 8: Applied tariffs on import from Bolivia, 1995-2021 (AHS Weighted Average %)



Sources: WITS

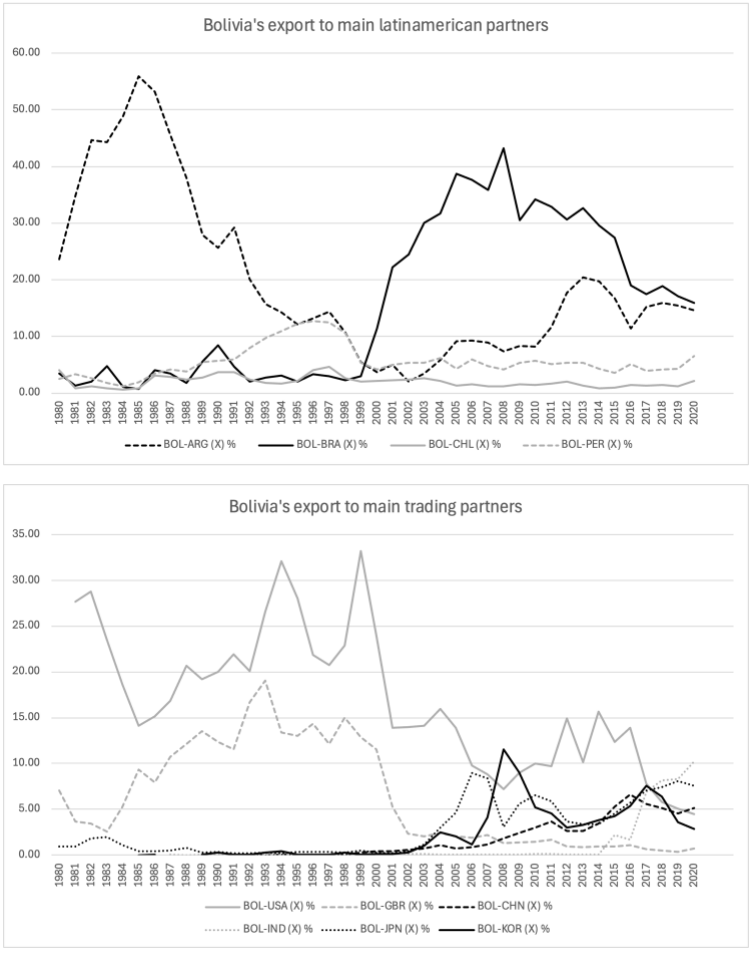
Regarding Bolivia's exports from 1980 to 2020, **Table 2** highlights the changing rankings of the top 10 countries by percentage share during this period, and **Figure 9** illustrates the evolving percentages of Bolivia's main trading partners. From 1980 to 2000, the United States was a significant destination for Bolivia's exports, accounting for more than 20%, and even exceeding 30% in some years. However, over the next two decades, the U.S.'s importance gradually declined, falling to just 4% by 2020. Another traditionally important trade partner, the United Kingdom, followed a similar trajectory. After an increase in the 1980s, its share of Bolivia's exports steadily decreased throughout the 1990s, eventually plummeting to less than 1% by 2020.

Table 2: Percentages of TOP 10 countries in Bolivia's export

1980		**1990**		**2000**		**2010**		**2020**	
USA	29%	Argentina	26%	USA	24%	Brazil	34%	Brazil	16%
Argentina	24%	USA	20%	Colombia	13%	USA	10%	Argentina	15%
United Kingdom	7%	United Kingdom	12%	United Kingdom	11%	Argentina	8%	India	10%
Switzerland	5%	Brazil	8%	Brazil	11%	Japan	7%	Japan	8%
Netherlands	4%	Belgium-Lux	7%	Switzerland	11%	Peru	6%	Peru	7%
France	4%	Peru	6%	Uruguay	5%	Belgium	5%	Colombia	5%
Chile	4%	Germany F. R.	4%	Peru	4%	Rep. of Korea	5%	China	5%
Germany F. R.	4%	Chile	4%	Argentina	4%	Venezuela	5%	USA	4%
Brazil	3%	France	2%	Venezuela	4%	Colombia	3%	UAE	4%
Belgium-Lux	3%	Switzerland	2%	Belgium	3%	China	3%	Netherlands	3%

Source: UN Comtrade data

Figure 9: Percentages of main trading partners in Bolivia's export, 1980-2020



Source: UN Comtrade data

As for Asian countries in Bolivia's export, the data show that they accounted for less that 3% in Bolivia's export until the early 2000s. From then on, their share began to grow. The peak of each country's share occurred at different times: Japan in 2006 with a share of 9%, South Korea in 2009 with 11.5%, China in 2016 with 6.6% and India in 2020 with 10%.

Bolivia's intraregional trade with its Latin American counterparts has also been crucial for its export. Argentina, Brazil, and Peru have consistently accounted for a large share of Bolivia's exports. In most of the 1980s, Argentina represented over 30% of Bolivia's exports, peaking at 55% in 1985. However, Argentina's share drastically decreased in the 1990s. From 2002 onwards, it began to rise again, reaching 15% by 2020. Brazil accounted for less than 5% of Bolivia's exports during most of the years before 2000, but its share surged dramatically afterward, reaching 43% in 2008. Although Brazil's share declined somewhat after 2008, it remained the country with the

highest share of Bolivia's total exports through 2020. Meanwhile, Chile's share of Bolivia's exports remained relatively stable, with a slight decrease from 2000 onward. Peru's share of Bolivia's exports also remained steady at around 6%, except for a boom between 1993 and 1998, when its share surged to over 10%.

However, official trade statistics may not fully capture all aspects of international trade. In landlocked countries like Bolivia, which lack direct access to ports, foreign trade heavily depends on transit through third countries. As a result, there may be an underlying and less visible dimension to their foreign trade that is not reflected in the official data.

2.3 Bolivia's cross-border trade and ZOFRI

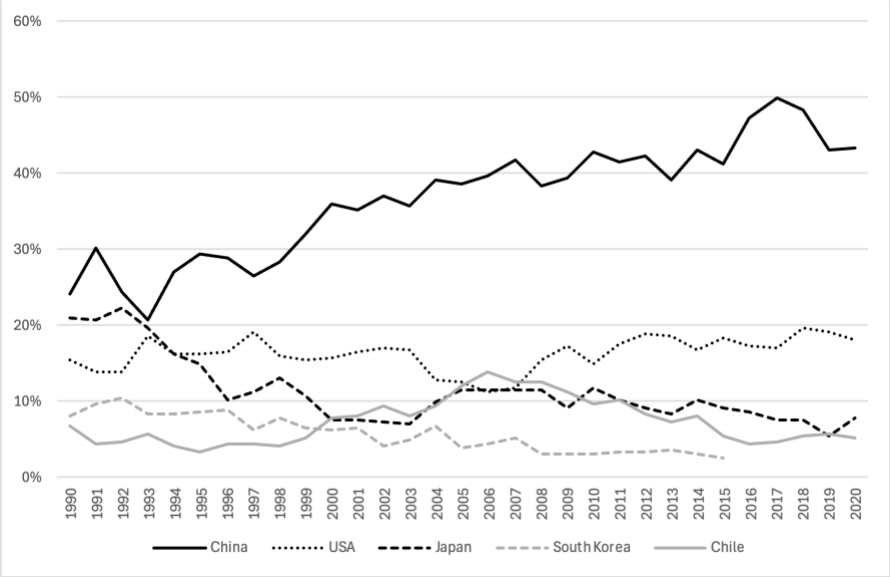
Cross-border trade is essential to Bolivia's economy due to its dependence on neighboring countries for access to international markets. Bolivia conducts trade with countries like Chile, Brazil, Argentina, and Peru, using various trade routes and border crossings. Among the neighboring countries, Chile is crucial for Bolivia's access to the Pacific Ocean, with the Ports of Arica and Iquique acting as major transit points for Bolivia's international trade. The Tambo Quemado (Bolivia) – Chungará (Chile) border crossing is a key route for transporting goods to and from these ports. Bolivia's imports from the Zona Franca de Iquique (ZOFRI) pass through this crossing.

Zona Franca de Iquique (ZOFRI), a prominent free trade zone in northern Chile, plays a vital role in regional trade between Chile, Bolivia, Peru, Argentina, and other global markets. Companies operating in ZOFRI benefit from tax exemptions, including Chile's Value Added Tax (VAT) and import duties (Condori Quispe 2014). The zone also simplifies customs procedures, reducing costs and time, making it an attractive hub for importing, warehousing, and re-exporting goods.

Figure 10 shows ZOFRI's imports from various source countries from 1990 to 2020. Among ZOFRI's main supplier countries, China is in first place, followed by the USA, Chile, Japan and South Korea. Over this period, China has become increasingly dominant as a source of imports, rising from $226 million in 1990 to a peak of more than $2 billion in 2012. China's share of ZOFRI imports grew from 24% in 1990 to over 40% in the 2010s. The United States remained the second-largest supplier, accounting for approximately 15% to 20% of ZOFRI's imports. Japan, which contributed about 20% in the early 1990s, saw its share decline to under 10% by the 2010s. Similarly, South Korea's share decreased from around 10% in the early 1990s to below 5% in the

latter half of the 2010s. Imports from Chile fluctuated—decreasing in the late 1990s, rising to around 10% between 2000 and 2010, and then declining again in the 2010s to contribute about 5% by 2020. This ranking of source countries in ZOFRI's imports aligns with Chile's overall import patterns. For example, in 2010, China and the United States were Chile's top two import sources, each accounting for 17% of total imports. Japan and South Korea were also among Chile's top ten import partners, each contributing 6% to the annual import total. However, Chile's Latin American neighbors, Argentina and Brazil, each accounted for 8% of Chile's imports but were not among the top suppliers for ZOFRI. This suggests that ZOFRI serves more as a transit port for goods from Asian countries across the Pacific rather than for imports from regional neighbors.

Figure 10: ZOFRI's imports from different countries, 1990-2020

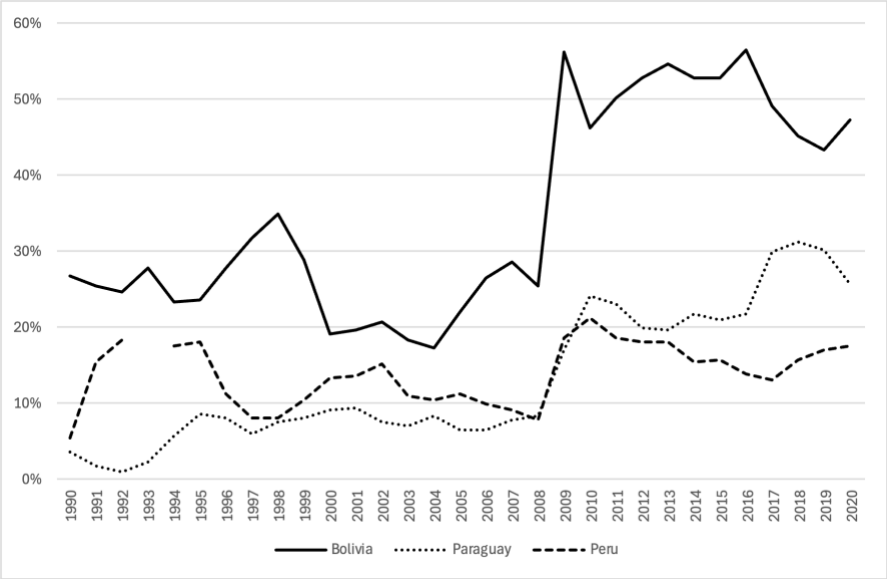


Sources: Statistical Bulletins of ZOFRI

Regarding ZOFRI's exports from 1990 to 2020, Bolivia has consistently been the largest destination (see **Figure 11**). In the 1990s, Bolivia accounted for 25% to 35% of ZOFRI's exports, with a slight dip to around 20% in the first half of the 2000s. However, since the second half of 2000s, Bolivia's share increased significantly, surpassing 50% from 2009 to 2016. Although Bolivia's share decreased somewhat after 2016, it still accounted for more than 40% of ZOFRI's exports from 2016 to 2020. Paraguay, while smaller, saw its share grow from under 5% in the early 1990s to more than 20%, and even over 30% in some years during the 2010s. Peru was a key destination in the 1990s, with a share as high as 18%. This declined to 10%-15% in the early 2000s

but rebounded to 15%-20% in the 2010s. This ranking of destination countries for ZOFRI's exports does not align with Chile's overall export pattern. In 2010, China, Japan, and the United States were Chile's top three export destinations, accounting for 24%, 11%, and 10% of Chile's exports, respectively. Bolivia and Peru each accounted for only 2% of Chile's exports, while Paraguay represented just 1%. This suggests that ZOFRI serves more as a transit port facilitating imports for Bolivia, Paraguay, and Peru, rather than reflecting Chile's general export trends.

Figure 11: ZOFRI's exports to different countries, 1990-2020



Sources: Statistical Bulletins of ZOFRI

The data on products exported in ZOFRI between 1995 and 2020 reveals several key trends. Throughout these years, electronic devices and automotive products consistently dominated the export categories. In 1995, electronics made up 19% of total exports, followed closely by automotive products at 17%. By 2005, automotive products took the lead, accounting for 15% of total exports, a position they maintained through 2015, reaching 17%. By 2020, electronic devices regained the top spot, making up 18% of exports, with automotive products following at 14%.

Other important categories include fuels and lubricants, which increased significantly during the 2000s, contributing around 14% of exports. This category continued to be relevant, accounting for 12% in 2015 and 10% in 2020. Machinery and equipment, clothing, footwear, and household items were also consistently among the top exports categories, each contributing between 5-10% over different periods.

The products exported to Bolivia show similar trends. In 2015, automotive products made up 26% of exports to Bolivia, followed by household items (10%), clothing (9%), and textiles (9%). By 2020, automotive products remained the most significant at 17%, with electronics (11%), household items (10%), machinery and equipment (10%), textiles (9%), and household electrical appliances (8%) making up the other main categories.

Smuggling has long been an issue in Bolivia's imports from ZOFRI (Muñoz and Garcés 2022). The primary drivers are price differences created by tax and duty exemptions in ZOFRI, combined with Bolivia's demand for affordable goods. This could include high-demand daily items like electronics, clothing, and automotive parts. Smuggling often involves bringing goods from ZOFRI into Bolivia without properly declaring them to customs. In some cases, importers underreport the value or quantity of goods to avoid taxes and duties, allowing them to sell products at lower prices in the Bolivian market.

This paper aims to explore several questions about the import smuggling of Bolivia. Which trade routes between Bolivia and neighboring countries are most affected by smuggling? What is the size of smuggling in Bolivia's imports? What are the primary products involved? And finally, what impact does this smuggling have on Bolivia's economy?

3. Methodology

In this paper, we use trade data from The United Nations Commodity Trade Statistics Database[1]. This database contains import and export data reported by statistical authorities of almost 200 countries or areas. We conduct a foreign trade data mirror analysis to compare the trade data reported by pairs of trading partners. This method rests on the economic principle that one country's export data should equal its trading partner's import data after adjustments for variables such as freight and insurance costs, timing discrepancies in transaction recordings, and exchange rate differences (Bhagwati, 1974; Federico & Tena, 1991; Morgenstern, 1963).

However, in practice, trade data reported by different countries for the same transactions often do not match perfectly due to several reasons. First, there are differences between export data and import data. Export data are typically recorded at Free on Board (FOB) prices, reflecting the value of goods at the exporter's port and excluding international shipping and insurance costs. In contrast, import data are recorded at Cost, Insurance, and Freight (CIF) prices, which include these

[1] https://comtradeplus.un.org/

additional costs. This means that, in theory, the import data value should be higher than the export data for the same trade flow.

Second, registration issues in trade data collection can cause discrepancies (Kuntz-Ficker 2018). Misallocation of the origin country or the final destination of products is common, especially in transit trade flows (Carreras-Marín and Rayes 2015; Peres-Cajías and Carreras-Marín 2018). Such misallocations can lead to over-reporting in import data due to re-imports via third countries.

Third, smuggling and illicit trade aimed at evading tariffs can significantly distort official trade statistics (Fisman and Wei 2004; Kuntz-Ficker 2018). Importers may under-report or avoide declaring imports, leading to under-reporting in import data (Feenstra et al. 1999). Smuggling is often more prevalent in countries with higher tariff rates (Javorcik and Narciso 2008). If tariff protection is extremely high, it can elevate smuggling activities, which would affect the accuracy of the official trade data. This results in import values that are lower than the actual trade values, creating discrepancies when compared to export data.

By conducting mirror analysis, we can measure these discrepancies between bilateral trade data, providing insights into international trade routes, transit trade, and smuggling activities. If the import data are significantly higher than the export data for the same trade flow, it may indicate potential errors in registering the origin or destination of products due to re-exports and re-imports. Conversely, if the import data are much lower than the export data, it could suggest potential smuggling in imports.

The application of mirror analysis in economics and international trade studies could provide critical insights into entrepôt trade, customs fraud, tariff evasion, and illicit trade flows. Ferrantino, Liu, and Wang (2012) highlighted complexities in bilateral trade statistics among China, Hong Kong, and the United States, revealing significant inconsistencies due to re-exports and recording disparities. Nitsch (2012) used mirror analysis to explore trade mispricing and its role in facilitating illicit financial transfers across borders. Javorcik and Narciso (2008) examined how differential tariff rates impact the misclassification of imports at the product level, providing evidence of tariff evasion strategies. Tena-Junguito (2010) reassessed the relationship between tariff protection and economic growth by scrutinizing tariff and trade data through cross-national comparisons. Fisman and Wei (2009) employed mirror analysis to uncover discrepancies in the trade of cultural property and antiques, indicating widespread smuggling and underreporting.

In the realm of economic history, mirror analysis has been pivotal in enhancing the comprehension of trade data accuracy and historical trade patterns. Kuntz-Ficker (2017) used this method to study Latin America's involvement in the first wave of globalization, highlighting the need for precision in trade data. Federico and Tena-Junguito (2019) adopted this method to reconcile historical trade data discrepancies, thereby weaving a comprehensive narrative of global trade from fragmented data sources. Other researchers have applied mirror analysis to reconstruct historical trade data for Latin American countries, offering new perspectives on 19th and early 20th-century global trade dynamics (Carreras-Marín and Badia-Miró 2008; Kuntz-Ficker 2018; Peres-Cajías and Carreras-Marín 2018; Rayes 2015; Tena-Junguito and Willebald 2013). These diverse works demonstrate the critical importance of mirror analysis in evaluating disparities in foreign trade data registered by different countries, contributing to the investigation of global trade networks.

Mirror analysis is conducted through a comparison of bilateral trade flows or via a multilateral aggregate index encompassing a broader range of countries. As we have mentioned before, our analysis compares a country's export data in Free on Board (FOB) prices, with its trading partner's import data in Cost, Insurance, and Freight (CIF) prices. The difference between FOB and CIF values reflects the costs of freight and insurance. Federico and Tena (1991) estimated that freight factors in international trade vary from 2% to 21%. Tena-Junguito and Willebald (2013) estimated these factors for Argentine exports between 1870 and 1913, finding a range from 16% to 28%, with an average of 19%. Consequently, various studies on historical trade data accuracy have adopted an average CIF/FOB ratio of 20% as a standard for acceptable bilateral data discrepancies (see Carreras-Marín & Badia-Miró, 2008; Peres-Cajías & Carreras-Marín, 2018). In our research, we apply this 20% standard to streamline the analysis of bilateral trade data discrepancies.

To calculate the bilateral data discrepancy between pairs of trading countries, we use these formulas on the basis of Morgernstern's work (Morgenstern 1963).

$$DX_{a.b} = \frac{X_{a.b} - M_{b.a}}{X_{a.b}} \quad (1)$$

$$DM_{a.b} = \frac{M_{a.b} - X_{b.a}}{M_{a.b}} \quad (2)$$

In formula (1), $DX_{a.b}$ evaluates the discrepancy between country a's export data and country b's import data. Here, $X_{a.b}$ is country a's export data to country b. $M_{b.a}$ is country b's import data from country a. The result of formula (1) should be negative because export data in FOB price are lower than import data in CIF price. Based on the acceptable range of around 20% because of the freight

factors, the bilateral data discrepancy is considered acceptable if the results of formula (1) fall between –0.2 and 0. If the results are below -0.2, it means that the export data are much lower than the import data, suggesting potential transit trade or errors in data registration on the origin and final destination of the trade flow. If the results are above 0, it means that the export data are much higher than the import data, implying potential smuggling in imports.

In formula (2), $DM_{a.b}$ calculates the discrepancy between country a's import data and country b's export data. $M_{a.b}$ is country a's import data from country b. $X_{b.a}$ is country b's export data to country a. The results of formula (2) should be positive given that, for the same trade flows, import values in CIF prices are generally higher than the export values in FOB prices. Considering the acceptable freight factor range of around 20%, the bilateral data discrepancy is acceptable if the results of formula (2) are between 0 and 0.2. If the results are above 0.2, it indicates that the import data are much higher than the export data, suggesting potential transit trade or errors in data registration. If the results are below 0, it means that the import data are much lower than the export data, indicating potential smuggling in imports.

4. Results

4.1 Discrepancy between China's export data and Latin American countries' import data

Before focusing on the case of Bolivia, we calculated the trade data discrepancy between Latin American countries' reported imports from China and China's reported exports to these countries from 1985 to 2020. The results are shown in **Table 3** and **Figure 12**. **Table 3** illustrates the evolution of the trade data discrepancy over different time periods for all Latin American countries. The acceptable range of the discrepancy ratio is 0-0.2. The results over 0.2 represent the importing country's over-reported import, and the results below 0 represent under-reported import. The results closer to the acceptable range imply lower bilateral trade data discrepancy. From 1984 until 2022, the overall discrepancy ratio between China's export data and Latin American countries' import data decreased.

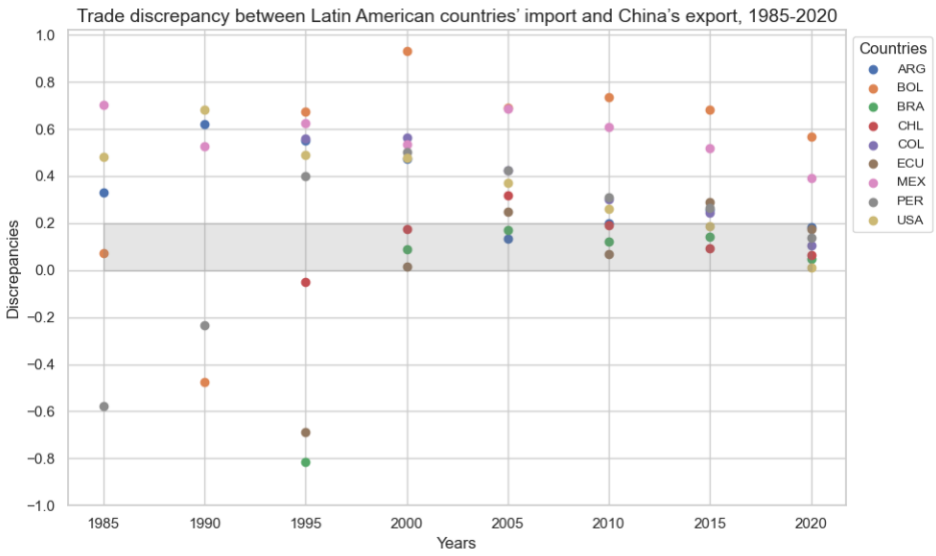
Table 3: Average of trade data discrepancy ratio between Latin-American's import and China's export

1984-1990		1991-2000		2001-2010		2011-2022	
SUR	0.98	SUR	0.84	SUR	0.80	SUR	0.65
MEX	0.74	PRY	0.67	BOL	0.76	BOL	0.62
ARG	0.37	MEX	0.60	PRY	0.65	PRY	0.58
BRA	0.35	COL	0.55	MEX	0.62	MEX	0.47
HND	0.24	BOL	0.51	DOM	0.45	SLV	0.46
CHL	0.22	CUB	0.47	COL	0.40	NIC	0.35
CUB	0.17	ARG	0.36	PER	0.40	CRI	0.32
URY	0.00	PER	0.18	CUB	0.36	DOM	0.31
COL	-0.25	CHL	0.08	SLV	0.36	HND	0.25
BOL	-0.27	BRA	-0.11	ARG	0.32	ARG	0.25
PER	-0.46	BLZ	-0.28	CRI	0.32	CUB	0.24
GTM	-0.57	URY	-0.58	CHL	0.24	PER	0.22
NIC	-0.83	HND	-2.41	ECU	0.20	ECU	0.21
CRI	-3.66	NIC	-4.93	NIC	0.15	COL	0.21
BLZ	-4.43	CRI	-5.77	BRA	0.13	BLZ	0.14
DOM	-10.91	ECU	-7.91	VEN	-0.13	CHL	0.11
SLV	-17.91	GTM	-8.67	URY	-0.24	VEN	0.09
ECU	-28.60	SLV	-61.48	BLZ	-0.34	BRA	0.07
PAN	-41.61	VEN	-88.62	HND	-0.65	GTM	-0.02
VEN	-194.42	PAN	-118.26	GTM	-0.88	URY	-0.26
PRY		DOM		PAN	-17.72	PAN	-1.86

Source: UN Comtrade data

Note: The formula is $DM_{la.chn} = \frac{M_{la.chn} - X_{chn.la}}{M_{la.chn}}$. $M_{la.chn}$ is latinamerican countries' import from china. $X_{chn.la}$ is China's export data to latinamerican countries. The acceptable range of discrepancy is 0-0.2. The results over 0.2 represent the importing country's over-reported import, and the results below 0 represent under-reported import.

Figure 12: Trade data discrepancy between Latin-American's import and China's export, 1985-2020



Source: UN Comtrade data

Note: 1. The formula is $DM_{la.chn} = \frac{M_{la.chn} - X_{chn.la}}{M_{la.chn}}$. $M_{la.chn}$ is latinamerican countries' import from china. $X_{chn.la}$ is China's export data to latinamerican countries. The acceptable range of discrepancy is 0-0.2. The results over 0.2 represent importing country's over-reported import, and the results below 0 represent under-reported import.

2. Some Latin-American countries are not included in Figure 2 because of their extremely large trade discrepancy result.

Table 3 shows that, since the 1990s, Suriname, Bolivia, Paraguay, and Mexico have reported higher imports from China than what China has recorded as exports to these countries. This over-reporting suggests possible errors in China's trade data registration, potentially because China records only the initial destination port of its exports and not the final destination country. As a result, Chinese products re-exported through third countries may not be accurately reflected. In the cases of Mexico and Suriname, re-imports from the United States might explain the higher import figures. For landlocked countries like Bolivia and Paraguay, significant portions of their imports come through neighboring transit countries such as Chile, Brazil, and Argentina, making intraregional trade and re-imports significant in their foreign trade. The impact of transit trade on Bolivia's trade data accuracy dates back to the early 20th century (Peres-Cajías and Carreras-Marín 2018).

On the contrary, small-scale countries like Panama, Venezuela, Ecuador, El Salvador, Dominican Republic, Costa Rica, Nicaragua and Guatemala showed large under-reporting of imports from China, especially before 2000s, indicating that the reported imports from China were much lower than China's registered exports to these countries. This implies possible smuggling in their import of Chinese goods, or a misallocation of the export destination in Chinese data.

In **Figure 9** we delete the countries with extreme high trade data discrepancy ratio, and we can observe that before 2000, the data discrepancy between China's export data and Latin American countries' import data was higher and more volatile. The trade data gap showed diminishing trend over time. It is worth mentioning that from 2000s on, the bilateral trade data discrepancy ratio between Chile and Brazil's import data and China's export data was stably within or very close to the acceptable range. By 2020 the data discrepancy ratio between China and most of its main Latin-American trade partners was within an acceptable range. This could be related to the growing import of Latin American countries from China from 2000s, which inversely enhanced this transpacific formal trade because of the sign of the bilateral free trade agreements (FTAs) between

China and these Latin American countries (Chile in 2005, Peru in 2009 and Costa Rica in 2010) (Lopez and Munoz 2020; Wise 2016).

However, from 1995 to 2020 Bolivia's import data from China showed a high discrepancy ratio comparing to China's export data. This indicates a significant over-reporting of import from China in Bolivia's records relative to the export to Bolivia recorded by China, which could imply that there is re-exportation of Chinese goods to Bolivia via transit countries.

4.2 Bolivia's foreign trade data analysis

Given Bolivia's significant over-reporting of imports from China compared to China's recorded exports between 1995 and 2020, we focus on analyzing discrepancies in Bolivia's foreign trade data with its trading partners to identify potential transit countries for Chinese products. **Table 4** and **Figure 13** provides a comparative analysis of trade discrepancies between Bolivia's import data and the export data of some of its main trading partners. Discrepancies with Western countries, particularly the United States and the United Kingdom, were generally within or close to the acceptable range. However, Bolivia's trade data with Asian countries shows high discrepancies. In most years, Bolivia reported higher imports from Asian countries than the corresponding export figures recorded by these countries, with particularly large discrepancies in the cases of China and Japan (see **Figure 10**). As mentioned before, this suggests that Bolivia may have imported some Asian products through re-exportation from other transit countries.

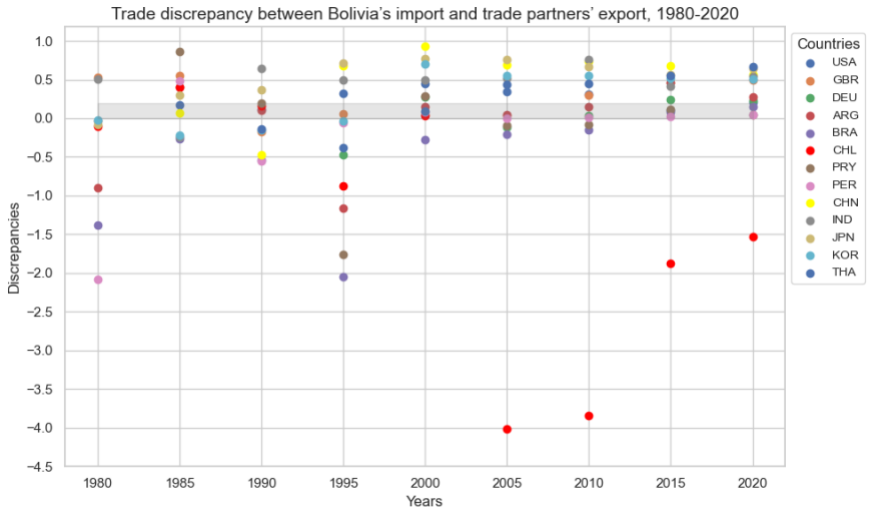
Table 4: Trade discrepancy between Bolivia's import and trade partners' export

	Western countries		Asian countries				Latin American countries			
	USA	GBR	CHN	IND	JPN	KOR	ARG	BRA	CHL	PER
1980		0.53		0.50	-0.08	-0.03	-0.90	-1.38	-0.10	-2.09
1985	0.18	0.55	0.07	-0.24	0.29	-0.22	0.40	-0.27	0.40	0.48
1990	0.11	-0.17	-0.47	0.65	0.37	-0.15	0.11	-0.54	0.17	-0.55
1995	0.32	0.05	0.68	0.49	0.71	-0.04	-1.16	-2.04	-0.88	-0.05
2000	0.44	0.05	0.93	0.50	0.77	0.70	0.15	-0.27	0.04	0.08
2005	0.35	0.03	0.69	0.52	0.76	0.55	0.05	-0.21	-4.02	0.00
2010	0.31	0.30	0.74	0.76	0.67	0.55	0.15	-0.15	-3.84	0.01
2015	0.10	0.47	0.68	0.41	0.57	0.52	0.46	0.08	-1.87	0.02
2020	0.21	0.49	0.57	0.54	0.64	0.51	0.27	0.14	-1.53	0.05

Source: UN Comtrade data

Note: The formula is $DM_{bol.tp} = \frac{M_{bol.tp} - X_{tp.bol}}{M_{bol.tp}}$. $M_{bol.tp}$ is Bolivia's import from its trading partners. $X_{tp.bol}$ is its trading partner's export data to Bolivia. The acceptable range of discrepancy is 0-0.2. The results over 0.2 represent Bolivia's over-reported import, which implies potential transit trade and errors in data registration. The results below 0 represent under-reported import, which implies potential contraband in Bolivia's import from this trading partner. Numbers in red imply that they are outside the acceptable range.

Figure 13: Trade discrepancy between Bolivia's import and trade partners' export



Source: UN Comtrade data

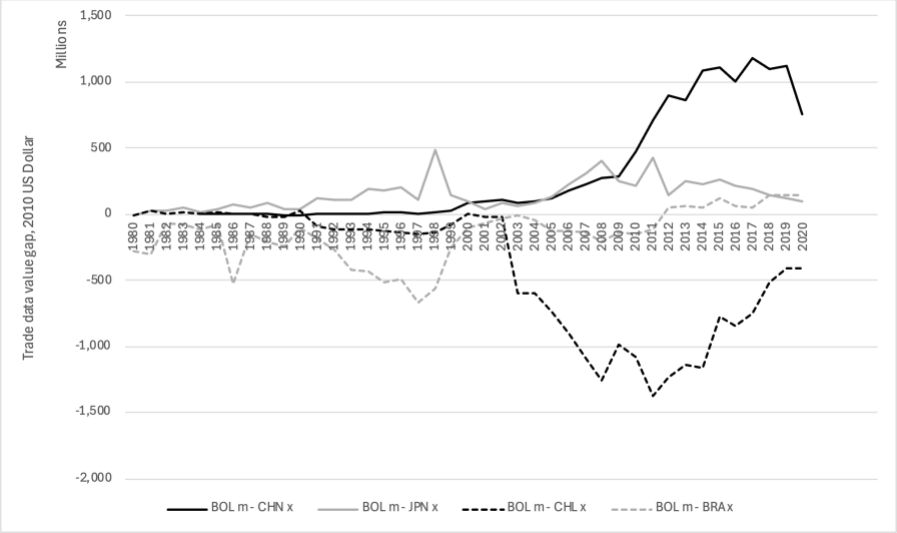
Note: The formula is $DM_{bol.tp} = \frac{M_{bol.tp} - X_{tp.bol}}{M_{bol.tp}}$. $M_{bol.tp}$ is Bolivia's import from its trading partners. $X_{tp.bol}$ is its trading partner's export data to Bolivia. The acceptable range of discrepancy is 0-0.2. The results over 0.2 represent Bolivia's over-reported import, which implies potential transit trade and errors in data registration. The results below 0 represent under-reported import, which implies potential contraband in Bolivia's import from this trading partner.

When comparing Bolivia's import data with the export data of neighboring Latin American countries, notable discrepancies emerge. Bolivia's reported imports from Brazil and Chile show substantial differences when compared to these two countries' reported exports to Bolivia. Before

2000, Bolivia's recorded imports from Brazil were lower than the export figures reported by Brazil, with particularly significant discrepancies in 1980 and 1995. From 2005 to 2020, Bolivia's recorded imports from Chile were significantly lower than the export data reported by Chile (see **Figure 13**). During this same period, Bolivia consistently accounted for a high share of exports from Chile's free trade zone, ZOFRI, representing more than 40% of the trade zone's total exports. These evidences could indicate that from 2005 to 2020 Chile serve as key transit point for Bolivia's imports, with part of this trade probably occurring through unofficial or illegal channels.

How large is the trade value gap? **Figure 14** illustrates the trade data value discrepancy between Bolivia's recorded import data and the export data of its trading partners. In most years, Bolivia's record of their import from China and Japan is higher than the export data to Bolivia in these two Asian countries' data. The gap between Bolivia's import and Japan's export data steadily increased from 1985 to 1998, followed by a sharp decline between 1999 and 2001. From then on, the discrepancy began to grow again, fluctuating between 2005 and 2015, before experiencing a slight decrease until 2020. The gap between Bolivia's import and China's export data was relatively small until 1999. After that, the gap showed a sharp increase to nearly 1.2 billion (in 2010 US Dollar) in 2017. In 2020, the gap narrowed.

Figure 14: Trade data value gap between Bolivia's import and trade partners' export, 1980-2020 (in 2010 US Dollar)

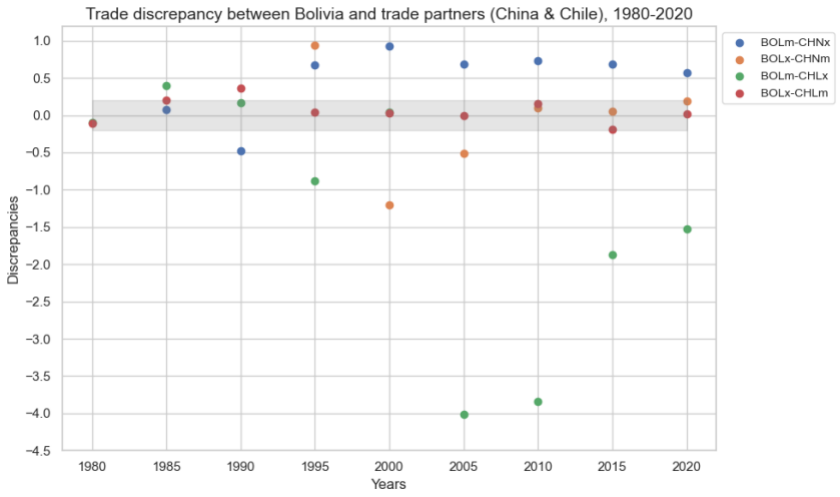


Source: UN Comtrade data

On the contrary, Bolivia's reported imports from Chile and Brazil are lower than the export data recorded by these two Latin American countries. This suggests possible smuggling in Bolivia's imports from these countries. The gap between Bolivia's imports and Brazil's exports fluctuated between 1980 and 1990. It increased during the 1990s until peaking in 1997, after which it declined until 2003. A slight increase followed, peaking in 2008, before the gap decreased once more. Since 2012, Bolivia's recorded import data has surpassed Brazil's export data. Meanwhile, the gap between Bolivia's import and Chile's export data grew throughout the 1990s. From 2002 onwards, the gap increased dramatically until 2012 with nearly 1.5 billion (in 2010 US Dollar), after which it decreased significantly until 2020.

Do these high discrepancies between Bolivia's import data and its trading partners' export data (China and Chile) in 21st century also occur in Bolivia's export data? **Figure 15** presents the trade data ratio discrepancies between Bolivia's foreign trade data and that of its trading partners. It is evident that while there are large discrepancies between Bolivia's import data and China's export data, the gap between Bolivia's export data and China's import data is closer to or within the acceptable range. A similar pattern is observed in Bolivia's trade data gap with Chile. Although there are substantial discrepancies between Bolivia's import data and Chile's export data, the gap between Bolivia's export data and Chile's import data is relatively small and is close to or within the acceptable range. As mentioned earlier, the significant disparities in Bolivia's imports from China could be attributed to the re-exportation of goods through other countries. Additionally, the discrepancies in Bolivia's imports from Chile may indicate that some of these imports were illegal.

Figure 15: Trade discrepancy between Bolivia and trade partners (China & Chile), 1980-2020



Source: UN Comtrade data

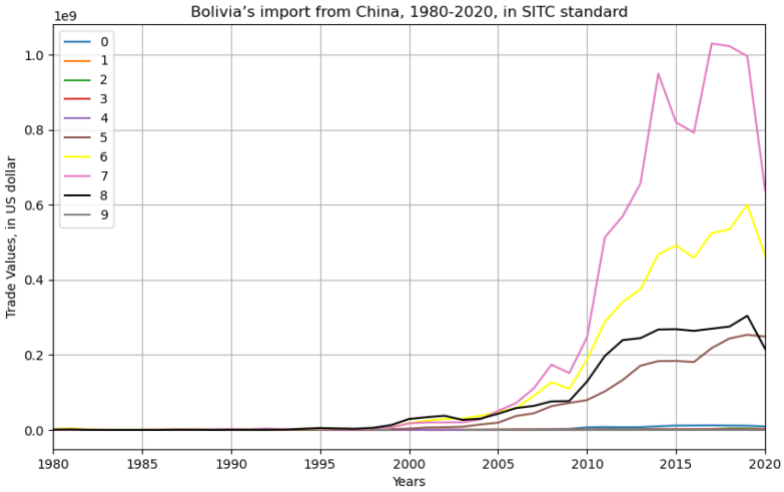
Note: For BOLm-CHNx and BOLm-CHLx, the acceptable range of discrepancy is 0-0.2. For BOLx-CHNm and BOLx-CHLm, the acceptable range of discrepancy is -0.2-0.

4.3 Products in the gap: Bolivia's imports from China and Chile

After identifying substantial over-reporting in Bolivia's imports from China and under-reporting in its imports from Chile, particularly in the 21st century, a detailed mirror analysis of trade data between Bolivia, China, and Chile was conducted. This analysis utilized the Standard International Trade Classification (SITC) categories to pinpoint the products with the highest trade data discrepancies.

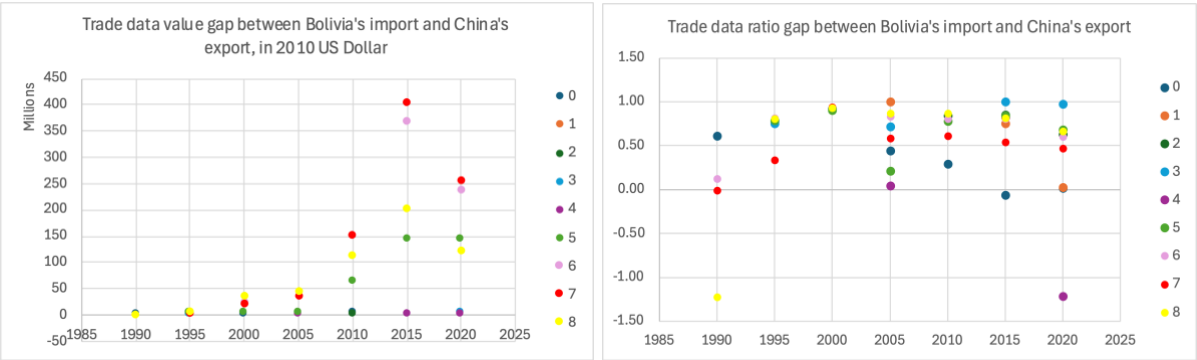
Figure 16 shows the categories of products in Bolivia's imports from China between 1980 and 2020. A noticeable increase in machinery, transport equipment, and manufactured goods occurred in this trade flow starting in 2000. **Figure 17** illustrates the trade value discrepancies between Bolivia's import data and China's export data across various product categories classified under the SITC 1-digit level. From 2000 onward, a drastic rise in discrepancies is evident in the categories of "machinery and transport equipment" (SITC 7), "manufactured goods classified chiefly by material" (SITC 6), and "miscellaneous manufactured articles" (SITC 8). Bolivia's import records for these products were significantly higher than the export data registered by China. The trade data ratio discrepancy further suggests relatively higher disparities in these product categories.

Figure 16: Bolivia's import from China, 1980-2020, in SITC 1-digit level



Source: UN Comtrade data
Note: SITC Classification (0: Food and live animals; 1: Beverages and tobacco; 2: Crude materials, inedible, except fuels; 3: Mineral fuels, lubricants and related materials; 4: Animal and vegetable oils, fats and waxes; 5: Chemicals and related products, n.e.s.; 6: Manufactured goods classified chiefly by material; 7: Machinery and transport equipment; 8: Miscellaneous manufactured articles; 9: Commodities and transactions not classified elsewhere in the SITC)

Figure 17: Trade data value and ratio gap between Bolivia's import and China's export, in SITC 1-digit level

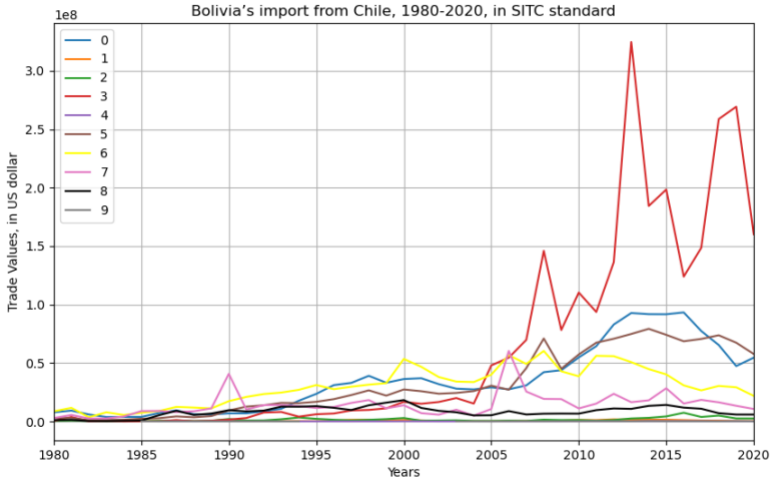


Source: UN Comtrade data

Note: 1. For trade data ratio gap, the formula is $DM_{bol.chn} = \frac{M_{bol.chn} - X_{chn.bol}}{M_{bol.chn}}$. $M_{bol.chn}$ is Bolivia's import from China. $X_{chn.bol}$ is China's export data to Bolivia. The acceptable range of discrepancy is 0-0.2. The results over 0.2 represent Bolivia's over-reported import, and the results below 0 represent under-reported import.
2. SITC Classification (0: Food and live animals; 1: Beverages and tobacco; 2: Crude materials, inedible, except fuels; 3: Mineral fuels, lubricants and related materials; 4: Animal and vegetable oils, fats and waxes; 5: Chemicals and related products, n.e.s.; 6: Manufactured goods classified chiefly by material; 7: Machinery and transport equipment; 8: Miscellaneous manufactured articles; 9: Commodities and transactions not classified elsewhere in the SITC)

Figure 18 shows the categories of products in Bolivia's imports from Chile between 1980 and 2020. Before 2005, manufactured goods, food and live animals, and chemicals and related products held the largest share of Bolivia's imports from Chile. Starting in 2000, there was an increase in the import of mineral fuels, lubricants, and related materials from Chile. **Figure 19** presents the trade data discrepancies between Bolivia's import data and Chile's export data according to the SITC 1-digit level. Both the value gap and the ratio gap indicate that the data discrepancies were higher between 2005 and 2020 than they were from 1980 to 2000, particularly in the categories of "machinery and transport equipment" (SITC 7), "miscellaneous manufactured articles" (SITC 8), and "manufactured goods classified chiefly by material" (SITC 6). Although these discrepancies showed a decreasing trend between 2015 and 2020, the gaps remained substantial compared to other product types. As we have mentioned before, during this same period between 2005 and 2020, Bolivia accounted for a high share of exports from Chile's free trade zone, ZOFRI, representing more than 40% of the trade zone's total exports. These evidences could indicate that from 2005 to 2020 Chile serve as key transit point for Bolivia's imports of the mentioned product categories, with part of this trade probably occurring through smuggling.

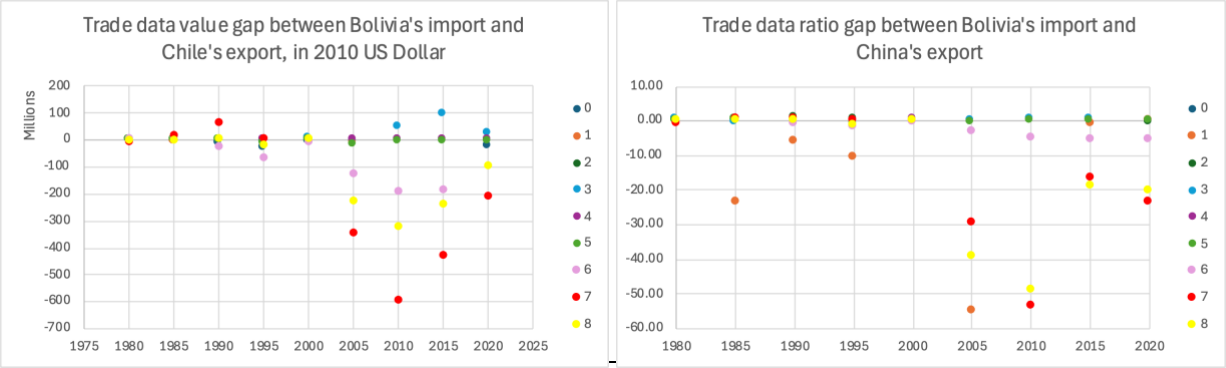
Figure 18: Bolivia's import from Chile, 1980-2020, in SITC 1-digit level



Source: UN Comtrade data

Note: SITC Classification (0: Food and live animals; 1: Beverages and tobacco; 2: Crude materials, inedible, except fuels; 3: Mineral fuels, lubricants and related materials; 4: Animal and vegetable oils, fats and waxes; 5: Chemicals and related products, n.e.s.; 6: Manufactured goods classified chiefly by material; 7: Machinery and transport equipment; 8: Miscellaneous manufactured articles; 9: Commodities and transactions not classified elsewhere in the SITC)

Figure 19: Trade data value and ratio gap between Bolivia's import and Chile's export, in SITC 1-digit level



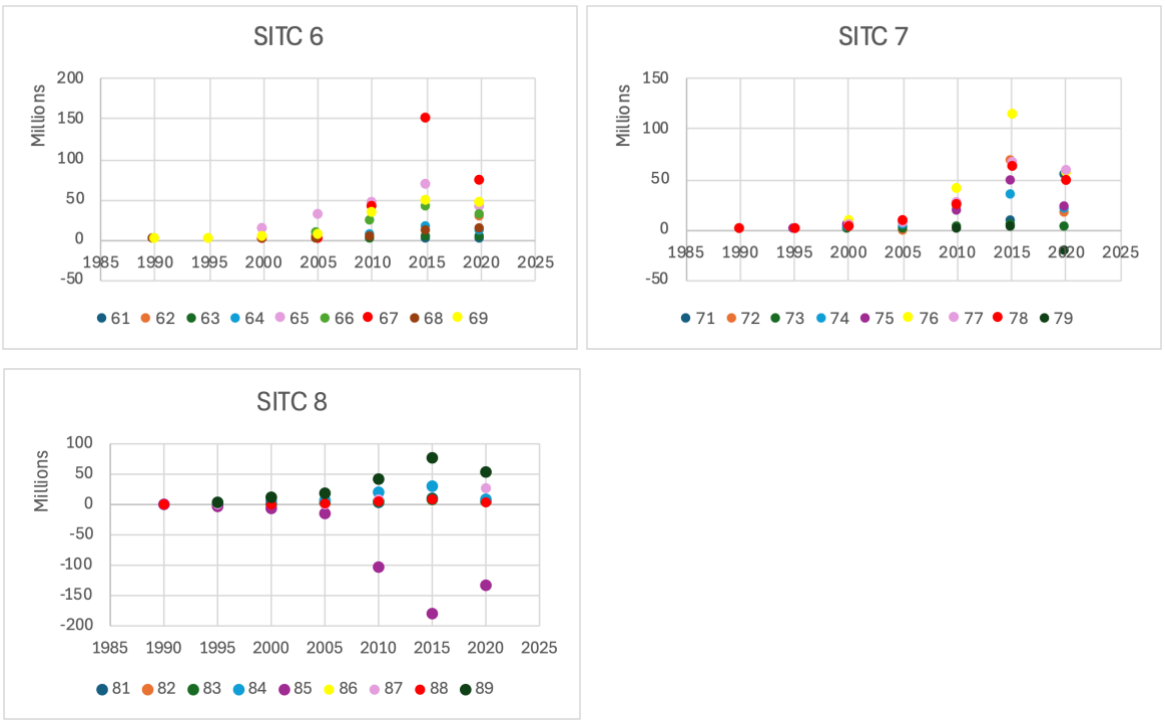
Source: UN Comtrade data

Note: 1. For trade data ratio gap, the formula is $DM_{bol.chl} = \frac{M_{bol.chl} - X_{chl.bol}}{M_{bol.chl}}$. $M_{bol.chl}$ is Bolivia's import from Chile. $X_{chl.bol}$ is Chile's export data to Bolivia. The acceptable range of discrepancy is 0-0.2. The results over 0.2 represent Bolivia's over-reported import, and the results below 0 represent under-reported import.
2. SITC Classification (0: Food and live animals; 1: Beverages and tobacco; 2: Crude materials, inedible, except fuels; 3: Mineral fuels, lubricants and related materials; 4: Animal and vegetable oils, fats and waxes; 5: Chemicals and related products, n.e.s.; 6: Manufactured goods classified chiefly by material; 7: Machinery and transport equipment; 8: Miscellaneous manufactured articles; 9: Commodities and transactions not classified elsewhere in the SITC)

Recognizing the discrepancies between Bolivia's import data and the export data from Chile and China in the categories of "Manufactured Goods Classified Chiefly by Material" (SITC 6), "Machinery and Transport Equipment" (SITC 7), and "Miscellaneous Manufactured Articles" (SITC 8), we conducted a detailed mirror analysis of trade data at the SITC 2-digit level for these product categories between Bolivia, China, and Chile.

Figure 20 illustrates the trade value discrepancies between Bolivia's imports and China's exports across various product types within the SITC 6, 7, and 8 classifications. Significant discrepancies were observed in several products, including "Textile yarn, fabrics, made-up articles, nes, and related products" (SITC 65), "Iron and steel" (SITC 67), "Manufactures of metals, n.e.s." (SITC 69), "Telecommunications and sound-recording and reproducing apparatus and equipment" (SITC 76), "Electrical machinery, apparatus and appliances, n.e.s., and electrical parts thereof" (SITC 77), "Road vehicles" (SITC 78), "Miscellaneous manufactured articles" (SITC 89), "Footwear" (SITC 85), "Articles of apparel and clothing accessories" (SITC 84). Bolivia's import records for these products were significantly higher than China's corresponding export data, suggesting a considerable amount of re-exportation of Chinese goods to Bolivia in these categories.

Figure 20: Trade data value discrepancy between Bolivia's import and China's export (SITC 2-digit level), in 2010 US dollar



Source: UN Comtrade data

Note: SITC 6 Classification (61: Leather, leather manufactures, n.e.s., and dressed furskins; 62: Rubber manufactures, n.e.s.; 63: Cork and wood manufactures (excluding furniture); 64: Paper, paperboard, and articles of pulp, of paper or of paperboard; 65: Textile yarn, fabrics, made-up articles, nes, and related products; 66: Non-metallic mineral manufactures, n.e.s.; 67: Iron and steel; 68: Non-ferrous metals; 69: Manufactures of metals, n.e.s.)
SITC 7 Classification (71: Power generating machinery and equipment; 72: Machinery specialized for particular industries; 73: Metalworking machinery; 74: General industrial machinery and equipment, n.e.s., and machine parts, n.e.s.; 75: Office machines and automatic data-processing machines; 76: Telecommunications and sound-recording and reproducing apparatus and equipment; 77: Electrical machinery, apparatus and appliances, n.e.s., and electrical parts thereof (including non-electrical counterparts, n.e.s., of electrical household-type equipment); 78: Road vehicles (including air-cushion vehicles); 79: Other transport equipment)
SITC 8 Classification (81: Sanitary, plumbing, heating, lighting fixtures and fittings, nes; 82: Furniture and parts thereof; 83: Travel goods, handbags and similar containers; 84: Articles of apparel and clothing accessories; 85: Footwear; 86: Scientif & control instrum, photogr gds, clocks; 87: Professional, scientific, controlling instruments, apparatus, nes; 88: Photographic equipment and supplies, optical goods; watches, etc; 89: Miscellaneous manufactured articles, nes)

Figure 21 shows the trade data discrepancy between Bolivia's import and Chile's export for products classified under SITC 6, 7, 8 standards. We could observe higher discrepancy between Bolivia's imports from Chile and the corresponding export records reported by Chile in the products of "Textile yarn, fabrics, made-up articles, nes, and related products" (SITC 65), "Rubber manufactures" (SITC 62), "Road vehicles" (SITC 78), "Telecommunications and sound-recording and reproducing apparatus and equipment" (SITC 76), "Miscellaneous manufactured articles"

(SITC 89), “Footwear” (SITC 85), “Articles of apparel and clothing accessories” (SITC 84). For these items, Bolivia’s import records were significantly lower than the corresponding export data reported by Chile. These product categories are the same ones that showed significant discrepancies in trade data comparisons between Bolivia and China, where Bolivia recorded higher imports from China. This suggests that Bolivia may have re-imported these Chinese products via transit countries. Additionally, Chile serves as an important transit country for Bolivia, and part of Bolivia's imports of these products from Chile could be attributed to smuggling. This finding aligns with anthropological literature on the informal market in Bolivia and the contraband cross-border trade in the border areas of Bolivia and Chile, where the main products in circulation include electrical goods, household appliances, and similar items (Müller 2017; Muñoz and Garcés 2022).

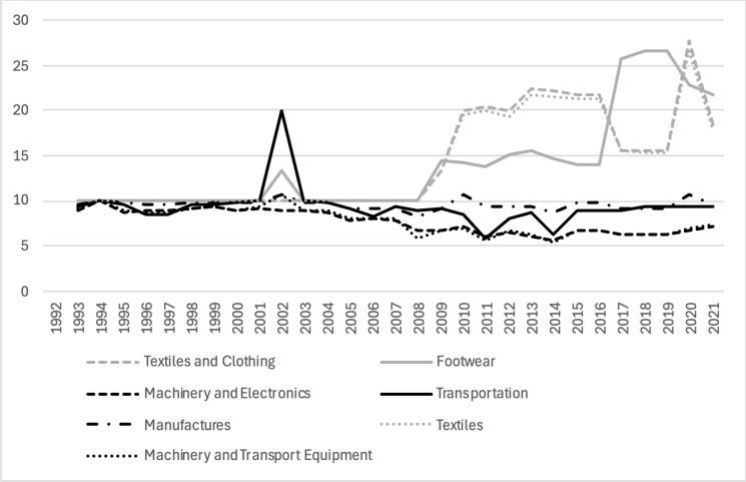
Figure 21: Trade data value discrepancy between Bolivia’s import and Chile’s export (SITC 2-digit level), in 2010 US dollar

Source: UN Comtrade data

The mentioned categories of higher trade data value would be related to tariff rates? **Figure 22** shows the evolution of Bolivia’s applied tariffs on imports from China between 1993 and 2021. Initially, tariffs across various product categories, including textiles, footwear, machinery,

electronics, manufactures and transportation, remained relatively stable around 10%. However, starting in 2000s, significant divergence in tariff rates began to emerge. The textile and clothing sector, along with footwear, saw substantial increases in tariffs, peaking at over 26% in 2018 for footwear and even higher for textiles and clothing in 2020. This sharp rise suggests a move to protect domestic industries from foreign competition in labor-intensive sectors where Bolivia may have perceived a vulnerability to cheaper imports from China. In contrast, tariffs on machinery, electronics and transport equipment, as well as manufactures and transportation, remained relatively low and stable. It is worthwhile mentioning that tariffs on machinery, electronics and transport equipment began to decrease from 2000 and from 2008 on, the tariffs remained around 6% and 7%.

Figure 22: Bolivia's applied tariff rates on import from China, 1993-1021

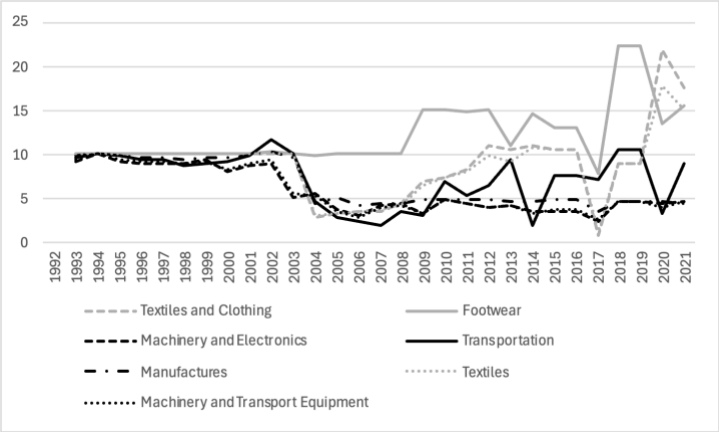


Sources: WITS

Bolivia's applied tariffs on imports from Chile on various product categories, such as textiles, footwear, machinery, and electronics, were uniformly high before 2000, typically around 10% (see **Figure 23**). From early 2000 to 2006, tariffs on textiles, clothing, machinery and electronics, transport equipment and manufactures, saw substantial decrease and in 2004-2008, the tariffs on the mentioned products were below 5%. From 2008 on, the tariffs on the import of footwear, textiles and clothing show increasing trend, particularly around 2017 and 2020, when they peaked at over 20%. On the contrary, the tariffs on manufactures, machinery, electronics and transport equipment stayed below 5% in most years until 2021. Overall, the higher import tariff on textiles and footwear likely helped preserve domestic industries and jobs but may have also led to higher

consumer prices and encourages the contraband in these products. However, the manufactures, machinery and road vehicles show high trade data gap between Bolivia's import and Chile and China's export, although the import tariffs on manufactures, machinery and transport equipment were relatively lower. This may imply that the tariff is not necessarily the main reason for contraband.

Figure 23: Bolivia's applied tariff rates on import from Chile, 1993-1021



Sources: WITS

4.4 What does smuggling mean for Bolivia?

According to a study of Bolivia's National Chamber of Industries (CNI)[2] in 2023, the value of smuggled goods increased by 44% between 2013 and 2022 (Baspineiro 2024). The CNI advisor, Hugo Siles, presented that in 2022, the total value of smuggled goods exceeded US$3.3 billion, accounting for 7.96% of the country's GDP, which implies Bolivia's total production of an entire month. What's more, while the economy grew by around 4%, smuggling grew by 8%. He also mentioned that most of the smuggling entering Bolivia comes from Iquique and Tacna because in these free trade zones there was no restrictions.

Previous bilateral trade data mirror analysis results also show high discrepancies between Bolivia's reported imports from Chile and Chile's recorded exports to Bolivia from 2002 to 2020. Bolivia consistently reported lower imports from Chile than Chile recorded as exports to Bolivia, indicating possible smuggling in Bolivia's imports from Chile. The cross border commercial activities between Bolivia and Chile have been intertwined and strengthened by smuggling

[2] These information are from a news of Bolivia's National Chamber of Industries (https://www.cni.bo/noticia/96).

practices from early 20th century (Laurent 2014; Muñoz Valenzuela 2023; Platt 2016; Rosemblitt 2013). From 2003 to 2012, potential smuggling from Chile accounted for more than 5% of Bolivia's national GDP[3]. It represented over 20% of the GDP of the department of La Paz, and from 2006 to 2008, it even exceeded 30% of the region's GDP. Furthermore, between 2003 and 2008, the trade discrepancy surpassed the entire GDP of the department of Potosí, reaching an 152% of Potosí's GDP in 2005.

Smuggling in Bolivia's imports presents both positive and negative consequences for the country's economy. On the negative side, smuggling could lead to significant losses in tax revenue, which undermines the government's ability to fund public services, infrastructure, and social programs (Karafo and Kayranto 2018). This illicit activity also creates unfair competition for formal businesses, which comply with regulations, pay taxes, and follow legal processes (Karafo and Kayranto 2018). These formal businesses are forced to compete with smuggled goods, which are untaxed and thus sold at lower prices, eroding profit margins and driving some businesses out of the market. Over time, this weakens the formal economy, reduces investment, and stifles business growth.

Smuggling often occurs due to corruption within customs and law enforcement and will further destroy public trust in government institutions and weakening the rule of law (Buehn and Farzanegan 2012; Karras 2009). Moreover, smuggling can flood the market with foreign products, particularly harming domestic industries. Local manufacturers and producers struggle to compete, which can lead to the collapse of small and medium-sized enterprises, increased unemployment, and reduced domestic production capacity. According to the study of Bolivia's National Chamber of Industries (CNI), smuggling has become the main problem for Bolivia's national industries. The Deputy Minister for the "Fight Against Smuggling" activity in Bolivia, highlighted that smuggling is a threat to the security and development of the state because it affects local businesses, leading to closures and layoffs.

On the other hand, smuggling provides access to goods that may otherwise be expensive or difficult to obtain due to tariffs, regulations, or trade barriers. For consumers in Bolivia, where wages are relatively low, this enables access to everyday products like electronics, household appliances, and clothing at affordable prices. The journalist Baspineiro (2024) highlights this reality by quoting a

[3] Bolivia's national and regional GDP are from World Bank and Bolivian National Statistical Institute (Instituto Nacional de Estadística).

buyer in La Paz's informal markets, who points out that she frequently goes to these markets for the "more affordable prices" compared to the formal market.

Smuggling also generates informal employment. Jobs in transportation, distribution, and selling of smuggled goods, although unregulated, provide a living for many people, particularly in areas with limited formal employment opportunities. These informal markets, often filled with smuggled goods, become an essential part of the local economy. According to the International Labour Organization (ILO), in Bolivia, more than 80% of the population works informally (Baspineiro 2024). She states that Bolivia's urban contraband markets provide a vital lifeline for many families and reveal a complex relationship between necessity, informality and economic adaptability. She details a bustling contraband market in Cochabamba, where vendors set up stalls to sell a wide variety of goods obtained through irregular channels at attractive prices.

According to a report of News Agency Fides (Agencia de Noticias Fides)[4], an estimated two million people, out of Bolivia's 12 million population, are involved in the smuggling trade. As indicated by the journalist Baspineiro (2024), none of them receive social security, retirement, or other formal employment benefits. In these informal market chains, some participants, such as importers, have earned a lot and became middle or upper class. For example, the new indigenous bourgeoisie of Aymara and Quechua descent, got benefited in this trade and have built the palace-liked colorful and surreal "cholets" (see **Picture 1**), by the side of modest houses, landfills and wastelands (Baspineiro 2024; Quesada 2021). However, there are other people who remain in precarious conditions. Baspineiro (2024) describes how these lower-tier workers in the smuggling network, who perform tasks like selling goods in markets, face difficult working conditions, including the risks of selling at night and carrying heavy loads. Their labor rights are not protected, and they face increasing exploitation as middlemen raise prices, squeezing profit margins further for those at the bottom of the smuggling chain.

Picture 1: Neo-Andean architecture "Cholets" in El Alto

[4] https://www.noticiasfides.com/economia/bajo-el-modelo-economico-del-gobierno-34el-contrabando-se-ha-convertido-en-una-forma-de-vida-34-417424#:~:text=%25E2%2580%259CEl%2520contrabando%2520en%2520Bolivia%2520es,el%2520pa%25C3%25ADs%25E2%2580%259D%252C%2520indic%25C3%25B3%2520Dunn.&text=La%2520Paz%252C%252031%2520de%2520agosto%2520de%25202022%2520(ANF)

Source: Arquitectura y Diseño[5]

5. Conclusion

This paper approaches smuggling in Bolivia's foreign trade by conducting a mirror analysis of trade data between pairs of trading partners. By employing this methodology, we provide a macroeconomic perspective that sheds light on the contraband trade emerging from Bolivia's economic periphery, thus contributing to the predominantly anthropological literature on smuggling activities in Bolivia.

The trade data mirror analysis results reveal high discrepancies between Bolivia's import data and the export data reported by China and Chile from 1995 to 2020. These discrepancies exceed the acceptable range of bilateral trade data differences that can be attributed to transport and transaction costs. The results show a substantial over-reporting in Bolivia's declaration of imports from China and under-reporting in its declaration of imports from Chile. Meanwhile, the discrepancies between Bolivia's export data and the import data of both China and Chile are much narrower and often within acceptable ranges. This contrast suggests that Bolivia have imported some Chinese products through re-exportation from other transit countries. Additionally, Chile is an important transit country for Bolivia's imports, with part of this trade probably occurring through unofficial or illegal channels.

A detailed mirror analysis results indicate that the largest trade data discrepancies appear in the categories of textile yarn, fabrics, made-up articles, rubber manufactures, road vehicles, telecommunications equipment, electrical machinery, articles of footwear, apparel and clothing accessories. This finding coincides with the literature on the informal market in Bolivia and

[5] https://www.arquitecturaydiseno.es/arquitectura/freddy-mamani-impregna-color-altiplano_2346

contraband cross-border trade in border areas of Bolivia and Chile, where the main products in circulation include electrical products, household appliances, etc.

The smuggling has become a severe and complex issue for Bolivia. It creates various challenges, such as reduced tax revenue, unfair competition for legal businesses, and weakening of domestic industries. On the other hand, smuggling provides access to everyday products at affordable prices and generates informal employment. In these informal market chains, while some individuals, particularly Aymara and Quechua traders, have risen economically, others remain in precarious conditions, without social security or other formal employment benefits.

Overall, the trade data discrepancies between Bolivia and its trading partners, particularly with China and Chile, illustrate the complex interplay between formal trade data and informal economic activities. The findings underscore the need for a better understanding of trade dynamics in Bolivia, taking into account transit trade mechanisms, informal practices, and cross-border contraband that impact foreign trade figures. Further investigation into the socio-economic and insitutional environments could provide deeper insights into the hidden patterns of the transpacific trade between China and Latin America, as well as the intraregional trade within Latin America.

References

Baspineiro, Roxana. 2024. "Bolivia's Contraband Markets: An Unsustainable Lifeline in a Country Where Informality Abounds." *Equal Times*. https://www.equaltimes.org/bolivia-s-contraband-markets-an (September 7, 2024).

Bhagwati, Jagdish N. 1974. "On the Underinvoicing of Imports." In *Illegal Transactions in International Trade*, Amsterdam: North-Holland Publishing Company, 138–47. doi:https://doi.org/10.1016/B978-0-444-10581-3.50016-1.

Buehn, Andreas, and Mohammad Reza Farzanegan. 2012. "Smuggling around the World: Evidence from a Structural Equation Model." *Applied Economics* 44(23): 3047–64. doi:10.1080/00036846.2011.570715.

Carreras-Marín, Anna, and Marc Badia-Miró. 2008. "La Fiabilidad de La Asignación Geográfica En Las Estadísticas de Comercio Exterior: América Latina y El Caribe (1908-1930)." *Revista de Historia Economica - Journal of Iberian and Latin American Economic History* 26(3): 355–74. doi:10.1017/S0212610900000380.

Carreras-Marín, Anna, Marc Badia-Miró, and José Peres Cajías. 2013. "Intraregional Trade in South America, 1912–1950: The Cases of Argentina, Bolivia, Brazil, Chile and Peru." *Economic History of Developing Regions* 28(2): 1–26. doi:10.1080/20780389.2013.866379.

Carreras-Marín, Anna, and Agustina Rayes. 2015. "La Fiabilidad En La Distribución Geográfica de Las Exportaciones Argentinas, 1875-1913." *America Latina en la Historia Economica* 22(3): 177–212. doi:10.18232/alhe.v22i3.654.

Condori Quispe, Olivia Jenny. 2014. “Las Importaciones de Mercadería Desde La Zona Franca de Iquique (ZOFRI-Chile) y Sus Efectos En La Economía Boliviana En Los Períodos 2000-2012.” Undergraduate Thesis. Universidad Mayor de San Andres.

Devlin, Robert, Antoni Estevadeordal, and Andres Rodríguez-Clare. 2006. *The Emergence of China: Opportunities and Challenges for Latin America and the Caribbean*. New York: Inter American Development Bank. https://books.google.com/books?hl=zh-CN&lr=&id=TspPmcyb41cC&oi=fnd&pg=PR10&dq=Devlin,+Estevadeordal+y+Rodr%C3%ADguez+(2006)+&ots=h2i5EIHL0x&sig=FxmPGQfpORuaaEtjEOIMBeFVoBE (March 31, 2024).

Dosch, Jörn, and Olaf Jacob. 2010. Asia and Latin America: Political, Economic and Multilateral Relations *Asia and Latin America: Political, Economic and Multilateral Relations*. eds. Jörn Dosch and Olaf Jacob. New York: Routledge. doi:10.4324/9780203860366.

Durán Lima, José Elías, and Andrea Pellandra. 2017. *La Irrupción de China y Su Impacto Sobre La Estructura Productiva y Comercial En América Latina y El Caribe*. CEPAL. https://repositorio.cepal.org/handle/11362/41021 (January 21, 2024).

Federico, Giovanni, and Antonio Tena. 1991. “On the Accuracy of Foreign Trade Statistics (1909-1935): Morgenstern Revisited.” *Explorations in Economic History* 28(3): 259–73. doi:10.1016/0014-4983(91)90007-6.

Federico, Giovanni, and Antonio Tena-Junguito. 2019. “World Trade, 1800-1938: A New Synthesis.” *Revista de Historia Economica - Journal of Iberian and Latin American Economic History* 37(1): 9–41. doi:10.1017/S0212610918000216.

Feenstra, Robert C., Wen Hai, Wing T Woo, and Shunli Yao. 1999. “Discrepancies in International Data: An Application to China-Hong Kong Entrepôt Trade.” *American Economic Review* 89(2): 338–43. doi:10.1257/aer.89.2.338.

Ferrantino, Michael J., Xuepeng Liu, and Zhi Wang. 2012. “Evasion Behaviors of Exporters and Importers: Evidence from the US–China Trade Data Discrepancy.” *Journal of international Economics* 86(1): 141–57. https://www.sciencedirect.com/science/article/pii/S0022199611000924 (February 5, 2024).

Fisman, Raymond, and Shang Jin Wei. 2004. “Tax Rates and Tax Evasion: Evidence from ‘Missing Imports’ in China.” *Journal of Political Economy* 112(2): 471–96. doi:10.1086/381476.

Fisman, Raymond, and Shang Jin Wei. 2009. “The Smuggling of Art, and the Art of Smuggling: Uncovering the Illicit Trade in Cultural Property and Antiques.” *American Economic Journal: Applied Economics* 1(3): 82–96. doi:10.1257/APP.1.3.82.

Fornes, Gaston, and Alvaro Mendez. 2018. The China-Latin America Axis: Emerging Markets and their Role in an Increasingly Globalised World, Second Edition *The China-Latin America Axis: Emerging Markets and Their Role in an Increasingly Globalised World*. New York: Springer. doi:10.1007/978-3-319-66721-8.

Galemba, Rebecca. 2008. “Informal and Illicit Entrepreneurs: Fighting for a Place in the Neoliberal Economic Order.” *Anthropology of Work Review* 29(2): 19–25. doi:10.1111/J.1548-1417.2008.00010.X.

Hosono, Akio. 2019. “Japan and Latin America.” In *Japan’s Foreign Relations: A Global Search for Economic Security*, ed. Robert S. Ozaki. New York: Routledge, 200–226. doi:https://doi.org/10.4324/9780429046353.

Javorcik, Beata S., and Gaia. Narciso. 2008. “Differentiated Products and Evasion of Import Tariffs.” *Journal of International Economics* 76(2): 208–22. https://www.sciencedirect.com/science/article/pii/S0022199608000688 (February 5, 2024).

Karafo, Addisu, and Addisu Karafo Kayranto. 2018. “The Effect of Contraband on Government Revenue: Case of Segen Area People’s Zone.” *Global Journal of Management and Business Research* 3(18). https://www.researchgate.net/profile/Addisu-Kayranto/publication/376083601_The_Effect_of_Contraband_on_Government_Revenue_Case_of_Segen_Area_People’s_Zone_The_Effect_of_Contraband_on_Government_Revenue_Case_of_Segen_Area_People’s_Zone_Addisu_Karafo_Year_2018/links/65697d673fa26f66f4422629/The-Effect-of-Contraband-on-Government-Revenue-Case-of-Segen-Area-Peoples-Zone-The-Effect-of-Contraband-on-Government-Revenue-Case-of-Segen-Area-Peoples-Zone-Addisu-Karafo-Year-2018.pdf (September 8, 2024).

Karras, Alan L. 2009. *Smuggling: Contraband and Corruption in World History*. Maryland: Rowman & Littlefield Publishers. https://books.google.es/books?hl=zh-CN&lr=&id=3OPpqrU1jjwC&oi=fnd&pg=PR5&dq=smuggling+corruption&ots=Tozn8VTKsp&sig=BkzeYfgKiMTSJq1pTXLkT1JZClk&redir_esc=y#v=onepage&q=smuggling%20corruption&f=false (September 8, 2024).

Kuntz-Ficker, Sandra. 2017. “Mexico in the Export Era (1870s–1929): Export Boom, Economic Modernization, and Industrialization.” In *The First Export Era Revisited*, Springer International Publishing, 233–76. doi:10.1007/978-3-319-62340-5_7.

Kuntz-Ficker, Sandra. 2018. “Latin American Foreign Trade Statistics for the 19th and Early 20th Centuries.” *Revista de Historia Economica - Journal of Iberian and Latin American Economic History* 36(1): 13–25. doi:10.1017/S0212610917000179.

Laurent, Muriel. 2014. *Contrabando, Poder y Color En Los Albores de La República: Nueva Granada, 1822-1824*. Universidad de los Andes. https://books.google.com/books?hl=zh-CN&lr=&id=4vF8EAAAQBAJ&oi=fnd&pg=PR13&dq=Laurent,+M.+(2014).+Contrabando,+poder+y+color+en+los+albores+de+la+Rep%C3%BAblica.+Nueva+Granada+1822-1824.+UNIANDES.&ots=vZ_7CtB5Ts&sig=GyPqe3bA0KfgjSOt_B6Mtir5ezQ (July 5, 2024).

Lopez, Dorotea, and Felipe Munoz. 2020. “China’s Trade Policy towards Latin America: An Analysis of Free Trade Agreements Policy.” *Asian Education and Development Studies* 10(3): 399–409. doi:10.1108/AEDS-08-2019-0133/FULL/HTML.

López Guerrero, María Luisa. 2018. “La Configuración Del Trabajo En El Siglo XXI: El Mercado Eloy Salmón y Los Movimientos Moleculares Del Capital.” *Íconos (FLACSO-Quito)* (62): 87–104. http://scielo.senescyt.gob.ec/scielo.php?pid=S1390-12492018000300087&script=sci_abstract&tlng=e (July 5, 2024).

Morgenstern, O. 1963a. “On the Accuracy of Economic Observations.” https://agris.fao.org/agris-search/search.do?recordID=XF2016049018 (April 7, 2021).

Morgenstern, O. 1963b. “On the Accuracy of Economic Observations.”

Müller, Juliane. 2017. “Place-Based (In) Formalization: A Bolivian Marketplace for Consumer Electronics and Global Brands.” *Latin American Research Review* 52(3): 393–404. doi:10.25222/larr.68.

Müller, Juliane. 2018. “Andean–Pacific Commerce and Credit: Bolivian Traders, Asian Migrant Businesses, and International Manufacturers in the Regional Economy.” *Journal of Latin American and Caribbean Anthropology* 23(1): 18–36. doi:10.1111/JLCA.12328.

Muñoz, José, and Alejandro Garcés. 2022. “Circulación y Contrabando de Mercancías Chinas En La Espacialidad Fronteriza Atacama-Lípez (Chile y Bolivia) Bajo El Influjo de La Zona Franca de Iquique (ZOFRI).” *Rumbos TS* 17(27): 99–128. doi:http://dx.doi.org/10.51188/rrts.num27.537.

Muñoz Valenzuela, José Miguel. 2023. “Entre Contrabando y Retail de Mercancías Electrónicas En La Espacialidad Fronteriza Atacama-Lípez (EFAL)(Chile y Bolivia).” *Universum (Talca)* 38(1): 215–36. doi:10.4067/S0718-23762023000100215.

Nitsch, Volker. 2012. “Trade Mispricing and Illicit Flows.” In *Draining Development?: Controlling Flows of Illicit Funds from Developing Countries*, https://books.google.com/books?hl=zh-CN&lr=&id=lT7rFac-tNoC&oi=fnd&pg=PT445&dq=Nitsch,+Volker,+%22Trade+Mispricing+and+Illicit+Flows,%22+Darmstadt+Discussion+Papers+in+Economics,+2012.&ots=J1jn0dseHI&sig=SaMtNK_tSfKPJpj9WS6468BWNQg (February 5, 2024).

Peres-Cajías, José Alejandro, and Anna Carreras-Marín. 2018. “Official Bolivian Trade Statistics (1910-1949): Landlockness and the Limits of a Standard Accuracy Approach.” *Revista de Historia Economica - Journal of Iberian and Latin American Economic History* 36(1): 53–86. doi:10.1017/S0212610917000246.

Peters, Dussel. 2005. *Economic Opportunities and Challenges Posed by China for Mexico and Central America*. Bonn: DEU. www.ssoar.info (June 10, 2020).

Platt, Tristan. 2016. “Time, Movement, Prices. the Paths of Rothschild’s Spanish Quicksilver between Almaden, London and Potosi. 1835-1848.” *Dialogo Andino* 1(49): 143–65. doi:10.4067/S0719-26812016000100017.

Quesada, Juan Diego. 2021. “Los ‘Cholets’, Las Casas de La Nueva Burguesía Boliviana.” *El Pais*. https://elpais.com/internacional/2021-10-31/los-cholets-las-casas-de-la-nueva-burguesia-boliviana.html (September 7, 2024).

Rayes, Agustina. 2015. “La Estadística de Las Exportaciones Argentinas, 1875-1913. Nuevas Evidencias e Interpretaciones.” *Investigaciones de Historia Economica* 11(1): 31–42. doi:10.1016/j.ihe.2014.03.015.

Ribeiro, Gustavo Lins. 2012. “La Globalización Popular y El Sistema Mundial No-Hegemónico.” *Nueva Sociedad* 214: 36–62. https://static.nuso.org/media/articles/downloads/3893_1.pdf (January 21, 2024).

Rosemblitt, Jaime. 2013. *Centralidad Geográfica, Marginalidad Política: La Región de Tacna-Arica y Su Comercio: 1778-1841.* DIBAM-Centro de Investigaciones Diego Barros Arana. https://bibliotecadigital.ciren.cl/handle/20.500.13082/147710 (July 5, 2024).

Tassi, Nico, Manuel Arbona, Giovanna Ferrufino, and Antonio Rodríguez-Carmona. 2012. “El Desborde Económico Popular En Bolivia: Comerciantes Aymaras En El Mundo Global.” *Nueva sociedad* 241: 93–105. https://biblat.unam.mx/hevila/Nuevasociedad/2012/no241/7.pdf (January 3, 2024).

Tena-Junguito, Antonio. 2010. “Bairoch Revisited: Tariff Structure and Growth in the Late Nineteenth Century.” *European Review of Economic History* (14 (1)): 111–43. https://www.cambridge.org/core/journals/european-review-of-economic-

history/article/bairoch-revisited-tariff-structure-and-growth-in-the-late-nineteenth-century/E915F59733364405A91825C88878EC51 (October 7, 2024).
Tena-Junguito, Antonio, and Henry Willebald. 2013. “On the Accuracy of Export Growth in Argentina, 1870-1913.” *Economic History of Developing Regions* 28(1): 28–68. doi:10.1080/20780389.2013.805508.
Wise, Carol. 2016. “Playing Both Sides of the Pacific: Latin America’s Free Trade Agreements with China.” *Pacific Affairs* 89(1): 75–100. doi:10.5509/201689175.