Magnitude and Determinants of Trade Misinvoicing in Burundi

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Research Paper 530

AFRICAN ECONOMIC RESEARCH CONSORTIUM
CONSORTIUM POUR LA RECHERCHE ÉCONOMIQUE EN AFRIQUE

Bringing Rigour and Evidence to Economic Policy Making in Africa

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AERC Research Paper 530
African Economic Research Consortium
August, 2023

THIS RESEARCH STUDY was supported by a grant from the African Economic Research Consortium. The findings, opinions and recommendations are, however, those of the author and do not necessarily reflect the views of the Consortium, its individual members or the AERC Secretariat.

Published by: The African Economic Research Consortium
P.O. Box 62882–- City Square
Nairobi 00200, Kenya

ISBN 978-9966-61-233-5

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Abbreviations and Acronyms

ADF	Augmented Dickey–Fuller
AIC	Akaike Information Criterion
ARDL	Autoregressive Distributed Lag
BIF	Burundian Franc
COVID-19	Corona Virus Disease 2019
EAC	East African Community
ECM	Error Correction Model
EU	European Union
FDI	Foreign Direct Investment
GDP	Gross Domestic Product
IMF	International Monetary Fund
ODECA	Office pour le Development du Café du Burundi (Burundi Coffee Development Office)
OECD	Organisation for Economic Co-operation and Development
OTB	Office du Thé du Burundi (Burundi Tea Office)
UAE	United Arab Emirates
UK	United Kingdom
UNCTAD	United Nations Conference on Trade and Development
USA	United States of America
VAT	Value-Added Tax

Abstract

The study examines trade misinvoicing at both aggregated and disaggregated levels by major trading partners, and by major export and import commodities. Aggregated trade misinvoicing and disaggregated trade misinvoicing by major trading partners are computed using DOTS database of the International Monetary Fund (IMF) over the period 1970–2019. Disaggregated trade misinvoicing by major trading commodities is computed using UN-COMTRADE database over the period 1993–2019. The study shows that the most occurring practices in trade misinvoicing are export underinvoicing and import overinvoicing. Exports of Burundi to most of its major trading partners are found to be underinvoiced, while imports of Burundi from its major trading partners are in general overinvoiced. The major trading commodities considered are found to be affected by trade misinvoicing to a great extent. Moreover, an empirical analysis of the determinants of those two common practices of trade misinvoicing indicates that financial incentives through tax fraud, civil conflicts, governance, capital account openness, the parallel market premium, and the real exchange rate, are the main determinants of export underinvoicing and import overinvoicing. Drivers of trade misinvoicing at product level were also analysed for some major export and import commodities. The main product-specific factors of trade misinvoicing are found to be the parallel market premium, the real exchange rate, governance, and civil conflicts. The study's findings suggest that reducing political instability, having a more open capital account, improving governance, as well as reducing taxes and duties, could be ways to reduce the extent of trade misinvoicing in Burundi. In addition, more effort is needed in ensuring systematic and transparent reporting of international trade transactions.

Key words: Trade misinvoicing; Capital flight; Burundi.

1. Introduction

The phenomenon of capital flight has become an issue of increasing concern over the past decades because of the scourge it inflicts upon poverty alleviation efforts in developing countries. Both private actors and public authorities are responsible for the phenomenon of capital flight. Due to factors such as macro-economic uncertainty and political instability, private actors prefer to channel their savings abroad, while because of corruption, public authorities embezzle funds and transfer them to their overseas bank accounts (Ndoricimpa, 2018). There exist capital flight-related economic costs, including the lost potential domestic investments and lost poverty reduction (Fofack & Ndikumana, 2010; Nkurunziza, 2015). For capital-scarce economies, capital flight represents a significant economic loss as it reduces domestic financial resources to spend on vital socio-economic sectors such as agriculture, education, health, and infrastructure. Existing evidence indicates that trade misinvoicing is an important mechanism of capital flight (see, for example, de Boyrie et al., 2007; Ndikumana et al., 2015; Nitsch, 2017; Ndikumana & Boyce, 2021). Global Financial Integrity (2018a) emphasizes that trade misinvoicing is the largest component of illicit financial outflows. Trade misinvoicing is a method for moving money illicitly across borders by falsifying the value or volume in an international commercial transaction of goods or services (Global Financial Integrity, 2018a). While the aim of trade misinvoicing is often to evade taxes, duties or capital controls, trade misinvoicing can also be a trade-based technique for smuggling or money laundering (The Economist, 2014)[1]. By import underinvoicing and export overinvoicing, money is slipped into a country; while by import overinvoicing and export underinvoicing, money flees a country (Ndikumana et al., 2015). For Burundi, the present case study, recent estimates (see Ndikumana & Boyce, 2021) indicate that the country lost resources amounting to US$5.7 billion in capital flight over the period 1985-2018, 56.1% of which went through trade misinvoicing. Moreover, Ndoricimpa (2018) shows that about 75% of capital that fled Burundi between 1985 and 2013 went through trade misinvoicing. It should be noted that capital flight from Burundi is taking place in a context of capital and foreign exchange scarcity. From four months of import cover in 2014, total reserves have fallen to less than one month in 2020. With this extent of scarcity of foreign exchange, the Central Bank of Burundi has to ration foreign exchange by supplying foreign exchange only to importers of strategic goods. Other categories of importers, mostly

1 http://www.economist.com/news/international/21601537-trade-weakest-link-fight-against-dirty-money-uncontained [Accessed on 6 June 2019].

small importers, turn to the higher parallel market exchange rate for their foreign exchange needs; the parallel market premium standing currently at around 75%. In a poor and fragile country like Burundi—in great need of more infrastructure, plant and equipment, and human capital—capital flight through any channel represents a great loss in domestic investment in social services such as health, education, and provision of clean water and electricity that could have improved the wellbeing of the population (Ndoricimpa, 2018).

Ndoricimpa (2018) examined capital flight from Burundi in the first ever country-specific study focusing on Burundi. The current study builds on Ndoricimpa (2018) by focusing on trade misinvoicing as a channel for capital flight. A number of studies have analysed the problem of trade misinvoicing (see, for example, Ndikumana & Boyce, 2012; de Boyrie et al., 2007). However, they examined trade misinvoicing at an aggregated level, which leaves out important information on trading partners involved in the phenomenon, as well as trading commodities affected. Thus, there has been recently growing interest in investigating trade misinvoicing at disaggregated levels, at product level and by trading partner (see United Nations Conference on Trade and Development [UNCTAD], 2016; Ndikumana & Boyce, 2019; Global Financial Integrity, 2018b, 2019). Burundi, like many other fragile African countries, faces financial constraints for development. With the uncertainty of external support which shrunk significantly with the 2015 political crisis[2], Burundi ought to discourage capital flight and encourage domestic resource mobilization.

The motivation of this study is, therefore, to explore trade misinvoicing in Burundi and identify ways to tackle the problem undermining domestic resource mobilization and the development of the country. Undeniably, Burundi relies on a few primary commodities for its export revenue. Up until early 2000s, exports of coffee and tea accounted for about 90% of total export revenue. The contribution of coffee and tea remains considerable although the export basket has been diversified to include a few other commodities such as minerals, beer, and gold (from 2016). Furthermore, Burundi imports a number of commodities from its trading partners. Therefore, exploring how these export and import commodities are affected by trade misinvoicing, and which trading partners are associated with it, could give insights on how to fight the phenomenon and reduce capital flight. This study seeks to focus on both export and import misinvoicing in Burundi by disaggregating at commodity level and by categories of major trading partners. Indeed, there are costs related to trade misinvoicing. As UNCTAD (2016) points out, the costs related to trade misinvoicing include lost foreign exchange, lost tax revenues, and unfair distribution of the gains from trade. Trade misinvoicing undermines the current development policy agenda calling for low-income countries to mobilize more tax revenues. As Global Financial Integrity (2014) points out, "trade misinvoicing robs governments of customs duties and corporate tax revenues", which undermines social service delivery, hence retarding economic growth and poverty reduction.

2 This is a crisis that followed when the late President Pierre Nkurunziza decided to run for a controversial third term.

In addition, to fight trade misinvoicing, there is need to understand the factors behind it. Existing evidence indicates that a number of factors can determine trade misinvoicing, including economic uncertainties, political instability and wars, corruption, capital controls, and high taxes and tariffs (see Buehn & Eichler, 2011; Patnaik et al., 2012). However, it is not clear whether factors depicted elsewhere may explain trade misinvoicing for the case of Burundi. The aim of this study is two-fold: (i) to disaggregate trade misinvoicing by major trading partners and by major export and import commodities, and (ii) to analyse the determinants of trade misinvoicing in Burundi.

The rest of the paper is organized as follows. Section 2 presents key import and export commodities in Burundi; Section 3 reviews the literature on the determinants of trade misinvoicing; Section 4 presents the methodology; Section 5 presents and discusses the results; and Section 6 concludes the study.

2. Key import and export commodities in Burundi

As far as imports are concerned, the six top import categories are mineral fuels, pharmaceuticals, machinery and mechanical appliances, electrical machinery and equipment, vehicles, and iron and steel. These account, respectively, for 21.85%, 8.37%, 6.97%, 5.74%, 5.74%, and 4.70%, of total imports over the period 2001-2018 (see Table A2 in the appendix).

On exporting side, Burundi relies on a few primary commodities for its export revenue. For the period 1990-2015, exports of coffee and tea accounted for more than 80% of total export revenue, contributing to the tune of 63.5% and 18.0%, respectively (see Table A1 in the appendix). In the export basket, these are followed by ores, slag and ash (3.0%), skins of bovine animals (2.2%), sugar (1.8%), beer (1.8%), and soap (1.4%). In the recent period (2016-2020), traditional commodities, coffee and tea, seem to be losing their place as the main cash crops, as gold enters the export basket. For the period 2016-2020, gold accounts, on average, for 28.6% of total exports.[3] However, the contribution of coffee and tea is still considerable, the two accounting for 42.6% over the period 2016-2020. The other commodities contributing to export revenue are wheat (5.1%); ores, slag and ash (5.0%); cigarettes (3.6%); and beer (3.3%).

We discuss here the organization of the production and trade of the three main export commodities: tea, coffee, and gold. The production of tea in Burundi is organized by tea factories located in a few areas where the weather is conducive for tea farming. These factories receive tea supplies from their plantations (30%) and smallholder farmers (70%). The tea factories are owned and managed by *Office du Thé du Burundi (OTB)*, a parastatal company, which handles the production, processing, marketing and trade of tea from Burundi (OTF Group, 2008). Around 95% of total tea production from Burundi is marketed internationally, where 85% is through an auction mechanism in Mombasa, Kenya, where OTB has export agents, and 10% through direct sales to international buyers. Main export destination for Burundian tea, are Oman, United Kingdom, Kenya, and Tanzania.

With regard to coffee, the production of coffee in Burundi is currently organized by *Office pour le Development du Café du Burundi (ODECA)*, a public company with an objective to coordinate, regulate and monitor the whole process of the coffee value chain. Washing stations buy coffee cherries from smallholder coffee farmers at a price

3 In recent years, the share of gold (non-monetary, excluding gold ores and concentrates) in total exports has been increasing, reaching 57.2% in 2019.

fixed after a consultation with representatives of all the stakeholders in the chain value, and an approval by the Council of Ministers. The coffee transformation process is in two steps: washing stations convert the cherries into parchment, and then the milling companies convert the parchment into green coffee. ODECA then sells coffee to international buyers through bidding. The top four destinations of coffee from Burundi are: Switzerland, United Kingdom, Belgium, and Germany.

It should be noted that from January 2003, export taxes on traditional exports (coffee, tea, and cotton) were abolished. However, exporters are required to repatriate all export receipts. Coffee and tea exporters may retain 30% of their earnings in foreign exchange denominated accounts in the domestic banking system (Organisation for Economic Co-operation and Development [OECD], 2004).

Concerning gold, currently gold in Burundi is generally exploited by mining cooperatives that do artisanal exploitation, along with a few mining companies that entered the race recently. Until the end of 2019, gold transaction activities in Burundi were done by the trading counters, that bought gold exploited and then exported it. Two types of these counters existed: those under the Burundian law, authorized to buy only minerals exploited from Burundi, and counters *in transit* that could only buy minerals from other countries. Counters *in transit* were not subject to the 4% ad valorem tax and were not obliged to surrender the foreign exchange from their export receipts. However, according to Midende (2010), 90% of minerals exploited from Burundi were exported by counters *in transit*, which implies that the government of Burundi lost considerable amount of resources in tax revenues and in foreign exchange which were not surrendered. However, in November 2019, a new law came in place and gave the Central Bank of Burundi the monopoly on gold transactions. The Central Bank of Burundi is currently the only institution authorized to buy all the gold exploited by mining companies and cooperatives in Burundi. The gold sellers are paid in local currency by the Central Bank of Burundi. The new law came in place in the context of an economic crisis of lack of foreign currency the country was going through. The Central Bank of Burundi was probably trying to centralize the foreign currency going through that sector. However, as the anti-corruption observatory noted[4], this new law is likely to encourage more fraud and corruption, while also pushing away the counters *in transit,* that are of foreign origin since they are likely not to accept to be paid in local currency.

It should be noted that gold is currently Burundi's largest export commodity, contributing approximately 29% of total export earnings (2016-2020). In the national statistics (Central Bank of Burundi), gold exports of Burundi starts in 2016 while in international statistics (COMTRADE), gold export appears from early 1990s. This could mean that foreign exchange earnings from gold export up to 2016 have never been surrendered to the government. Indeed until recently, the major problem the Burundian mining sector faced was informal exploitation, with anarchic mining which was not profitable to the country.

4 Le commerce d'or confié à la Banque centrale, une décision critiquée (voaafrique.com).

According to COMTRADE, for the period 1993-1996, the main gold export destination was Belgium (83.4%) followed by Switzerland (16.1%); for 1999-2003, Belgium was the sole destination (100%) of gold from Burundi; for 2004-2006, Switzerland became the main destination (67.8%) followed by United Arab Emirates (22.2%), then Belgium (3.7%). In the 1990s and early 2000s, Belgium was the major destination of gold from Burundi due to the presence of a Belgian gold refinery in Burundi.

In recent years (2007-2019), United Arab Emirates is the main gold export destination (92.5%) followed by Belgium (4.4%). Indeed from 2006, Dubai has become one of the world's major gold trading hubs. Gold importers usually follow some standards regarding the source of gold and how it was produced, e.g., if gold originated in a conflict-affected or high-risk country or if it is associated with gross human rights violations. However, United Arab Emirates (UAE) follows few of these standards, which explains the UAE's rapid rise as a major global gold hub.[5] Moreover, another explanation for the UAE as one of the major gold importers is that there is no import duty tax or value added tax on gold brought into the UAE.

5 Dubai's Problematic Gold Trade – Dubai's Role in Facilitating Corruption and Global Illicit Financial Flows - Carnegie Endowment for International Peace.

3. Literature review on the determinants of trade misinvoicing

Empirical literature

One of the best studies on the determinants of trade misinvoicing found in the literature is by Buehn and Eichler (2011). According to the study, the financial incentives are the motives behind trade misinvoicing. They determine the decision as to whether they should engage in illegal trade and by how much. Buehn and Eichler (2011) consider six variables determining trade misinvoicing, namely, parallel market premium, tax on income and profits, tax on exports, tax on imports, real exchange rate, intensity of prosecution, and punishment costs, proxied by fines (% of GDP). Buehn and Eichler (2011) considers also GDP per capita as proxy for punishment costs, capturing opportunity costs in terms of lost labour income while in prison, if illegal trade is detected.

Buehn and Eichler (2011) postulate that a higher parallel market premium increases the amount of export underinvoicing and decreases export overinvoicing, whereas it decreases import underinvoicing and increases import overinvoicing. On the effect of parallel market premium on trade misinvoicing, Pitt (1984) points out that the parallel market equilibrates the supply of foreign exchange from illegal exports and the demand for it to purchase illegal imports. Biswas and Marjit (2005) find a positive association between parallel market premium and export underinvoicing as illegal exporters sell the foreign exchange of unreported transactions on the parallel market, as well as a negative association between parallel market premium and import underinvoicing as illegal importers buy the foreign exchange of unreported transactions on the parallel market.

On the effect of tax, Buehn and Eichler (2011) argue that a higher tax on income or export tax increases export underinvoicing, and reduces export overinvoicing. On import side, tax fraud can be a motivation to overinvoice the value of imports, the higher the tax on income and profits, the higher the import overinvoicing, but the lower import underinvoicing. High customs duties is another motive for trade misinvoicing found in the literature (de Boyrie et al., 2007; Boyce & Ndikumana, 2001). Firms tend to understate the true value of imports when they pay high rates of customs duties or VAT on imports. Mahmood (1997) finds that high import taxes are associated

with import underinvoicing, while non-tariff restrictions are not. For a sample of 86 countries over the period 1980-2005, Buehn and Eichler (2011) find that the parallel market premium and tariffs motivate illegal trading activities, and that evasion of taxes on trade is a major incentive for trade misinvoicing. Tiwari et al. (2022) find the tariff rates to influence import misinvoicing in India. Import overinvoicing is found mainly in commodities with higher tariff, and import underinvoicing in commodities with lower tariff. Dujava and Širaňová (2017) conclude that increase in taxes and customs is accompanied by an increase in trade misreporting, and that countries with bigger current account deficits tend to be more prone to export underinvoicing. Similarly, Karataş et al. (2021) analysed the impact of non-tariff measures on misinvoicing in the context of Turkey's exports to the European Union (EU) and found that tariffs, along with non-tariff measures, have negative relationship with the misinvoiced amount.

Buehn and Eichler (2011) also show that, higher punishment costs, in the form of fines or opportunity costs in terms of lost labour income while in prison, for illegal trade when detected could decrease trade misinvoicing for both imports and exports. Concerning the effect of exchange rate, Buehn and Eichler (2011) argues that a higher real exchange rate increases both export and import misinvoicing since the purchasing power parity-adjusted value of the US dollar-denominated misinvoicing revenue rises.

Factors determining capital flight are also found in the empirical literature as determinants of trade misinvoicing (see, for example, Patnaik et al., 2012). This is because, traditionally, trade misinvoicing is viewed as a method for achieving capital flight. Suffice to say that the problem is capital flight and trade misinvoicing is only acting as a channel for that. Indeed, in the capital flight literature (see, for example, Ndoricimpa, 2018; Ndikumana & Boyce, 2019), trade misinvoicing is found to be an important conduit of capital flight. Patnaik et al. (2012) examined the determinants of trade misinvoicing and considered current account deficit, capital account openness, political stability, real interest rate, inflation, currency overvaluation, trade openness, and indebtedness as potential determinants.

On the effect of current account deficit, Patnaik et al. (2012) argues that when current account deficit is high, economic agents are likely to transfer their assets abroad. Indeed, a persistent current account deficit can be seen as a manifestation of economic instability and induces capital owners to transfer resources to foreign shores. Patnaik et al. (2012) find that export underinvoicing and import overinvoicing are positively associated with current account deficit. Regarding the effect of external debt, highly indebted countries are likely to witness greater capital flight. According to Ndikumana et al. (2015), external debt can fuel capital flight as external borrowing finances capital flight. Moreover, external debt can drive capital flight as a high debt overhang worsens macroeconomic conditions which deteriorate the investment climate (Ndoricimpa, 2017). Saxena and Gupta (2020) find that the determinants of trade misinvoicing in India are: current account deficit, external debt, trade openness, corruption, interest rate, and customs and duties.

Capital controls can encourage capital flight as they not only restrict capital movement, but they also add to volatility of the economic environment with agents acting speculatively. Aizenman (2004) shows that, in countries with capital account restrictions, greater trade integration creates greater opportunities to shift capital

through trade misinvoicing. According to Qureshi and Mahmood (2016), when financial markets are liberalized, local investors are free to invest in foreign assets; they therefore don't have to move capital abroad illegally. Moreover, according to Rojas-Suarez (1990), when capital controls are perceived as a policy instrument used on a discretionary basis, expecting such controls can encourage capital flight. Greater capital account openness is, therefore, expected to reduce trade misinvoicing. According to Patnaik et al. (2012), increased capital account openness allows domestic economic agents to engage freely with the global financial market in buying and selling foreign assets, hence reducing the incentive to take out capital through trade misinvoicing. Patnaik et al. (2012) find that export overinvoicing declines with a rise in capital account openness.

On the effect of trade openness, Patnaik et al. (2012) argues that a larger tradeable sector increases the opportunity for trade misinvoicing. Patnaik et al. (2012) find that export misinvoicing increases with trade openness. Political instability causes capital flight as agents fear losses in their domestic assets and prefer sheltering them abroad (Ndoricimpa, 2018). Political instability also induces capital flight as investors try to seek to minimize the risk of expropriation due to political crises. Patnaik et al. (2012) find that export underinvoicing is negatively associated with political stability. On the effects of governance and institutional quality, Berger and Nitsch (2012) and Fisman and Wei (2007) conclude that trade misinvoicing increases with the level of corruption.

Among the factors reviewed above, we consider parallel market premium, taxes and tariffs, capital account openness, real exchange rate, openness to trade, current account deficit, civil conflicts, and governance index as the most relevant in explaining trade misinvoicing in Burundi.

The parallel market premium is one of the potential factors that can explain trade misinvoicing in Burundi given the shortage of foreign exchange the country has been experiencing, evidenced by a high parallel market premium which currently stands at around 75%. Taxes and tariffs is another factor expected to explain trade misinvoicing in Burundi, as exporters and importers usually bear a burden of high taxes and tariffs. Capital controls measured by the degree of the capital account openness are also expected to affect trade misinvoicing in Burundi. Indeed, due to the shortage of foreign exchange, the Central Bank of Burundi has often administered foreign exchange controls which were especially tightened during the 1990s crisis and recently after the 2015 political crisis. Current account deficit is added to capture the effect of economic instability (Patnaik et al., 2012).

Political instability and wars, and corruption and poor governance are other potential factors that may explain trade misinvoicing in Burundi. Regarding political instability and wars, indeed since independence in 1962, Burundi has been characterized by cycles of political instabilities and civil conflicts. Burundi has recorded five episodes of civil conflicts, i.e., in 1965, 1969, 1972, 1988, and 1993-2004. The recurrent civil conflicts have created persistent uncertainties which may then cause capital flight through trade misinvoicing. Regarding corruption and poor governance, customs officials are reportedly corrupt[6] and regularly extort bribes from exporters and importers, thus

[6] https://www.state.gov/reports/2021-investment-climate-statements/burundi/

facilitating trade misinvoicing. According to Afrobarometer (2014), there exists a high level of perceived corruption among tax officials in Burundi, with 46% of respondents in a survey indicating that most or all tax officials are corrupt.

Potential factors in explaining capital flight through trade misinvoicing: Some stylized facts for Burundi

As already discussed, trade misinvoicing is traditionally viewed as a method for achieving capital flight. Here, trade misinvoicing acts as a channel through which capital moves. A number of factors—political, economic, and institutional—can induce capital flight (see, for example, Collier et al., 2001; Ndikumana et al., 2015; Ndoricimpa, 2018), which can then go through trade misinvoicing. Economic uncertainties caused by high and unsustainable fiscal and current account deficits, high and rising inflation, sluggish economic growth, etc. can create a loss of confidence in the domestic economy, prompting capital owners to transfer their resources abroad, as they forecast a fall in the rate of return. Other factors include capital controls, political instability and wars, and institutional factors such as poor governance and corruption. This subsection highlights the stylized facts on these factors that could explain capital flight from Burundi.

Economic instabilities are analysed by discussing government budget and current account deficits, and economic growth. Both government budget and current account deficits have been high and persistent in Burundi. For the period 2011-2020, the budget deficit is on average 9.0% of GDP. Similarly, current account deficits have been worsening; from an average of 6.1% during 2000-2009, current account deficit increased to 12.3% for the period 2010-2018 due to weak global demand and a fall in commodity prices at international markets. The deterioration of current account may have also been caused by the widening of the gross saving gap (gross saving minus gross investment), from -5.2% in 2000-2009 to -7.6% during 2010-2018. A deteriorating current account position is a sign of economic instability, causing economic agents to expect currency depreciation, hence prompting them to shift their assets abroad. Moreover, for a country running fiscal deficits means that the government has to borrow to finance its expenditure. However, credit to central government can be a significant source of money creation.[7] If a large part of fiscal deficit is financed by monetary creation, this may result in inflation and create incentives for capital flight as agents try to prevent losses in the real value of their domestic asset holdings (Rojas-Suarez, 1990). Indeed for Burundi, claims on central government (% GDP) have significantly increased over the past few years, from 7.7% over the period 2009-2014 to 22.9% over the recent period 2015-2020. In addition, persistent budget deficit means a continuous accumulation of public debt which can become unsustainable over time, and which may increase the risk of debt distress.

Concerning growth performance, economic growth in Burundi has been low and sluggish over the years owing to a number of factors, including the recurrent civil conflicts since independence in 1962. Although modest, the growth rate in the

6 https://economic-research.bnpparibas.com/Views/DisplayPublication.aspx?type=document&IdPdf=43264

1980s (4.3%) was much higher than sub-Saharan average (1.6%) due to investment projects undertaken by the government and the easing of political tensions that had characterized the 1970s. However, the civil war of the 1990s that started in 1993 and ended in 2005, caused major disruptions to the economy. Consequently, the economy contracted on average by 0.3% during the period 1990-2015. It should be noted that over the period 1993-2000, Burundi recorded a positive growth rate only once, in 1998. Although the economy recovered after the civil conflicts of the 1990s, it is unfortunate that it did not grow enough as other post-conflict countries (Mozambique, Rwanda, Sierra Leone, etc.) did, recording high growth rates in the post-conflict period. Notably, even post-conflict, the undercurrents of instability have continued to characterize the political atmosphere. The atmosphere has been characterized by what Nkurunziza (2018) describes as one with political capture within which those in power feed state fragility through rent extraction, corruption, and mismanagement. Over the period 2006-2014, Burundi recorded an average growth rate of 4.5%. However, the 2015 political crisis cut the growth momentum, and while the economy was still recovering from it, the COVID-19 pandemic along with its effects struck; an average growth rate of -0.04% was recorded for the period 2015-2020.

Burundi relies on a few traditional commodities (tea, coffee, and minerals) for its foreign exchange, which has often created a problem of foreign exchange scarcity. Moreover, it seems exporters do not surrender the totality of foreign exchange from export proceeds. For example, it is reported[8] that from gold exports, about US$29 million and US$45 million were not surrendered to the Central Bank of Burundi in 2017 and 2018, respectively. Total reserves (in months of imports) was 3.0 months of import cover in the second half of the 1980s, then increased in the 1990s to around 7.5 on average for the period 1990-1997. Due to the civil war of the 1990s which intensified from 1997, and the 1996 economic embargo which went up to 1999, the foreign reserves level fell by half in 1998, from 9.6 in 1997 to 4.8 months of import cover in 1998. The downtrend continued and hit the bottom lowest of 1.3 months of import cover in 2001. There was a recovery in the 2000s but never reached the 1990s levels, with an average of 4.5 months of import cover for the period 2002-2014. However, with the political crisis of 2015, the situation worsened again with total foreign exchange reserves standing on average at 1.4 months of import cover for the period 2015-2018. As at the end of 2020, foreign exchange reserves could cover less than 30 days of imports. Due to the shortage of foreign exchange, the Central Bank of Burundi has often administered exchange controls which were especially tightened during the 1990s crisis and recently after the 2015 political crisis. The Central Bank of Burundi introduced foreign exchange rationing by supplying foreign exchange only to

8 http://burundi-eco.com/2019-annee-record-dans-le-rapatriement-des-devises/#.YYX8SbjMLIU

importers of strategic goods such as fuel and pharmaceutical products. Consequently, the rest of importers, mostly small importers, have to turn to the higher parallel market exchange rate to buy foreign exchange needed. The high demand of foreign exchange at the parallel market has caused the parallel market rate to continue increasing. It is to be noted that the parallel market premium stands currently at around 75%, which indicates a serious scarcity of foreign exchange at the official rate.

Regarding political instability and wars, since independence in 1962, Burundi has been characterized by cycles of political instability and civil conflicts. Burundi has experienced five military coups and has recorded five episodes[9] of civil war. The recurrent civil conflicts have created persistent uncertainties inhibiting investment, especially long-term investment. No investor will risk pouring big cash in an economy if the risk of recurrent political crisis is high, when there is constant fear that his capital could be destroyed by a sudden crisis. It is, therefore, no surprising that domestic and foreign investment is low in Burundi. Capital investment (% GDP) in Burundi remains among the lowest in the world, averaging 10.9% for the period 1960-2020. Highest capital investment level was in the 1980s, during which period big investment projects were undertaken, with a peak at 22.8% in 1983. Due to the 1990s civil war, investment rate fell and reached its minimum at 2.8% in 2000. It recovered thereafter with the Arusha peace agreements[10] and later with the total ceasefire, but has never reached the 1980s levels. The latest value for 2020 is 11.4%, which is far below the sub-Saharan average of 22.3% for the same year 2020. It should be noted that if residents are not investing domestically, they are taking their capital abroad where they can have that peace of mind knowing that their capital is safe from sudden destruction. Similarly, the same prevailing political uncertainties have been a major barrier for foreign investment. Indeed, for the period 1970-2019 Burundi has only managed to attract foreign direct investment (FDI) equivalent to 0.3% of GDP, which is ridiculously low compared to FDI attracted by other countries in the region.

Corruption and poor governance is another major driver of capital flight (see Ndikumana et al., 2015). The Corruption Perceptions Index ranks Burundi at 165 out of 180 countries. Customs officials are reportedly corrupt[11] and regularly extort bribes from exporters and importers, thus facilitating trade misinvoicing. According to Afrobarometer (2014), there exists a high level of perceived corruption among tax officials in Burundi, with 46% of respondents in a survey, indicating that most or all tax officials are corrupt in Burundi (Ndoricimpa, 2021). In addition, Nicaise (2020) did a five-month investigation of tax collectors in Burundi and came to a conclusion that corruption in Burundi is systemic, from tax collectors' petty corruption to government officials' grand corruption, with the latter mostly happening in the award of licences and concessions

9 Military coups happened in 1966, 1976, 1987, 1993, and 1996; civil conflicts occurred in 1965, 1969, 1972, 1988, and 1993-2004; 2015 was also a year of political instability.

10 This was a transitional peace treaty signed in August 2000 which brought the Burundian Civil War to an end. Negotiations for the agreement were mediated by former Tanzanian president Julius Nyerere from 1996 until his death in October 1999, and thereafter by former South African president Nelson Mandela.

11https://www.state.gov/reports/2021-investment-climate-statements/burundi/

taking place in a non-transparent environment. An example is a recent scandal[12] on a hydroelectric dam construction project executed by a Chinese construction company (CNME-CGC), which was supposed to be at 45% execution rate, the president was stunned during a visit to the construction site, discovering that after a disbursement of BIF 54 billion (about US$28 million at the current official exchange rate), no tangible work had been done. The question one would ask is, "where did the money go?" This is one among many examples involving grand corruption causing tremendous losses to the country, which help to understand the importance of good governance.

12 https://www.iwacu-burundi.org/un-gouffre-nomme-mpanda/

4. Methodology

Estimating trade misinvoicing

Trade misinvoicing is an old phenomenon. Bhagwati (1964) discovered that there were discrepancies between the amounts of imports reported by a country and exports reported by its trading partners. As Schneider (2003) argues, capital flight can occur when traders keep capital abroad by faking the trade documents most of the time due to exchange controls by underinvoicing exports and/or overinvoicing imports. Following Ndikumana and Boyce (2021), the amount of trade misinvoicing is estimated by comparing trade values declared by Burundi with those declared by trading partners in a bilateral international transaction. Since trade statistics reported by advanced countries are assumed to be more reliable, trade misinvoicing is usually computed by considering only industrialized trading partners.

To disaggregate trade misinvoicing by major trading partners and by major export and import commodities, export misinvoicing and import misinvoicing are estimated as follows:

For country i (Burundi in this study),i (Burundi in this study), product kk and partner $j, j,$ export misinvoicing, denoted by DX, is given by the following:

$$DX_{ij,t}^{k} = M_{ji,t}^{k} - \left(X_{ij,t}^{k} * cif\right) \quad (1)$$

Where: $M_{ji}^{k}M_{ji}^{k}$ is the value of imports of product kk by partner j from country i as recorded by partner j, X_{ij}^{k} is exports of product k by country $i\,i$ to partner $j\,j$ as recorded in country $i's i's$ data. Similarly, for a country i (Burundi in this study), i (Burundi in this study), product kk and partner $j, j,$ import misinvoicing, denoted DM, is given by:

$$DM_{ij,t}^{k} = M_{ij,t}^{k} - \left(X_{ji,t}^{k} * cif\right) \quad (2)$$

Where: M_{ij}^{k} is imports of product k by country $i\,i$ from partner j as reported in country $i's$ data, X_{ji}^{k} is exports by partner j to country ii as reported in partner j's data. *cif* is the factor representing the costs of insurance and freight.

Total trade misinvoicing is then given by the sum of export misinvoicing and import misinvoicing.

A positive export misinvoicing (export underinvoicing) indicates a net outflow, while export overinvoicing (negative export misinvoicing) indicates a net inflow. Similarly, imports can be overinvoiced (positive sign of import misinvoicing) or underinvoiced (negative sign of import misinvoicing), the latter indicating a net inflow while the former indicates a net outflow.

In this study, major export trading partners considered are Italy, France, USA, Netherlands, United Arab Emirates, Belgium, Switzerland, Germany, and UK; and the major import trading partners considered are Saudi Arabia, China, India, Belgium, France, Japan, Germany, USA, Denmark, Netherlands, Italy, South Africa, and UK (see Table 3). On disaggregating by commodity export misinvoicing, we consider coffee, tea, and gold (in the recent periods), as major export commodities. For import misinvoicing, top six import commodities are considered. It should be noted that, in computing trade misinvoicing by commodity or by trade partner, *cif* factor used was obtained from the *International Trade by Commodity Statistics* database of OECD, by taking an average of the *cif* factor in the trade between Burundi and its trading partners.

Aggregated trade misinvoicing and disaggregated trade misinvoicing by trading partners are computed using DOTS database of International Monetary Fund (IMF) over the period 1970-2019. Disaggregated trade misinvoicing by trading commodities is computed using UN-COMTRADE database over the period 1993-2019.

Empirical model of the determinants of trade misinvoicing

To analyse the determinants of trade misinvoicing, the following equation is estimated:

$$TM_t = c + X_t'\beta + \varepsilon_t \qquad (3)$$

Where: TM, trade misinvoicing (export misinvoicing or import misinvoicing), is the dependent variable, *X* is a vector of explanatory variables, and $\varepsilon\varepsilon$ is the error term. While analysing trade misinvoicing, we found that the most common practice in export misinvoicing is underinvoicing, and overinvoicing for import misinvoicing. Two equations are therefore estimated; one for export underinvoicing and another for import overinvoicing. For both equations, following Buehn and Eichler (2011) and Patnaik et al. (2012), the vector *X* contains the following variables; corporate tax (% GDP), tax on imports (% GDP), real exchange rate, parallel market premium, openness to trade, current account deficit, capital account openness, a civil conflict dummy variable, and polity2 index as a proxy for governance.

The definition, descriptive statistics, and sources of the variables used are presented in Table 1. The theoretical expected effect of each regressor according to the literature (see, for example, Buehn & Eichler, 2011; Patnaik et al., 2012) is in Table 2. The period of study is 1970-2019, but after discarding the observations corresponding to export overinvoicing and import underinvoicing, the number of observations is reduced to 36 and 35, respectively, for export underinvoicing and import overinvoicing equations.

We also examine the drivers of trade misinvoicing at the product level by considering some major export (coffee and gold) and import commodities (pharmaceutical products, machinery, and vehicles). This is done over the period 1993-2019.

Table 1: Definition, descriptive statistics and sources of variables

Variables	Definition, description and source	Obs.	Mean	Std. Dev.	Min	Max
xuinv	Export Underinvoicing [Source: Own computation using UNCTAD's COMTRADE data]	36	4.81	4.59	0.094	15.95
moinv	Import Overinvoicing [Source: Own computation using UNCTAD's COMTRADE data]	36	3.66	2.95	0.18	11.27
coxmis	Coffee Export Misinvoicing [Source: Own computation using UNCTAD's COMTRADE data]	27	0.09	1.15	-1.50	4.06
goxmis	Gold Export Misinvoicing [Source: Own computation using UNCTAD's COMTRADE data]	25	0.63	2.93	-4.19	6.83
phmmis	Pharmaceutical products' Import Misinvoicing [Source: Own computation using UNCTAD's COMTRADE data]	27	0.15	0.23	-0.56	0.54
mammis	Machinery Import Misinvoicing [Source: Own computation using UNCTAD's COMTRADE data]	27	0.21	0.64	-0.87	1.75
vehmmis	Vehicles Import Misinvoicing [Source: Own computation using UNCTAD's COMTRADE data]	27	0.34	0.24	-0.04	1.04
ctax	Corporate Tax (% GDP) [(Source: Annual and monthly reports of the Central Bank of Burundi]	36	1.76	0.46	0.68	2.71
mtax	Tax on imports (% GDP) [Source: Annual and monthly reports of the Central Bank of Burundi]	36	2.13	0.65	0.93	4.07
kaopen	Capital account openness index also known as The Chinn-Ito index [Source: Chinn and Ito (2006)]	36	-1.36	0.28	-1.92	-1.22
prem	Parallel market premium (%) [Source: Central Bank of Burundi]	36	22.0	17.74	0.33	55.99
cadef	Current account deficit (% GDP) [Source: World Development Indicators]	36	-4.82	3.70	-12.0	1.04
lnopen	Natural log of openness to trade, measured by the GDP ratio of the sum of exports and imports [Source: World Development Indicators]	36	3.46	0.21	3.07	3.84
lnrer	Natural log of real effective exchange rate [Source: World Development Indicators]	30	4.94	0.32	4.43	5.51
civcon	A variable capturing periods of civil conflicts indicating the magnitude of civil conflict in a given period. The score ranges from 1 (lowest) to 10 (highest). [Source: Center for Systemic Peace]	36	1.36	1.85	0	4
gov	Polity2 index, proxy for governance. The index ranges from -10 (strongly autocratic) to +10 (strongly democratic) [Source: Polity IV Project Database]	36	-3.08	4.72	-7	6

Source: Author's own construction.

Table 2: Theoretical expected effect of regressors

Variables	Export Underinvoicing	Import Overinvoicing
Corporate tax	+	+
Tax on imports		-
Capital account openness	-	-
Current account deficit	+	+
Parallel market premium	+	+
Openness to trade	+	+
Real exchange rate	+	+
Civil conflicts	+	+
Governance index	-	-

Source: Author's own compilation from reviewed literature.

5. Presentation of results

Trade misinvoicing at disaggregated levels

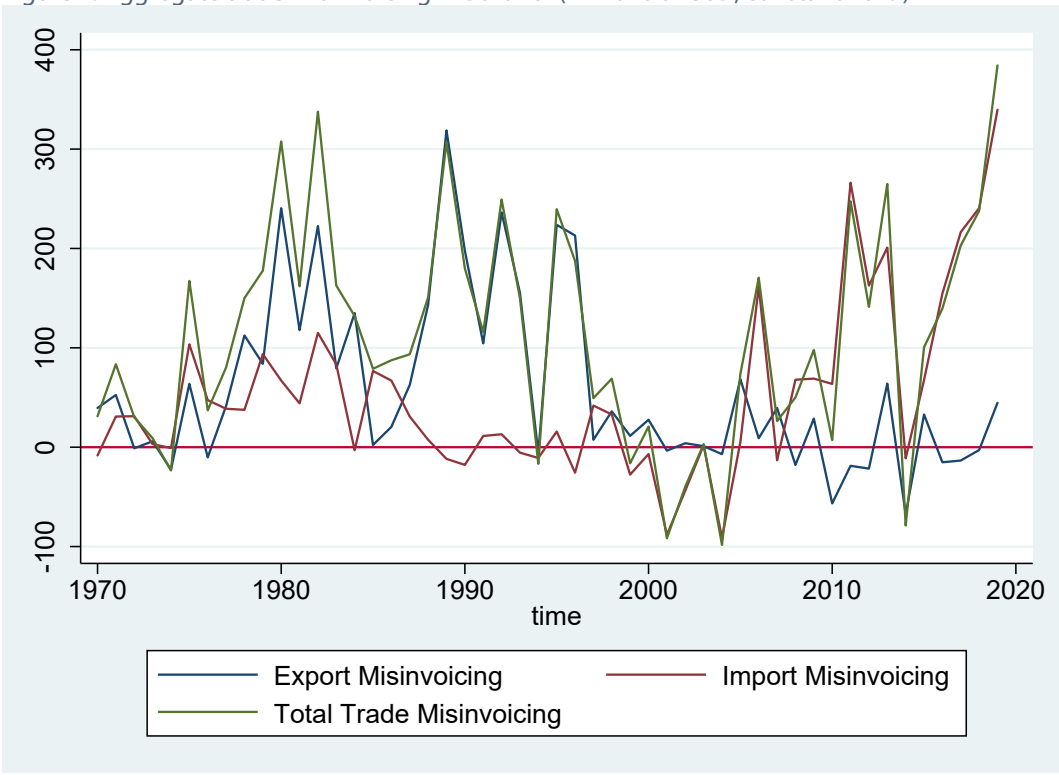
Figure 1 shows the magnitude of trade misinvoicing of Burundi at the aggregate level in its trade with advanced economies as a group. It should be noted that advanced economies accounted, on average, only for 53.6% of Burundi's total trade over the period 1970-2019. Therefore, trade misinvoicing at aggregate level computed is not total trade misinvoicing. The magnitude of trade misinvoicing with all partners could be different.[13]

Figure 1 clearly indicates that exports of Burundi to advanced economies are generally underinvoiced (with a net cumulative of US$2,776.6 million over 1970-2019) while imports of Burundi from advanced economies are generally overinvoiced (a net cumulative of US$2,460.9 million over 1970-2019); which is what should be expected if trade misinvoicing is a conduit for capital flight. Apart from a few years, the net effect is indeed an outflow of capital (US$5,237.5 million over 1970-2019). The phenomenon of import overinvoicing seems, however, counterintuitive, and may be limited to few big importers who execute government contracts and have access to foreign currency at the favourable official rate. Another plausible explanation for the phenomenon is that some import commodities, such as petroleum and pharmaceutical products, are controlled in Burundi by monopolists who do not pay import taxes, hence the incentive to overinvoice imports.

However, trade misinvoicing at aggregate level conceals information on which trading partners are involved and which commodities are affected. Table 3 and Table 4 present disaggregated trade misinvoicing by major trading partners. To avoid two-sided misinvoicing and following previous studies (see, for example, Ndikumana & Boyce, 2021), only advanced and emerging economies are considered as trading partners. Major trade partners are determined based on average shares in cumulative exports or imports. The aim was to constitute a group of trading partners that represents at least 70% of Burundi's total exports/imports. However, this was not possible because of the importance of intra-African trade in Burundi's total trade.

13 For comparison purposes, trade misinvoicing in the trade of Burundi with all its partners (Rest of the World) was computed (see Figure A1 in the appendix). Over the period 1970-2019, the net cumulative of export misinvoicing is found to be US$1,972.1 million, while the net cumulative of import misinvoicing is US$3,909.4 million, making trade misinvoicing to be US$5,881.5 million over 1970-2019. The common practices are to underinvoice exports and to overinvoice imports.

Figure 1: Aggregate trade misinvoicing in Burundi (millions of USD, constant 2019)



Source: Author's calculation using IMF's DOTS Database.

Trade misinvoicing by major trading partners

On the exporting side, nine industrial major trading partners are considered, accounting for 59.3% of Burundian total exports. This low total export share is explained by the exclusion of low-income trading partners. It should be noted that intra-African trade has increased in recent years with EAC4[14] alone accounting for 19.4% of Burundian total exports. The three leading trading partners of Burundi are Switzerland, United Arab Emirates (UAE), and the United Kingdom (UK).

14 The remaining four EAC members: Kenya, Rwanda, Tanzania, and Uganda.

Table 3: Export misinvoicing (1970-2019) by major trading partners (millions of USD, constant 2019)

Partner Countries	Burundi's Exports (fob): A	Partners' share in Total Export (%) (1997-2019)	Partner's Imports from Burundi (cif): B	Difference between (B) and (A)	Export Misinvoicing
Italy	126.4	0.7	241.1	114.7	102.7
France	144.4	0.6	410.9	266.5	252.5
USA	1176.9	0.9	1453.3	276.4	159.4
Netherlands	131.6	1.3	298.5	166.9	154.9
UK	523.5	11.1	309.6	-213.9	-258.9
Germany	1022.4	5.1	2054.6	1032.2	933.3
Belgium	374.9	6.1	1366.7	991.8	959.1
Switzerland	540.7	18.8	95.5	-445.2	-482.4
United Arab Emirates*	357.6	14.5	1386.5	1028.9	1007.5
Total		59.3			

Source: Author's own calculation.

Notes: (*) In computing export misinvoicing for UAE, the period 1997-2019 is considered due to data availability. Partners' share is calculated for the period 1997-2019, where data is available for all the countries.

As Table 3 indicates, exports of Burundi to most of its major trading partners are underinvoiced. The top destinations for export underinvoicing are United Arab Emirates (UAE), Belgium, and Germany, with net underinvoicing amounting, respectively, to US$1007.5 million, US$959.1 million, and US$933.3 million. Burundi exports mainly precious stones and metals to the United Arab Emirates, and coffee and tea to Belgium and Germany. As Ndikumana et al. (2015) point out, export underinvoicing may be an important conduit for capital flight as operators conceal their actual earnings and keep the difference in foreign accounts. Exports of Burundi to United Kingdom (UK) and Switzerland are overinvoiced. According to Ndikumana and Boyce (2021), this can be that the two countries are trading hubs acting as a transit for goods to other final destinations. It could reflect re-exports of goods initially exported to these countries that end up in other countries. Also, according to UNCTAD (2016), by overinvoicing, exporters can sneak into a country cash which had been hidden overseas disguised as export earnings.[15] Indeed, United Kingdom and Switzerland are among the world's known tax havens due to their history of financial secrecy. The main exports of Burundi to United Kingdom and Switzerland are also coffee and tea.

15 http://www.scmp.com/business/article/1403214/how-export-invoicing-trick-works

On importing side, 13 major industrial trading partners are considered, accounting for 60% of total imports of Burundi. Table 4 shows that imports of Burundi from its major trading partners are in general overinvoiced, except in the trade with Italy and Germany. Countries whose trade with Burundi exhibits relatively high import overinvoicing, are Saudi Arabia, China, and Japan, to the tune of US$978.4 million, US$505.2 million, and US$413.3 million, respectively. Burundi imports from Saudi Arabia mainly mineral fuels, oils, and distillation products; major imports from China include iron and steel, machinery, electrical and electronic equipment, clothing, and cereals; and imports from India include pharmaceutical products, vehicles, articles of iron or steel, electrical and electronic equipment, and textile articles. In the next sub-section, we analyse how these import products are affected by misinvoicing. For Italy and Germany, import underinvoicing is to the tune of US$139.5 million and US$71.0 million, respectively, which could suggest some form of smuggling. In 2019, the main imports from Italy included electrical, electronic equipment, and cereal, flour, starch and milk products. For the same year, the main imports from Germany were cereals, vehicles, and textile articles.

Table 4: Import misinvoicing (1970-2019) by major trading partners (millions of USD, constant 2019)

Partner Countries	Burundi's Imports (cif): A	Partners' share in Total Import (%) (2009-2019)	Partner's Exports to Burundi (fob): B	Difference between (A) and (B)	Import Misinvoicing
Italy	510.7	1.2	598.3	-87.6	-139.5
France	1407.8	3.6	1290.4	117.4	4.2
USA	572.6	2.3	457.5	115.1	78.4
Netherlands	496.8	1.8	436.6	60.2	23.7
UK	408.9	1.2	289.4	119.5	93.9
Germany	1113.8	2.1	1087.4	26.4	-71.0
Belgium*	822.6	6.7	686.6	136	94.8
Denmark	262.3	1.8	72.3	190	184.2
China*	1295.4	11.6	741.1	554.3	505.2
India	912.8	9.2	510.3	402.5	367.1
Japan	1120.7	3.7	647.9	472.8	413.3
Saudi Arabia*	981.5	12.2	1.9	979.6	978.4
South Africa*	305.1	2.5	147.5	157.6	148.2
Total		60.0			

***Notes**:* (*) Due to data availability, periods considered in calculating import misinvoicing are: 2003-2019 for Belgium, 1981-2019 for China, 2009-2019 for Saudi Arabia, and 1998-2019 for South Africa. Partners' share is calculated for the period 2009-2019, where data is available for all the countries.

Trade misinvoicing by major products

i. Misinvoicing in major export commodities

We consider three major export commodities, coffee, tea, and gold, accounting for 70% of total exports of Burundi over the period 2016-2020.

a. Tea export misinvoicing

Tea is currently Burundi's third largest cash crop, contributing approximately 15% of total export earnings (2016-2020). According to COMTRADE's records as reported by Burundi, the consistent buyers of Burundian tea have been Oman, United Kingdom, Kenya, and Tanzania. However, there seems to be a lack of transparency in Burundi tea trade as Burundi and its trading partners do not consistently report the trade values. For example, data extracted from COMTRADE indicate that Japan reports tea imports from Burundi for the period 2000-2020 for a cumulative amount of US$815,641 but Burundi reports exporting tea to Japan only once in 2005 for an amount of US$1,187. Similarly, Pakistan reports tea imports from Burundi for 2003-2020 for a cumulative amount of US$151,761,833 while Burundi reports tea export to Pakistan four times only (2009 and 2017-2020) for a cumulative amount of US$37,263,895. Furthermore, United Kingdom (UK) reports tea imports from Burundi for 1993-2020 for a cumulative amount of US$34,024,519 but Burundi reports tea exports only for the periods 1993-1999 and 2017-2019 for a cumulative amount of US$17,688,131. In addition, Burundi reports tea exports to Kenya for the periods 1993-1997, 1999-2011, and 2013-2016 but Kenya reports tea imports from Burundi only for 2009-2010, 2013, and 2015-2020. Likewise, Burundi reports to consistently export tea to Tanzania but Tanzania does not report any tea import from Burundi. This lack of information on Burundi tea trade statistics poses a challenge in estimating tea export misinvoicing. For years where it was possible to do so, the results are presented in Table 5. Estimates indicate that tea exports to Kenya and Oman could be overinvoiced, but underinvoiced in the trade with United Kingdom (UK) and Pakistan. However, this is only indicative of what could be happening given the lack of data.

b. Coffee export misinvoicing

Coffee is currently Burundi's second largest cash crop, contributing approximately 24% of total export earnings (2016-2020). The coffee value chain in Burundi is as follows: coffee farmers, typically smallholders, deliver cherry to washing stations or exporters who then process and dry the coffee, dry mill and export green coffee.[16] In computing coffee export misinvoicing, ten main trading countries are considered, accounting for 81.1% of Burundi total coffee export. The top four destinations of coffee from Burundi are Switzerland, United Kingdom (UK), Belgium, and Germany, with a total share of 71.1%. As Table 6 shows, coffee exporting underinvoicing is most pronounced in exports to Germany (US$501.0 million) and USA (US$118.8 million), and less pronounced in exports to Russia (US$6.3 million), Canada (US$1.8 million), and South Africa (US$0.9 million). Coffee export overinvoicing occurs in the trade with Switzerland (US$460.3 million), UK (US$230.8 million), and Belgium (US$30.9 million). As Ndikumana and Boyce (2021) point out, this can be that these countries are only acting as trade hubs used as transit routes to other final destinations.

16 https://nordicapproach.no/origins/burundi/

c. Gold export misinvoicing

Gold is currently Burundi's largest export commodity, contributing approximately 29% of total export earnings (2016-2020). In the national statistics (Central Bank of Burundi), gold exports of Burundi starts in 2016 while in international statistics (COMTRADE), gold export appears from early 1990s. This could mean that foreign exchange earnings from gold export up to 2016 have never been surrendered to the government. Indeed until recently, the major problem the Burundian mining sector faced was informal exploitation, with anarchic mining which was not profitable to the country. According to COMTRADE, for the period 1993-1996, the main gold export destination was Belgium (83.4%) followed by Switzerland (16.1%); for 1999-2003, Belgium was the sole destination (100%) of gold from Burundi; for 2004-2006, Switzerland became the main destination (67.8%) followed by United Arab Emirates (UAE) (22.2%), then Belgium (3.7%). In recent years (2007-2019), United Arab Emirates (UAE) is the main gold export destination (92.5) followed by Belgium (4.4%). Estimates of gold export misinvoicing are reported in Table 7 for the few periods where trade values were available on both sides. Results indicate an underinvoicing amounting to US$641.1 million in the gold export to United Arab Emirates and an overinvoicing in the gold export to Belgium amounting to US$30.1 million.

Table 5: Tea export misinvoicing [HS 0902] (millions of USD, constant 2019)

Countries	Periods	Burundi's Exports (fob): A	Partner's Imports from Burundi (cif): B	Difference between (B) and (A)	Export Misinvoicing	cif Factor
Kenya	2009-2010, 2013, 2015-2016	55.6	0.9	-54.7	-58.3	1.0665
Oman	1993, 1995-1996, 1998-1999, 2004-2011, 2013, 2015-2016	15.3	11.6	-3.7	-4.6	1.0545
UK	1993-1999, 2017-2019	21.5	44.7	23.2	24.8	1.017
Pakistan	2009, 2017-2019	38.1	47.2	9.1	6.7	1.0628

Source: Author, using data from UNCTAD COMTRADE database.

Table 6: Coffee export misinvoicing (millions of USD, constant 2019)

Countries	Period	Burundi's Exports (fob): A	Partner's Imports from Burundi (cif): B	Partner's share in Burundi's Total Exports (%)		Difference between (B) and (A)	Export Misinvoicing	cif Factor
				Exports (Burundian data)	Exports (partner's data)			
France	1999–2019	17.9	81.5	1.8	8.1	63.6	62.9	1.0374
USA	1993–2019	45.0	165.2	2.7	13.1	120.2	118.8	1.0278
Netherlands	1995–2019	35.6	75.3	3.6	5.8	39.7	38.3	1.04
Switzerland	1993–2019	486.4	43.0	33.8	2.8	-443.4	-460.3	1.0348
UK	1993–2019	245.0	17.2	15.3	1.4	-227.8	-230.8	1.0126
Germany	1993–2019	156.0	660.5	10.0	39.3	504.5	501.0	1.0224
Belgium	1999–2019	121.3	94.9	12.6	10.2	-26.4	-30.9	1.0376
Canada	1999–2019	3.1	5.1	0.4	0.7	2.0	1.8	1.0278
Russia	2002–2019	6.7	13.3	1.2	2.3	6.6	6.3	1.0428
South Africa	2000–2019	1.1	2.1	0.2	0.4	1.0	0.9	1.00
Total				81.6	84.1			

Source: Author, using data from UNCTAD, COMTRADE database.

Table 7: Gold export misinvoicing (millions of USD, constant 2019)

Countries	Period	Burundi's Exports (fob): A	Partner's Imports from Burundi (cif): B	Difference between (B) and (A)	Export Misinvoicing	cif Factor
UAE	2005-2019	728.1	1371.8	643.7	641.1	1.0036
Belgium	1995-1996, 1999-2002, 2009-2010	170.4	150.5	-19.9	-30.1	1.06

Source: Author using data from UNCTAD, COMTRADE database.

ii. Import misinvoicing in some major commodities

Burundi's top six import commodities over the period 2011-2020 are: refined petroleum (22% of total imports), pharmaceutical products (8.4%), machinery and mechanical appliances (7%), vehicles [combining *HS code: 8702; HS code: 8704; and HS code: 8708*] (6.9%), electrical machinery and equipment (5.7%), and iron and steel (4.7%). In 2019, the top five countries from which Burundi imported are: China (15.4% of total imports), followed by Saudi Arabia (15.2%), India (7.9%), United Arab Emirates (6.9%), and Tanzania (5.5%). In this subsection, import misinvoicing is estimated for the six major import commodities.

a. Petroleum [HS code: 2710]

Burundi imports its refined petroleum primarily from Saudi Arabia (75.2%) and from United Arab Emirates (19.2%). However, while Burundi reports importing mineral fuels from Saudi Arabia, no records of Saudi Arabia's export to Burundi were found in COMTRADE. Consequently, misinvoicing is only estimated for petroleum imports from United Arab Emirates (UAE), Tanzania, India, Kenya, Rwanda, and South Africa. Table 8 suggests that petroleum imports are mainly overinvoiced, except in the trade with Kenya and Rwanda. Over the period 2000-2009, import overinvoicing is observed to the tune of US$304.2 million, US$136.5 million, and US$81.3 million, respectively, in the trade with India, UAE, and South Africa. It should be noted that some countries like Tanzania, Kenya, and Rwanda, most probably only acted as a hub for oil imports into Burundi.

b. Pharmaceutical products [HS code: 30]

Pharmaceutical products is the second leading import category for Burundi, accounting for 8.4% of total imports. Misinvoicing is computed for ten trading partners. Table 9 gives evidence of substantial overinvoicing for imports from Denmark, Belgium, India, and China. The leading destinations for import overinvoicing are Denmark (US$65.7 million) and Belgium (US$48.0 million). Import underinvoicing is observed in the trade with France, Netherlands, USA, and UK, the leading destination for import underinvoicing being France (US$49.1 million).

c. Machinery and mechanical appliances, parts thereof [HS code: 84]

Burundi's imports of machinery and mechanical appliances from its major trading partners are mostly overinvoiced except for imports from Germany and Netherlands (Table 10). The largest overinvoicing is in the trade with China (US$42.3 million), United Arab Emirates (US$21.9 million), Belgium (US$20.9 million), and France (US$20.6 million).

d. Vehicles [HS code: 8702; HS code: 8704] and motor vehicles; parts and accessories [HS code: 8708]

Import misinvoicing for vehicles is calculated in Table 11. Vehicles considered are: public transport passenger type (*HS code: 8702*), and vehicles for the transport of goods (*HS code: 8704*). Misinvoicing is also calculated for motor vehicles; parts and accessories *(HS code: 8708)*. Burundi imports primarily vehicles; public transport type (carries ten or more passengers) from Japan (77.5%) followed by United Arab Emirates (10.9%). Table 10 shows that the most occurring practice is to overinvoice vehicles imports, and the highest misinvoicing is observed for the imports from Japan (US$127.6 million), followed by France (US$50.1 million) and Germany (US$17.2 million).

e. Electrical machinery and equipment, and parts thereof [HS code: 85]

The highest overinvoicing exhibited in the imports of electrical machinery and equipment, and parts thereof, is in the trade with Belgium (US$28.2 million), United Arab Emirates (US$20.1 million) and China (US$15.4 million); and the highest import underinvoicing is in the trade with Hong Kong (US$34.5 million), while lowest underinvoicing are observed in the imports from Denmark (US$1.2 million), Germany (US$1.3 million), and South Africa (US$0.3 million) (see Table 12).

f. Iron and steel [HS code: 72]

Iron and steel import misinvoicing is calculated considering five trading partners. Table 13 indicates that the common practice seems to be overinvoicing of imports for the five trading partner countries, with the highest misinvoicing observed for the imports from China (US$41.0 million) and South Africa (US$17.7 million).

Table 8: Petroleum import misinvoicing (millions of USD, constant 2019) over 2000-2019

Countries	Burundi's Imports (cif): A	Partner's Exports to Burundi (fob): B	Difference between (A) and	Oil import Misinvoicing
United Arab Emirates	141.6	5.1	136.5	136.2
Tanzania	69.2	28.5	40.7	39.0
India	312.5	8.33	304.2	303.7
Kenya	118.9	163.9	-45.0	-54.8
Rwanda	10.9	70.3	-59.4	-63.6
South Africa	98.8	17.5	81.3	80.2

Source: Author, using data from UNCTAD, COMTRADE database.

Table 9: Import misinvoicing for pharmaceutical products (millions of USD, constant 2019)

Countries	Period	Burundi's Imports (cif): A	Partner's Exports to Burundi (fob): B	Difference between (A) and (B)	Import Misinvoicing	cif Factor
China	1993-2019	42.9	30.1	12.8	11.2	1.051
India	1993-2019	232.9	201.9	31	20.5	1.0522
Belgium	1999-2019	206.7	150.0	56.7	48.0	1.0576
Denmark	1993-2017	68.0	2.1	65.9	65.7	1.0586
France	1994-2019	108.0	149.5	-41.5	-49.1	1.051
Germany	1993-2019	13.8	10.9	2.9	2.3	1.05
Netherlands	1993-2019	27.4	30.1	-2.7	-4.4	1.0556
USA	1998-2019	13.4	18.2	-4.8	-5.9	1.0678
UK	1993-2019	10.8	3.6	7.2	6.9	1.058
South Africa	2000-2019	3.2	1.3	1.9	1.8	1.0704

Source: Author, using data from UNCTAD, COMTRADE database.

Table 10: Import misinvoicing for machinery and mechanical appliances, parts thereof (millions of USD, constant 2019)

Countries	Period	Burundi's Imports (cif): A	Partner's Exports to Burundi (fob): B	Difference between (A) and (B)	Import Misinvoicing	cif Factor
China	1993-2019	109.6	63.1	46.5	42.3	1.0664
Japan	1993-2019	17.0	11.6	5.4	4.6	1.06
India	1996-2019	32.9	19.8	13.1	11.8	1.0678
United Arab Emirates	1999-2019	49.9	26.0	23.9	21.9	1.0752
Belgium	1999-2019	158.9	128.6	30.3	20.9	1.0732
France	1994-2019	83.4	58.7	24.7	20.6	1.069
Germany	1993-2019	91.7	99.3	-7.6	-14.3	1.0676
Netherlands	1993-2019	48.7	49.0	-0.3	-3.8	1.071
South Africa	2000-2019	18.5	12.4	6.1	5.0	1.087

Source: Author, using data from UNCTAD, COMTRADE database.

Table 11: Import misinvoicing for vehicles (millions of USD, constant 2019)

Countries	Period	Burundi's Imports (cif): A	Partner's Exports to Burundi (fob): B	Difference between (A) and (B)	Import Misinvoicing	cif Factor
Japan	1993-2019	195.4	63.8	131.6	127.6	1.0678
United Arab Emirates	2003-2019	30.9	30.6	0.3	-2.3	1.0844
UK	1995-2019	21.2	6.6	14.6	14.0	1.0832
China	2006-2019	13.8	7.1	6.7	6.3	1.0765
Germany	1993-2019	61.4	41.4	20	17.2	1.0751
SA	2000-2019	21.0	12.6	8.4	7.6	1.0813
France	1994-2019	60.4	9.5	50.9	50.1	1.0764
Belgium	1999-2019	31.6	15.6	16	14.6	1.0829

Source: Author, using data from UNCTAD, COMTRADE database.

Table 12: Import misinvoicing for electrical machinery and equipment, and parts thereof (millions of USD, constant 2019)

Countries	Period	Burundi's Imports (cif): A	Partner's share in Total imports (%)	Partner's exports to Burundi (fob): B	Difference between (A) and (B)	Import Misinvoicing	cif Factor
China	1993-2019	234.7	25.7	205.6	29.1	15.4	1.067
India	1994-2019	24.6	2.7	12.9	11.7	10.8	1.0696
United Arab Emirates	1999-2019	60.8	8.3	37.8	23	20.1	1.0756
Belgium	1999-2019	82.7	13.8	50.8	31.9	28.2	1.0726
Denmark	1993-2019	7.9	1.1	8.7	-0.8	-1.2	1.06
Hong Kong	1993-2019	37.5	3.6	67.1	-29.6	-34.5	1.0722
France	1994-2019	89.8	14.2	75.6	14.2	8.9	1.0712
Germany	1993-2019	33.4	2.7	32.6	0.8	-1.3	1.064
Netherlands	1993-2019	26.6	2.6	27.9	-1.3	-3.3	1.072
USA	1993-2019	26.3	2.5	18.1	8.2	6.6	1.0868
UK	1993-2019	15.0	1.6	16.0	-1.0	-2.2	1.071
Italy	1994-2019	13.9	1.9	18.3	-4.4	-5.7	1.0704
South Africa	2000-2019	10.1	1.6	9.6	0.5	-0.3	1.0898
Japan	1993-2019	11.5	0.8	9.9	1.6	0.9	1.0706
Total			83.1				

Source: Author, using data from UNCTAD, COMTRADE database. Partner's share is calculated for 2000-2019.

Table 13: Import misinvoicing for iron and steel (millions of USD, constant 2019)

Countries	Period	Burundi's Imports (cif): A	Partner's Exports to Burundi (fob): B	Difference between (A) and (B)	Import Misinvoicing	cif Factor
China	1993-2019	54.5	12.5	42	41.0	1.0796
India	1993-2019	10.0	6.6	3.4	2.8	1.0806
Belgium	1999-2019	7.7	2.4	5.3	5.1	1.08
France	1994-2019	7.7	3.2	4.5	4.2	1.08
South Africa	2000-2019	30.6	11.9	18.7	17.7	1.08

Source: Author, using data from UNCTAD, COMTRADE database.

The above analysis of trade misinvoicing at disaggregated levels has shown to which extent major trade commodities are affected by misinvoicing and which trading partners are involved. The most common practices in trade misinvoicing are found to be export underinvoicing and import overinvoicing, which are the channel for capital flight since they both result in capital outflow. It should be noted that the finding that most importers overinvoice their imports could seem counterintuitive since such practice comes at the cost of inflated customs and VAT tax payments. However, the finding makes sense given the selected import commodities this study is focusing

on. Some of them like petroleum and pharmaceutical products, are controlled by monopolists who do not pay import taxes, hence the incentive to overinvoice imports. Moreover, given the position of these products as strategic goods, importers are favoured by the Central Bank of Burundi in their demand of foreign currency.

Analysing trade misinvoicing denotes that more effort is needed in ensuring a systematic record of international trade transactions and more transparency in reporting the same. For example, in the national statistics (Central Bank of Burundi), gold exports of Burundi starts in 2016 while in international statistics (UN-COMTRADE), gold export appears from early 1990s. There is also a staggering lack of data on tea exports for most of the years, while trade partners systematically reported importing tea from Burundi.

Determinants of trade misinvoicing

We first analyse the properties of the variables using augmented Dickey–Fuller (ADF) unit root test to check the order of integration; then decide on the estimation approach of the trade misinvoicing equation. ADF unit root test (Table 14) indicates that some variables, export underinvoicing (% GDP), import overinvoicing (% GDP), coffee export misinvoicing (% GDP), pharmaceutical products' import misinvoicing (% GDP), machinery import misinvoicing (% GDP), vehicle import misinvoicing (% GDP), corporate tax (% GDP), tax on imports (% GDP), and the logarithm of openness to trade (% GDP), are stationary I(0) processes; while gold export misinvoicing (% GDP), the logarithm of real exchange rate, the logarithm of parallel market premium, and capital account openness index, and current account deficit (% GDP) are non-stationary I(1) processes. The mixture of I(0) and I(1) variables prompts us to use the bounds testing approach of Pesaran et al. (2001), which is based on autoregressive distributed lag (ARDL) modelling, to examine the long-run relationship among the variables and their dynamics when analysing the drivers of trade misinvoicing at the aggregate level and at the product level.

Table 14: Unit root test results

	Level		First Difference		
Variables	Lag	ADF Stat	Lag	ADF Stat	I(d)
xuinv	0	-3.362**			I(0)
moinv	0	-4.309***			I(0)
coxmis	0	-5.812***			I(0)
goxmis	0	-1.659	0	-5.066***	I(1)
phmmis	0	-4.469***			I(0)
mammis	0	-5.096***			I(0)
cammis	1	-4.220***			I(0)
ctax	0	-4.464***			I(0)
mtax	3	-4.865***			I(0)
lnrer	0	-1.722	0	-4.462***	I(1)
kaopen	0	-3.073	0	-8.120***	I(1)
cadef	1	-1.206	0	-9.300***	I(1)
lnopen	0	-2.857*			I(0)
lnprem	0	-2.027	0	-7.462***	I (1)

The error correction model (ECM) from an autoregressive distributed dag (ARDL) model is written as:

$$\Delta y_t = \rho y_{t-1} + b_1 x_{1t-1} + b_2 x_{2t-1} + b_3 x_{3t-1} + \cdots + b_k x_{kt-1} + \sum_{j=1}^{p-1} \gamma_j \Delta y_{t-j} + \sum_{j=1}^{q-1} \alpha_j \Delta x_{1t-j} + \sum_{j=1}^{r-1} \beta_j \Delta x_{2t-j} + \sum_{j=1}^{s-1} \delta_j \Delta x_{3t-j} + \cdots + \sum_{j=1}^{z-1} \theta_j \Delta x_{kt-j} + e_t \quad (4)$$

Equation 4 can also be written as follows:

$$\Delta y_t = \lambda \xi_{t-1} + \sum_{j=1}^{p-1} \gamma_j \Delta y_{t-j} + \sum_{j=1}^{q-1} \alpha_j \Delta x_{1t-j} + \sum_{j=1}^{r-1} \beta_j \Delta x_{2t-j} + \sum_{j=1}^{s-1} \delta_j \Delta x_{3t-j} + \cdots + \sum_{j=1}^{z-1} \theta_j \Delta x_{kt-j} + e_t \quad (5)$$

Where: $\xi_t = y_t - a_1 x_{1t} - a_2 x_{2t} - a_3 x_{3t} - \cdots - a_k x_{kt}$, and where $a_1 = -b_1/\rho$, $a_2 = \frac{-b_2}{\rho}, \ldots,$ and $a_k = \frac{-b_k}{\rho}$ represent the long-run coefficients. To test for

cointegration from an ARDL model, Pesaran et al. (2001) suggest an *F*-test denoted F_{PSS} with the null hypothesis of no cointegration written as,

$H0: \rho = b_1 = b_2 \ldots = b_k = 0.$ The critical values for F_{PSS} statistics are in Pesaran et al. (2001). Given the number of observations available, we limit the maximum number of lags to two in the search for the optimal lag structure of the ARDL model, selected by Akaike Information Criterion (AIC).

a. Determinants of export underinvoicing

Table 15 (panel c) indicates that F_{PSS} test rejects the null hypothesis of no cointegration for the equation of export underinvoicing for all cases considered, indicating a level relationship between export underinvoicing and its determining factors. The long-run relationship equation is estimated, the results are reported in Table 15 (panel d). The long-run determinants of export underinvoicing are found to be corporate tax and openness to trade. The estimated coefficients of these variables are all well-signed (positive), indicating a positive association with export underinvoicing. An error correction model (ECM) was estimated and diagnostic tests performed. The results, reported in Table 15 (panel b), show that the residuals from the estimated ECM are serially independent, homoscedastic and normally distributed. The results from the estimated ECM suggest that the short-run determinants of export underinvoicing are past export underinvoicing, corporate tax, capital account openness, parallel market premium, trade openness, current account deficit, real exchange rate, civil conflicts, and governance (polity2 index).

A positive effect of the lagged export underinvoicing indicates a persistence effect; past export underinvoicing is positively associated with current export underinvoicing. For most of the rest of regressors, contemporaneous and lagged effects are observed. The results indicate a positive contemporaneous effect and a lagged negative effect of corporate tax, with a positive net effect. This is in accordance with the literature; according to Buehn and Eichler (2011), since the underinvoiced part is not reported to authorities, hence not subject to taxation, an increase in corporate tax should increase the incentive to underinvoice exports.

For capital account openness, results suggest significant lagged negative effects on export underinvoicing. Patnaik et al. (2012) also found that, export underinvoicing is negatively associated with capital account openness. This means that a more open capital account is associated with lower export underinvoicing. Indeed, as countries' integration in the global financial market increases, this allows domestic residents to engage more freely in foreign assets transactions (buying and selling) through licit channels, hence reducing the incentive to take out capital through export underinvoicing.

Export underinvoicing is found to be positively associated with parallel market premium. As Buehn and Eichler (2011) point out, a higher parallel market premium increases the incentive for export underinvoicing as the exporting firm could sell the illegal US dollar-denominated export revenues at a higher price in domestic currency. The results indicate that a 1% increase in the parallel market premium increases the export underinvoicing (% GDP) by 0.03 percentage point. Buehn and Eichler (2011) found no significant effect of parallel market premium on export underinvoicing.

Results further show that openness to trade exerts positive contemporaneous effect, while current account deficit exerts both contemporaneous and lagged effects on export underinvoicing. With openness to trade measured by the GDP ratio of the sum of imports and exports, the larger the tradeable value, the greater the opportunity to engage in trade misinvoicing. Estimation results indicate that a 1% point increase in openness to trade (% GDP) is associated with 0.08 percentage point increase in export underinvoicing (% GDP). Patnaik et al. (2012) also found export underinvoicing to be positively associated with openness to trade. On the effect of current account deficit, Patnaik et al. (2012) point out that a persistent current account deficit is a sign of economic instability. This induces owners of capital to transfer their resources abroad for fear of value loss or government appropriation. Patnaik et al. (2012) also found that export underinvoicing is positively associated with current account deficit.

Real exchange rate exerts a negative contemporaneous effect and a positive lagged effect on export underinvoicing, with a negative net effect. However, this is counterintuitive; as Buehn and Eichler (2011) mention, an increase in real exchange rate, which is real currency depreciation, leads to an increase in the value of the foreign currency-denominated export underinvoicing revenue, adjusted for purchasing power parity. A real currency depreciation increases export misinvoicing in real terms, expressed in foreign currency.

As expected, civil conflicts are found to encourage export underinvoicing. Indeed, investors fear losses in their domestic assets and prefer sheltering them abroad (Ndoricimpa, 2018). Le and Zak (2006) and Davies (2008) also reached at the conclusion that political instability and war significantly increase capital flight. The coefficient of polity2 index, a proxy for governance, is negative and statistically significant. This means that better institutions reduce export underinvoicing, as more emphasis is put on combating corruption and other malpractices, and on increased transparency.

Table 15: Determinants of export underinvoicing in Burundi

	ARDL (2, 2, 2, 2, 2)	ARDL (2, 1, 0, 2, 2, 1)	ARDL (2, 2, 2, 1, 2, 2)
Panel a: Error Correction Model			
Variables	**Parameters**	**Parameters**	**Parameters**
ECT	-1.264***(0.187)	-1.486*** (0.156)	-1.187*** (0.149)
$\Delta xuinv_{t-1}$	0.098 (0.088)	0.334** (0.114)	0.387** (0.131)
$\Delta ctax_t$	4.707***(1.148)	1.668 (0.946)	9.177***(1.958)
$\Delta ctax_{t-1}$	-4.460**(1.254)	-	-7.556**(1.896)
$\Delta kaopen_t$	-1.089 (2.163)	-	-2.358 (3.112)
$\Delta kaopen_{t-1}$	-8.946***(2.111)	-	-18.48***(3.183)
$\Delta lnopen_t$	-2.214 (2.326)	8.219** (2.940)	-
$\Delta lnopen_{t-1}$	-5.499 (4.901)	-	-
$\Delta cadef_t$	0.968***(0.155)	1.229*** (0.150)	1.813*** (0.263)
$\Delta cadef_{t-1}$	0.930***(0.151)	0.499*** (0.112)	1.440***(0.239)
$\Delta lnrer_t$	-	-18.239*** (3.833)	7.097 (4.120)
$\Delta lnrer_{t-1}$	-	16.405** (5.558)	-
$\Delta lnprem_t$	-	-	0.477 (0.576)
$\Delta lnprem_{t-1}$	-	-	3.276** (1.175)
$civcon_t$	-	0.378* (0.174)	1.424*** (0.159)
gov_t	-0.454***(0.109)	-0.771*** (0.145)	-0.868*** (0.114)
	$Adj.R^2 = 0.88$	$Adj.R^2 = 0.89$	$Adj.R^2 = 0.79$
Panel b: Diagnostic Tests			
	$F(SC) = 2.985\ \ (p = 0.193)$	$\chi^2_{LM}(1) = 0.93\ (p = 0.333)$	$F(SC) = 0.394\ \ (p = 0.717)$
	$F(HET) = 1.117\ (p = 0.490)$	$\chi^2_{HET}(1) = 16.4\ (p = 0.354)$	$F(HET) = 0.332\ (p = 0.949)$
	$JB = 0.189\ (p = 0.909)$	$JB = 0.753\ (p = 0.686)$	$JB = 0.939\ (p = 0.652)$
Panel c: Bound Test for Cointegration Analysis			
	$F_{PSS} = 3.78$	$F_{PSS} = 5.82$	$F_{PSS} = 3.60$
Panel d: Levels Equations and Long-run Coefficients			

$$xuinv_t = \underset{[0.056]}{-46.0} + \underset{[0.243]}{4.83}\ ctax_t + \underset{[0.479]}{6.69}\ kaop_t + \underset{[0.019]}{15.15}\ lnopen_t + \underset{[0.833]}{0.18}\ cadef_t$$

$$xuinv_t = \underset{[0.036]}{131.0} + \underset{[0.044]}{11.62}\ ctax_t + \underset{[0.278]}{10.90}\ kaopen_t - \underset{[0.059]}{16.63}\ lnrer_t - \underset{[0.157]}{3.816}\ lnprem_t + \underset{[0.566]}{0.815}\ cadef_t$$

$$xuinv_t = \underset{[0.158]}{-114.5} - \underset{[0.664]}{2.30}\ ctax_t + \underset{[0.832]}{2.346}\ kaopen_t + \underset{[0.025]}{32.17}\ lnopen_t + \underset{[0.271]}{1.688}\ cadef_t + \underset{[0.704]}{3.259}\ lnrer_t - \underset{[0.907]}{0.323}\ lnprem_t$$

Notes: Between (.) are standard errors; between [.] are *p*-values in panel d of the table. For F_{PSS}, 5% $CV\ (LB) = 2.39$; 5% $CV\ (UB) = 3.3$ F_{PSS}, 5% $CV\ (LB) = 2.39$; 5% $CV\ (UB) = 3.30$.

b. Determinants of import overinvoicing

Results in Table 16 (panel c) indicate that there exists a cointegration relationship between import underinvoicing and its determining factors. The estimated levels equations and long-run coefficients are in Table 16 (panel d). They indicate that the long-run determinants of import overinvoicing include corporate tax, capital account openness, openness to trade, and real exchange rate. The estimated coefficients of these variables are well-signed except for openness to trade and real exchange rate. Import overinvoicing is positively associated with corporate tax and negatively associated with capital account openness.

The results of the estimated ECM model give the following insights on the short-run determinants of import overinvoicing. Corporate tax exerts positive effects on import overinvoicing. Buehn and Eichler (2011) also reach the same conclusion. According to Buehn and Eichler (2011), to the extent that firms engage in import overinvoicing to inflate the cost of imported inputs and reduce the taxable profits, an increase in corporate tax will increase the firms' incentive for import overinvoicing. However, import overinvoicing is found to be positively associated with import tax, which is counterintuitive. Since the overinvoiced part is reported to the authorities hence subject to taxation, an increase in import tax would reduce the incentive for import overinvoicing.

Estimation results also indicate that a more open capital account reduces import overinvoicing. We also find a positive effect of openness to trade and parallel market premium on import overinvoicing. Better institutions also reduce the extent of import overinvoicing.

Table 16: Determinants of import overinvoicing in Burundi

	ARDL (1, 1, 1, 1, 1, 1, 1)	ARDL (1, 1, 1, 1, 1, 1)	ARDL (1, 1, 1, 1, 1, 1)	ARDL (1, 1, 1, 1, 1)	ARDL (1, 0, 1, 1, 2, 2,2)
Panel a: Error Correction Model					
Variables	**Parameters**	**Parameters**	**Parameters**		
ECT	-0.88***(0.12)	-0.98***(0.16)	-0.92***(0.16)	-0.90***(0.15)	-0.78***(0.08)
$\Delta ctax_t$	3.80***(1.11)	-	2.88**(1.05)	2.71**(1.10)	-
$\Delta mtax_t$	0.64(0.43)	0.75(0.52)	1.11**(0.47)	-	1.02**(0.37)
$\Delta kaopen_t$	-19.95***(2.47)	-14.96***(2.78)	-19.61***(2.81)	-17.91***(2.95)	-15.47***(2.21)
$\Delta lnopen_t$	-4.27*(2.46)	1.13(2.50)	-0.71(2.44)	1.39(2.48)	-5.24**(1.89)
$\Delta lnopen_{t-1}$	-	-	-	-	6.80***(1.85)
$\Delta lnrer_t$	-5.81**(2.27)	-1.16(2.29)	-	-	-10.14****(1.72)
$\Delta lnrer_{t-1}$	-	-	-	-	-6.06***(1.78)
$\Delta lnprem_t$	-0.50(0.29)	-0.28(0.35)	0.62*(0.33)	0.40(0.35)	-0.14(0.24)
$\Delta lnprem_{t-1}$	-	-	-	-	0.78***(0.26)
$polity2_t$	-0.13**(0.05)	-	-0.29***(0.07)	-0.37***(0.08)	-
	$Adj.R^2 = 0.83$	$Adj.R^2 = 0.73$	$Adj.R^2 = 0.78$	$Adj.R^2 = 0.75$	$Adj.R^2 = 0.89$

Table 16: Continued

Panel b: Diagnostic Tests					
	$\chi^2_{LM}(2) = 1.645\ (p = 0.439)$	$\chi^2_{LM}(1) = 1.97\ (p = 0.372)$	$\chi^2_{LM}(2) = 2.34\ (p = 0.309)$	$\chi^2_{LM}(1) = 0.36\ (p = 0.834)$	$\chi^2_{LM}(1) = 4.61\ (p = 0.099)$
	$\chi^2_{HET}(1) = 12.15\ (p = 0.593)$	$\chi^2_{HET}(1) = 11.2\ (p = 0.508)$	$\chi^2_{HET}(1) = 16.58\ (p = 0.166)$	$\chi^2_{HET}(1) = 17.20\ (p = 0.069)$	$\chi^2_{HET}(1) = 22.18\ (p = 0.103)$
	$JB = 24.80\ (p = 0.000)$	$JB = 6.36\ (p = 0.041)$	$JB = 3.23\ (p = 0.198)$	$JB = 1.746\ (p = 0.417)$	$JB = 3.277\ (p = 0.194)$
Panel c: Bound Test for Cointegration Analysis					
	$F_{PSS} = 5.20$	$F_{PSS} = 4.21$	$F_{PSS} = 3.53$	$F_{PSS} = 4.41$	$F_{PSS} = 7.92$
Panel d: Levels Equations and Long-run Coefficients					

$$moinv_t = \underset{[0.182]}{52.3} + \underset{[0.025]}{5.89}\ ctax_t + \underset{[0.538]}{0.75}\ mtax_t - \underset{[0.000]}{12.76}\ kaop_t - \underset{[0.048]}{10.82}\ lnopen_t + \underset{[0.293]}{0.49}\ lnprem_t - \underset{[0.175]}{6.20}\ lnrer_t$$

$$moinv_t = \underset{[0.461]}{16.0} + \underset{[0.593]}{0.67}\ mtax_t - \underset{[0.002]}{9.72}\ kaop_t - \underset{[0.659]}{1.62}\ lnopen_t + \underset{[0.241]}{0.45}\ lnprem_t - \underset{[0.242]}{3.38}\ lnrer_t$$

$$moinv_t = \underset{[0.932]}{1.41} + \underset{[0.039]}{4.67}\ ctax_t + \underset{[0.110]}{1.91}\ mtax_t - \underset{[0.000]}{12.86}\ kaopen_t - \underset{[0.102]}{8.54}\ lnop_t + \underset{[0.932]}{0.31}\ lnprem_t$$

$$moinv_t = \underset{[0.838]}{2.81} + \underset{[0.060]}{4.35}\ ctax_t - \underset{[0.000]}{9.86}\ kaop_t + \underset{[0.833]}{0.087}\ lnprem_t - \underset{[0.203]}{6.43}\ lnopen_t$$

$$moinv_t = \underset{[0.029]}{69.4} + \underset{[0.008]}{7.33}\ ctax_t + \underset{[0.971]}{0.04}\ mtax_t - \underset{[0.006]}{8.71}\ kaopen_t - \underset{[0.018]}{14.86}\ lnop_t - \underset{[0.042]}{5.88}\ lnrer_t + \underset{[0.171]}{0.51}\ lnprem_t$$

Notes: Between (.) are standard errors; between [.] are p-values in panel d of the table. For

F_{PSS}, 5% $CV\ (LB) = 2.39$; 5% $CV\ (UB) = 3.38$.

Drivers of trade misinvoicing at the product level

In this subsection, drivers of trade misinvoicing at the product level are analysed. Coffee and gold are considered for export commodities, while pharmaceutical products, machinery (*HS code: 84* and *HS code: 85*), and vehicles are considered for import commodities. A parsimonious ARDL model is estimated given the limited number of observations at hand (27 observations). The estimation results are in Table 17 and Table 18, respectively, for export and import commodities. The F_{PSS} test rejects the null hypothesis of no cointegration for the equation of export and import misinvoicing for all cases considered, indicating a level relationship between export and import misinvoicing and its determining factors for the commodities considered.

The results from the estimated error correction model in Table 17 suggest that the short-run drivers of coffee export misinvoicing are: parallel market premium, governance indicator (polity2 index), and civil conflicts. Coffee export misinvoicing is found to be negatively associated with parallel market premium. This makes sense since the most occurring practice in Burundi is to overinvoice coffee exports (see Table A3 in the appendix). As Buehn and Eichler (2011) point out, a higher parallel market premium decreases the value of export overinvoicing as the exporting firm must buy the illegal US dollar-denominated export revenues at a higher price in domestic currency. As it would be expected, the results further show that better institutions reduce the extent of coffee export misinvoicing, and civil conflicts encourage it. The estimated coefficients of corporate tax and real exchange rate are found to be well-signed (positive), but statistically insignificant.

The results in Table 17 also suggest that the short-run drivers of gold export misinvoicing are: capital account openness, real exchange rate, and civil conflicts. Gold export misinvoicing is found to be positively associated with the three variables. A more open capital account seems to encourage gold export misinvoicing. Similarly, real currency depreciation is positively associated with an increase in gold export misinvoicing. This also makes sense as the most occurring practice in Burundi is to underinvoice gold exports (see Table A3 in the appendix). As Buehn and Eichler (2011) mention, an increase in real exchange rate, which is real currency depreciation, leads to an increase in the value of the foreign currency-denominated export underinvoicing revenue, adjusted for purchasing power parity. A real currency depreciation increases export misinvoicing in real terms, expressed in foreign currency. Also, civil conflicts are found to encourage gold export misinvoicing.

Table 17: Determinants of commodity export misinvoicing

	COFFEE	GOLD	
	ARDL (1, 1, 1, 1, 1)	ARDL (1, 1, 1, 1, 1)	
Panel a: Error Correction Model			
Variables	Parameters	Parameters	
ECT	-1.12***(0.19)	-0.47***(0.07)	
$\Delta ctax_t$	0.54(0.57)	-0.69(0.77)	
$\Delta kaopen_t$	0.04(0.98)	6.09***(1.21)	
$\Delta lnrer_t$	1.84(1.81)	5.20**(1.95)	
$\Delta lnprem_t$	-0.75***(0.22)	-0.22(0.23)	
gov_t	-0.32***(0.08)	-0.08(0.06)	
$civconf_t$	0.29**(0.10)	1.14***(0.15)	
	$Adj.R^2 = 0.61$	$Adj.R^2 = 0.80$	
Panel b: Diagnostic Tests			
	$\chi^2_{LM}(2) = 4.72\ (p = 0.09)$	$\chi^2_{LM}(2) = 5.01\ (p = 0.081)$	
	$\chi^2_{HET}(1) = 15.92\ (p = 0.1$	$\chi^2_{HET}(1) = 14.3\ (p = 0.218)$	
	$JB = 2.69\ (p = 0.26)$	$JB = 0.18\ (p = 0.911)$	
Panel c: Bound Test for Cointegration Analysis			
$F_{PSS} = 4.04$		$F_{PSS} = 3.70$	
Panel d: Levels Equations and Long-run Coefficients			
$coxmis_t = \underset{[0.802]}{-5.17} + \underset{[0.229]}{1.488}\ ctax_t - \underset{[0.995]}{0.010}\ kaop_t - \underset{[0.244]}{0.863}\ lnprem_t + \underset{[0.469]}{0.533}\ lnrer_t$			
$goxmis_t = \underset{[0.433]}{-52.1} - \underset{[0.246]}{8.02}\ ctax_t + \underset{[0.105]}{21.21}\ kaop_t - \underset{[0.121]}{6.44}\ lnprem_t + \underset{[0.166]}{15.44}\ lnrer_t$			

Notes: Between (.) are standard errors; between [.] are p-values in panel d of the table. For F_{PSS}, 5% $CV\ (LB) = 2.56$; 5% $CV\ (UB) = 3.49$.

Table 18 presents the estimation results for the drivers of some commodity import misinvoicing. The results suggest that quality of institutions (polity2 index) is the main variable determining pharmaceutical products import misinvoicing in the short run. The estimated coefficient is negative, indicating that better institutions would reduce pharmaceutical products import misinvoicing. The results also show that the drivers of machinery import misinvoicing include corporate tax, capital account openness, a proxy variable for quality of institutions, and civil conflicts. Machinery import misinvoicing is positively associated with corporate tax, which makes sense since the most occurring practice in Burundi is to overinvoice machinery imports (see Table A3 in the appendix). As also expected, a more open capital account reduces the extent of machinery import misinvoicing; better institutions reduce the extent of it, while civil conflicts encourage it.

The drivers of vehicles import misinvoicing include corporate tax, capital account openness, parallel market premium, embargo period dummy variable, a proxy variable for quality of institutions, and civil conflicts. The estimated coefficients are well-signed except for the coefficient of parallel market premium.

Table 18: Determinants of commodity import misinvoicing

	PHARMACEUTICALS	MACHINERY	VEHICLES
	ARDL (1, 1, 1, 1, 1)	ARDL (1, 1, 1, 1, 1, 1, 1)	ARDL (1, 1, 1, 1, 1, 1, 1)
Panel a: Error Correction Model			
Variables	Parameters	Parameters	Parameters
ECT	-1.19***(0.21)	-1.25***(0.17)	-1.70***(0.25)
$\Delta ctax_t$	0.22(0.13)	1.36***(0.410	0.43***(0.12)
$\Delta mtax_t$	-	0.27(0.14)	-
$\Delta kaopen_t$	-0.38(0.32)	-1.73*(0.78)	-0.85**(0.31)
$\Delta lnopen_t$	-	-0.01(0.88)	-1.05***(0.30)
$\Delta lnrer_t$	-0.23(0.33)	0.54(0.85)	0.55(0.32)
$\Delta lnprem_t$	-0.04(0.04)	-0.11(0.11)	-0.23***(0.04)
$\Delta embargo_t$	-	-	-0.68***(0.16)
gov_t	-0.03***(0.01)	-0.17***(0.03)	-0.12***(0.02)
$civconf_t$	-	0.18**(0.06)	0.07***(0.02)
	$Adj.R^2 = 0.55$	$Adj.R^2 = 0.71$	$Adj.R^2 = 0.78$
Panel b: Diagnostic Tests			
	$\chi^2_{LM}(2) = 5.11\ (p = 0.07)$	$\chi^2_{LM}(2) = 12.6\ (p =$	$\chi^2_{LM}(2) = 7.36\ (p = 0.025)$
	$\chi^2_{HET}(1) = 7.99\ (p = 0.62$	$\chi^2_{HET}(1) = 11.3\ (p =$	$\chi^2_{HET}(1) = 13.21\ (p = 0.585)$
	$JB = 2.57\ (p = 0.27)$	$JB = 0.76\ (p = 0.68$	$JB = 1.65\ (p = 0.437)$
Panel c: Bound Test for Cointegration Analysis			
$F_{PSS} = 3.88$		$F_{PSS} = 3.77$	$F_{PSS} = 3.25$
Panel d: Levels Equations and Long-run Coefficients			

$$phmmis_t = \underset{[0.655]}{-1.93} + \underset{[0.852]}{0.033}\ ctax_t - \underset{[0.669]}{0.087}\ kaop_t - \underset{[0.156]}{0.094}\ lnprem_t + \underset{[0.635]}{0.298}\ lnrer_t$$

$$mammis_t = \underset{[0.900]}{-1.61} + \underset{[0.337]}{0.66}\ ctax_t + \underset{[0.433]}{0.34}\ mtax_t - \underset{[0.218]}{1.64}\ kaop_t - \underset{[0.311]}{0.67}\ lnopen_t - \underset{[0.215]}{0.31}\ lnprem_t + \underset{[0.778]}{0.54}\ lnrer_t$$

$$vehmmis_t = \underset{[0.721]}{-1.17} + \underset{[0.001]}{0.59}\ ctax_t - \underset{[0.270]}{1.24}\ kaopen_t + \underset{[0.091]}{0.83}\ lnrer_t - \underset{[0.002]}{1.55}\ lnopen_t - \underset{[0.042]}{0.13}\ lnprem_t - \underset{[0.078]}{0.36}\ embargo_t$$

Notes: Between (.) are standard errors; between [.] are p-values in panel d of the table. For

F_{PSS}, 5% $CV\ (LB) = 2.39$; 5% $CV\ (UB) = 3.38$.

6. Conclusion

The objective of this study was to examine trade misinvoicing in Burundi at both aggregated and disaggregated levels. The study examined trade misinvoicing at disaggregated levels by major trading partners, and by major export and import commodities, and found evidence of capital flight from Burundi through export underinvoicing and import overinvoicing. Exports of Burundi to most of its major trading partners are found to be underinvoiced. The top destinations for export underinvoicing are United Arab Emirates (UAE), Belgium and Germany. Over the period 1970-2019, export underinvoicing with these three countries is estimated to be, respectively, US$1007.5 million, US$959.1 million, and US$933.3 million. Export underinvoicing may be a conduit for capital flight as operators conceal their actual earnings and keep the difference in foreign accounts. Burundi exports mainly precious stones and metals to the United Arab Emirates, and coffee and tea to Belgium and Germany. However, exports of Burundi to United Kingdom (UK) and Switzerland are found to be overinvoiced. The three major export commodities considered, namely, tea, coffee and gold, are found to be affected by trade misinvoicing to a great extent. Coffee export underinvoicing is most pronounced in trade with Germany and USA, where underinvoicing amounts, respectively to US$501.0 million and US$118.8 million over the period 1993-2019. Coffee export was found to be overinvoiced in the trade with Switzerland, UK, and Belgium, to the tune of US$460.3 million, US$230.8 million, and US$30.9 million, respectively. Gold export is found to be underinvoiced, with underinvoicing amounting to US$641.1 million in the trade with United Arab Emirates and US$30.1 million in the trade with Belgium. Regarding tea exports, we observed lack of trade data for many years on the side of Burundi, which posed a challenge in estimating tea export misinvoicing. Nevertheless, tea export to Oman was found to be overinvoiced, while tea export to United Kingdom (UK) and Pakistan is found to be underinvoiced.

On the import side, the estimation results indicate that imports of Burundi from its major trading partners are in general overinvoiced. Relatively high import overinvoicing is observed in the trade with Saudi Arabia, China, and Japan to the tune of US$978.4 million, US$505.2 million, and US$413.3 million, respectively. On commodity level, for the six top commodities considered, that is, refined petroleum, pharmaceutical products, machinery and mechanical appliances, vehicles, electrical machinery and equipment, and iron and steel, imports were to a great extent found to be overinvoiced.

In addition, an empirical analysis of the determinants of the two common practices of trade misinvoicing, namely, export underinvoicing and import overinvoicing, was done. The results indicated that, financial incentives through tax fraud, capital account openness, political instability, governance, trade openness, the parallel market premium, and the real exchange rate, are the main factors behind export underinvoicing and import overinvoicing. Drivers of trade misinvoicing at product level were also analysed for some major export and import commodities. Product-specific factors of trade misinvoicing also include the parallel market premium, the real exchange rate, governance, and civil conflicts.

The findings of this study suggest that, reducing economic instabilities, reducing political instabilities, having a more open capital account, and improving governance, could be ways to reduce the extent of trade misinvoicing in Burundi. In addition, we found a staggering lack of data on Burundi's commodities exports for a number of the years, while trade partners systematically reported imports from Burundi. The opacity of gold trade data before 2016 in the national statistics should be noted. More effort is, therefore, needed in ensuring systematic and transparent reporting of international trade transactions.

When disaggregating trade misinvoicing, this study considered import commodities accounting only for less than 50% of total imports. For further research, a study can be done with a focus on import misinvoicing only, but analysing all import commodities. It should also be noted that while UN-COMTRADE database has been a reliable data source for trade flows, it has some data quality issues, including outliers and missing values (Chen et al., 2022).

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Appendix

Methodology to compute aggregate trade misinvoicing

Aggregate trade misinvoicing in the trade of an African country *i* with advanced economies as a group is estimated following the methodology by Ndikumana and Boyce (2021). In trade statistics, it's common to find that some exports and imports are recorded under the category 'unspecified territories' by an African country, while the advanced country trading partner properly records the transaction; this results in an upward bias in the export underinvoicing and a downward bias in the import overinvoicing (Ndikumana & Boyce, 2021). This is taken into account when computing aggregate trade misinvoicing.

Export misinvoicing with the industrialized trading countries (DXIC) is given by:

$$DXIC_{it} = M_{IC,it} - [cif * (X_{i,IC,t} + X^{U}_{i,IC,t})]$$

Where: $M_{IC,it}$ is the value of imports from an African country *i* at time *t* as reported by the industrialized trading countries (*IC*); $X_{i,IC,t}$ is the African country *i*'s exports to industrialized countries (*IC*) as reported by the African country; *cif* is the costs of freight and insurance factor.

Import discrepancies with the industrialized trading countries (DMIC) are given by:

$$DMIC_{it} = (M_{i,IC,t} + M^{U}_{i,IC,t}) - (cif * X_{IC,it})$$

Where: $M_{i,IC,t}$ is the African country *i*'s imports from the industrialized trading countries (*IC)* as reported by the African country *i;* $X_{IC,it}$ is the industrialized countries' exports to the African country *i* as reported by the industrialized trading countries *(IC)*. To compute aggregate export and import misinvoicing, this study follows the IMF/DOTS convention and uses a *cif/fob* factor of 10% up to 1,999 and 6% from 2,000 onwards (see also Ndikumana & Boyce, 2021). $X^{U}_{i,IC,t}$ and $M^{U}_{i,IC,t}$ are the amounts of exports and imports recorded under '*unspecified areas*'.

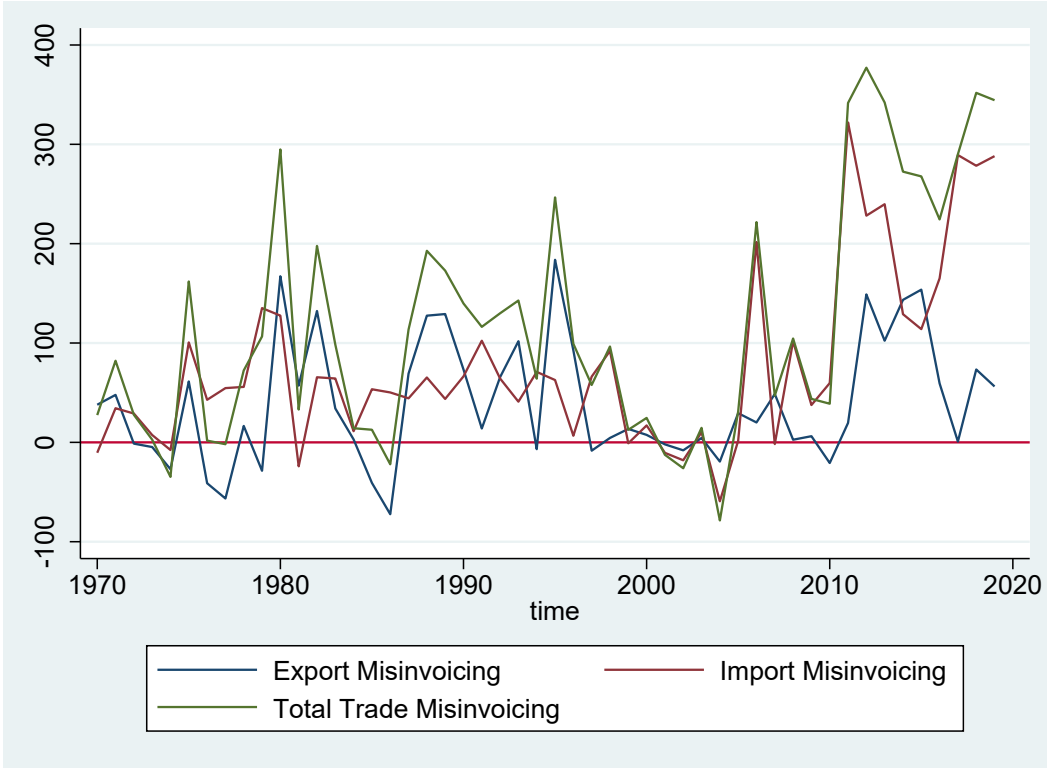
Total trade misinvoicing is then given by the sum of export misinvoicing and import misinvoicing as follows:

$$MISINV_{it} = \frac{DXIC_{it}}{ICXS_{it}} + \frac{DMIC_{it}}{ICMS_{it}}$$

Where: $ICXS = \frac{XIC}{XIC+XED}$, and $ICMS = \frac{MIC}{MIC+MED}$

ICXS is the share of advanced economies in the country's total exports, and ICMS is the share of advanced economies in the country's total imports. XIC and MIC are, respectively, exports to and imports from industrialized countries, while XED and MED are, respectively, exports to and imports from emerging and developing countries.

Figure A1: Aggregate trade misinvoicing in the trade of Burundi with the rest of the world (millions of USD, constant 2019)



Source: Author, using data from IMF's DOTS database.

Table A1: Export commodities and share in total exports in Burundi

		1990–2015		2016–2020	
Custom Commodity Code	Commodity Names	Average Export Value (millions of BIF)	(% of total exports)	Average Export Value (millions of BIF)	(% of total exports)
01	Animals; live	4.88	0.02	5.91	0.00
030110	Fish; live, ornamental	125.3	0.26	63.29	0.03
06	Trees and other plants; live	94.9	0.20	41.49	0.01
07	Vegetables and certain roots and tubers; edible	102.13	0.14	158.83	0.07
08	Fruits; edible	98.07	0.17	937.36	0.32
090111	Coffee	37698.2	63.55	67049.16	25.51
090220	Tea	13607.9	18.00	44868.92	17.19
0904	Pepper of the genus piper	0.51	0.00	0.06	0.00
1006	Rice	25.19	0.05	4.21	0.00
1101	Wheat or meslin flour	876.86	0.47	14369.65	5.15
1102	Cereal flours; other than of wheat or meslin	1.52	0.00	107.68	0.03
121190	Plants and parts	96.99	0.20	82.73	0.03
1511-1513	Vegetable oils	58.69	0.12	227.82	0.07
1701	Cane or beet sugar and chemically pure sucrose, in solid form.	676.22	1.82	50.17	0.01
2202	Non-alcoholic beverages	7.11	0.01	59.03	0.02
2203	Beer made from malt	1749.94	1.80	8547.98	3.33
2401	Tobacco, unmanufactured; tobacco refuse	122.69	0.49	0.45	0.00
240220	Cigarettes; containing tobacco	1477.72	1.38	9641.52	3.64
25-26	Ores, slag and ash	3262.19	3.08	14934.53	5.01
252329	Cement	5.05	0.00	179.84	0.07
2710113	Kerosene	-	-	6029.48	1.86
27101931	Diesel fuel	-	-	367.81	0.11
3401	Soap	2067.06	1.40	4043.83	1.85
4101-4103	Raw hides and skins of bovine or equine animals	2102.05	2.24	2732.25	1.18
44	Woods and articles of wood	32.62	0.04	96.53	0.04
5201-5203	Cotton	453.28	0.49	29.82	0.01
		1990–2015		2016–2020	

Table A1: continued

				74.47	0.02
5208-5212	Woven fabrics of cotton	99.87	0.39	0.00	0.00
6811	Asbestos-cement	6.43	0.02	2774.62	0.93
701093	Bottles	165.68	0.53	87800.03	28.61
710812	Metals; gold, non-monetary	-	-	396.26	0.15
73	Iron or steel articles	81.59	0.07		

Table A2: Import commodities and share in total imports for the period 2001-2018

Custom Commodity Code	Commodity Names	Import Value (millions of BIF)	(% of total imports)
27	Mineral fuels, mineral oils and products of their distillation; bituminous substance; mineral waxes	2299943.21	21.85
30	Pharmaceutical products	881268.04	8.37
84	Machinery and mechanical appliances, parts thereof	733174.53	6.97
85	Electrical machinery and equipment, and parts thereof	603595.44	5.74
72	Iron and steel	494824.64	4.70
8702-03	Vehicles; public transport passenger	401135.51	3.81
252329	Cement; Portland	374234.07	3.56
31	Fertilizers	253756.50	2.41
73	Iron or steel articles	240458.07	2.28
39	Plastics and articles thereof	237761.82	2.26
8704	Vehicles; for the transport of goods	202975.23	1.93
90	Optical, photographic, cinematographic, measuring, checking, medical, or surgical instruments and apparatus; parts thereof	197141.12	1.87
1107	Malt	194910.50	1.85
1001	Wheat and meslin	194415.41	1.85
48	Paper and paperboard, and their articles	185523.56	1.76
17019110-9910	Sugars in solid form	165562.10	1.57
1006	Rice	162924.66	1.55
4011-12	New pneumatic tyres, of rubber	130957.58	1.24
8708	Motor vehicles; parts and accessories	121519.49	1.15
6308-10	Textiles; sets of woven fabric an yarn/worn clothing	111271.31	1.06
8711-14	Motorcycles and cycles, bicycles; parts and accessories	110479.25	1.05
1507-1515	Vegetable Oils	107511.36	1.02

Table A2 continued: continued

8525-29	Transmission, radar, and reception apparatus for radio-telephony, radio telegraphy, radio-broadcasting or television	107279.28	1.02
49	Printed books, newspapers, pictures and other products of the printing industry	104854.67	1.00
33	Essential oils and resinoids; perfumery, cosmetic or toilet preparations	103275.48	0.98
21	Miscellaneous edible preparations	96963.02	0.92
9401-04	Furniture and bedding, mattresses, cushions and similar stuffed furnishings	89230.55	0.85
87	Vehicles; other than railway or tramway and rolling stock	74827.89	0.71
32	Tanning or dyeing extracts	73564.15	0.70
69	Ceramic products	72418.90	0.69
701090	Bottles, flasks, jars, pots, phials and other containers of glass	70690.73	0.67
64	Footwear	66969.52	0.64
8506-07	Cells and battery, and electric accumulators	66365.07	0.63
62	Apparel and clothing accessories; not knitted or crocheted	65597.10	0.62
28	Inorganic chemicals	65192.11	0.62
83	Metal; miscellaneous products of base metal	56040.40	0.53
2501	Salt	45688.37	0.43
3401-05	Soap, washing and cleaning	44163.47	0.42
61	Apparel and clothing accessories; knitted or crocheted	44063.39	0.42
82	Tools, implements, cutlery, spoons and forks, of base metal; parts thereof		
07	Vegetables and certain roots and tubers	41923.64	0.40
2203	Beer made from malt	39452.62	0.37
2401	Tobacco, unmanufactured	38851.88	0.37
76	Aluminium and articles thereof	38618.45	0.37
70	Glass and glassware	38411.40	0.36
04	Dairy produce	38309.31	0.36
02	Meets	37978.33	0.36
8504	Electric transformers, static converters	37674.46	0.36
44	Wood and articles of wood	36869.96	0.35
29	Organic chemicals	30341.82	0.29
42	Articles of leather	28343.38	0.27
40	Rubber and articles thereof	27966.57	0.27
20	Preparations of vegetables, fruits, nuts or other parts of plants	27421.51	0.26

Table A2 continued

1101	Wheat and Meslin Flour	26167.89	0.25
8501	Electric motors and generators	22879.19	0.22
1704	Sugars confectionery, not containing cocoa	21893.98	0.21
03	Fish and Crustaceans, molluscs and other aquatic invertebrates	21765.84	0.21
1302	Vegetables saps and extracts	21067.17	0.20
5512-16	Woven fabrics of synthetic/artificial staple fibres	20941.36	0.20
68	Stone, plaster, cement, asbestos, mica; articles thereof	20291.78	0.19
01	Animals; live	17913.76	0.17
2207-08	Spirits and Liqueurs	17256.03	0.16
5206-12	Cotton yarn and woven fabrics of cotton	14834.35	0.14
252310	Cement clinkers	13749.86	0.13
190531	Biscuits	13598.04	0.13
95	Toys, games and sports requisites; parts and accessories thereof	13246.14	0.13
8701	Tractors	12421.04	0.12
2204	Wine of fresh grapes, including fortified wines	11194.00	0.11
8301	Padlocks and locks of base metal	10813.53	0.10
5407- 08	Woven fabrics of synthetic and artificial filament yarn	10514.76	0.10
4013	Inner tubes, of rubber	8632.39	0.08
190110	Food preparations for infants and young children	8441.62	0.08
1517	Margarine	8176.23	0.08
9608	Pens and pencils	7748.95	0.07
380810	Insecticides	6671.51	0.06
1902	Pasta	5356.48	0.05
16	Meat and fish preparations	5197.15	0.05
240220	Cigarettes, containing tobacco	4934.01	0.05
1209	Seeds, fruit and spores; of a kind used for sowing	4315.13	0.04
9603	Brooms, brushes, hand operated floor sweepers, mops and feather dusters		
37	Photographic or cinematographic goods	3323.35	0.03
92	Musical instruments; parts and accessories of such articles	2508.90	0.02
380840	Disinfectants and similar products	1559.65	0.01
9610	Slates and boards; with writing or drawing surfaces	1333.48	0.01
08	Fruits and nuts	1102.45	0.01
3605	Matches	1093.21	0.01
2205	Vermouth and other wine of fresh grapes, flavoured with plants or aromatic substances	809.79	0.01
5607	Twine, cordage, ropes and cables	481.46	0.00
5903	Textile fabrics impregnated, coated, covered or laminated with plastics		

Table A3: Aggregate trade misinvoicing at the product level (millions of USD, constant 2019)

	Export Commodities		Import Commodities		
Time	Coffee	Gold	Pharmaceutical	Machinery	Vehicles
1993	20.01		1.65	-1.30	6.09
1994	-22.33		1.97	9.84	-0.67
1995	63.64	7.73	4.12	2.79	10.64
1996	29.28	-7.41	-3.04	0.13	6.18
1997	-10.05		3.73	1.85	3.27
1998	-8.21		1.65	2.69	3.62
1999	3.76	-13.47	1.22	-0.60	0.97
2000	7.31	-1.79	1.21	8.89	2.59
2001	-8.50	-8.50	3.98	0.43	5.45
2002	-2.27	-3.50	2.58	0.42	2.97
2003	2.30		-0.93	1.39	2.06
2004	-16.44		1.46	-10.12	2.52
2005	15.39	-35.51	-8.06	-0.17	5.15
2006	-10.30	-66.70	2.51	11.94	16.58
2007	11.45	-47.21	2.41	-11.66	13.68
2008	-16.88	-58.38	7.86	7.27	7.41
2009	15.66	-0.07	-0.81	-5.21	0.98
2010	-17.95	0.86	9.43	-5.63	7.93
2011	10.17	-44.40	10.20	44.96	16.76
2012	3.87	127.10	14.31	40.83	9.29
2013	1.25	114.96	10.86	1.79	5.19
2014	-32.23	200.95	5.29	-18.16	19.76
2015	-10.93	161.73	-0.79	12.11	5.46
2016	-16.03	97.64	12.87	20.65	6.03
2017	-6.06	39.53	8.33	-28.91	4.57
2018	-1.29	70.83	-1.11	35.42	6.04
2019	3.53	76.64	-2.55	19.04	13.39

Note: Figures in this table were obtained by summing misinvoicing for the major trading partners considered for each product.

Mission

To strengthen local capacity for conducting independent, rigorous inquiry into the problems facing the management of economies in sub-Saharan Africa.

The mission rests on two basic premises: that development is more likely to occur where there is sustained sound management of the economy, and that such management is more likely to happen where there is an active, well-informed group of locally based professional economists to conduct policy-relevant research.

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