

Trade Misinvoicing in Developing Countries

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Abstract

This paper discusses selected issues in the analysis of trade misinvoicing. It starts by examining various motives for the misdeclaration of trade activities. It is argued that the broad range of incentives to fake customs declarations provides an important challenge for the empirical assessment of the extent of trade misinvoicing. After analyzing the costs and

benefits of different empirical approaches to quantifying trade misinvoicing, the accuracy and reliability of estimation results reported in the literature are reviewed. It is shown that quantitative findings are heavily dependent on the underlying assumptions in the empirical analysis, making estimation results on trade misinvoicing practices largely a matter of faith.

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1. Introduction

A common and frequent feature of many fraudulent acts is the misdeclaration of economic activities. Income and earnings from illegal businesses, for instance, typically remain unreported to fiscal authorities in order to hide such operations. Expenditures eligible for public fund reimbursement, in contrast, may be overstated to increase transfer revenues. In general, publicly recorded activities may be misreported for a broad range of potential reasons.

Declarations of cross-border trade transactions are not exempt from such misbehavior. Similar to other cases of false reporting, criminal traders face incentives to fake data entries in customs declarations and other official documents for various reasons and along almost every dimension. For instance, the quantity and the value of a shipment may be manipulated to either reduce the payment of customs duties (underinvoicing) or to better take advantage of export subsidies (overinvoicing); a misclassification of products or a misdeclaration of the final destination of a shipment may allow circumventing trade restrictions. Overall, the accuracy of international trade statistics is likely to be compromised, to an unknown degree, by fake transactions.

Misreporting of economic activities is far from being a new phenomenon.¹ It has also been analyzed extensively, especially by statistical offices seeking to produce more reliable statistics. Still, despite the ongoing interest in identifying and correcting for misreporting, misinvoicing of international trade transactions seems to have recently attracted growing attention, for at least three reasons. First, international trade typically accounts for an increasing share of a country's GDP. As trade has become relatively more important, there has also been a growing interest in the precision of the measurement of trade activities.² Second, in contrast to other forms of misbehavior, misinvoicing of international trade transactions seems to be, in principle, more easy to detect because of the existence of mirror statistics. Since every cross-border shipment is recorded independently by two separate authorities, at the time of leaving the source country as an export and at the time of arriving in the destination country as an import, any discrepancy between corresponding data entries may provide a direct indication of misreporting. Finally, it has been argued that trade misinvoicing is a major conduit to move capital unrecorded out of a country. Observed evidence of misinvoicing may therefore serve as a reasonable benchmark estimate of the magnitude of illicit financial flows.

In this paper, instead of reviewing the literature extensively, I discuss selected issues in the analysis of trade misinvoicing. I focus, in particular, on experiences and examples from developing countries. The remainder of the paper is structured as follows. In Section 2, I examine various motives for the misdeclaration of trade activities. Specifically, it is argued that the broad range of incentives to fake customs declarations provides an important challenge for the empirical assessment of the extent of trade misinvoicing. Consequently, Section 3 analyzes the costs and benefits of different empirical approaches to quantifying trade misinvoicing, followed by a review of the accuracy and reliability of estimation results that are reported in the literature. Finally, Section 5 briefly concludes.

¹ Bhagwati (1964) provides an early analysis.

² For instance, when in 2003 the United Kingdom's Office for National Statistics made corrections to trade figures for VAT fraud, real GDP growth for previous years was lowered by up to 0.2 percentage points. Ruffles, Tily, Caplan and Tudor (2003) provide a more detailed description.

2. Motives

For traders, it may be attractive to manipulate official trade documents along various lines and for various reasons. While individual motives to fake invoices are probably highly diverse, often depending on circumstances, general incentives to misreport trade activities are directly related to a country's trade and fiscal policies. Trade restrictions, for instance, provide an incentive to hide trade activities; trade subsidies, in contrast, imply an incentive to inflate trade values.

Measured by their impact on a country's national trade statistics, then, four types of trade misinvoicing can be distinguished: overinvoicing of exports, underinvoicing of exports, overinvoicing of imports, and underinvoicing of imports. Each type of misinvoicing is observed in practice and documented by both anecdotal evidence and empirical findings.

Export overinvoicing, for instance, is a frequent phenomenon in countries which seek to promote exports by offering tax incentives. Celâsun and Rodrik (1989a, 1989b) provide a detailed account of this form of misbehavior for Turkey. In the early 1980s, a comprehensive package of policy measures was introduced that was explicitly oriented toward encouraging manufactured exports; these measures included export tax rebates, subsidized export credits, and preferential allotment of foreign exchange and duty-free imports. To take advantage of these subsidies, "Turkish entrepreneurs, never too shy in exploiting arbitrage opportunities" (Celâsun and Rodrik, 1989b, p. 723), changed their invoicing practices; exporters substantially overinvoiced shipments or simply declared exports where none had in fact taken place. Celâsun and Rodrik (1989a, p. 207) conclude that "a non-negligible share of the increase in exports after 1980 turns out to have been the result of a statistical fiction."

Another form of misinvoicing, underinvoicing of exports, allows fraudulent traders to evade export restrictions. At an extreme, it may be attractive for traders to not only report reduced trade values but to manipulate official trade documents at even greater scale. Sanctions of countries, for instance, may be circumvented by a misdeclaration of the final destination of a shipment (thereby adding further distortions to a country's trade statistics by effectively overinvoicing its exports to other destinations); export bans on specific products may be bypassed by a misdeclaration of the product category. Fisman and Wei (2009) provide an illustrative example for this type of misreporting by examining trade for a specific product category, cultural objects, for which exports are often prohibited without permission. Specifically, Fisman and Wei (2009, p. 83) argue that for this product there is a "stark difference in legality of shipments between importing and exporting countries." Analyzing mirror trade statistics, they find that the observed gap in reported trade figures is highly correlated with corruption levels of exporting countries, with particularly strong effects for artifact-rich countries.

Import overinvoicing is typically observed in product categories with low or zero import tariffs. In practice, fake imports appear in international trade statistics for at least two reasons. First, a large import bill allows producers to lower their domestic profits (which are then subject to lower taxation). Since this strategy comes at the cost of inflated tariff payments, however, the approach only seems reasonable for products which are largely exempt from taxes. Second, overreporting of imports is a direct consequence of misclassification. If imported goods are not declared under the appropriate tariff heading (e.g., in order to evade trade taxes by classifying high-taxed goods as zero-taxed products), imports in the product category that is mistakenly reported in the customs

declaration are effectively overreported. Chalendar, Raballand and Rakotoarisoa (2016) document this fraudulent behavior for Madagascar. Noting that the importation of fertilizers, books and some cereals is exempt from tariff and VAT in Madagascar, they find that the import value for these products indeed significantly exceeds the corresponding export value. Overall, their estimates suggest that customs fraud reduced non-oil customs revenues (duties and import value-added tax) in Madagascar by at least 30 percent in 2014, with tariff misclassification (and, consequently, import overinvoicing) accounting for slightly less than one half of these losses.

Finally, the opposite strategy of manipulating customs declarations at the time of arrival, underinvoicing of imports, is probably the most prominent form of trade misreporting, mainly because of its immediate benefits. Since customs duties are typically determined based on the declared value of the article, which may be difficult to verify in practice, undervaluation directly reduces tax payments. Yang (2008) provides an illustrative example that highlights tax evasion behavior of importers. When Philippine customs increased enforcement by hiring private firms to conduct preshipment inspection of imports from a subset of countries, imports from treatment countries shifted to an alternative duty-avoidance method: shipping via duty-exempt export processing zones.

In view of these alternative motives and methods to manipulate customs declarations, it seems difficult to identify a predominant type of misreporting. Country studies suggest that the incentives to fake trade declarations often depend on specific circumstances and, therefore, vary sizably both across countries and over time; these studies typically put strong emphasis on a specific form of misreporting that seems to be particularly relevant for the episode that is analyzed. Still, the findings in Chalendar, Raballand and Rakotoarisoa (2016) and Yang (2008) indicate that underinvoicing of imports to evade payment of import taxes is a frequent and widely-used practice of trade misinvoicing.³

As a consequence of the diversity in misinvoicing behavior, a general focus on the capital flight motives of trade misreporting seems misguided. Approaches that automatically attribute instances of import overinvoicing and export underinvoicing to illicit financial outflows ignore other (potentially more relevant) motives of traders for this type of misbehavior. More notably, the analysis of import overinvoicing and export underinvoicing covers only a fraction of a country's total trade misinvoicing. Overall, the extent to which intentions to move capital unrecorded out of the country indeed determine trade misinvoicing behavior in practice is unknown. The special interest in trade misinvoicing when quantifying illicit financial flows is mainly motivated by the idea that faking trade declarations is a main conduit for the illicit movement of capital. Beja Jr. (2005, p. 63), for instance, claims that "trade misinvoicing may be the least risky technique for capital flight."⁴

³ Kellenberg and Levinson (2016) provide additional evidence at a very aggregate level. Examining gaps between importer- and exporter-reported trade for a large sample of country pairs, they find that higher import tariff rates (and, therefore, stronger incentives to underreport imports) are associated with significantly smaller pair-wise trade gaps.

⁴ In similar fashion, Ndikumana (2016, p. 3) claims, without evidence, that "trade misinvoicing continues to be used as a key mechanism of capital flight and illicit financial flows from developing countries."

3. Empirics

In the literature, various empirical approaches are applied to quantify the extent of trade misinvoicing. While each method has specific strengths and weaknesses, discussed in more detail below, all quantitative results are subject to an important qualification, as not all fraudulent trade activities are taken into account in the analysis.⁵ More specifically, the empirical identification of trade misinvoicing practices crucially depends on two features of a trade transaction. First, the transaction has to be recorded somewhere. Trade activities which remain hidden completely from public authorities, often labeled as smuggling, are not considered in the analysis of trade misinvoicing. Second, the trade declaration should have at least some correct entries. For instance, trade misinvoicing is difficult to identify from mirror statistics when the same details are misreported in both the exporting and the importing country. Similarly, a transaction is less suspicious of mispricing when both the value and volume of the transaction are misreported. Overall, given that only an unknown fraction of all misreported trade activities is identified from official statistics, also the accuracy of trade misinvoicing estimates is unknown.

Apart from this general source of uncertainty, estimates of trade misinvoicing are highly sensitive to the type and quality of data that is analyzed. Misinvoicing practices are, in principle, best identified by examining information from individual trade declarations. This highly disaggregated transaction-level data, however, is only rarely available to researchers, especially for the broad range of countries for which data is needed in order to provide a meaningful empirical analysis. Given the lack of data, misinvoicing behavior is often identified from more aggregate trade information, which introduces at least two types of problems. First, at a more aggregate level, discrepancies in mirror trade statistics from misinvoiced trade transactions may cancel each other out. At an extreme, a country's reported trade with the rest of the world can be perfectly identical to the corresponding figure of the rest of the world's trade with the country (which would imply that there is no evidence of trade misinvoicing), although there are possibly large differences in mirror trade statistics with individual partners. Second, for the analysis of aggregate data, the set of assumptions that is used for the identification of misinvoicing practices typically becomes even more restrictive (and debatable). In view of these difficulties, estimates of the extent of trade misinvoicing activities often seem to lack any substantive meaning.

3.1 Mirror Trade Statistics

The most prominent method for identifying trade misinvoicing is to compare the reported value of a trade transaction in a country with the corresponding entry in the mirror statistics of the partner country. Implicitly, it is assumed that traders have an incentive to misdeclare on only one side of a transaction, while the data entry on the opposite side of the transaction is correct. The difference between the flawed and the correct declaration of a transaction is then interpreted as misinvoicing.⁶

⁵ Missing some activities in the analysis does not automatically imply that reported results of trade misinvoicing are a lower bound estimate of misinvoicing activities; observed misinvoicing may still be overestimated (e.g., when trade activities are simply misattributed in official trade statistics).

⁶ Berger and Nitsch (2012) apply this approach to product-level trade for a large sample of countries.

Although this approach seems to be generally intuitive, there are, in practice, a number of critical issues, each having the potential to seriously affect (and possibly distort) quantitative results. As is well known, for instance, discrepancies in mirror trade statistics do not necessarily provide evidence of misinvoicing, but often arise for legitimate statistical reasons, ranging from conceptual differences in the valuation of exports and imports to the redirection of shipments while en route; Nitsch (2012) provides a more comprehensive discussion. To the extent that these factors are not properly taken into consideration in the empirical analysis of mirror trade statistics, estimates of trade misinvoicing are misspecified. Moreover, the often-used practice of applying a plain correction factor to adjust matched export and import values for their different statistical treatment of freight and insurance costs introduces additional distortions; see Nitsch (2016).

Another source of concern is the assumption that misinvoicing of trade activities is limited to only one side of a transaction. Fisman and Wei (2009) convincingly make this case for a specific product category, cultural property and antiques. For these goods, traders often face strict export restrictions, with many countries prohibiting the export of cultural objects, while zero import tariffs and the risk of forfeiture (in case of improper declaration) imply strong incentives to truthfully report shipments upon entry. For other goods, however, the difference in reporting incentives between source and destination countries may be less pronounced. At a more aggregate level, it has become common practice to only analyze a country's trade with developed countries, arguing that the trade statistics of these countries are generally more accurate than those in developing countries.⁷ While this assumption seems plausible, trade flows between developing countries are not ignored in the computation of total values of trade misinvoicing, but observed discrepancies in mirror statistics with developed countries are simply scaled up for a country's overall trade; see, for instance, Beja Jr. (2005). Accordingly, observed evidence of misreporting is hypothesized to affect all partners alike, proportional to the partner's share in a country's total trade.

A key concern for the analysis of mirror trade statistics is the common unavailability of transaction-level trade data. In principle, misinvoicing can only be identified if the export and import declarations of a transaction are compared and, therefore, the corresponding entries in mirror trade statistics are successfully matched.⁸ Once an inconsistency is detected, it may be possible to figure out the likely reason for the difference in the declarations (allowing to reasonably interpret this finding). Any analysis of aggregate trade data, in contrast, produces, by definition, unreliable results, with quantitative outcomes being potentially distorted in either direction. At aggregate levels, for instance, a misclassification of a trade transaction, when a product is reported under different tariff headings in the export and import declarations, may imply a double counting of misinvoicing practices, thereby inflating the overall estimate. Alternatively, the empirical assessment of trade misinvoicing is biased downwards when different types of misinvoicing (that is, overinvoicing in one transaction and underinvoicing in another transaction) simply cancel each other out.

⁷ Potential explanations for this claim range from a better quality of the national statistical service to smaller incentives for a misdeclaration of trade activities.

⁸ As a result, it is not sufficient to obtain access to transaction-level trade data from one country (which is typically highly restricted), but the matching procedure requires access to similar data for at least one other country.

3.2 Abnormal Prices

Another approach to identify misinvoicing practices is to make systematic use of the unit values that are reported in customs declarations. More specifically, given the system of finely disaggregated product classifications for customs purposes, with often very detailed and specific product descriptions, it is hypothesized that the unit values for transactions in a given product category should vary only within a reasonably tight interval. Consequently, shipments for which the reported unit values display a substantially large deviation from the country average (i.e., outliers) may be indicative of misinvoicing behavior.⁹ Alternatively, for highly standardized (or homogeneous) commodities, it may be useful to take the world market price (instead of the country average) as reference price. Based on this approach, for instance, Chalendard, Raballand and Rakotoarisoa (2016) find considerable misinvoicing in Madagascar's imports of rice.¹⁰

Similar to the exploration of mirror trade statistics, the approach crucially hinges on the analysis of transaction-level data from individual customs declarations. In contrast to the analysis of matched declarations, however, the focus on unit values has one key advantage: in order to assess a country's total amount of customs fraud due to misinvoicing, it is sufficient to analyze data for a single country only. As a result, the approach is relatively less data-demanding and, therefore, more easy to implement in a reasonably consistent way.

Again, however, the outcome critically depends on a number of sensitive assumptions, some of which are discussed in more detail in Nitsch (2012). For instance, the definition of what is an 'abnormal unit value' is based on arbitrary limits. Tighter (wider) limits automatically increase (decrease) the number of transactions that are classified as subject to misinvoicing, thereby allowing to modify the results directly. Also, misinvoicing in customs declarations is not necessarily limited to the unit value but may also affect the weight or quantity of a shipment. As these types of fraud are ignored (by definition) in the analysis of unit values, the accuracy of the aggregate result remains unknown.

4. Estimates

The ultimate aim of empirical analyses of trade misinvoicing is to quantify the extent of misbehavior by traders, potentially allowing to assess the relevance and the policy implications of such unlawful practices. Given the hidden nature of activities, indirect estimation approaches are applied which critically depend on assumptions. For a proper understanding and interpretation of the quantitative results, therefore, it is essential that the empirical methodology is well documented, including a plausible motivation and detailed description of the underlying assumptions that are made in the analysis.

Even if these conditions are met and the quantitative results of a study are fully replicable, however, available estimates of trade misinvoicing face at least three types of challenges. First, there are often sizable differences in reported outcomes across studies,

⁹ Once suspicious transactions have been identified, it may be possible to track the activities of 'risky' traders; see Chalendard, Raballand and Rakotoarisoa (2016) for an illustration.

¹⁰ Using data on world prices for different sorts of rice from the Food and Agriculture Organization, Chalendard, Raballand and Rakotoarisoa (2016, p.12) note that, "[g]iven Madagascar's poverty rate [...], the rice imported is probably of poor quality. [...] Yet, the declared import unit value is closer to the top value."

making it difficult (if not impossible) to identify a reliable benchmark estimate. Second, given the variability in outcomes, the empirical methodology should be reasonably robust in the sense that it provides plausible results for a broad range of countries. Third, country-specific features should be taken into account. The uncritical application of a given methodology across the board runs the risk that findings are based on a flawed interpretation of the data.

4.1 Consistency

Estimates of trade misinvoicing turn out to be highly sensitive to the empirical approach that is applied to analyze the data. Consequently, there is large variation in reported misinvoicing estimates across studies. A wide range of published estimates, however, undermines the credibility of individual findings as it is not exactly clear which estimate is actually close to the ‘true’ value.

For illustration, Figure 1 plots recent estimates of trade misinvoicing for Africa from two different sources. For 2010, the last year for which both sources report results, the High Level Panel on Illicit Financial Flows from Africa (2015) estimates a capital outflow due to trade misinvoicing of 40 bn. US\$. Kar and Spanjers (2015), in contrast, report an estimate of 55 bn. US\$ for Sub-Saharan Africa alone, a difference of more than 37 percent.

In similar fashion, Table 1 presents estimates of trade misinvoicing for selected countries. Although the results are not fully comparable (e.g., referring to different time spans or specific products), it is striking to note that the estimates sometimes differ by various orders of magnitude, raising serious doubts about the validity of some quantitative results.¹¹

4.2 Applicability

In view of their strong sensitivity to modeling choices, estimates of trade misinvoicing practices derived from a highly restrictive empirical approach (or under very specific assumptions), particularly designed for specific circumstances, require some serious and convincing explanation. In principle, the methodology should be general enough to yield reasonable results also for other countries or settings. Similarly, a selective interpretation of the quantitative outcomes, emphasizing some results while ignoring others, lowers the trustworthiness of the empirical analysis.

For trade misinvoicing practices, for instance, it is interesting to note that Kellenberg and Levinson (2016) find only few measurable differences in empirical patterns between developing and developed countries. Therefore, an exclusive focus on trade misinvoicing in developing countries (often linked to a single motive for trade misinvoicing, the transfer of financial funds across borders) does not seem to be justified.

¹¹ The impression of inconsistent results is strengthened by the tendency in the literature to report estimates of trade misinvoicing in absolute values (that is, nominal currency) instead of relative values (such as shares of trade or GDP).

4.3 Validity

An important qualification of the argument in favor of a widespread applicability of an empirical approach to analyze trade misinvoicing is the call for an informed interpretation of the results. Although an empirical methodology (e.g., an algorithm for examining mirror trade statistics) may be generally reasonable, country-specific features may sizably affect (or, more precisely, distort) the quantitative results. If these idiosyncrasies are not taken properly into account, the interpretation of the results can be seriously flawed.

Potential problems in the analysis of official trade statistics may arise, for instance, from re-exports, quasi-transit trade, and from country-specific features in the coverage of individual products. For China, for instance, Kessler and Borst (2013) highlight the role of Hong Kong as an intermediary for Chinese exporters. They argue that “[t]he main explanation [for the trade gap between China and the US] is not false invoicing, but the role of Hong Kong in Chinese trade.” Overall, they estimate that once re-exports from Hong Kong are included in the analysis, estimates of trade misinvoicing by Chinese traders are reduced by about factor four.

A related phenomenon, quasi-transit trade, sizably affects trade figures for countries, such as Belgium and the Netherlands, where goods bound for other destinations arrive in a country’s ports (e.g., Antwerp or Rotterdam) and are subsequently transferred to other countries. The misattribution of imports and exports to the country of transit as opposed to the ‘real’ partner country is a well-known cause of asymmetries between countries trade data; Herrigan, Kochen and Williams (2005) provide a detailed assessment of the issue. Ndikumana’s (2016) finding of substantial export overinvoicing in Chile’s, Nigeria’s and Côte d’Ivoire’s trade with the Netherlands, whilst there is underinvoicing in trade with other European Union countries (most notably Germany), is highly indicative of the Rotterdam effect. On Zambia, another country covered in Ndikumana’s (2016) analysis of mirror trade statistics, Brühlhart, Dihel and Kukenova (2015, p. 4) note that “a large part of Zambian mining exports are evidently assigned to Switzerland in the statistics because the relevant multinational firms are headquartered there and not because the goods are destined for or even physically shipped to Switzerland.”¹²

For other countries, discrepancies in mirror trade statistics may be explained by specific features of the data collection. In South Africa, for instance, due to legacy data rules, gold is treated as a country in the national trade statistics, such that it is not possible to determine where the exports are going to or the imports are coming from; see Forstater (2016) for a discussion.

¹² Brühlhart, Dihel and Kukenova’s (2015, p. 4) discussion of Zambian trade data is insightful. They note: “Astonishingly, Switzerland appears as Zambia’s main export destination in the most recent sub-period, 2008-2011, absorbing more than half of all Zambian exports. This cannot possibly reflect the true flow of goods. In Swiss import data, reported imports from Zambia are some 6,000 times smaller than reported Zambian exports to Switzerland. Moreover, Swiss import statistics do not suggest copper to feature among Switzerland’s main import products from Zambia. Hence, a large part of Zambian mining exports are evidently assigned to Switzerland in the statistics because the relevant multinational firms are headquartered there and not because the goods are destined for or even physically shipped to Switzerland..”

5. Conclusion

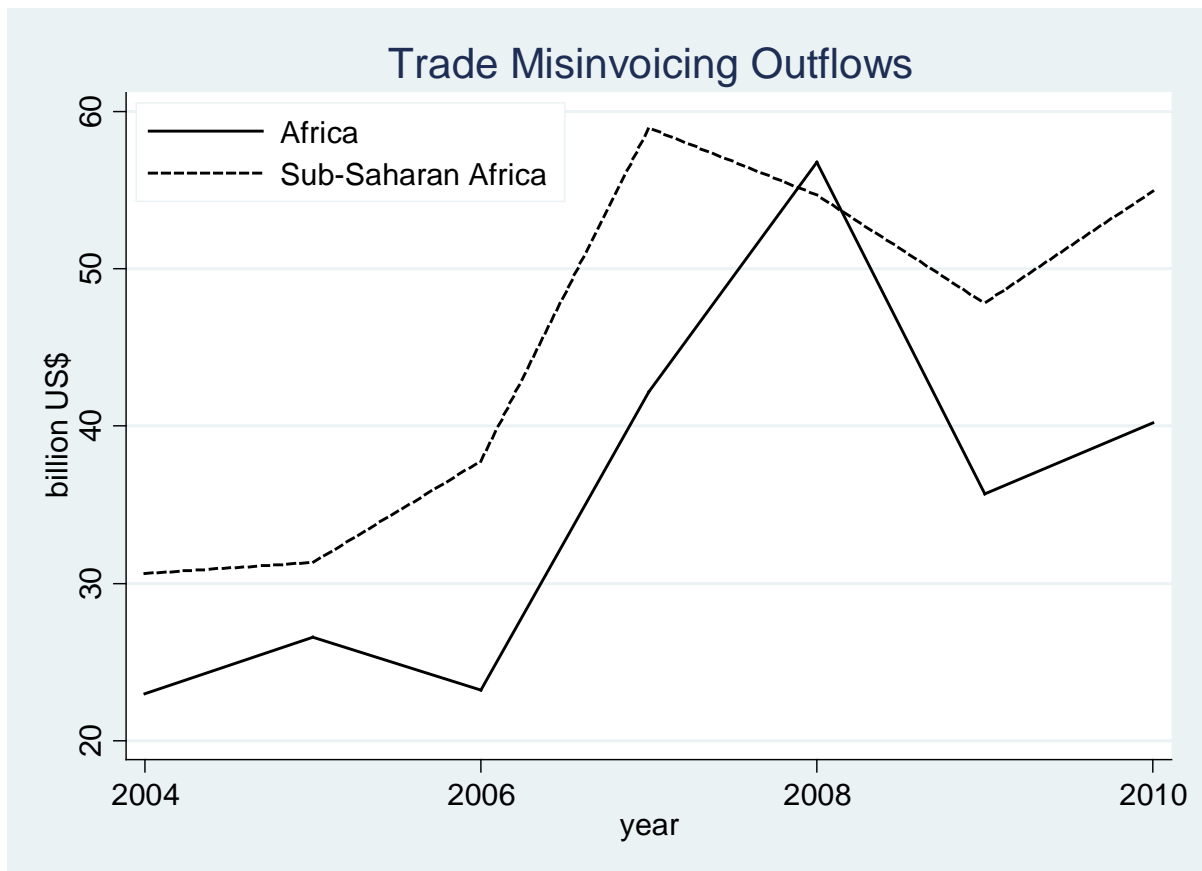
In recent years, there has been a growing interest in the understanding of trade misinvoicing practices, both among policy-makers and economists. This paper discusses selected issues in the analysis of trade misinvoicing with a specific focus on developing countries. Examining various motives for the misdeclaration of trade activities, it is argued that the broad range of incentives to fake customs declarations provides an important challenge for the empirical assessment of the extent of trade misinvoicing. After analyzing the costs and benefits of different empirical approaches to quantifying trade misinvoicing, the accuracy and reliability of estimation results reported in the literature are reviewed. It is shown that quantitative findings are heavily dependent on the underlying assumptions in the empirical analysis, making estimation results on trade misinvoicing practices largely a matter of faith.

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Figure 1: Estimates of Trade Misinvoicing Outflows



Sources: High Level Panel on Illicit Financial Flows from Africa (2015), Table AIII.4; Kar and Spanjers (2015), Table A4.

Table 1: Selected Estimates of Trade Misinvoicing

Country	Type	Source	Period	Estimate	Yearly Average	Remark
Chile	Export misinvoicing	Ndikumana (2016), Table 3	1990-2014	-44.4 bn. US\$	-3.0 bn. US\$	Copper only, constant US\$
		Kar and Spanjers (2015), Table A6	2004-2013	-15.4 bn. US\$	-1.5 bn. US\$	
Côte d'Ivoire	Export misinvoicing	Ndikumana (2016), Table 8	1995-2014	3.8 bn. US\$	0.2 bn. US\$	Cocoa only, constant US\$
		Kar and Spanjers (2015), Table A6	2004-2013	-9.5 bn. US\$	-0.9 bn. US\$	
Nigeria	Export misinvoicing	Ndikumana (2016), Table 5	1996-2014	-89.7 bn. US\$	-4.7 bn. US\$	Oil only, constant US\$
		Kar and Spanjers (2015), Table A6	2004-2013	-39.3 bn. US\$	-3.9 bn. US\$	
South Africa	Export misinvoicing	Ndikumana (2016), Tables 9-11	2000-2014	102.9 bn. US\$	6.9 bn. US\$	Silver, platinum, iron ore and gold only, constant US\$
		Kar and Spanjers (2015), Table A6	2004-2013	85.7 bn. US\$	8.6 bn. US\$	
Turkey	Gross trade misinvoicing	Yalta and Demir (2010), p. 57	1990-2007	145.7 bn US\$	8.1 bn. US\$	
		Kar and Spanjers (2015), Table A6	2004-2013	499.8 bn US\$	50.0 bn. US\$	
Zambia	Export misinvoicing	Ndikumana (2016), Table 4	1995-2014	-17.3 bn. US\$	-0.9 bn. US\$	Copper only, constant US\$
		Kar and Spanjers (2015)	2004-2013	-38.3 bn. US\$	-3.8 bn. US\$	