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# **THE SIZE OF TRADE MISINVOICING IN PAKISTAN**

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## ABSTRACT

Trade misinvoicing has remained a critical issue for the entire developing world. Trade misinvoicing involves misreporting in the invoices of imported and exported commodities for various malign purposes. This study conducted estimation of the extent of trade misinvoicing carried out in Pakistan from 1972-2013 with its 21 developed trading partners in 52 major traded commodities. The study adopted c.i.f./f.o.b. methodology to measure discrepancies in the partner countries data. All four components of trade misinvoicing, i.e., imports under-invoicing, imports over-invoicing, exports under-invoicing and exports over-invoicing are estimated here. The study finds that total trade misinvoicing in Pakistan for the overall period of 41 years was more than \$92.7 billion and on average, annual trade misinvoicing is estimated at \$2.25 billion. The gross revenue losses incurred to the national exchequer due to trade misinvoicing in the overall period was estimated at \$21.2 billion with an annual average of \$0.5 billion. Moreover, the total net loss was estimated to be \$11 billion for the total period and annually the national exchequer is deprived of \$0.26 billion in the form of the evasion of customs duties and exports withholding tax.

**Keywords:** Trade Misinvoicing, Revenue Loss, Capital Flight, Reverse Capital Flight

**JEL Classifications:** F13, F14, K42, H26, O17

## 1. Introduction

Intuitively, when two countries engage in trade with each other, the data reported by the exporter country should be the same as reported by the partner importer country after c.i.f./f.o.b. adjustment. However, this is always not the case for various reasons. One justification for these discrepancies in the data of bilateral trade is trade misinvoicing.

Trade misinvoicing is an illegal activity in which the trader misinvoices the exports or imports in the form of under-invoicing or over-invoicing for attaining various malign objectives such as evasion of taxes or both way flight of capital, etc. To estimate the trade misinvoicing performed, the exports (imports) of the reporting country are compared with the imports (exports) of the partner country after making adjustments for costs of freight and insurance.

Large amount of revenue in the form of customs duties is robbed from the government through trade misinvoicing. The economy is deprived of domestic capital and is transferred abroad, which could be used domestically for beneficially in further investment. This results in the decline in economic growth due to lack of capital. In addition, due to loss of revenue, the government cannot utilize potential resources for the expansion of social services.

Kar and Devon(2014) estimated a sum of US\$946.7 billion in 2011 was misinvoiced through trade in the developing countries. Trade misinvoicing during 2002 and 2011 was estimated to be around US\$5.9 trillion for 55 developing countries. This research gave the notion that illegal financial flows resulting from trade misinvoicing are due to the factors devastating the developing economies. This issue is creating a great impact

Kar and Devon further pointed out that in the global South, the worst part to note is that the trade misinvoicing is increasing over the time. Trade misinvoicing out of the emerging countries is increasing on average by more than 10% per annum. Total trade misinvoicing in Asia is 39.6% out of the total misinvoicing from the emerging countries of the world, which is the largest. Kar (2010) found that the top exporters of illegal capital are Asian countries including Malaysia, China, India, Philippines, Indonesia and Thailand. Russia is the main generator of trade misinvoicing from Europe and such illicit flows from Western Hemisphere are mostly generated by Mexico and Brazil.

The first study that estimated illegal flows of capital from developing countries due to trade misinvoicing was Bhagwati (1964). He compared the bilateral trade statistics of Turkey with that of its trading partners. He then presented a theory that explained the discrepancies found between the

trade figures of partner countries. It indicated that either of the two parties or both of them exploited the trade invoices for moving the capital.

According to Bhagwati and Hansen(1973), it is significant to determine which country out of the two transacting parties reported the value of invoice to the officials. In case the data of trade is weak on both sides, then the methodology which is created on the basis of differences in bilateral trade is considered unreliable as there is no figure which could be utilized for making the comparisons. To overcome this problem, trade misinvoicing is measured between advanced and developing countries only. The advanced countries have more transparent, accountable and simple system of customs administration as compared with that of developing countries. Therefore, it is assumed that the data of developed countries are more reliable for the comparison. Bhagwati and Hansen further argued that a major difference between smuggling and trade misinvoicing is that that smuggling is an illegal activity carried out through illegal channels, whereas trade misinvoicing is an illegal activity carried out through legal means.

Pakistan has historically maintained very high rate of tariffs. It has also relied on the use of non-tariff barriers (NTBs) to protect domestic industries from foreign competition. Both tariffs and NTBs are regarded as the major reasons for the imports underinvoicing. Pakistan has been also offering many incentives to promote export-oriented industrialization. Whereas these incentives have assisted the country in managing a reasonable rate of growth of exports, many exporters have manipulated these incentives for their benefit by indulging into unfair and illegal practices. These illegal practices have caused not only financial losses to the exchequer but also undermined the very objective of policies. Consequently, the exporters that are against such malpractices have to face huge losses because of the fact that their bargaining position in the market gets deteriorated adversely (Mahmood and Mahmood, 1994).

The tax-to-GDP ratio of Pakistan is currently very low, at 9.5%.Only 0.9% of the total population of the country files tax returns (World Bank, 2014). Many reforms were introduced by the government to increase the tax base; however, a large sum of revenue is lost on account of tax evasion and avoidance. This is mainly because of the lack of tax culture in the country, corrupt tax collection machinery and laws that allow easy avoidance of taxes.

Very few studies have been conducted on the estimation of trade invoicing in Pakistan. The first calculation of the size of imports under-invoicing was conducted by Sheikh (1974). He also determined importance of black market premium in influencing the level of misinvoicing. Later,

Mahmood and Mahmood (1993) estimated the amount of imports under-invoicing in Pakistan in 1981 and 1988 and found huge extent of underinvoicing in imports. Mahmood and Azhar (2001) conducted a study on overinvoicing of exports from Pakistan with 13 major developed trading partners from 1984 to 1994 and indicated large size of exports overinvoicing.

The main rationale for conducting this study is to focus on those areas of trade misinvoicing that have never been explored by the researchers in Pakistan. For example, there has been no research on the issue of imports over-invoicing and exports under-invoicing in Pakistan with respect to commodities and trading partners. Moreover, there exist even a big gap on the other two components of trade misinvoicing; i.e., imports underinvoicing and exports overinvoicing, as the available studies were conducted in 1993 and 2001. Mahmood and Mahmood (1993) and Mahmood and Azhar (2001) incorporated 6 and 13 trading partners respectively and estimation was limited for only two and three years respectively, which lead to underestimation of the actual size of trade misinvoicing. A recent study by Mahmood (2013) estimated the total size of export overinvoicing and import underinvoicing for all countries. The purpose of this research is to find out the major misinvoiced traded commodities for major trading partners with whom the highest extent of trade misinvoicing is carried out. Moreover, the study has taken into account all the years since 1972.

No study is available for Pakistan, which has estimated the revenue loss incurred to national exchequer due to evasion of customs duties and withholding tax at the export stage. This study is the first one to estimate the average loss in revenues due to trade misinvoicing using Baker *et al.* (2014) methodology.

Rest of this paper is divided into seven sections. Section 2 discusses the macroeconomic, structural and governance related drivers of trade misinvoicing. Literature review of the relevant available studies is given in section 3. Section 4 provides the theoretical framework of trade misinvoicing. Empirical model used is reported in section 5. Estimated results are interpreted and discussed in section 6. Finally, section 7 concludes the paper and implies certain policies from the findings of the analysis to eradicate the menace of trade misinvoicing from Pakistan.

## **2. Macroeconomic, Structural and Governance related Drivers of Trade Misinvoicing**

The incentives offered by trade misinvoicing are regarded to be complicated. They are provided on the basis of the impact of exchange control regulations, price controls for the commodities that are imported and the tax rate structure as well. Various other factors also hold



responsibility for the provision of such incentives. Money laundering is also one critical factor in determining the extent of trade misinvoicing. Trade misinvoicing can be divided into four main categories: export over-invoicing, imports under-invoicing, export under-invoicing and import over-invoicing. These illegal acts are performed with the approval of both buyers and sellers involved in the transactions and with the connivance of customs officials. As trade misinvoicing benefit parties involved in the trade, which is motivated by various factors. This is the subject matter of the following discussion on drivers of trade misinvoicing.<sup>1</sup>

## **2.1 Drivers of Underinvoicing of Exports**

Under-invoicing of exports enable exporters to shift a part of their taxable income out of the country. For this purpose the exporter may ask the purchaser to make a payment on partial basis to a foreign bank account. The remaining amount is asked to be paid to the bank account of the company located in the home country. The amount which is diverted to the foreign account is not taxed and is not utilized for the purposes of development. The only amount which is taxed is the actual amount reported to the customs in the home country. This falsification of invoice includes reporting lesser amount of what was actually shipped. This act is absolutely illegal.

Another factor that strongly induces under-invoicing of exports is the 'black market premium' on foreign exchange. By underinvoicing exports, the exporter has some unreported foreign exchange proceed. In case, the premium on foreign exchange in the black market is greater than the regulated market, exporter will sell the foreign exchange in the black market to earn high profit. However, most importantly, an exporter will indulge in underinvoicing of exports only when the benefits gained through underinvoicing are greater than the loss of export subsidy that is forgone.

## **2.2 Drivers of Overinvoicing of Exports**

Overinvoicing of exports is usually performed when there are subsidies and credits of export tax such as duty drawbacks, concessional rate on export finance, etc., given to the high performing exporters. Exporters claim that they have shipped greater amount than the amount which is exported in real. Another reason for over-invoicing of exports is that it is performed to bring back

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<sup>1</sup> Drivers of misinvoicing are reported in studies including Bhagwati (1973), Baker (2011), Gupta and Shah (2010) and Marjit and Biswas (2005).

the illicit capital residing outside the country. The agents overinvoice exports and in return get more amount of money than would have earned by reporting the actual amount of exports.

### **2.3 Drivers of Underinvoicing of Imports**

The most influencing factor for under-invoicing of imports is the high rate of import duties. By under-reporting imports, the importer pays less duty. Most of the countries who suffer from this problem have restricted trade regimes.

Another aim of an individual or corporation to indulge in under-invoicing of imports is to reverse capital flight (Mahmood, 2013). The reverse capital flight takes place in the form of goods and not in cash. Importer buys foreign exchange from the black market to underinvoice imports. Importer will indulge into under-invoicing of imports practices when benefits from underinvoicing of imports are greater than the premium paid on foreign exchange obtained from the black market.

### **2.4 Drivers of Overinvoicing of Imports**

Overinvoicing of imports is mainly performed for the purpose of capital flight; it allows traders involved to keep their illicit capital out of the country and earn premium in the black market. In addition, if price controls exist for imported commodities then traders may choose to overinvoice the imported commodity to justify charging of higher prices for the commodity sold in the domestic market. However, an importer has to buy excess foreign exchange from the black market in case of overinvoicing of imports. Therefore, an importer will indulge in overinvoicing only when the benefits gained from overinvoicing of imports are greater than the premium paid on buying of foreign exchange from the black market.

## **3. Literature Review**

This section is divided into three parts. The first part shed light on the available literature investigating trade misinvoicing with a focus on developing countries. The second part reviews studies carried out in the Southeast and West Asia as well as the Middle East. Third part reviews studies that were conducted on investigating trade misinvoicing issues in Pakistan.

### **3.1 Analytical Studies**

Bhagwati and Hansen (1973) developed a framework in which they assumed that legal and illicit trade is carried out at the same market price prevailing in the world. The illicit traders try to avoid tariffs and thus face lesser favorable transformation rate because of the costs associated with

misinvoicing. If the cost of misinvoicing is equal to the tariff rate, then both kinds of trades can coexist. However, if they are not equal, then each firm has to trade legally or illicitly. When illegal trade is conducted, it reduces the revenues obtained from taxes without efficiency enhancements. Their paper concluded that illicit trade does not create any positive impact on welfare.

Cooper (1974) investigated the misinvoicing phenomenon by setting up market prices for imported goods. He compared the imported commodities' domestic wholesale prices with their tariff inclusive c.i.f. prices. He found that there was great tendency for the prices to increase less than proportionately with tariff. In case the tariff inclusive prices exceed the domestic wholesale price of the imported commodity then it was inferred that there was tariff evasion and the goods were misinvoiced.

Gupta and Shah (2010) conducted a study on factors that influence trade misinvoicing and stated that a critical factor influencing trade misinvoicing that has been identified in the literature is the extent of exchange rate overvaluation. An overvalued exchange rate as well as high inflation rate raise expectations of depreciation in the near future and stimulate capital flight. They further found that trade misinvoicing should be seen as one element of *de facto* openness on the capital account. Economic agents, who desire capital movements for traditional reasons such as financial portfolio diversification, bets on exchange rate movements, are likely to achieve these movements through trade misinvoicing. To the extent that misinvoicing is feasible, countries do not have a choice about embarking on high capital account openness once they have adopted high current account openness.

### **3.2 International Evidence**

Mariaand Simon (2007) discussed trade misinvoicing from African continent to USA from 2000 to 2005. Their results suggested that misinvoicing has been increased by around 60%. The reason of this misinvoicing was low prices of exports, which facilitated evasion of taxes and money laundering. The imports that have higher prices are also utilized for capital flows and they can be utilized for camouflaging illicit commission. They examined the data for finding out deviations from average prices of exports and imports. This was used as an indicator of capital outflows. The four out of top thirty countries of Africa (Algeria, Tunisia, Morocco and Egypt) moved around \$6.7 billion via trade misinvoicing. The remaining 26 countries moved approximately \$13.41billion. South Africa moved the most capital to the US via trade misinvoicing.

Ndikumana (2008) worked on the panel data estimation of 40African countries to find out the magnitude of trade misinvoicing from Sub Saharan Africa. He covered the time period of 1970-

2004 and adopted the methodology of robust OLS, fixed effects panel data and instrumental variables to estimate results. His estimation found that capital flight through overinvoicing of imports amounted to \$420 million. When imputed interest is added, the misinvoicing stock for these 40 countries increased to \$607 billion in 2004.

Berger and Nitsch (2012) studied the relation between trade misinvoicing and corruption from 2002-2006 for the top five importers of the world, i.e., USA, Germany, China, UK, and Japan. They analyzed trade statistics of 4-digit level using the c.i.f. and f.o.b. methodology with the data sets of UN COMTRAD and IMF Direction of Trade Statistics. They found discrepancies in the figures of recorded exports by the partner countries and their conclusion was that trade misinvoicing of the partner countries increases with the increase in level of corruption.

Baker *et al.* (2014) studied trade misinvoicing in four African countries, i.e., Ghana, Mozambique, Tanzania and Kenya for the period 2002 to 2011. They used the data of UN COMTRADE and by applying Bhagwati's methodology estimated that Tanzania experienced the highest amount of illicit flows worth \$1.87 billion. Kenya was number second with \$1.51 billion average annual illicit trade flow and Ghana was experiencing \$1.44 billion annually. Uganda was low on the number with \$884 million annual average, while Mozambique was on the lowest position with illicit trade flows of \$585 million annually on average.

They further estimated the loss of revenues in the form of tariff revenues and domestic taxes for each country due to trade misinvoicing. Their results suggested that Ghana lost \$386 million on average per year, Kenya lost \$435 million, Mozambique lost \$187 million, Tanzania's average annual loss was \$248 million, while Uganda lost \$243 million per year during 2002 to 2011. These losses represent the resources that government was unable to capture and invest in developmental projects that may include education, infrastructure or healthcare projects for the masses. The opportunity lost in providing these public goods to their citizens is the symbol of tangible harm caused due to illicit financial flows in the developing countries.

### **3.3 Evidence on Asia**

Bhagwati (1964) analyzed the trade data of Turkey with Italy, Germany, United States, France, and Netherlands. After allowing for possible statistical reasons for such discrepancies as were obvious, he concluded that major discrepancies were left, for which the only possible explanation appeared to be underinvoicing of imports. He found a very strong indication of import

underinvoicing in the goods related to transport equipment and machinery. Both of these products were subject to very high tariff at that time in Turkey.

Fisman and Wei (2004) examined the effects of tax rates on tax evasion through misreporting of trade invoices. They performed analysis on trade discrepancies between China and Hong Kong for six-digit level products. They kept discrepancy measures as dependent variable and made tax rates and tax exemption as independent variables. Their results suggested that a 1% rise in the tax rate will result in 3% increase in gap between reported imports and exports. This gap is highly and positively correlated with tax rates for China and Hong Kong.

Fisman and Wei (2007) reviewed cultural goods and antique items that were exported from Egypt to USA from 1996-2005. By using the c.i.f. and f.o.b. methodology, they found out that there is a large number of illicit trade going on in cultural and antique goods between the USA and Egypt. Their major finding was that the level of underinvoicing of exports is highly correlated with the level of corruption in the exporting county.

Yalta and Demir (2010) conducted a study on Turkey's exports to its major trading partners to examine the extent of trade misinvoicing from the period of 1970-2007. They found out that exports are underinvoiced while the imports from China are overinvoiced. They also analyzed the effect of customs unions and trade liberalization policies on trade misinvoicing. They found out that liberalization policies have negative effect on import misinvoicing at an aggregate level.

Gupta and Shah (2010) investigated the determinants of trade misinvoicing by using panel data of 53 countries from 1980-2005. They applied the methodology of feasible generalized least square and suggested that one of the key determinants of capital flight through export underinvoicing is the extent of current account deficit. If there is 1 percentage point increase in the ratio of current account deficit to GDP, it raises capital flight through export underinvoicing by 0.15 to 0.26 percentage points. A higher current account deficit raises the probability of devaluation of the domestic currency, and reduces the incentive to invest in domestic assets. In such circumstances, investors seek out different routes to acquire foreign assets. A rise in capital account openness is associated with a strong and significant decline in export overinvoicing. As countries undertake greater integration with the global financial market, allowing domestic residents to buy and sell foreign assets, the incentive to take out capital through trade misinvoicing diminishes. An increase in the capital account liberalization index by 0.1 points, by modifying laws to allow freer movement of capital, results in lowering export misinvoicing by 0.8 to 1.3 percentage points.

Jha (2014) threw light on India's trade with its major 17 trading partners from the period of 1988-2012 by using Bhagwati's methodology of comparing c.i.f. values with f.o.b. values after taking into account the adjustment factor of 1.1. He found that trade misinvoicing from India has increased since 2004 and has peaked after 2007 till 2012. He estimated that around \$40 billion was the illicit trade flow in 2008 only and the total illicit outflow in 14 years outnumbered \$186 billion.

### **3.4 Evidence on Pakistan**

First investigation on underinvoicing of imports for Pakistan was conducted by Sheikh (1974) for the period 1965 to 1968. Using the partner-country comparison technique, Sheikh worked with 36 different products and with partner countries that supplied over 80% of Pakistan's imports at that time. He then divided the commodities into two broad groups, restricted and liberal group based on a careful examination of the incidence of import licensing at that time. The results showed a very robust tendency for goods in the restricted category to have the Pakistani import values fall considerably below the partner-country export figures, representing underinvoicing of imports for each of the four years considered. The author further managed to institute a relationship between underinvoicing and the categorization of a commodity in a high-tariff category or a low-tariff category. The former category proved to be more prone to underinvoicing.

Mahmood and Mahmood (1993) estimated the size of underinvoicing of imports in Pakistan from 1981 to 1988. In their study, the partner countries taken were France, Germany, Italy, UK, Netherlands and Japan, because about 40% of total imports of Pakistan were coming from these countries. They found that underinvoicing is performed in large size for chemicals, machinery, manufactured goods and transport equipment. They also found that commodities that were being under invoiced had significantly high duties from 40% on rubber to 450% on automobiles.

Mahmood (1997) examined the major determinants of imports under-invoicing in Pakistan for the period of 1981-1988 by pooling data of 96 goods and imports from six developed countries. He tested import taxes and non-tariff restrictions on imports and found out import taxes to be the most significant variable having a positive correlation with imports under invoicing, while non-tariff restrictions turned out to be insignificant.

Mahmood and Azhar (2001) undertook a study on over invoicing of exports from Pakistan with 13 major developed trading partners over the period of 1984-1994. They found that for the aggregate level, exporters overinvoiced exports to the amount of US\$2.4 billion in 10 years

Mahmood (2013) conducted the latest work on the issue of reverse capital flight in Pakistan. He found out that reverse capital flight conducted in Pakistan from 1972-2013 was of about \$30 billion. The findings of the paper did not estimate the misinvoicing commodity-wise with each country.

In sum, the issue of trade misinvoicing mostly exists in the developing countries, while industrialized countries have curtailed this problem to a great extent. China and India turned out to be countries with the highest size of misinvoicing in Asia while majority of African and Middle Eastern countries are also facing this issue. Earlier literature points out that the major determinants of trade misinvoicing are the degree of customs duties and taxes, corruption, current and capital account openness, real exchange rate, the extent of capital controls in the country, domestic and foreign interest rates, black market premium and political instability in the country.

#### **4. Theoretical Framework**

Following Biswas (2009), this section discusses theoretical framework of all the components of trade misinvoicing.

##### **4.1 Export Misinvoicing**

Under- or over-invoicing takes place when an exporter does not expose the true export values to the customs officials. Underinvoicing takes place when the value of official exchange rate is overvalued. On the other hand, overinvoicing occurs when the subsidy on exports is high. Two cases have been taken in the model to create a functional objective for an exporter who is misinvoicing. He performs it for gaining black market premium (BMP) by selling out the exports that are unreported at the value of market exchange rate when he considers that subsidy loss will be outweighed by the gain on BMP. The value of exports is also over-reported by him for gaining additional financial advantages. These benefits are obtained in the form of subsidies when exporters anticipate that the BMP loss will be outweighed by the gain on subsidy. Following notations have been utilized for building a model of comparative static within the given time frame:

*X<sub>o</sub>*: reported or official dollar value of export,

*X<sub>a</sub>*: actual dollar value of export,

*e*: official exchange rate,

*E*: market exchange rate, and

$s$ : per unit subsidy on dollar value of official export.

The relationship between actual ( $Xa$ ) and reported ( $Xo$ ) export can be expressed as:

$$Xo = (1-a) Xa, a \leq 1 \text{ (} a \text{ is the rate of misinvoicing)} \quad \dots (1)$$

It is quite clear from Eq. (1) that over-reporting occurs when the value of  $a \leq 0$  whereas on the other hand, the values are underreported by the exporter. The model assumes that the gap that lies between official exchange rate and market exchange rate reduced when there is devaluation of domestic currency. Therefore, changes in official exchange rate and BMP are related to each other in an inverse manner. The term BMP has been denoted with  $v$  and can be defined as:

$$v = E - e, v > 0 \text{ with } de / dv < 0 \quad \dots (2)$$

Suppose that the penalty charges and bribe payments on an exporter are included in the cost of misreporting. In addition to these things, this cost also includes the amount of misinvoicing. The first and second order derivatives of cost of misreporting are estimated to be positive and because of higher level of misinvoicing, the cost of punishment becomes higher and monitoring becomes rigorous too.

Let us now analyze how the objective function of a misinvoicing exporter is formulated. The exports that are officially reported are expressed in terms of dollar and are denoted with  $Xo$ . The exporter evaluates these terms of domestic currency at the value of official rate of exchange and the gain he earns is denoted with  $sXo$ . The level of misinvoicing is represented as  $(Xa-Xo)$ . When the gap is positive, an exporter tends to underinvoice. In that case, he sells out that value of export which is underreported at the exchange rate of market and then gains  $E(Xa-Xo)$ . However, when misinvoicing is conducted by the exporter, he needs to know that the cost of punishment is  $F$ , which depends on level of misinvoicing. Therefore, the total cost of punishment would be  $F(Xa-Xo)$  with  $F', F'' > 0$ .

Therefore, we can write the objective function of an exporter who mis-invoices as:

$$MaxW(\alpha) = eXo + esXo + E(Xa-Xo) - F\{(Xa-Xo)\}.$$

Incorporating Eq.(1) and Eq. (2), we can write,

$$MaxW(\alpha) = [eXa(1+s)] + \alpha Xa \{v - es\} - F(\alpha Xa) \quad \dots (3)$$



The first order condition (FOC) of maximization gives us,

$$dw / d\alpha = 0, i.e., \{v(e) - es\} = F'(\alpha Xa) \quad \dots (4)$$

When it is assumed that the punishment cost is covered from Eq. (4), a condition termed as dishonesty condition needs to be fulfilled as  $v \neq es$ . Under-invoicing by a rational exporter will be conducted with the condition  $v > es$  and  $\alpha$  is positive and both sides of Eq. (4) are positive too,  $v$  is the extra income that is earned in the form of local currency against each unit of dollar.  $es$  is that income which is earned in the form of local currency that is forgone for per unit of dollar in case the value of dollar is worth of export and is not reported on official basis. Therefore, the condition that is worked out for under-invoicing states that it is advantageous to do under-invoicing of the value of export when the subsidy loss on per unit value of officially reported export is greater than the value that is compensated by BMP. Likewise, he is going to overinvoice  $v < es$ . In this case,  $\alpha$  will be negative and both sides of Eq. (4) will be negative as well.

## 4.2 Import Misinvoicing

Import misinvoicing occurs when there is a difference between the actual payable value of imports and the stated values of imports. This may happen in two cases. The first case is when there is a tariff duty on the commodity that is imported. The second case is when BMP is very high. When the gain on tariff is greater than the gain on BMP, import under-invoicing occurs. On the other hand, import over-invoicing takes place when the gain on BMP outweighs the gain on tariff. A risk is attached in the model of over and understatement of import value. This should be considered by the importers when it comes to the formulation of objective function. Here:

$M_o$ : reported or official dollar value of import,

$M_a$ : actual dollar value of import and  $d$ : per unit import duty on dollar value of import.

We may write the relationship between actual and stated values of import as

$$M_o = (1 - \beta) M_a, \beta \leq 1 (\beta \text{ is the rate of misinvoicing}) \quad \dots (5)$$

The importer's objective function of misinvoicing is formulated in the following way.

The value of officially reported import is denoted with  $M_o$ . Foreign exchange is required in order to reduce the expenditure on import. In addition, an equal amount of domestic currency is provided to the authority of exchange. Therefore, the cost of importer is  $eM_o$  considering official

rate of exchange.  $edMo$  denotes the tariff duty that needs to be paid via official rate of exchange. This tariff duty is paid on the augment import value of foreign currency. In case the importer underinvoices the amount of import  $\beta Mt$ , he has to make the payment of market rate of exchange for buying the import. This is performed in order to get that amount of foreign exchange; therefore, the additional cost is  $E\beta Ma$ . This cost is termed as punishment cost of the importer which is a function of the level of misinvoicing. It is assumed that this cost G functions exactly the cost did in the previous case of exports, which means  $G', G'' > 0$ . Therefore, the importer's objective function of misinvoicing can be written as:

$$Max\beta V(\beta) = R(Ma) - eMo - edMo - E(Ma - Mo) - G(Ma - Mo) \quad Max\beta \dots (6)$$

Where  $R(Ma)$  is the fixed revenue earned by the importer as  $Ma$  is fixed. From equations (2) and (5) we have,

$$Max\beta V(\beta) = R(Ma) - eMa(1 + d) + \beta Ma(ed - v) - G(\beta Ma) \quad \dots (7)$$

The FOC gives us,

$$\frac{dv}{d\beta} = \{ed - v(e)\} = G'(\beta Ma) \quad \dots (8)$$

When the punishment cost is covered from Eq. (8), the condition of dishonesty is  $v \neq ed$ . Under-invoicing will be performed by a rational importer in case  $ed > v$ . It is evident from the condition that when augment tariff rate of domestic currency on per unit value of dollar of import at the official rate of exchange is greater than the BMP, the importer chooses to underinvoice. In the same way, over-invoicing occurs when the condition gets reversed  $v > ed$  the condition of over-invoicing indicated the attainment of profitable BMP.

Further derivation of Eq. (8) yields:

$$\frac{d\beta}{de} = \frac{\frac{dv}{de} - d}{-\beta Ma G''(\beta Ma)} > 0 \quad \dots (9)$$

$$\frac{d\beta}{dd} = \frac{-e}{-\beta Ma G''(\beta Ma)} > 0 \quad \dots (10)$$

According to Eq.(9), when  $e$  increased and BMP is reduced, an importer can buy foreign exchange in a cost effective manner at market rate of exchange. However, according to Eq (10),

when tariff increases, the under-invoicing rate is increased by the importer in order to avoid the higher rate of tariff.

## 5. Empirical Model

This study has used two different methodologies for the estimation of trade misinvoicing and the loss of revenue respectively. Firstly, the c.i.f. & f.o.b. methodology estimated the extent of misinvoicing taking place in exports and imports by using the UN Commodity Trade Statistics Database. This study made use of Standard International Trade Classification (SITC) Rev. 3 commodity codes to compare the exports of reporter country with imports of partner country and vice versa.

This study incorporated 52 major traded commodities and 21 developed trading partners of Pakistan for the period of 1972-2013 (see Appendices A, B and C). In total, more than 45,000 trade entries were reviewed to identify the trade misinvoicing.

The methodology of revenue loss was taken from the Baker *et al.* (2014) who has used this methodology to estimate revenue losses from trade misinvoicing in the African continent.

### 5.1 C.i.f. and F.o.b. Methodology

Trade misinvoicing can take place either through export and import overinvoicing or underinvoicing. Ideally, the observed exports from country A to country B (including the cost of insurance and shipping (c.i.f.) should match the observed imports of Country B from Country A. Using the IMF criteria, this study has adjusted the c.i.f. value with 1.1 adjustment factor. This adjustment factor is considered to be the costs of insurance and shipping, which makes c.i.f. equivalent to f.o.b.

$MI = [MI_x] + [MI_m]$  Misinvoicing in total trade.

$[MI_x] = [M_{icp}] - [X_{pic}] * Ad$  Misinvoicing of exports.

If  $[MI_x] < 0$  then exports over-invoicing is taking place in Pakistan.

If  $[MI_x] > 0$  then exports underinvoicing is taking place in Pakistan.

$[MI_m] = [M_{pic}] - [X_{icp}] * Ad$  Misinvoicing of imports.

If  $[MI_m] > 0$  then imports overinvoicing is taking place in the country.

If  $[MI_m] < 0$  then imports under-invoicing is taking place in the country.  
where,

$[M_{.icp}]$  = Imports of industrial countries from Pakistan (c.i.f.).

$[X_{.pic}]$  = Exports of Pakistan to industrial countries (f.o.b.).

$[M_{.pic}]$  = Imports of Pakistan from industrial countries (c.i.f.).

$[X_{.icp}]$  = Exports of industrial countries to Pakistan (f.o.b.).

$Ad$  = Adjustment factor defined as c.i.f.-f.o.b. ratio.

## 5.2 Estimation of Loss of Revenue

To estimate the loss of revenues incurred by the government in the form of potential customs tariff and exports withholding tax, the following methodology was used.

### 5.2.1 Net Loss of Revenue through Misinvoicing of Imports

$$Uim \text{ per year} \times (\text{Average Tariff Rate of Commodity} + \text{Average Sales Tax}) / 100 - Oim \text{ per year} \times (\text{Average Tariff Rate of Commodity} + \text{Average Sales Tax}) / 100$$

### 5.2.2 Net Loss of Revenue through Misinvoicing of Exports

$$Ux \text{ per year} \times \text{withholding tax on export proceeds} / 100 - Ox \text{ per year} \times \text{withholding tax on export proceeds} / 100$$

where,

$Uim$  = Underinvoicing of imports

$Oim$  = Overinvoicing of imports

$Ux$  = Underinvoicing of exports

$Ox$  = Overinvoicing of exports

## 6. Results & Interpretations

This section is divided in two parts. First part provides results obtained by estimating the size of trade misinvoicing. Second part discusses the revenue losses.

### 6.1 Trade Misinvoicing

In this section, results of estimates of trade misinvoicing will be discusses with their relation with various policy related matters of Pakistan

### 6.1.1 Total Misinvoicing

Table 1 provides the estimated total trade misinvoicing listed with the breakdown in its two main categories. Total misinvoicing from 1972-2013 was estimated \$92.7 billion or 9.3 trillion rupees. This mammoth figure shows the extent at which trade misinvoicing has taken place in Pakistan in the past 41 years and that is with the developed economies only. This figure does not take account of trade misinvoicing that took place with developing trading partners and in minor traded commodities. Hence, to that extent the reported figures are under-estimated. The average annual trade misinvoicing that took place in Pakistan is about \$2.25 billion or Rs.225 billion.

In the broad categories, export misinvoicing takes the highest share in total trade misinvoicing. Estimates show that export misinvoicing is higher than import misinvoicing even though the commodities taken into account for export misinvoicing are fewer than the commodities incorporated for the estimation of import misinvoicing. This implies that evasion of tariff has not been the foremost objective of traders and trade misinvoicing is mainly conducted for the purposes of capital flight, reverse capital flight, to earn black market premium and gaining export subsidies.

One of the primary reasons for this finding could be the fact that as Pakistan curtailed its tariff significantly in the previous two decades and ad-valorem rates were reduced from a peak of 350% in the 1970s to 90% in the early 1990s and then to 56% in 1995 and current average tariff of 9.9%. Hence, high import duties are not the only attraction for importers to misinvoice.

On the other hand, export subsidies were and are still beneficial for the powerful export industry as exporters benefited from various export subsidies including duty drawback schemes in the 1970s and 1980s, while they still enjoy reimbursement of sales tax and federal excise duties for the imported raw material and benefit from concessional export refinancing by showing much higher volume of exports. Due to various economic and political factors; flight and reverse capital flight of capital have always remained major issues in Pakistan and trade misinvoicing has remained one of the major ways of performing such acts.

**Table 1: Total Trade Misinvoicing (1972-2013)**

(US\$ Billions)

	<b>Import Misinvoicing</b>	<b>Export Misinvoicing</b>	<b>Total Trade Misinvoicing</b>
<b>Total</b>	45.8	46.9	92.7
<b>Average Annual</b>	1.11	1.14	2.25

Source: Authors' estimation

### 6.1.2 Import Misinvoicing

The highest share in import misinvoicing is of under-invoicing in the overall time period (Table 2). Under-invoicing of imports also turned out to have the highest extent of misinvoicing in total trade misinvoicing.

High underinvoicing of imports takes place to evade import tariff and to reverse flight of capital. On the other hand, import overinvoicing has picked up with trade liberalization. Besides, lower taxable profits for the finished goods and black market premium are achieved through import overinvoicing.

**Table 2: Total Imports Misinvoicing (1972-2013)**

(US\$ Billions)

	<b>Imports Under-invoicing</b>	<b>Import Over-invoicing</b>
<b>Total</b>	30.2	15.6
<b>Average Annual</b>	0.73	0.3

Source: Authors' estimation.

### 6.1.3 Export Misinvoicing

Table 3 shows that the highest component of export misinvoicing is estimated to be overinvoicing of exports while underinvoicing in exports was half than overinvoicing. This implies that the most prominent and common purposes of export misinvoicing were reverse flight of capital and availing export subsidies and tax credits from the government. Export subsidies in the form of export refinance scheme by State Bank of Pakistan in which exporters with certain amount of annual exports are provided with credit at an interest rate lower than benchmark rate by 1-1.5%. Moreover, tax credits are availed by the exporters in the form of reimbursement of sales tax paid on the imported raw materials that were used in producing finished goods in Pakistan. As no kind of export duty is currently applicable on exports from Pakistan, overinvoicing of exports has become lucrative for exporters.

**Table 3: Total Exports Misinvoicing (1972-2013)**

(US\$ Billions)

	<b>Export Under-invoicing</b>	<b>Export Over-invoicing</b>
<b>Total</b>	18.04	28.9
<b>Average Annual</b>	0.4	1.07

Source: Authors' estimation.

## 6.2 Highest Misinvoiced Commodities

Table 4 lists the commodities with the highest amount of misinvoicing in their respective categories. In the category of under-invoicing of imports, electric machinery tops the list. The customs tariff on electric machinery was on average 75% in 1970s, 1980s and 1990s and dropped to 25% in the 2000s. Due to high customs duties in the earlier period, and being the second most imported item in Pakistan after oil, importers found it beneficial to underinvoice.

On the other hand, iron and steel was found to be the most overinvoiced import in the entire period. This finding gives the indication that the importers of iron and steel in Pakistan are indulged in the highest extent of over-invoicing for purposes such as flight of capital, benefitting from tax credits and earning black market premium in the past.

Linen was found to be most overall underinvoiced export from Pakistan followed by and under-garments. Both goods belong to the category of textiles, which is the sector that contributes highest in the exports of Pakistan. This shows that under-garments industry is availing illicit export subsidies and tax credits from the government by underinvoicing exports.

There is a lack of hindrance on overinvoice exports as exporter paltry pay 1% tax on exports proceeds. On the other hand, the benefits gained from export subsidies or black market premium are more than losses faced by paying higher export tax.

Interestingly, exporters of linen fabric appear to be least interested in availing export subsidies, they are engaged in the flight of capital. The main reason is that the linen industry which is dominant textile export industry accounts for more than \$3 billion exports annually. The linen exporters by fully availing export subsidies on account of performance requirement do not indulge into overinvoicing of exports to avail subsidies but they rather underinvoice exports for the purpose of capital flight.

**Table 4: Highest Misinvoiced Commodities (1972-2013)**

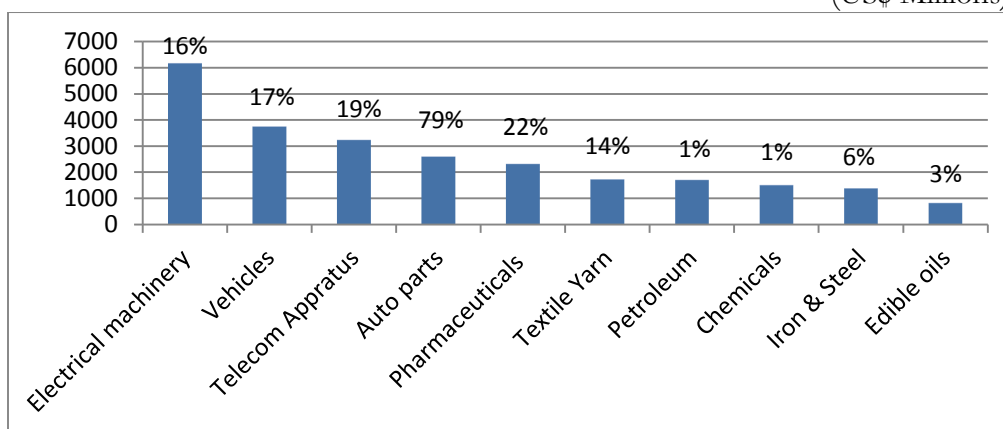
(US\$ Billions)

Type of Misinvoicing	Commodity
Highest Under-invoicing in Imports	Electric Machinery(6.1 )
Highest Over-Invoicing in Imports	Iron &Steel (1.2)
Highest Under-invoicing in Exports	Linen (2.59)
Highest Over-invoicing in Exports	Under Garments (4.9)

Source: Authors' estimation.

Top ten commodities that were under invoiced and overinvoiced during the total time period are shown in Figures 1 and 2. The percentages show the ratio of misinvoicing with respect to total imports/exports in that commodity, while the bar chart values depict misinvoicing in absolute term values.

**Figure 1: Underinvoicing imports: Top 10 Commodities (1972-2013)**  
(US\$ Millions)



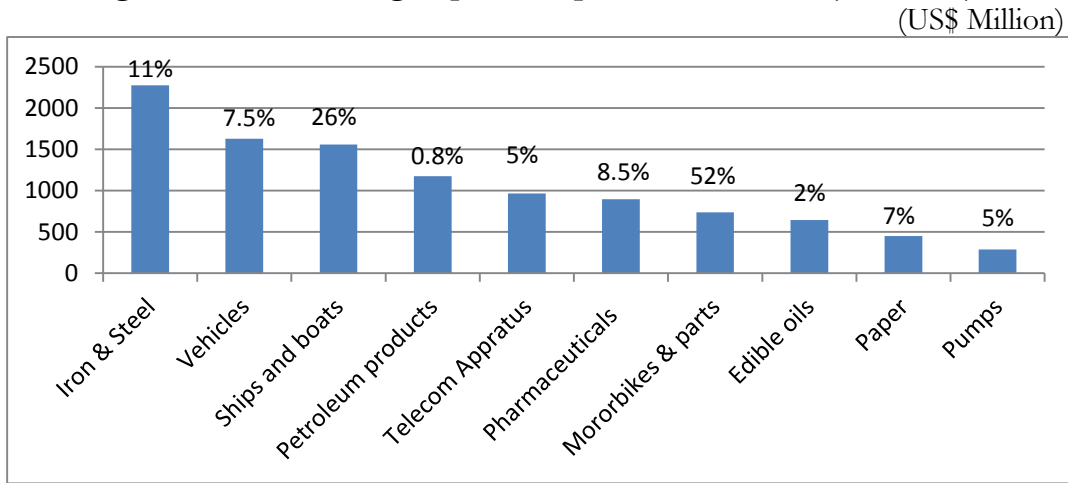
Source: Authors' estimation

Figure 1 shows that the electrical machinery is the highest underinvoiced imported item. However, as a ratio of total imports, automobile parts are the highest under invoiced commodity for the total period. Auto parts are mainly imported from Japan and bear an average tariff of 50%. Similarly, in absolute terms, vehicles are the second most underinvoiced imported good mainly due to the fact that the average tariff on vehicles is about 175%. Vehicles and their parts have remained a major source of revenue for the Pakistan government in the form of high customs tariff. Vehicles have seen tariff of up to 250% in the past, inducing importers to underinvoice.

Figure 2 shows that the highest overinvoiced imported commodity by ratio of total imports comes out to be motorbikes and their parts. Interestingly, motorbikes have average customs tariff of 95%, which makes it expensive for the importers to overinvoice it. Similarly, vehicles are the second most overinvoiced import in absolute terms and have very high tariff rate. These findings suggest that tariff structure is not a major deterrence or reason for overinvoicing and underinvoicing of imports. Thus, importers indulge in underinvoicing and overinvoicing of imports for gaining other malign objectives such as capital flight and reverse capital flight.



**Figure 2: Overinvoicing imports: Top 10 Commodities (1972-2013)**



Source: Authors' estimation.

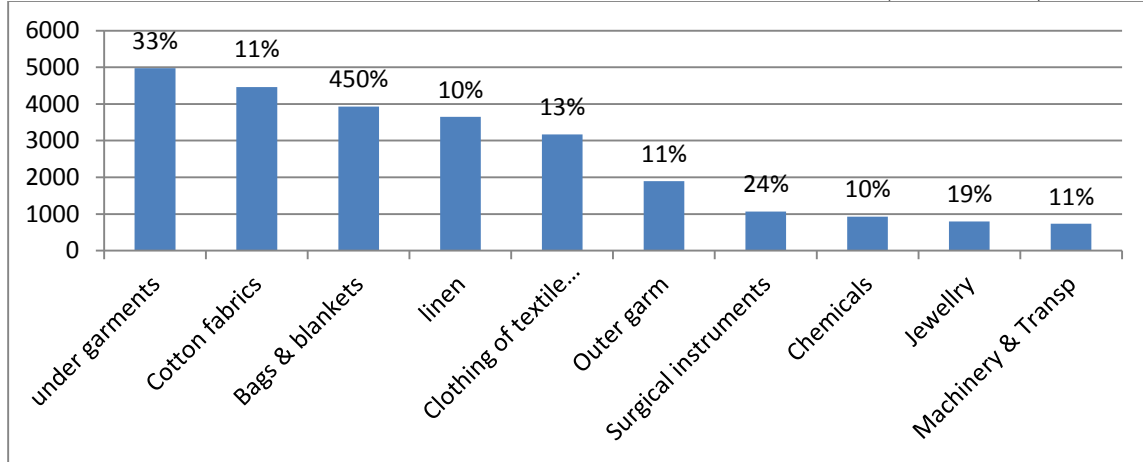
Black money holders transfer their capital out of Pakistan by using the services of major importers of vehicles and motorbikes in return of service fees. These findings show that the money launderers do not mind paying high amount of duties by overinvoicing vehicles and motorbikes, mainly due to the fact that those who transfer their black money abroad also pay such additional custom duties from their black money. Therefore, such high costs are bearable to them as long as they are successful in their task of capital flight.

Figure 3 shows the highest overinvoiced export in ratio of total exports is bags and blankets with a whopping figure of 450% in the total time period. Such high extent of overinvoicing is an outlier compared to all other estimations of this study. The total exports of bags and blankets industry in 2013 were \$57 million and if we account for such high overinvoicing then the actual figure might be much lower than reported.

This leads to the argument that for gaining export subsidies such as export refinance scheme which is linked with performance, the exporters of bags and blankets industry highly overinvoice their exports. It could be argued that the actual performance of bags and blankets industry is worse and they are the top beneficiary of export subsidies in Pakistan. Besides, reverse capital flight could be another reason for such high overinvoicing of exports.

**Figure 3: Overinvoicing of exports- Top 10 Commodities (1972-2013)**

(US\$ Million)

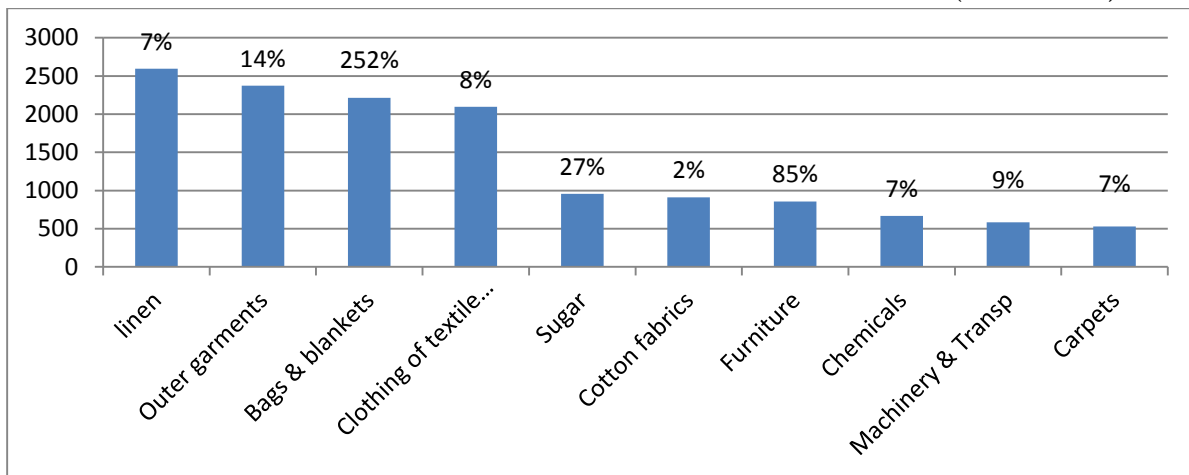


Source: Authors' estimation.

Figure 4 shows that bags and blankets are the most underinvoiced export with 252% of the total bags and blankets exports being underinvoiced in overall time period. This again leads to the earlier argument, that a same industry is being used to carry out both kinds of misinvoicing just like in imports (vehicles).

**Figure 4: Underinvoicing of exports- Top 10 Commodities (1972-2013)**

(US\$ Million)



Source: Authors' estimation.

Bags and blankets industry not only enjoys export subsidies from the government through overinvoicing but also carries out transfer of capital by severely underinvoicing its goods. Few manufacturers of bags and blankets might be linked with those who ought to transfer their capital

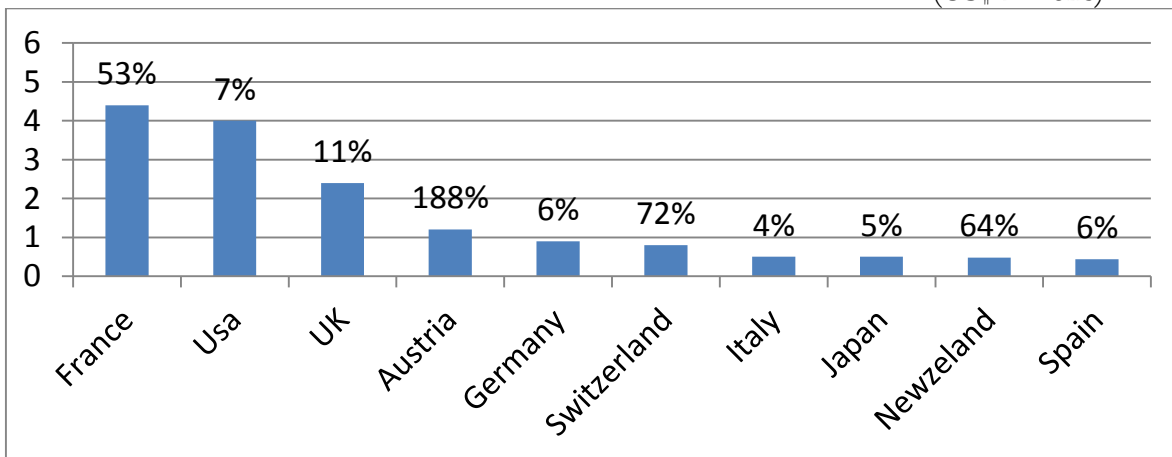
aboard, while other manufacturers are illegally availing export subsidies. European Union is the largest importer of bags and blankets from Pakistan and the analysis show that Pakistani capitalist and black money holders are transferring their capital to Europe.

### 6.3 Country-Wise Misinvoicing

As this study estimated trade misinvoicing with respect to commodities, similarly misinvoicing was estimated with respect to country as well. In each component of trade misinvoicing, the top ten countries with highest misinvoicing in terms of absolute numbers and ratio of total imports and exports are shown in Figures 5-8.

Figure 5 shows that France turns out to be the most popular destination for overinvoicing of exports in terms of ratio of total exports. France seems to be one of the most desirable places for illicit funds. We can argue that once the capital is arrived at France, then it is further transferred to other tax haven countries such as Switzerland, etc., famous for billions of dollars of illicit money deposited in their banking system. Moreover, France and other European Union countries are major importer of Pakistan’s Linen and garments. 27% of the linen imported in EU is from Pakistan. The high extent of overinvoicing in linen and outer garments is evidence of the fact that major destination of overinvoicing of textile industry is France, UK, Germany, Austria, etc.

**Figure 5: Underinvoicing of Exports- Top 10 Destinations (1972-2013)**  
(US\$ Billions)



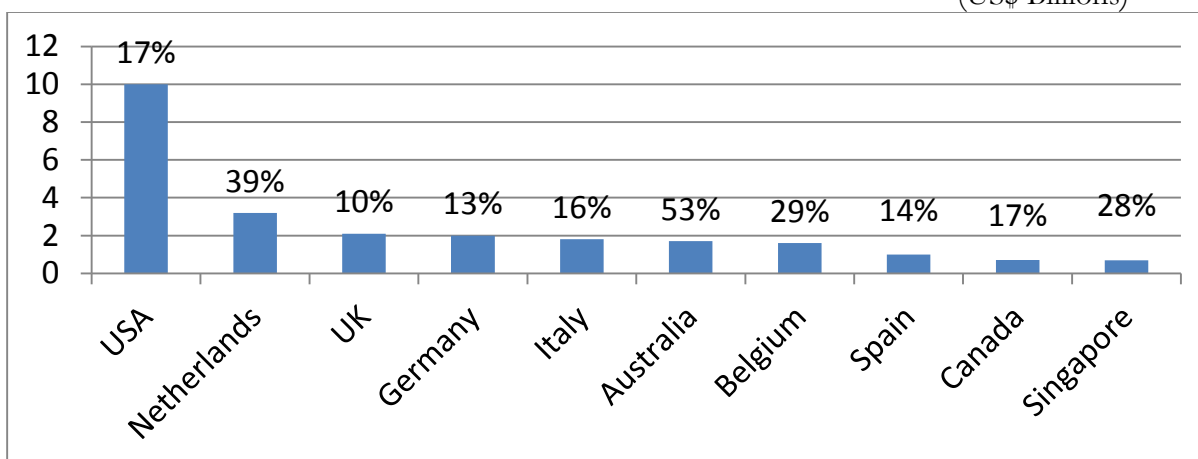
Source: Authors’ estimation

USA on the other hand is the top destination for underinvoicing in absolute terms. One of the reasons can be the fact that the USA is one of the major trading partners of Pakistan with \$3.6 billion exports to the USA from Pakistan in 2013. Furthermore, Pakistan majorly exports linen and

outer garments to the USA and it supports the estimation that shows outer garments and linen as amongst the highest underinvoiced commodities.

Figure 6 shows the top destinations for underinvoicing of exports in the overall period. USA is again at the top position in absolute number. This finding can be related with Mahmood (2013) who argued that the people bring back their money to Pakistan when they deem that the socio-political factors are favorable. Hence, the large amount of capital that is transferred to the USA in hard times is brought back in the country during favorable times.

**Figure 6: Overinvoicing of Exports- Top 10 Destinations (1972-2013)**  
(US\$ Billions)



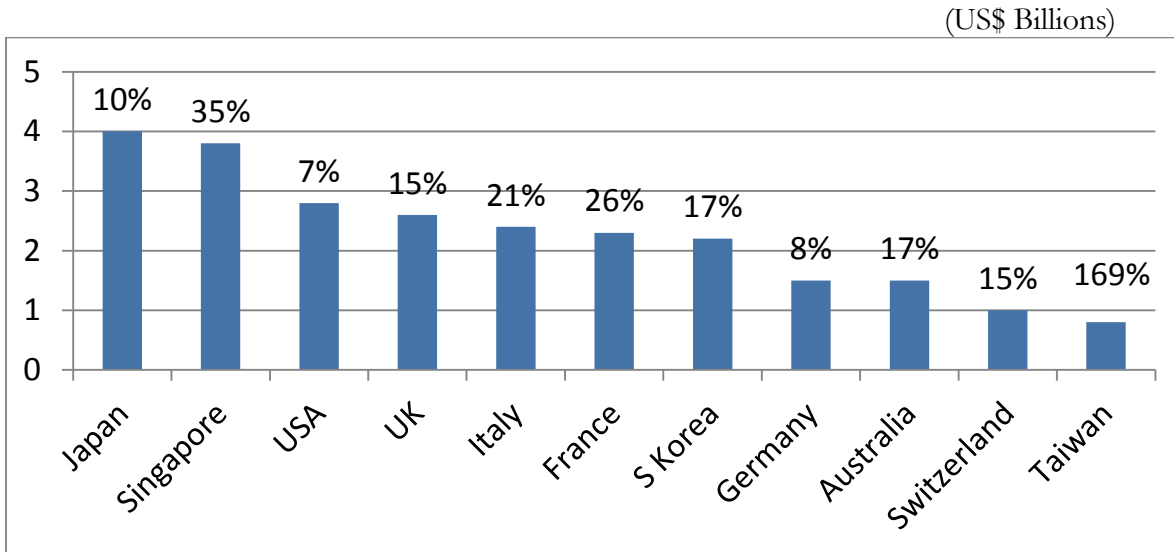
Source: Authors' estimation

Australia is the top destination in terms of ratio of total exports and Pakistan major exports to Australia are bed linen and rice. The results show that rice is the 17<sup>th</sup> most overinvoiced export from Pakistan. It can be inferred that large extent of overinvoicing that is carried out in rice is performed with Australia. Moreover, cotton fabrics and outer garments are also amongst the top exported commodities to Australia, which are amongst the top overinvoiced commodities.

On the imports side, Figure 7 shows the top ten destinations for underinvoicing of imports. Highest extent of imports underinvoicing was recorded with Japan along with highest overinvoicing of imports was also estimated to be conducted with Japan. The results show that vehicles, parts of vehicles, motorbikes and their parts are the highest underinvoiced and overinvoiced imports (Figures 7 and 8). As Japan is the largest exporter of the above goods to Pakistan, the notion is justified that Japan comes out to be the most favorite destination in absolute numbers. However,

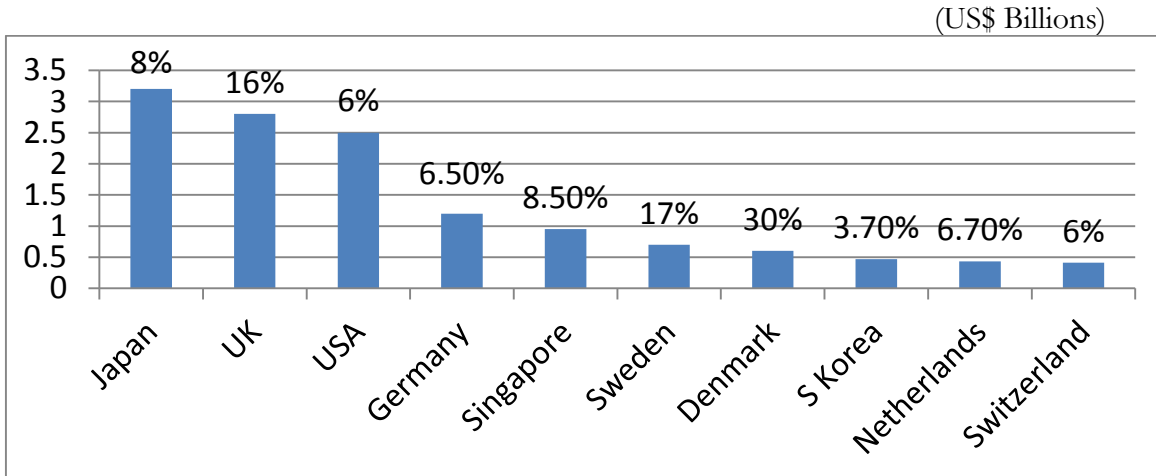
Taiwan is the top destination in terms of ratio of total imports with a huge figure of 188%. Textile yarn was the most underinvoiced import from Taiwan.

**Figure 7: Underinvoicing of imports: Top 10 Destinations (1972-2013)**



Source: Authors' estimation

**Figure 8: Overinvoicing of imports: Top 10 Destinations (1972-2013)**



Source: Authors' estimation

#### 6.4 Gross Revenue Losses

This section presents the estimates for the loss in revenue that was incurred by the government of Pakistan in terms of evasion of customs tariff by the importers. Table 5 shows the losses incurred to the national exchequer due to under-invoicing of imports to less payments in the

form of customs duties. In total, \$21.2 billion is the mammoth amount of revenue loss that the national exchequer has incurred from 1972-2013 according to my estimation. While the government of Pakistan faces an average annual revenue loss of \$0.5 billion.

**Table 5: Gross Revenue Losses (Underinvoicing of Imports) (1972-2013)**  
(US\$ Billions)

	<b>Losses due to Underinvoicing of imports</b>
<b>Total</b>	21.2
<b>Average Annual</b>	0.5

Source: Authors' estimation

The gross revenue losses due to underinvoicing of exports are those potential revenues that could have been gained from withholding tax on export proceeds if the exports would not have been underinvoiced. The total revenue loss is estimated at \$0.18 billion with an annual average of \$4.4 million (Table 6).

**Table 6: Gross Revenue Losses (Underinvoicing of Exports) (1972-2013)**  
(US\$ Millions)

	<b>Losses due to Underinvoicing of Exports</b>
<b>Total</b>	180
<b>Average Annual</b>	4.4

Source: Authors' estimation

### 6.5 Gross Revenue Gains

Following section analyzes the gross revenue gains incurred to national exchequer due to trade overinvoicing. Table 7 shows the sum of gross revenue gains to the national exchequer due to higher payments in the form of customs duties. The gross revenue gain turned out to be \$10.4 billion for the overall period while annual average gains are estimated at \$0.26 billion.

**Table 7: Gross Revenue Gains (Overinvoicing of Imports) (1972-2013)**  
(US\$ Billions)

	<b>Gains due to overinvoicing of Imports</b>
<b>Total</b>	10.4
<b>Average Annual</b>	0.26

Source: Authors' estimation

The revenue gains incurred from the overinvoicing of exports are in the form of 1% withholding tax that is received on almost all of the export proceeds in Pakistan. Table 8 depicts that the total revenue gain accounted was \$0.29 billion in the overall period as exporters paid higher taxes by overinvoicing their exports.

**Table 8: Gross Revenue Gains (Overinvoicing of Exports) (1972-2013)**  
(US\$ Billions)

	<b>Gains due to overinvoicing of Exports</b>
<b>Total</b>	0.29
<b>Average Annual</b>	0.01

Source: Authors' estimation

### 6.6 Net Revenue Loss

Net revenue loss depicts the figure that is obtained after subtracted the gross revenue losses from gross revenue gains and are shown in Table 9. The total net revenue loss that national exchequer incurred in the form of potential customs duties and export withholding tax is estimated at \$11 billion, while the average annual net revenue loss is estimated at \$0.26 billion.

**Table 9: Net Revenue Loss (1972-2013)**  
(US\$ Billions)

	<b>Gross Revenue Loss</b>	<b>Gross Revenue Gains</b>	<b>Net Revenue Loss</b>
<b>Total</b>	21.3	10.4	11
<b>Average Annual</b>	0.5	0.26	0.26

Source: Authors' estimation

## 7. Conclusion & Policy Implications

This study has identified that not only there exists high extent of misreporting of traded commodities in Pakistan but the losses incurred by the government in terms of potential customs duties and exports withholding tax are also in huge sum. Estimates show that annually about two hundred and twenty five billion rupees worth of goods are misinvoiced. Trade misinvoicing is not only a major source of capital flight and reverse capital flight but it also deprives national exchequer of more than twenty six billion rupees per annum in net revenue loss. Consequently, trade policies

devised in the presence of misinvoicing are bound to be impotent. Hence, to make trade policies effective and current account balance reflecting the true picture, it is imperative that trade misinvoicing is eliminated

To eliminate trade misinvoicing, following policy implications are drawn from the analysis:

- Discourage export overinvoicing by devising a policy in which all exporters are awarded concessional credit without any discrimination.
- Pakistan Customs should require the submission of verified invoice from the customs of the partner country.
- High tariffs and NTBs encourage this menace. Therefore, a policy of meaningful trade liberalization needs to be pursued.
- Export rebates should be granted only to achieve export performance of non-traditional products. They should not be given under the threat or pressure from the industry.
- Introduce proper scrutiny of products subject to reimbursement of General Sales Tax and Federal Excise Duty with updated input-output coefficients system.
- Take punitive actions against top misinvoicers and start strict scrutiny of top exports and imports such as linen and under garments. Scrutinize and enforce strict monitoring for all goods exported or imported from countries identified as the major sources of misinvoicing.



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**Appendix A: List of commodities used in the estimation of import misinvoicing & average tariff thereon**

<b>SITC Rev 3 CODE</b>	<b>Commodity Description</b>	<b>Average Tariff (Percentage)</b>
112	Alcoholic Beverages	100
111	Non-Alcoholic Beverages	30
512	Chemicals	30
02	Dairy & Eggs	45
411	Animal Fats and Oils	20
95	Firearms and Ammunition	60
7328	Auto Parts	50
72	Electrical Machinery	30
7118	Engines	25
7329	Motorbikes and their parts	95
7192	Pumps	35
735	Ships and boats	25
724	Telecom Apparatus	50
732	Vehicles	175
684	Aluminum	50
682	Copper	35
67	Iron and Steel	50
664	Glass	40
621	Materials of Rubber	25
641	Paper	60
65	Textile yarn, fabric and thread	50
6291	Tyres	40
84	Clothing	75
82	Furniture	75
864	Watches and Clocks	50
33	Petroleum products	40
54	Pharmaceuticals goods	25
12	Tobacco	100

Note: 15% sales tax was used as average for all the commodities and for all the time period. Edible oil were not incorporated in the revenue loss methodology because the tariff on edible oil is specific and not ad-valorem, hence an average tariff based on invoices of goods cannot be estimated.

**Appendix B: List of Commodities used in the estimation of export misinvoicing**

<b>SITC Rev 3 Code</b>	<b>Commodity Description</b>
1	Beverages
5	Chemicals
8411	Clothing of textile material
84144	Outer garments
84143	Under garments
03	Fish
05	Fruits and vegetables
01	Rice
075	Spices
06	Sugar
85	Footwear
82	Furniture
897	Jewelry
611	Leather
7	Machinery & Transport
54	Pharmaceutical goods
2631	Raw Cotton
8944	Sports good
8617	Surgical goods
656	Bags and Blankets
657	Carpets and rugs
652	Cotton fabric
6537	Knitted fabrics
65691	Linen

**Appendix C: List of countries used in the estimation of trade misinvoicing**

Australia, Austria, Belgium, Canada, Denmark, France, Germany, Italy, Japan, Netherlands, Norway, New Zealand, Portugal, S Korea, Singapore, Spain, Switzerland, Taiwan, UK, USA
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