Trade misinvoicing:
A channel for de facto capital account openness

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Abstract

In this paper we examine trade misinvoicing as a means of evading capital controls. With the trade liberalisation that has taken place in most emerging markets, and with an outlook of high GDP growth in many of these countries, traditional explanations for trade misinvoicing such as high custom duties and weak domestic economies cannot explain the misinvoicing witnessed today. We construct a multi-country dataset over a 26 year span, covering both industrialised and developing countries to study this phenomenon. The scale of misinvoicing that is observed is large when compared with capital flows. The incentives created by capital controls coupled with the opportunity offered by trade liberalisation play an important role in explaining trade misivoicing.

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Contents

1 Introduction

Trade misinvoicing refers to misreporting of trade data either by the exporting country or the importing country. A firm interested in moving capital out of the country would underinvoice its exports and bring less foreign exchange into the country than it has earned on its exports. Similarly, over-invoicing of imports would allow the domestic importer to gain access to greater foreign exchange than required, which can then be used to acquire foreign assets.

A number of developing countries continue to have capital controls and fairly closed *de jure* closed capital accounts. However, the current account has been opened up in most countries, and the current account has grown considerably when compared with GDP in most countries. In this environment, misinvoicing provides an opportunity for evading capital controls.

The traditional literature on trade misinvoicing focussed on two reasons for misinvoicing. The trade literature focussed on import misinvoicing due to high custom duties. The literature on indebted countries such as those in Africa looked at misinvoicing as a means for achieving capital flight.

In the trade literature the focus was on importers trying to avoid paying high custom duties. The empirical evidence supports this hypothesis. In addition, capital flight is motivated by prospective losses that can arise from nationalisation or confiscation of wealth, imposition of excessively high tax rates and duties as well as expectations of an impending deterioration in economic health due to unsound macroeconomic policies. This literature focussed, therefore, on specific countries that had weak economies such as those of Africa, and documented the role that misinvoicing was playing in enabling capital flight.

By the logic of this traditional literature, when economies like India and China achieved high GDP growth and cut customs duties, the motivation for misinvoicing should have subsided. The evidence on trade misinvoicing for these countries, however, suggests that this is not the case. There is hence a need to revisit the question of what causes misinvoicing, in the context of the new policy environment of developing countries where trade liberalisation has taken place, where there is a bright economic outlook, but capital controls continue to exist.

There is now a evolving recent literature that is linking trade and capital account openness. This paper contributes to this literature, by focusing on the extent to which misinvoicing is motivated by the desire to avoid capital controls, and the extent to which misinvoicing constitutes an important element of *de facto* convertibility. In countries with an open trade account, the ability to misinvoice offers a means of evading controls and renders

capital controls ineffective. As a consequence, despite the *de jure* closed capital accounts, in *de facto* terms the capital account is much more open. The evidence presented by this paper thus contributes to the debate on capital account convertibility.

The data on misinvoicing used in earlier studies is usually limited to a few countries or a continent. We construct an original data set for about 50 major countries over the last 26 years and evaluate the extent of trade misinvoicing. The dataset covers industrialised and developing countries, and has measures of misinvoicing against the world as well as industrialised countries.

By looking at both industrialized and developing countries we are able to identify the principal factors affecting capital mobility through trade misinvoicing. A key source of variation in our dataset is the heterogeneity in current account and capital account opening. During the period that we focus on, a number of industrialised countries underwent significant liberalisation of the trade and financial account. On the other hand, the emerging markets although witnessed significant liberalization of the trade account, a number of them moved relatively slowly in opening the capital account. Thus we are thus able to isolate the impact of a liberalised capital account on trade misinvoicing.

We use this dataset to identify the principal determinants of trade misinvoicing. The existing literature has found that external debt, inflation, current account deficit, custom duties, interest rate differential, real interest rate etc are some of the key determinants of trade misinvoicing. After controlling for these, we explore the role of *de jure* capital controls. We find that more onerous capital controls are associated with larger misinvoicing.

We, thus, contribute to the existing literature on trade misinvoicing in a number of ways. We work with a broader dataset than has been generally used in the literature. Most of the existing literature has focused on countries from Africa and Latin America. We extend the dataset by looking at a number of countries from South and East Asia, as well as Eastern Europe. We include a number of industrialized countries in our dataset, which have not featured in most of the existing literature on capital flight. We also examine additional variables such as custom duties, tax rates, capital controls, political stability, economic stability, law and order etc. as potential determinants of trade misinvoicing. We analyse misinvoicing from the viewpoint of *de facto* convertibility.

The remainder of this paper is organised as follows. Section 2 presents a brief review of the existing literature. In Section 3, we describe the multicountry data set. Section 4 and Section 5 present evidence about India and China from this database, as examples which illustrate the reasoning of the paper.

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Simple graphical analysis is shown in Section 6 and Section 7 examines the data using statistical models. Section 8 concludes.

2   Literature review

Trade misinvoicing has been used as a way of measuring capital flight (Claessens and Naude, 1993). Trade misinvoicing is computed by examining the trade data from both the importing and exporting country. Importers resort to capital flight by reporting higher values of imported goods compared to the values reported by the exporters. Similarly, exporters engage in capital flight by under reporting the value of goods exported than the importers of these goods. Both export underinvoicing and/or import overinvoicing and facilitate capital flight as both these malpractices provide channels to siphon domestically accumulated wealth outside the country.

Countries with high custom duties are also susceptible to misinvoicing. According to Boyce and Ndikumana (2001) evasion of import restrictions and customs duties are a principal motivation for trade misinvoicing among 25 low income sub-Saharan African countries. Schulze (1994) concludes that an importer interested in maximizing profits would typically either over- or underinvoice. The direction of misinvoicing depends on rates of taxes and duties at home relative to abroad while the the extent of misinvoicing is influenced by probability of detection and the degree of penalty. A number of papers including de Boyrie *et al.* (2007) and Beja *et al.* (2005) have shown that countries, which impose a high tax on imports in the form of customs and other duties are also likely to face capital flight.

The ability to achieve capital flows through misinvoicing increases with the extent of trade openness. When gross flows on the current account are 50% of GDP, average misinvoicing of 10% yields capital flows of 5% of GDP. This rises to capital flows of 10% of GDP when gross flows on the current account reach 100% of GDP.

In countries with restrictions on flow of capital, agents can move capital in and out of the country by misreporting their trade transactions. Thus there exists a strong linkage between trade openness and *de facto* financial openness. Aizenman and Noy (2008) find that one standard deviation increase in commercial openness is associated with 9.5% increase in financial openness. Moreover, *De facto* financial openness has strong implications for future trade openness. Aizenman (2004) argues that greater trade integration in countries, which resort to financial repression thereby creating an impetus for capital flight, raises the cost of enforcing capital controls by creating greater opportunities to shift capital through trade misinvoicing.

Countries are likely to witness greater capital flight if they experience greater economic instability. Typically, economic instability can manifest itself in a number of ways like persistently high current account deficit, budget deficit and public debt. High budget deficits and public debt may encourage capital flight by inducing expectations of future taxes. Another critical factor influencing trade misinvoicing 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. The large outflow of capital from the Latin American countries in 1980s and Asian economies in late 1990s was largely due to macroeconomic instability.

Apart from macroeconomic instability, several institutional factors also exert significant influence on capital flight. First and foremost is the degree of political stability. Economies characterized by high political instability are likely to witness greater capital flight as when different governments with support from different interest groups come into power, there is an increase in the risks and uncertainty regarding fiscal policy outcomes. Lensink *et al.* (2000) argue that political instability also raises the possibility that the government may erode the future value of asset holding by raising economic instability.

Tax rates also have a strong influence on the degree of capital flight. Countries which levy higher tax rates (both corporate and personal tax) are likely to encounter greater capital flight to countries of relatively low tax rates. Loungani and Mauro (2002) show that relatively high and unevenly forced tax rates were one of the causes for capital flight from Russia.

We also expect countries imposing capital controls with the objective of earning seignorage revenue to witness capital flight.

The empirical literature has hitherto focused on this mixture of economic instability and customs duties as the rationale underlying misinvoicing. The empirical findings have been mixed due to the their sensitivity to the set of countries and period of analysis. A large number of these studies have focused on Latin American economies, which experienced massive amounts of capital flight during the debt crisis. Cuddington (1986) and Cuddington (1987) focus on countries like Argentina, Brazil, Chile, Columbia, Mexico and Venezuela over the period 1974-84 and find that apart from domestic interest rate and foreign interest rate, the difference between the two, corrected for exchange rate, is an important determinant of capital flight.

Ketkar and Ketkar (1989) focuses on the three large Latin American economies i.e. Argentina, Brazil and Mexico and find that apart from the other factors, the real interest rate is also a significant predictor of capital flight. They use a simple interest rate spread between the domestic and foreign assets (without correcting for the exchange rate) and find it to have a significant impact

on capital flight. Using a broader dataset from 1973-87, Pastor (1990) finds that in addition to the above variables, the budget deficit has a positive impact on capital flight while growth rate of the the real economy has a negative impact. These variables are also found to be significant for 4 Latin American economies and Philippines in a study by Muscatelli and Hallett (1992).

Another region which suffered from capital flight over the last two decades and has been a subject of intense study is sub Saharan Africa. Moreover, given the low level of development in this area, the relative burden of capital flight has been very high on these economies. Hermes and Lensink (1992) focus on Nigeria, Sudan, Tanzania, Zaire, Uganda and Cote d'Ivoire over the period 1978-88 and find that capital flight in these countries can be largely explained by ratio of external debt to GDP and the real effective interest rate are the key predictors of capital flight. A number of other variables, like the difference between domestic and foreign interest rates, corrected for exchange rate, growth rate of real GDP, share of foreign aid to GDP and the ratio of short term debt to GDP, are found to not significantly incfluence capital flight. Murinde *et al.* (1996) repeat the analysis for the same set of countries using a broader time frame i.e. 1976-91 and find that only the ratio of external debt to GDP exerts a significant positive influence on capital flight.

In a more recent paper Ndikumana and Boyce (2002) focus on a large sample of 30 sub Saharan African economies over the period 1970-96. Using dynamic panel techniques they conclude that both one period and two period lagged capital flight have a strong impact on current period's capital flight. Other variables that have a positive impact on capital flight include debt to GDP ratio, total external debt service as a percentage of GDP and corruption. On the other hand, political freedom and a measure of voice and accountability have a significant negative impact on capital flight. Interestingly, they find that budget deficit has a negative impact on capital flight.

Employing cumulative distribution function and the residual method to look at capital flight across 85 developing countries over the period 1971 to 1991, Hermes and Lensink (2001) conclude that capital flight is positively influenced by a number of factors including bank and trade related lending as a percentage of GDP and share of aid to GDP. Moreover, uncertainty related to budget deficit, government consumption expenditure, inflation, real interest rates and taxes also have a significant positive impact on capital flight.

Apart from these cross country studies there have also been a spate of individual country studies. The countries of interest have been largely from Latin America, Asia and Africa. A number of these studies have focused on

the Philippines. In one of the earlier studies on the Philippines, Vos (1992) focuses on the period 1971-88 and finds that the ratio of debt to GDP, real effective exchange rate, spread between the domestic and foreign interest rate and the stock of capital flight are the principal determinants of capital flight. However, when Boyce (1002) repeats the exercise covering an earlier time frame, i.e., 1962-88, he finds that apart from the ratio of debt to GDP, only real interest rate and budget deficit have an impact on capital flight.

Focusing on Malaysia, Duasa (2004) concludes that the capital controls imposed in the country in the wake of the financial crisis of 1997 were effective in reducing capital flight due to trade misinvoicing. However, the reduction in capital flight was achieved only for a couple of years as private players found newer ways of taking capital out, and the amount of capital that moved out of Malaysia in 2001 and 2002 were higher than pre-1996 levels.

Studies focusing on Africa have typically found that inflation and the difference between domestic and foreign interest rate corrected for exchange rate are the principle determinants of capital flight. For e.g. Ngeno (2000) concludes that apart from the above factors, real effective exchange rate has a strong impact on capital flight from Kenya, while political risk is a crucial determinant in explaining capital flight from Tanzania, according to Nyoni(2002).

In a recent set of papers, Aizenman (2003) and Aizenman and Noy (2004) describe the two-way links between trade liberalisation and capital account liberalisation. Wei and Zhang (2007) show that capital controls impede trade. Our work contributes to this emerging literature, where trade liberalisation and capital account liberalisation are seen as closely inter-related.

3 The Data

3.1 Misinvoicing Measures

Trade misinvoicing can take place either through export and import overinvoicing or underinvoicing. We measure trade misinvoicing by using data from IMF's *Data on Trade Statistics* (DOTS) CD ROM. The DOTS database reports bilateral merchandise exports and imports data between trading partners.

Ideally exports from country A to country B (including the cost of insurance and shipping *(cif)*) should match imports of Country B from Country A. If *cif* claimed exports from Country A to B are less than the claimed imports of Country B from A then the difference can be attributed to export underinvoicing by Country A, or import overinvoicing by Country B. We calculate

the the insurance and shipping cost or cif/fob ratio for each country for each year, from the same data base.

The discrepancy between data from an importer and the data from the exporter could be attributed to mistakes in recordkeeping. However, if the errors in recordkeeping take place randomly and have mean zero, then averaging these across millions of containers should yield very small discrepancies at an aggregative level. Further, when we examine misinvoicing measures between industrial countries – where both the importer and the exporter are countries with good governance and extensive IT systems – misinvoicing measures do not drop to zero.

Our dataset comprises 53 countries over the 26 year period 1980-2005. The dataset includes 18 industrialized countries and 35 developing countries.[1] We take top countries in terms of GDP. Consequently, these countries constitute more than 95% of global GDP in exchange rate terms and over 91% of GDP in terms of purchasing power parity.

We include a long enough time period so that a number of important changes that took place during this period are accounted for. The decade of 1980s and 1990s saw widespread trade liberalization in both industrialized and developing countries. Under the aegis of the WTO and its predecessor GATT, tariff barriers were significantly reduced in both developed and developing countries. Furthermore, given the success of several East Asian countries, which adopted outward oriented approach, a number of developing countries adopted a more liberal trade regime. In contrast, the path towards greater capital account liberalization has not been smooth and several countries resorted to capital controls in the aftermath of a crisis or external shock. These include Brazil after the crisis ending the real Plan in 1999, Malaysia and Thailand after the Asian crisis in 1998, Spain after the ERM crisis in 1992 etc.

We measure misinvoicing *vis-á-vis* industrialized countries and the world. We separately look at misinvoicing *vis-á-vis* industrial country trade data, for trading partner data comparisons, on the assumption that industrial country trade statistics are more accurately recorded in the IMF DOTS database. Figure 1 describes the kernel density plots of export and import misinvoicing measures. In the figures below, the solid black line represents the density plot for industrialized countries, while the red dashed line refers to the developing countries. The vertical yellow lines exhibit the 2.5% and 97.5% boundaries for the industrialized countries.

Comparing the density plots of the developing countries with the industrialized countries, it is clearly evident that a sizeable proportion of observations for developing countries lie outside the 95% interval for the industrialized
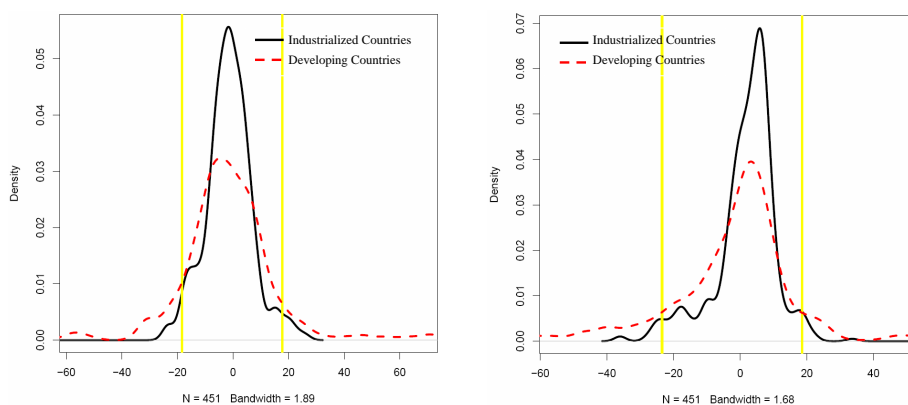
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[1]The list of countries is given in Appendix A.

Figure 1: Kernel Density Plots of Invoicing Measure
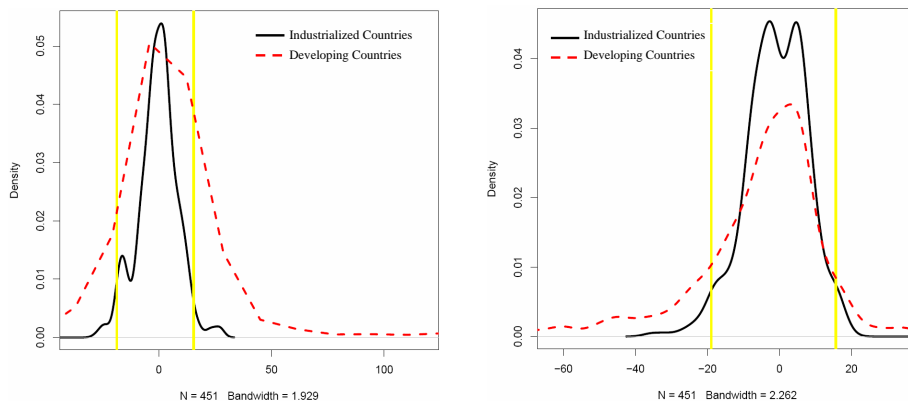
(a) Export Misinvoicing *vis-á-vis* ICs

(b) Imports Misinvoicing *vis-á-vis* ICs

(c) Exports Misinvoicing *vis-á-vis* World

(d) Imports Misinvoicing *vis-á-vis* World

countries. This pattern is uniform across export and import misinvoicing *vis-á-vis* industrialized countries as well as the world. Thus the extent of misinvoicing seems to be significantly higher amoung developing countries compared to industrialized countries.

The extent of misinvoicing has steadily decreased in industrialized countries over the last 25 years. Figure 2 traces the path of export misinvoicing across 6 countries – 3 industrialized countries and 3 emerging markets. Around 1980 the United States was experiencing export underinvoicing worth of more than 14% of its exports. However, over the next 25 years this has steadily declined to less than 1% in 2005. Similarly, Italy and France, which experienced capital flight through export underinvoicing in early 1980s saw a reversal in its trend since 1992 onwards as capital started flowing into these economies through trade misinvicing. A similar pattern of decline in capital

flight through export misinvoicing was also witnessed in other industrialized countries like Spain, Netherlands, Finland and Canada.

In contrast, the decline in capital flight through export underinvoicing in developing countries was nowhere as dramatic as in the industrialized countries. In fact the evidence from developing countries is quite mixed. While some countries like India and Philippines witnessed a decline in export misinvoicing between 1980 and 2005, others like Brazil, Chile an Colombia did not experience a significant decline. On the hand, several countries like Indonesia, Thailand and Malaysia saw an increase in capital flight through export misinvoicing.

Focussing on import underinvoicing also yields a similar picture whereby the developed countries witnessed a strong decline in capital flight through import underinvoicing during the period 1980-2005 whereas the developing countries provide a mixed response.

Figure 2: Export Misinvoicing as a percentage of Exports (1980-2005)

(a) United States

(b) France

(c) Italy

(d) India

(e) Brazil

(f) Indonesia

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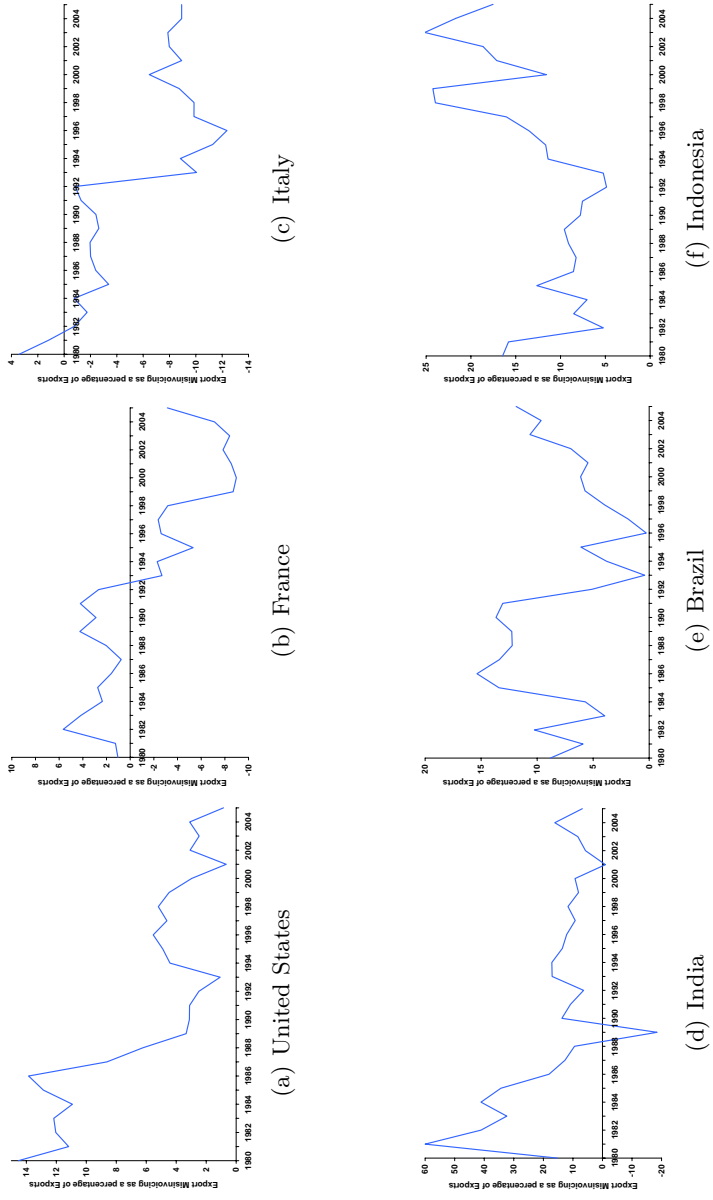
3.2 Other Variables

The average custom duties is calculated by looking at the ratio of total customs revenue calculated on merchandise goods to the value of merchandise goods being imported into the country. As defined by the World Development Indicators customs duties refer to all levies collected on goods entering the country or services delivered by nonresidents to residents. They include levies imposed for revenue or protection purposes and determined on a specific or ad valorem basis as long as they are restricted to imported goods or services. However, given that an overwhelming majority of custom duties are levied on merchandise goods, we normalize the revenue collection by total merchandise imports. Data on both custom duties and merchandise trade is taken from the *World Development Indicator.*

Political Stability variable is taken from the *Intra Country Risk Guide.* This variable is made up of 12 weighted components including government stability, socio-economic conditions, investment profile, internal and external conflicts, corruption, law and order and ethnic tensions, among others. Across all these sub categories a low score implies greater risk. Overall, the political stability variable ranges from 0 to 100 with a higher score reflecting a more stable regime.

Although corruption forms a part of the political stability measure we employ, we also separately look at the impact of corruption on trade misinvoicing. By distorting the economic and financial environment through allowing people to assume positions of power through patronage than ability, increasing the pervasiveness of bribes connected with licenses, tax assessments, police protection etc., corruption is likely to lead to capital moving out of the country. The corruption measure employed in the paper is more concerned with corruption in the form of excessive patronage, nepotism, job reservations, secret ties between government and business etc. The corruption measure is also taken from Intra Country Risk Guide and goes from 0 to 6, with a higher number indicating a less corrupt regime. Again, with a view of making it more intuitive we take the inverse of this measure so that a higher number refers to greater corruption.

Data on inflation is taken from the *World Development Indicators* with inflation being measured as the annual growth rate of the GDP implicit deflator. The GDP implicit deflator is the ratio of GDP in current local currency to GDP in constant local currency. We consider the log of average inflation instead of the level of inflation as a few countries in the sample have extremely high average inflation rates. Thus the parameter estimates from a regression would be determined by a handful of observations.

We measure the real interest rate by looking at the difference between nom-

inal deposit rate and the inflation rate based on GDP deflator. Data on nominal deposit rate is taken from the *World Development Indicators*. The real interest rate differential is calculated is the difference between real deposit rates in the home country and a risk free real interest rate. We proxy the risk free real interest rate with real deposit rates prevailing in the United States. Thus a positive real interest rate differential implies that the risk free real interest rate is higher than interest rates prevailing in the home country.

Extent of *de jure* capital account liberalization is measured using the Chinn-Ito index, developed by Chinn and Ito (2006), to measure capital account liberalization. The index is the first principal component of the binary variables pertaining to cross border financial transactions, based on the International Monetary Fund's (IMF) categorical enumeration reported in Annual Report on Exchange Arrangements and Exchange Restrictions (AREAER). This is a compilation of four dichotomous variables accounting for restrictions on capital account transaction, current account transactions, requiring surrendering of export proceeds, and the presence of multiple exchange rates. Since these four binary variables account for the degree of control than openness, Chinn and Ito flip their values and construct an index based on the standardized principal components. The index ranges from -2.54 to 2.54 and a higher value of the index indicates greater financial openness.

The current account balance is defined as the sum of net exports of goods, services, net income, and net current transfers, with a positive number indicating a current account surplus. Data for current account balance is also taken from the *World Development Indicators*. We look at the ratio of the current account balance to GDP. Since capital flight is concerned with countries exhibiting current account deficit, we take the inverse of the ratio of current account balance to GDP such that a positive number reflects a current account deficit. Data on GDP is also taken from *World Development Indicators*.

To control for the exchange rate regime, we use the exchange rate index formulated by Levy-Yeyati and Sturzenegger (2005), which is a *de facto* classification based on data on exchange rates. The index ranges from 1 to 5 with a lower number implying a more flexible exchange rate regime.

Data on trade openness and external indebtedness is also taken from the *World Development Indicators*. While trade openness is calculated by summing up the share of imports and exports of goods and services in GDP, external indebtedness is defined as debt owed to nonresidents repayable in foreign currency, goods, or services. External debt comprises public, publicly guaranteed, and private non-guaranteed long-term debt, use of IMF credit, and short-term debt.

We take the data on overvaluation of currencies devloped in Johnson *et al.* (2007). Begining from 1990, the authors run a cross-section regression of the log of a country's price level relative to the United States on the country's per capita GDP in PPP terms. The Balassa-Samuelson effect implies that as per capita GDP of a country increases the real exchange rate, given by the relative price level vis-á-vis the US, should appreciate. The predicted value of the above regression is then taken as the equilibrium exchange rate and the difference between the predicted and actual exchange rate is a measure of overvaluation.

4   Example: Misinvoicing in India

In this section we focus on India's experience with capital flight through misinvoicing. This extends the earlier work of Mishra *et al.* (2007); Patnaik and Vasudevan (2000) on related issues.

Prior to the reforms of 1991, India had an extremely restrictive external sector regime. On the eve of the reforms, the import weighted average of tariffs for all imports stood at 87%, with tariffs on some imports exceeding 350%. Thus there was a tremendous incentive to misinvoice imports to evade custom duties. By 1990, imports of nearly 65% of all products and 90% of manufacturing were subject to non-tariff barriers.

The post 1991 reforms were aimed largely at liberalising the current account. There was a significant reduction in list of imports subject to any quantitative restrictions, with most of the capital and intermediate goods being removed from the list. In 1993 the rupee was made convertible for current account transactions. A conscious policy to reduce maximum tariffs in a phased manner was combined with a reduction in average level of tariffs as well as reduced dispersion of rates of tariffs. From a high of 355% in 1990-91, the maximum tariff rate was reduced to 45% in 1997-98. Similarly, the import-weighted average tariff fell to 24.6% in 1996-97 from 87% in 1990-91.

The other motivation for trade misinvoicing as described above is to engage in capital flight due to economic instability in the country and the fear of appropriation of assets by the state. However, as can be seen from Table 4 there has been a significant improvement in the overall economic scenario since 1992. In terms of the economic stability measure developed by the *Intra Country Risk Guide*, India's overall score has jumped by more than 10 points from 25.5 in 1992 to 36 in 2005. Real GDP growth rate has been extremely healthy during the past few years, and the Indian economy has grown consistently over 8% since 2003. After being in deficit for most of the 1990s, the current account registered a surplus during 2001-02 to 2003-04 due to a jump in services' exports. Although rising merchandise imports and

declining export of services reversed trhis trend and by 2005-06 the current account registered a deficit of 1%.

Table 1: Key Macroeconomic Indicators for India

	1992	1996	2000	2005
Real GDP Growth (3 year average)	4.02	6.39	5.54	9.07
Current Account Deficit (% of GDP)	-1.84	-1.55	-1.00	-0.97
Fiscal Deficit (% of GDP)	5.89	5.29	6.17	4.50
Inflation	8.97	7.55	3.52	4.45
External Debt (% of GNI)	37.34	24.3	21.77	15.39
Reserves ($ Billion)	9.54	24.89	41.06	137.82

Source: World Development Indicators 2008 CD ROM and RBI Handbook of Statistics 2007

The enactment of the Fiscal Responsibility and Budget Management (FRBM) Act in 2004 required the central government to lower its fiscal and revenue deficit by certain percentage points every year. Despite some slippages, Government of India has largely adhered to these targets. As a result the central government fiscal deficit decreased from a high of 7% in 1998-99 to 4.50% in 2005-06.

The rapid growth of the economy also ensured that the ratio of external debt to Gross national Income (GNI) witnessed a steep fall over the last few years. While external debt witnessed an increase of 36% from $90 billion in 1992 to reach $123 billion in 2005, as a percentage of GNI, it fell from 37.43% to 15.39%. The modest growth in external debt was accompanied by massive accumulation of international reserves leading to a sharp increase in the resrves to debt ratio. International reserve holdings increased from $9.5 billion to $137 billion during this period resulting in an increase in the reserve to debt ratio from 10.57% to 112%.

Thus given the significant improvement in the economic health in the Indian economy and reduction in custom duties and tariffs, one would have expected trade misinvoicing to reduce significantly in recent years. However, as is evident from Figure 3, this did not happen. Import overinvoicing, which as described in Section 7 is negatively impacted by custom duties and tariffs, did not commensurately reduce with the reduction in tariffs by the mid 1990s.

Underinvoicing of imports decreased from 1991 to 1992 as crisis conditions in the domestic economy countered the tariff evasion motive. However, in the subsequent year, tariff evasion again dominated over fears of capital depreciation and there was a surge in import underinvoicing. There was a reversal in the trend between 1993 and 1995 with net import underinvoicing

Figure 3: Trade Misinvoicing in India *vis-á-vis* the World (Share in GDP)

(a) Export Underinvoicing   (b) Import Overinvoicing
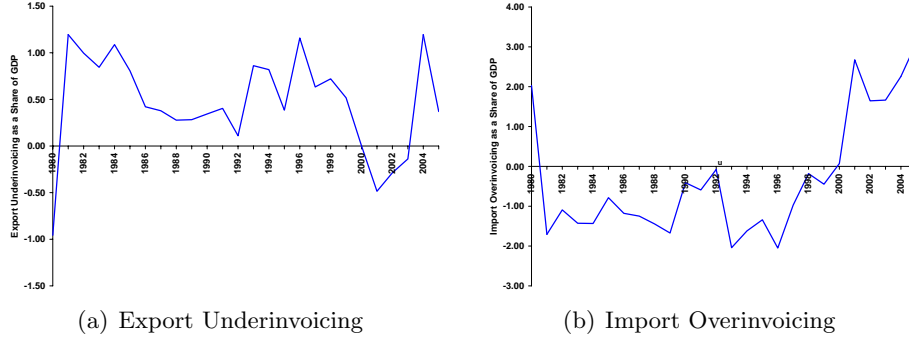
declining from earlier levels. Some amount of overinvoicing of imports in these years could be attributed to the capital boom witnessed in that period, which facilitated the financing of a number of industrial projects that were associated with imports of capital goods. These imports allowed corporates to accumulate illegal assets overseas. The incentive to overinvoice imports declined in 1996 with the collapse of the public issue market and tightening of credit in 1995-96.

The desire to overinvoice imports to take capital out of the country again countered the need to underinvoice imports to evade tariffs in 1997 and 1998. Increased overinvoicing in this period resulted in a sharp decline in net import underinvoicing. While in 1996, India witnessed underinvoicing of around 2% of its GDP, by 1998 it had declined to 0.18%. This was a period of political instability with as many as four governments holding office in the span of 11 months.

Overinvoicing of imports significantly increased after 2000 and jumped from negligible levels in 2000 to over 2.67% of GDP in 2001. It declined somewhat in 2002 and 2003 but since then has peaked again and in 2005 was around 3.1% of GDP.

Figure 3 also shows that export underinvoicing has not witnessed a secular decline in recent years despite the strengthening of the economy. As discussed below, one of the key factors influencing trade misinvoicing is the expectations of currency depreciation. If the currency is perceived to be overvalued then by underinvoicing exports, the exporter is able to realize greater amount of domestic currency for a given amount of foreign exchange receipts, when the expected depreciation happens. Thus one would expect underinvoicing of exports to reduce after the expected depreciation. However, at times a fall in the value of the currency can create expectations of further falls and induce the exporter to keep capital outside. These two contrasting expectations influences the pattern of export underinvoicing in

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the year of depreciation.

In February 1992, a dual exchange rate system was introduced, which allowed exporters to convert 60% of their export proceeds at market exchange rate and the remaining 40% at a lower official rate. This resulted in a drop in export misinvoicing In 1993-94. The surge in foreign portfolio inflows put an upward pressure on the exchange rate but the RBI responded by maintaining the exchange rate at constant levels. Despite expectations of appreciation, export underinvoicing significantly increased in 1993 and 1994. With the Indian rupee depreciating in September 1995, export underinvoicing levels briefly decreeased in that year, but political instability from 1996-98 again saw export underinvoicing jump to higher levels.

Export underinvoicing witnessed a sharp fall since 1999 reaching negative levels in 2001 for the first time in nearly two decades. It continued to record negative levels till 2003. Over this period the current account posted a surplus due to declining merchandise imports and booming services exports, thereby reducing expectations of currency depreciation. The widening current account deficit, on account of high commodity prices and reduced services' exports, from 2004, again raised expectations of a possible erosion of the value of Rupee and induced capital flight through misinvoicing.

One of the reasons for continued misinvoicing of trade despite strengthening of the economy and lowering of tariffs could be the extent of capital account liberalization in India relative to other countries (Shah and Patnaik, 2007). Table 4, based on Prasad (2009), presents summary statistics on some of the major *de jure* and a *defacto* measure of the openness of the capital account. Looking at the *de jure* measures it is clear that, barring the Edwards measure, India has remained virtually stagnant in terms of liberalization of the capital account since the mid-1980s.

Table 2: Extent of Capital Account Openness in India & China

	India	China	Full Sample Median	Emerging Markets Median
Chinn-Ito				
1985	-1.13	-1.13	-1.13	-1.13
1995	-1.13	-1.13	-0.09	-0.09
2006	-1.13	-1.13	0.14	0.03
Edwards				
1985	25	37.5	50	37.5
1995	25	37.5	75	50
2000	75	37.5	81.25	62.5
Miniane				
1985	0.83		0.86	0.86
1995	0.83		0.43	0.86
2000	0.86		0.36	0.86
Lane & Milesi-Ferreti				
1985	23.95	17.54	99.97	74.47
1995	31.93	58.71	113.51	100.05
2004	57.75	102.78	156.52	132.28

Source: Prasad (2009) and Lane and Ferretti (2007)
In both Chinn-Ito index and Edwards index a higher number represents a more open capital account. While the Chinn-Ito index goes from -2.54 to 2.54 the Edwards index goes from 0 to 100. In contrast, the Miniane index represents capital account restrictions and goes from 0 to 1, with a higher number indicating a less open capital account.

Given that most of the *de jure* measures are based on IMF's AREAER, these measures might be on the conservative side as the AREAER counts as restriction even some minimal registration requirements. Therefore we also look at the *de facto* measure developed in Lane and Ferretti (2007), which constructs a volume based measure of international financial integration, looking at the ratio of stock of external assets and liabilities to GDP. While the ratio increased from 24% in 1985 to 32% in 1995 and further to 58% in 2004, India was well below international averages throughout this period.

India's extent of integration was only one-third of the median level of integration amongst emerging markets.[2] While in 1985, India ranked as the second most restrictive emerging market according to this measure, just behind China, by 1995 it had become the most restrictive emerging market. Even as late as 2004, India's extent of integration was only higher than Iran among the emerging markets.

A number of these restrictions are in the form of the outflow of capital by

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[2]The set of emerging markets include Argentina, Brazil, Chile, China, Colombia, Czech Republic, Egypt, Hungary, India, Indonesia, Iran, Israel, Jordan, Korea, Malaysia, Mexico, Morocco, Peru, Philippines, Poland, Russia, South Africa, Taiwan, Thailand, Tunisia, Turkey and Vietnam.

Figure 4: Current and Capital Accounts and the Yuan

(a) Capital Account Openness

(b) Exchange Rate Overvaluation

(c)
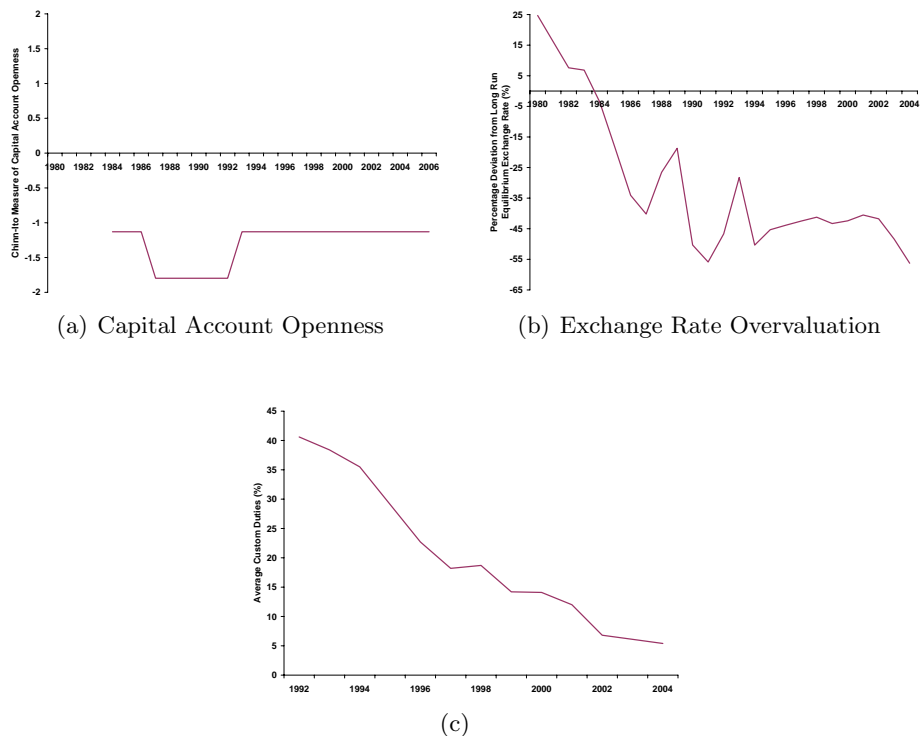
domestic residents. Thus the closed nature of the capital account could offer an explanation for agents preferring to misinvoice trade as way to take capital out.

# 5 Example: Misinvoicing in China

Hong Kong is an *entrepot* trading centre that is highly linked to the Chinese economy. Hence, in our analysis, we deal with misinvoicing with respect to the sum of China and Hong Kong.

China's evolution is similar to that of India's. Economic conditions have been strong from the late 1980s onwards, thus diminishing the incentive for capital flight. Trade liberalisation has taken place to a greater extent when compared with that seen in India (Figure 4). Moreover, the renminbi has consistently remained undervalued through the 1990s.
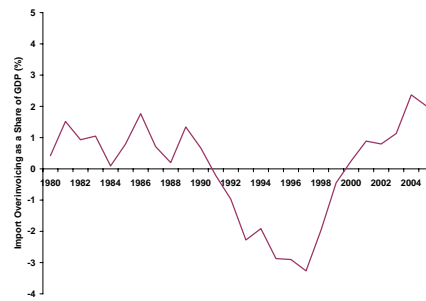
As with India, the capital account has not been opened up. This combination has created the incentives and the means to misinvoice imports.

Figure 5 shows misinvoicing measures for China. Export misinvoicing has
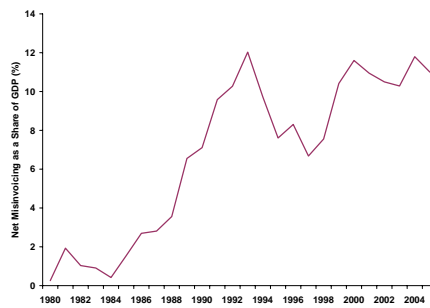
Figure 5: Trade Misinvoicing in China *vis-á-vis* the World (Share in GDP)
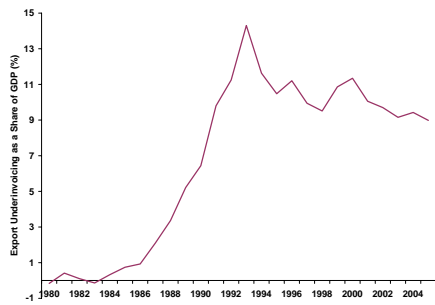
(a) Export Underinvoicing

(b) Import Overinvoicing

(c) Net Misinvoicing

attained very large values, with over 5% of GDP coming into the country every year. Import overinvoicing has changed sign dramatically after the mid 1990s. Putting these together, the net misinvoicing has involved over 8% of GDP coming into the country from 1998 onwards. In recent years, when there were expectations that the CNY would appreciate, it appears that misinvoicing was somewhat larger.

As with India, the size of misinvoicing related flows is very large compared with the overt measures of capital mobility seen on the Balance of Payments. This underlines the importance of misinvoicing as an important element of capital account openness.
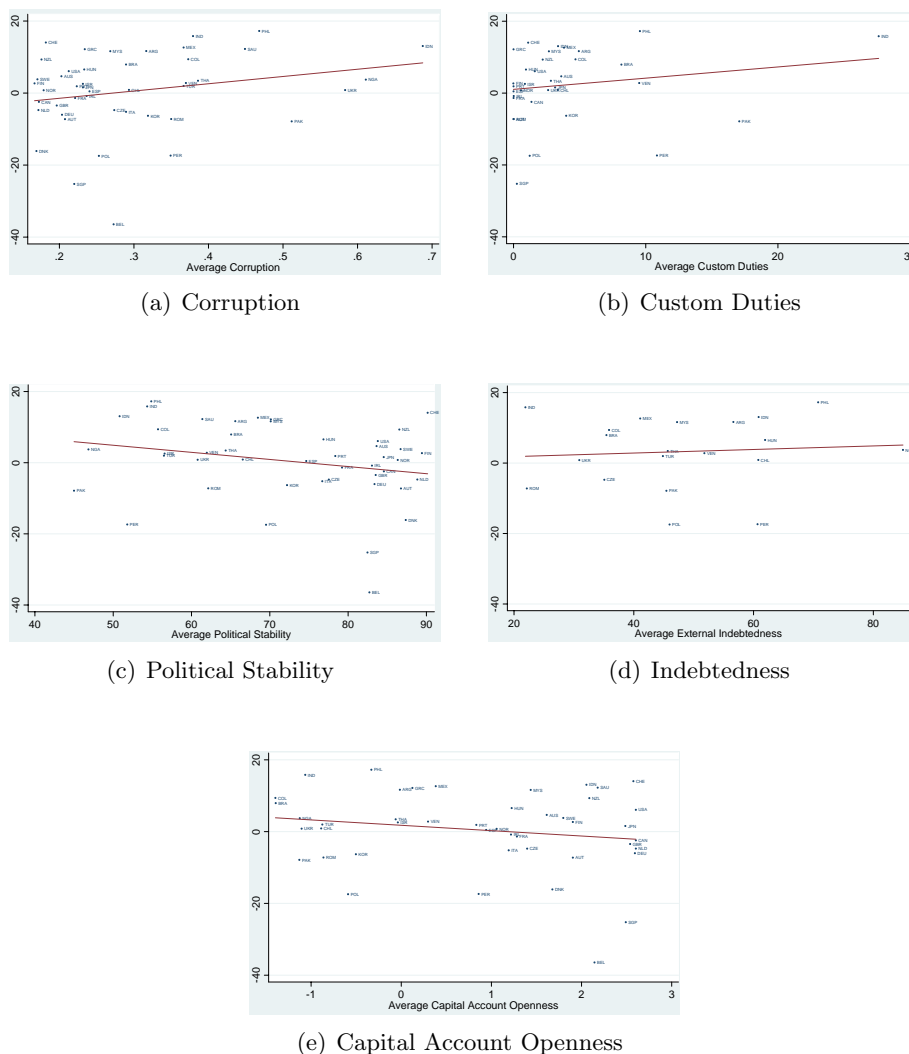
6   Graphical Analysis

Prior to undertaking formal regression analysis, we present below some of the observed relationships between trade misinvoicing and some of the key macroeconomic and institutional variables. In Figure 6 we measure the extent of export underinvoicing on the vertical axis. A higher number indicates greater capital flight through export underinvoicing with the industrialized countries i.e. exporting country is claiming that it has exported less than what is being reported as having been imported by importing countries.

We find that higher capital flight tends to be associated with more corrupt countries. For e.g countries like Nigeria, Pakistan and Ukraine, which rank as most corrupt countries, according to our measure are also the countries that witness maximum capital flight.

Countries, which have high customs rates have also experienced more capital flight through misinvoicing of exports. A prime example in this case is India, which averaged customs rate in excess of 27% during this period, experienced capital flight through export misinvoicing to the extent of 15% of its total exports. On the other hand, industrialized countries like Australia, Ireland, Spain etc., which virtually abolished custom duties during this period, witnessed very limited capital flight from misinvoicing of exports.

Capital account liberalization mitigates capital flight by reducing the market distortions. Also, with an open capital account capital flight is likely to take place through the capital account. Consequently, a country with an open capital account, even if it witnesses capital flight, is not likely to see it happen through trade misinvoicing. In our sample of countries, there is an inverse relationship between capital account liberalization and capital flight. However, if financial markets are repressed then capital account liberalization can have adverse consequences. With domestic interest rates being significantly lower than foreign interest rates, domestic agents will have the

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Figure 6: Relationship between Export Underinvoicing and Key Variables

(a) Corruption

(b) Custom Duties

(c) Political Stability

(d) Indebtedness

(e) Capital Account Openness

incentive to hold their wealth in foreign assets. Moreover, the liberalization of capital account operations if the exchange rate is overvalued, can lead to higher capital flight. Again we find that although greater capital account openness is associated with lower export misinvoicing, the relationship is not very strong. Finally, greater political stability tends to be related with lower misinvoicing of exports.

There is a positive relationship between external indebtedness and misinvoicing. Evidence from African countries has shown that typically government engages in foreign borrowing from donor countries and multilateral agencies while the private sector shifts funds abroad. Moreover, the drain of foreign

exchange resources through capital flight creates further demand for external borrowing. Khan and Ul-Haque (1985) point out that in developing countries the perceived risk of investment is higher than in industrialized countries. Residents of developing countries can expect risk-free compensation for the additional risk on their investment at home. Khan and Ul-Haque (1985) call this the *expropriation risk*, implying that residents of these countries can have their assets expropriated by the government, through outright nationalization, taxes, or exchange controls, whereas the risk on similar assets held abroad is negligible. Consequently, an exogenous or policy-induced shock that raises the perceived level of risk could result in capital flight.

Figure 7: Relationship between Import Overinvoicing and Key Variables

(a) Corruption

(b) Custom Duties

(c) Political Stability

(d) Indebtedness

(e) Capital Account Openness
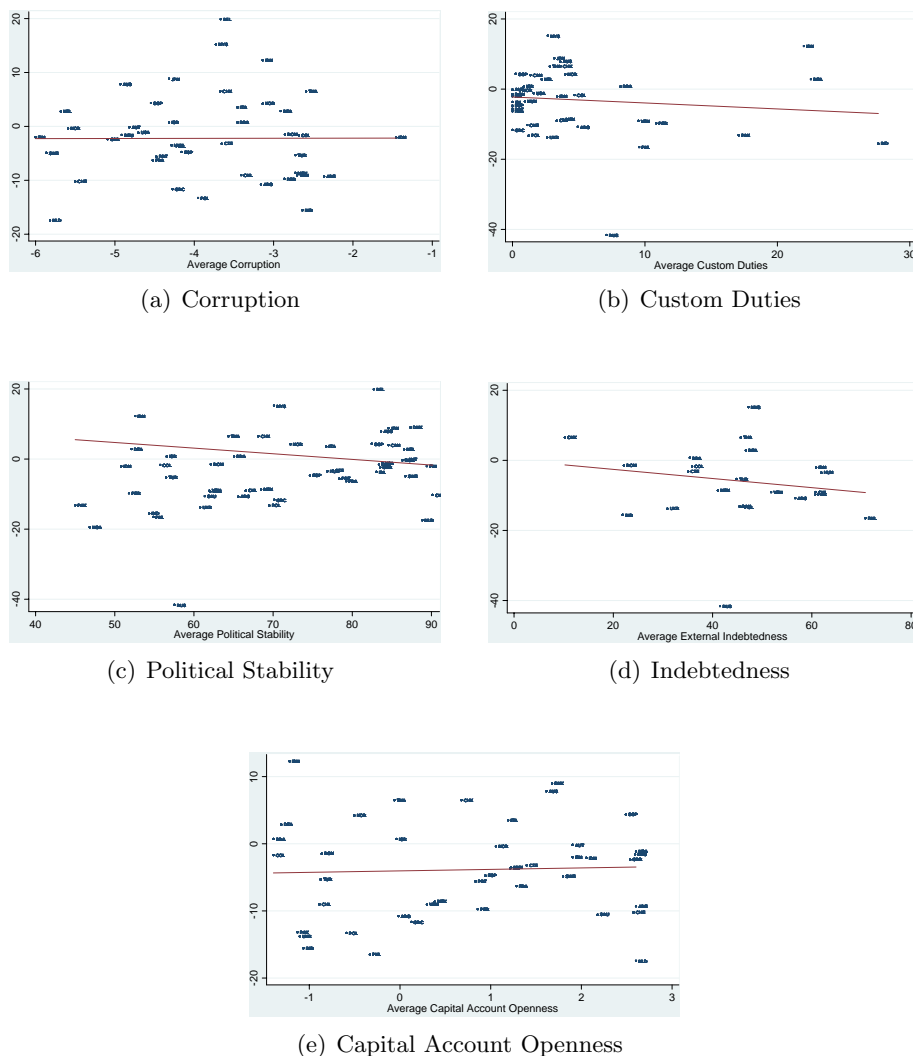
Next, we consider the case where capital flight takes place through overin-

voicing of imports, i.e. the importing country has claimed it has imported more than what the exporting countries have exported. We find that corruption and capital account openness exert limited influence on capital flight through import overinvoicing. Higher custom duties are associated with lower overinvoicing of imports. Typically, in countries with high custom duties, importers will have the incentive to declare a lower worth of their goods to avoid paying these duties.

Political stability continues to be associated with capital flight in the expected direction. More stable countries witness lower import overinvoicing limiting the extent of the capital flight. Finally, we obtain the rather surprising relationship between indebtedness and import overinvoicing. More indebted countries are found to engage in lower import overinvoicing. A closer look at the countries reveal that this result is largely driven by Philippines as well as Latin American economies like Argentina and Peru, which have witnessed high levels of external indebtedness but have experienced relatively modest capital flight through import misinvoicing.

7   Regression Analysis

In this section, we use empirical methods to study the principal determinants of cross-country variation in the level of trade misinvoicing over the period 1980 to 2005. Our primary dependent variable is trade misinvoicing measured as export underinvoicing as well as import overinvoicing *vis-á-vis* industrialized countries. We use industrial country trade data, for trading partner data comparisons, on the assumption that industrial country trade statistics are more accurately recorded in the IMF's Direction of Trade Statistics Yearbook.

Apart from the variables introduced in Section 6, we also look at number of other variables that can influence capital flight. Countries, with high current account deficit are likely to experience capital moving off to foreign shores. A persistent current account deficit can be looked upon as a manifestation of economic instability and induce capital owners to transfer resources to foreign shores. A country that is faced with persistent current account deficit is likely to undertake a devaluation to improve the currant account balance. Alternatively, it can raise resources internally by engineering a transfer from the private sector. This can happen either by direct appropriation/nationalization of private assets or generating seignorage revenue through an inflation tax. In either of the cases the private sector will have the incentive to move its assets beyond the control of the government.

Capital flight also tends to occur in countries, which have low political stability. Politically less stable countries such as Nigeria and Zimbabwe have

experienced a substantial volume of capital flight through import misinvoicing. Political instability causes capital flight as agents seek to minimize the risk of expropriation and future portfolio losses due to political crisis.

Capital is likely to illegally move from home country to a foreign country if the returns are higher in the latter. To evaluate this possibility we look at both the real interest rate prevailing in the home country as well as the real interest rate spread. While the the real interest rate is calculated by looking at the difference between the deposit rates prevailing in a country and the inflation rate, the real interest rate spread is the difference between real deposit rates in the home country and a risk free real interest rate. We proxy the risk free real interest rate with real deposit rates prevailing in the United States.[3] One would expect capital flight to be inversely related with real deposit rates and positively related with real interest rate spread.

Table 3 and 5 displays the regression results employing feasible generalized least squares estimations. We allow for the presence of AR(1) autocorrelation within panels and a heteroscedastic error structure. While Table 3 illustrates the principal determinants of capital flight through export underinvoicing vis-a-vis industrialized countries, Table 5 highlights principal predictors of capital flight through overinvoicing of imports with industrialized countries. Looking across Tables 3 and 5 it is evident that while countries can engage in capital flight through both export underinvoicing and import overinvoicing, the underlying factors driving these are quite different,

Table 3: FGLS Estimates: Determinants of Export Underinvoicing

	I	II	III	IV	V	VI
Dependent Variable: Share of Export Underinvoicing in Exports to Industrialized Countries						
Current Account Deficit	0.267*** [3.311]	0.221*** [2.770]	0.204** [2.550]	0.203** [2.449]	0.152* [1.900]	0.083 [0.667]
Capital Account Openness	-1.326** [-2.349]	-1.137** [-2.060]	-1.298** [-2.324]	-1.039* [-1.675]	-0.854** [-1.992]	-1.413** [-1.982]
Customs Rate	0.026 [0.177]	0.198 [1.305]	0.177 [1.252]	0.169 [0.985]	0.312** [2.287]	0.333** [2.150]
Political Stability	-0.079* [-1.717]	-0.074* [-1.811]	-0.087** [-2.090]	-0.071* [-1.700]	-0.094** [-2.054]	0.107* [1.702]
Real Interest Rate		-0.015 [-0.411]	-0.021 [-0.518]	-0.007 [-0.181]	0.016 [0.453]	0.040 [0.920]
Log of Inflation			0.127 [0.606]	0.217 [1.084]	0.194 [0.936]	0.32 [0.564]
Exchange Rate Rigidity				-0.083 [-0.408]		
Trade Openness					0.062*** [3.710]	0.877*** [3.864]
Indebtedness						0.050** [1.983]
No. of Countries	36	34	34	34	33	17

Robust t statistics in parentheses
*** indicates significant at 1 % , ** indicates significant at 5 % and *indicates significant at 10 %

[3]A positive real interest rate spread implies that the real deposit rates in the United States are higher than in the home country.

One of the key determinants of capital flight through export underinvoicing is the extent of current account deficit. This variable is significant across almost all the specifications outlined in Table 3. A one percentage point increase in the ratio of current account deficit to GDP 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 thereby 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 0.08 to 1.32 percentage points.

Apart from the above direct impact on capital flight, liberalization of the capital account can influence extent of capital flight through what Kose et al. (2006) term as, 'potential collateral benefits' of financial integration. Liberalization of the capital account can act as a catalyst for imposing discipline on macroeconomic policy. With financial globalization, the threat of capital outflow, in the face of opportunistic policies, acts as a 'discipline effect' for the policymaker. Thus an open capital account induces policymakers to undertake and adhere to good policies. As pointed out by Tytell and Wei (2004) these include national competition policy, regulatory rules on private listed companies, regulation of banks, equity and labour markets and finally, monetary and fiscal policy. A number of papers like Tytell and Wei (2004), Gruben and McLeod (2002) and Razin and Yuen (1995) have argued that capital account openness appears to lower inflation by disciplining monetary authorities. Similarly, Kim (2003) goes on to argue that capital account liberalization is associated with a lower fiscal deficit.

Adherence to good policies like low inflation and fiscal deficit increases the economic stability of the country and boosts the confidence of investors to hold assets within the country thereby reducing the extent of capital flight.

On the other hand, increased trade openness is associated with greater capital flight. Export misinvoicing increases by about 0.08 percentage points with an increase in trade openness of one percentage point A larger tradeable sector offers greater opportunities for agents to misinvoice trade, with the objective of moving capital outside the country.

Political stability also shows up as a significant predictor of capital flight and has a strong negative influence on export overinvoicing. Typically, in

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countries with low political stability, the residents take out their money to avoid the possibility that government in some form can erode away the future value of such holdings. Higher customs rate is also associated with higher capital flight although the impact is not significant across all specifications. On the other hand, real interest rate, inflation rate and exchange rate regime do not have a significant impact on export overinvoicing.

Finally, we find that countries with higher external indebtedness have experienced greater capital flight. A number of reasons have been forwarded for the positive association between capital flight and external debt. Debt disbursements can signal an increase in the probability of a fiscal crisis and induce capital flight. Provision of external debt is also likely to put upward pressure on domestic currency, motivating residents too acquire foreign assets before an expected devaluation takes place.

Focusing on subsamples and looking specifically at the industrialized and developing countries separately one can see that the overall results are largely driven by the performance of the developing countries. For the industrialized countries, customs rate and real interest rate show up as key predictors of export misinvoicing. The positive relationship between customs rate and export underinvoicing is largely driven by countries like Australia and Japan, which maintained relatively high customs duties.

On the other hand, in the developing countries, export underinvoicing can largely be explained by capital account openness, political stability and trade openness. Countries like Singapore, Czech Republic, Ireland and Peru had undertaken significant liberalization of the capital account over the last two decades and witnessed diminishing capital flight through export misinvoicing during this period. On the other hand countries like India, Philippines and Columbia, which moved relatively little on liberalization of capital account during most of this period, witnessed strong capital flight through trade misinvoicing.

Another factor, which had a strong influence on trade misinvoicing in developing countries was the extent of political stability. Again, more politically stable countries like Singapore, Czech Republic and Korea witnessed lower misinvoicing compared to countries like Pakistan, Nigeria and Algeria. Finally, trade openness also shows up a significant predictor of trade misinvoicing among developing countries.

Table 4: FGLS Estimates: Determinants of Export Underinvoicing (Sub sample analysis)

Dependent Variable: Share of Export Underinvoicing in Exports to Industrialized Countries											
	Industrialized Countries					Developing Countries					
	I	II	III	IV	V	VI	VII	VIII	IX	X	XI
Current Account Deficit	-0.188 [-1.134]	0.042 [0.272]	0.018 [0.115]	-0.039 [-0.222]	-0.04 [-0.244]	0.322*** [3.414]	0.298*** [3.216]	0.285*** [2.900]	0.260** [2.154]	0.181* [1.802]	0.083 [0.667]
Capital Account Openness	-0.183 [-0.0894]	0.645 [0.339]	0.24 [0.136]	0.07 [0.0366]	0.534 [0.300]	-1.006** [-2.475]	-1.196** [-1.969]	-1.249** [-1.982]	-1.407** [-2.074]	-0.83* [-1.868]	-1.413* [-1.823]
Customs Rate	2.366*** [3.625]	2.122*** [3.596]	2.131*** [3.866]	2.061*** [3.472]	1.681*** [2.725]	-0.123 [-0.741]	0.038 [0.220]	0.012 [0.0706]	0.084 [0.674]	0.258* [1.694]	0.334** [2.150]
Political Stability	0.008 [0.0991]	0.075 [0.997]	0.068 [0.877]	0.079 [1.007]	0.108 [1.347]	-0.171** [-2.519]	-0.193*** [-3.016]	-0.193*** [-2.896]	-0.216*** [-3.019]	-0.160** [-2.568]	-0.107 [-1.202]
Real Interest Rate		-0.432*** [-2.802]	-0.383** [-2.113]	-0.405** [-2.066]	-0.382** [-2.179]		-0.004 [-0.0948]	0.001 [0.0261]	-0.039 [-0.824]	0.046 [1.154]	0.04 [0.920]
Log of Inflation			-0.137 [-0.270]	-0.125 [-0.241]	-0.108 [-0.212]			0.361 [1.398]	-0.011 [-0.0265]	0.364 [1.376]	0.321 [0.564]
Exchange Rate Rigidity				-0.191 [-0.714]					-0.324 [-0.763]		
Trade Openness										0.092*** [4.523]	0.088*** [3.864]
Indebtedness					-0.059 [-1.642]						0.05 [1.933]
Number of ccountries	11	11	11	11	11	25	23	23	23	22	17

Robust t statistics in parentheses

*** indicates significant at 1 % , ** indicates significant at 5 % and *indicates significant at 10 %

Next, when we focus on the key determinants of capital flight through import overinvoicing, the results are quite different from above. Current account deficit continues to be a significant determinant of capital flight through import overinvoicing. Again, across all specifications it exerts a significant positive impact on trade misinvoicing. On the other hand, both capital account openness and political stability have an impact on trade misinvoicing on expected lines but the effect is not significant.

Table 5: FGLS Estimates: Determinants of Import Overinvoicing

	I	II	III	IV	V	VI
Dependent Variable: Share of Import Overinvoicing in Imports to Industrialized Countries						
Current Account Deficit	0.260*** [4.846]	0.219*** [3.208]	0.232*** [3.331]	0.228*** [2.906]	0.246*** [3.205]	0.734*** [2.619]
Custom Duties	-0.357*** [-3.448]	-0.332*** [-3.054]	-0.320*** [-2.875]	-0.274** [-2.396]	-0.275** [-2.390]	-0.319** [-1.982]
Overvaluation	0.028* [1.935]	0.047*** [2.702]	0.053*** [2.994]	0.067*** [3.314]	0.073*** [3.574]	0.049 [1.295]
Political Stability	-0.043 [-1.309]	-0.044 [-1.038]	-0.042 [-1.018]	-0.022 [-0.375]	-0.028 [-0.462]	-0.113 [-0.746]
Capital Account Openness		-0.188 [-0.361]	-0.35 [-0.592]	-0.664 [-0.982]	-0.84 [-1.218]	1.003 [0.830]
Log of Inflation				-0.469 [-1.009]	-0.464 [-0.986]	-2.781 [-1.567]
Real Rate	0.071*** [3.434]	0.053 [1.568]		0.046 [1.184]		-0.005 [-0.0646]
Exchange Rate Regime				-0.586 [-1.555]	-0.571 [-1.494]	1.32 [1.324]
Real Interest Rate Differential			-0.042 [-1.160]		-0.023 [-0.475]	
Indebtedness						-0.026 [-0.357]
Number of Countries	33	33	33	33	33	16

Robust t statistics in parentheses
*** indicates significant at 1 % , ** indicates significant at 5 % and *indicates significant at 10 %

Custom duties now show up as a strong determinant of import overinvoicing. Higher custom duties exert a strong negative impact on the desire to overinvoice and the effect is significant across all specifications. By reporting a lower value of shipment, the traders are able to evade import tariffs or customs duties, avoide quotas, and launder illegally obtained money, and engage in capital flight. We find that one percentage point increase in custom duties will reduce import overinvoicing by around 0.3 percentage points.

Another important variable explaining the extent of misinvoicing is extent of currency overvaluation. Exchange rate overvaluation induces devaluation expectations which could induce capital flight for hedging purposes. The farther the adjustment is postponed, the stronger the expectation will be for the devaluation. Moreover, in some latin American countries like Argentina and Mexico, the central bank and the government authorized transfers abroad at the official exchange rates. In such instances, capital flight was a direct result of overvaluation. We find that one percentage point increase in overvaluation results in 0.03 to 0.07 percentage point increase in capital flight

through import overinvoicing.

The real interest rate has a sign opposite to expectations in Column (1) of Table 5. However, once we control for other variables like capital account openness, exchange rate regime etc. we obtain the expected sign but the impact is not significant across any of the specifications. Similarly, real interest rate differential, exchange rate regime, indebtedness and inflation do not have a significant impact on import overinvoicing.

Splitting the overall sample into developing and industrialized countries yield a similar result as before with bulk of the results being driven by the developing countries.

8   Conclusion

Economists have long been aware of trade misinvoicing. The traditional literature has focused on evasion of customs duties, and capital flight, as being the forces at work with misinvoicing. This literature has generally done case studies of individual countries or of a group of countries.

In our knowledge, this paper is the first exploration of misinvoicing in 53 countries over 26 years. If misinvoicing was driven by economic instability and customs duties, in many emerging markets such as China and India, conditions had changed enough to deliver a sharp reduction in misinvoicing. The broad summary statistics suggest that such a reduction has not taken place. This suggests the need for a further exploration of the factors affecting misinvoicing.

The most important source of variation lies in looking at both industrial and emerging economies. In the early years, industrial countries were open to trade and had some capital account restrictions. By and large, in the years under examination, these capital account restrictions were eliminated. In the early years, emerging markets were closed to both trade and capital flows. A substantial opening took place on the trade account, but through the full span of the data, a lot of *de jure* restrictions against capital flows remain in place.

Our analysis shows a link between *de jure* capital controls and capital flows achieved through misinvoicing. We find that opening up of the capital account leads to a significant decline in capital flight through export underinvoicing. However, we do not get a similar relationship in the case of import overinvoicing. In the latter case, we believe that the net import misinvoicing is a result of two competing factors - desire to keep capital out of the ecountry leading to import overinvoicing, and the willingness to evade custom duties resulting in import underinvoicing.

Moreover, capital movements achieved through misinvoicing are substantial when compared with those seen under the capital account on the Balance of Payments. Our results, hence, suggest that trade misinvoicing is an important element of *de facto* convertibility.

These results are connected with an emerging literature on the two-way links between liberalisation of the current account and liberalisation of the capital account. Some policy analysts have argued that it is beneficial for developing countries to open the current account but to keep the capital account closed. To the extent that there are two-way links between opening the current account and opening the capital account, an open current account might not be compatible with a closed capital account.

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Appendix

A List of Countries

Industrialized Countries	Developing Countries	
Australia	Algeria	Mexico
Austria	Argentina	Nigeria
Belgium	Brazil	Pakistan
Canada	Chile	Peru
Denmark	CHK	Philippines
Finland	Colombia	Poland
France	Egypt	Portugal
Germany	Greece	Romania
Italy	Hungary	Russia
Japan	India	Saudi Arabia
Netherlands	Indonesia	Singapore
New Zealand	Iran, I.R. of	South Africa
Norway	Ireland	Thailand
Spain	Israel	Turkey
Sweden	Korea	Ukraine
Switzerland	Kuwait	United Arab Emirates
United Kingdom	Malaysia	Venezuela, Rep. Bol.
United States		

B Summary Statistics of Key Variables

Variable	Obs	Mean	Std.Dev	Min	Max
Export Misinvoicing *vis-á-vis* IC	1345	3.19	22.7	-89.27	169.54
Import Misinvoicing *vis-á-vis* IC	1345	-3.77	15.89	-138.43	81.65
Net Misinvoicing *vis-á-vis* IC	1345	-0.92	10.69	-48.36	62.76
Export Misinvoicing *vis-á-vis* World	1319	-1.14	17.98	-78.94	106.03
Import Misinvoicing *vis-á-vis* World	1319	-1.45	15.15	-115.64	72.87
Net Misinvoicing *vis-á-vis* World	1319	-1.41	8.74	-43.56	31.28
Political Stability	1132	70.35	14.82	20.00	97.00
Corruption	1135	3.76	1.45	0.00	6.00
Exchange Rate Rigidity	1142	3.57	1.38	1.00	5.00
Average Custom Duties	652	6.42	9.09	-0.09	66.34
Inflation	1329	40.96	282.99	-25.70	6836.88
Real Interest Rate	1028	5.94	10.99	-91.72	88.11
Indebtedness	616	45.05	25.72	0.74	158.57
Capital Account Openness	1263	0.81	1.64	-1.77	2.54
Real Interest Differential	1028	-0.47	11.02	-80.12	95.34
Trade Share	1297	69.65	49.62	11.55	456.09
Current Account Deficit	1254	0.07	9.58	-54.67	240.50
Exchange Rate Overvaluation	1251	6.93	40.28	-231.79	193.03